EVIDENCE FOR HEALTHY CHILD AND YOUTH DEVELOPMENT

INTERVENTIONS FOR CORE PUBLIC HEALTH FUNCTIONS

McCreary Centre Society

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EXECUTIVE SUMMARY

For children and youth in British Columbia, the school years are important periods of physical, cognitive, social, and moral development. Choices made during this time influence health and behaviours throughout their lives, but these choices are influenced by social environments and broader determinants of health. There is a large body of research focused on effective interventions to prevent and reduce risk, but evidence about public health interventions to promote healthy development is much less common. Public health can promote the healthy development of school-aged children and youth through a variety of population-focused interventions and programs.

Aspects of this healthy child & youth development approach include:
o A shift towards interventions that enhance and facilitate adaptive qualities in youth, not just a focus on interventions that reduce risk factors and negative behaviours.
o Identifying protective factors and assets that buffer risky environments and lead to positive child and youth development.
o Focuses on the key developmental tasks of school-age children and youth:
   ▪ Healthy physical growth and pubertal development
   ▪ Healthy emotional and cognitive development
   ▪ Healthy sexual development
   ▪ Healthy social development and community engagement
   ▪ Healthy peer relationships and supportive peer networks
   ▪ Healthy moral development.
   Young people who effectively accomplish their developmental tasks will not only be less likely to become a strain on the public health infrastructure, but will also be more likely to live a long and enjoyable life.

The Interventions and Evidence of Effectiveness

There are a number of different public health intervention strategies for healthy child and youth development, including mentorship programs, skill-building interventions, health education interventions to alter knowledge or social norms and attitudes, social marketing interventions to alter social norms and attitudes, as well as community development, coalition-building, and policy interventions. This review explored the research evidence for public health interventions that promote positive child and youth development. Studies focused on these sorts of interventions are much less common than studies focused on risk reduction or risk prevention, but the literature yielded evidence about interventions that are or could be implemented in British Columbia.

Health Education Programs –
   o Most commonly conducted and evaluated single-strategy programs
   o Relatively inexpensive, can be implemented broadly through schools or community groups
   o Unfortunately, as a sole strategy, health education has limited effectiveness in fostering healthy child and youth development.

Skill building –
- o Seldom used alone, but even as a single strategy, it has been shown to be an effective approach
- o Effective with health education strategies and with supportive groups
- o Most often used to promote sexual health, emotional regulation, and physical activity

Mentoring Programs –
- o Unlike other strategies, commonly stand-alone programs
- o Focused on positive child and youth development through matching young people with caring adults to help foster social support and connectedness
- o Evidence of effectiveness, especially if longer term programs
- o Financial constraints of supporting each match can limit program

Policy Development –
- o Public health core functions are seldom in the position of enacting policy, but may be involved in advocating for or developing health-related policies, or in analyzing the health effects of various policies enacted in other sectors
- o Most policies focused on preventing or reducing risks, very limited research evidence on policies to promote healthy development
- o However, one policy with evidence for effectiveness has been mandating community service or service-learning involvement as part of educational requirements (to graduate from high school)

Community Development and Coalition Building –
- o Seldom stand-alone strategies, but are often incorporated with health education, skill building, or policy development
- o Community development has good evidence of effectiveness for several different areas of healthy development, including healthy growth and development, social development and community engagement, and creating positive school environments

Multiple Strategy Approaches –
- o Many population-level interventions to foster healthy child and youth development use a combination of strategies
- o Combinations vary widely, even in similar areas of youth development, and so it is quite difficult to compare the relative effectiveness of different combinations
- o In general, multiple strategy approaches show stronger effects and longer-term improvements than individual strategies, especially when compared to health education as a stand-alone strategy
- o Multi-strategy approaches are more expensive, and size of effect should be weighed; must be strong enough to justify the increased complexity and expense.

o   Programs that include a community development or policy/ environment change, or skill building as part of multiple strategies, have stronger, more lasting effects, and more lasting effects--Action Schools! BC is a clear example.

Gaps in Evidence

While there is a growing body of evidence for public health interventions to promote protective factors and assets for healthy child and youth development, some areas have almost no evidence, and few if any interventions. Families are key supportive environments for fostering healthy development among school-age children and adolescents, yet we were unable to find evidence of effective public health interventions designed to foster family connectedness or supportive parenting for this age group. Further work in developing and testing such interventions may be an important first step.

Similarly, there are very few examples of policies designed to promote healthy development for this age group, and even less research evaluating the effectiveness of policy changes. Strategies to link policy change to population indicators of healthy development at the local or regional level may help document effects of policy change.

Indicators and Surveillance

As health promotion efforts incorporate a healthy child and youth development perspective, existing surveillance techniques that focus on risks and problems are inadequate. Indicators must be able to measure changes in positive outcomes and protective factors or assets, both in individuals and across populations. It is important to actually measure the outcomes that healthy child and youth development interventions are designed to promote, rather than only measuring reductions in morbidity and mortality.

Some measures of protective factors and positive child and youth development are being used in British Columbia and other places. Some of these measures may be useful as indicators for monitoring the effectiveness of interventions at the local level. At the same time, comprehensive population-level data collection tools that have these measures, such as the BC Adolescent Health Survey, when conducted at regular intervals, can help track trends in the development of school-aged children and youth, document the potential effects of population-level interventions, and identify needs for future interventions. By incorporating both protective factors and risk factors in the same surveillance tools, the effects of positive youth development approaches on both promoting healthy development and reducing risky behaviours are possible.

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Chapter 1. Introduction

For children and youth in British Columbia, the school years are important periods of physical, cognitive, social, and moral development. At the same time that young people are maturing physically, they develop more advanced ways of thinking, a growing sense of identity, and more nuanced values, all within the context of a widening circle of relationships. The choices that are made during this time influence health and behaviours throughout their lives, and the potential for positive growth during this period is significant. Public health has a unique opportunity to promote the healthy development of school-aged children and youth, through population-focused interventions and programs.

What is healthy child and youth development?

Healthy child and youth development represents a shift towards interventions that enhance and facilitate adaptive qualities in youth, and away from interventions that reduce risk factors and negative behaviours. There is a large body of research on risk factors for young people, such as exposure to abuse or poverty, and on risky behaviours that contribute to morbidity and mortality, such as problem substance use. However, there is now an emerging healthy development approach attempting to identify protective factors that buffer risky environments and lead to resilience through positive child and youth development. Resilience is often the emphasis of healthy development programs for young people, with the assumption that the more resources a young person has, the more prepared they are to make adaptive decisions and avoid negative outcomes. The positive youth development perspective represents a shift towards enhancing these qualities, and away from risk-reducing interventions. It is not possible to remove all risk exposures, and in itself that may not be the most health-producing circumstance; there is some support for the function of adversity in the lives of healthy youth experience, and that "problem-free is not fully-prepared" (Catalano, 2002). But equipping young people with the skills and supportive resources to negotiate risk exposures without harm is an important process.

Within the healthy child and youth development perspective, there are a number of different approaches to defining and identifying healthy young people. For example, some researchers conclude that positive growth is simply an absence of negative characteristics. Lerner, Fisher, & Weinberg (2000) identified "5 C's" that represented key components of healthy child and youth development: competence across domains, confidence in oneself, connections to all elements of the community, character and moral commitment, and a sense of caring and compassion. Other researchers have defined healthy child and youth development as living up to potential, or achieving other developmental goals, such as developing problem-solving skills, or having a personal purpose (McCreary Centre Society, 2003).

Although it is common to categorize young people based on age ranges, the majority of evidence for child and youth interventions is based in primary and secondary schools. Inclusion in many evaluations is determined by grade, not age, and therefore this review will be restricted to evaluations of programs for primary and secondary school students.

Different developmental tasks of school-age children and adolescents

School-age children and youth have a variety of developmental tasks during this part of the lifespan. This review will focus on evidence of positive child and youth development interventions that enhance the capacity of young people or help them achieve the developmental tasks of childhood and adolescence. The developmental tasks are:

- *Healthy physical growth and pubertal development:* Puberty commonly begins during the early school-age period, often at around age 8 or 9. During the next several years, through adolescence, children will attain their peak growth, increase the deposition of fat in different places on the body, develop secondary sex characteristics, deposit calcium in their bones, and prune the neural connections and pathways in their brains. Public health interventions that encourage healthy growth, and the development of *sound nutritional habits and regular physical activity* among adolescents, can lead to long-term reductions in chronic conditions during adulthood.

- *Healthy emotional and cognitive development, and self-regulation:* In the early school years, children are predominantly concrete thinkers. During their teenage years, adolescents begin developing the capacity for formal operational thought, and develop their own perceptions of the self. Although early adolescence is still a time of "magical thinking," in which adolescents feel they are different and unique, and may not perceive all the consequences of their actions, decision-making skills become increasingly more sophisticated over the teen years. Similarly, there is a shift in the emotional response systems of the brain, from more impulsive and emotionally labile states to more reasoned and self-regulating states, and the ability to be aware of, and more effectively manage, moods. During this period, children and adolescents begin to develop skills at *delaying gratification* and making choices that will positively affect their futures.

- *Healthy sexual development:* With the onset of puberty and eventual physical sexual maturation, young people experience formative moments in sexual development during the school age years and throughout adolescence. Young people become aware of sexual attractions and arousal, and most youth identify their sexual orientation during these years. This is often the time when young people begin to develop intimate romantic relationships and may become sexually active. Positive development during this time can lead to a *safe, healthy and mature approach to intimate relationships and sexuality*.

- ***Healthy social development and community engagement:*** As children move into the school setting, and as adolescents gradually gain autonomy, their social environments outside the family expand, and begin to have a greater effect on their health and developmental trajectories. In order to develop into caring and contributing members of society, children and young people need opportunities to *learn how to help others, and to become aware of the social issues that affect their communities*. Programs that promote social development through school connectedness and community involvement may be effective in promoting long-term health and well-being.

- ***Healthy peer relationships and supportive peer networks:*** Peer networks become increasingly significant as a child grows older. Close friends start to replace parents as role models, sources of advice, and behavioural reinforcement. This transition can be influenced a great deal by their relationships with families and communities. Young people should *develop positive peer networks, with healthy norms and positive role models*, that can support academic achievement, reduce emotional stress, and promote healthy decision-making around risk behaviours.

- ***Healthy moral development:*** While the early school age is the stage at which children begin to develop an understanding of moral precepts as well as internal motivation to do what is right, adolescence is the time of both strong idealism and questioning the basis of judgments about good and evil. As young people experience cognitive development and gain emotional autonomy from their parents, they also begin to develop more sophisticated understandings of right and wrong actions and moral reasoning. At the same time, they may face pressure from peers to develop values and behaviours different from those expressed by their family. Instead of unquestioningly accepting the values and opinions of others, a task for adolescents is *deciding who they are, what they believe in, and what they consider right or good*.

Despite facing some risk factors, the majority of children and young people successfully achieve these developmental tasks and grow into healthy adults. Young people who effectively accomplish their developmental tasks will not only be less likely to become a strain on the public health infrastructure, but will also be more likely to live a long and enjoyable life.

Why is a healthy child and youth development perspective important for health promotion?

It has been quite common in public health practice to focus on interventions that aim to prevent negative health outcomes by preventing or reducing key risk factors that lead to negative developmental outcomes, such as smoking (Thomas, 2006), alcohol use (Foxcroft, 2006), and violence (Petrosino, 2006). This focus on preventing behaviours that can derail healthy development is important, but it is incomplete: health is not just the absence of illness or disability. Although some of these programs are successful in

achieving their goals, the scope of such interventions is often limited to a single risky behaviour. When the programs are successful, they rarely have a positive effect on other facets of the lives of young people, and can often create unforeseen negative effects. Furthermore, interventions designed to reduce risk factors are often restricted to at-risk youths, whereas positive child and youth development programs can be implemented to benefit entire populations (McCreary Centre Society, 2002).

> *A focus on preventing behaviours that can derail healthy development is important, but incomplete: health is not just the absence of illness or disability.*

But what actually promotes healthy development? There have been few interventions and programs focused on positive youth development, but this is a growing area of interest, in part because the emerging evidence shows such factors have the opportunity to influence health and risk across a variety of domains. Reducing risk exposures and problem behaviours in these interventions becomes a secondary outcome to capacity building; as children and youth are supported in developing adaptive coping skills, positive attitudes and values, healthy behaviours and supportive social networks, risk exposures become less influential, and health-compromising behaviours are less likely to be taken up, or to become lifelong patterns. A growing body of observational evidence has demonstrated the importance of social support or connectedness to family, peers, school, and community in promoting healthy development (Catalano, Berglund, Ryan, Lonczak, & Hawkins, 2004). Parents have a significant role in the lives of young people, and family and parental connectedness can be a key protective factor. Furthermore, it is connectedness to school that can play a strong role in the emotional development of young people, not school policies (Blum & Rinehart, 1998). As support grows for the usefulness of these factors, the challenge becomes developing techniques to foster them and facilitate healthy development.

What does healthy child and youth development look like? - Measurement challenges and decisions for communities

Although there is some consensus on the risk factors that are associated with unhealthy outcomes, and the general developmental tasks that should be accomplished in adolescence, there can be great variation in identifying the specific characteristics of healthy children and youth. In some areas, such as education, it may be easy to reach agreement on how to measure healthy development, but that is not always the case. For example, some populations may believe that healthy young people completely abstain from sexual activity, but others may associate healthy sexual development with safe sexual behaviour. In British Columbia, some cultural groups may have different norms and values than other communities, and healthy growth may look much different to them (Brokenleg, 2003). Even in developmental tasks that may seem universal, such as physical development and nutrition, there can be cultural differences regarding what constitutes physical health, and how it is appropriate to accomplish and work towards that goal. Prior to implementing any intervention to promote positive child and youth

development, it is important to first identify what the community believes is a healthy school-aged child or young person, and what qualities should be promoted or facilitated.

Once outcomes have been identified, there are some specific measurement challenges that are associated with healthy development. It is often difficult to specifically identify and measure the mechanism of change, instead of the final outcome. For example, if a program is implemented to foster a protective factor, such as school connectedness, with the goal of promoting safe sexual behaviour, positive changes in the outcome (sexual behaviour) are not necessarily indicative of changes in school connectedness. Without the proper measurement tools, it is difficult to accurately identify the impact of interventions.

It is also important to establish effective surveillance mechanisms to track positive child and youth development and associated protective factors. Surveillance strategies are often implemented to monitor the occurrence of negative events and health problems. Yet commitment to a positive child and youth development approach to population interventions will require monitoring of those outcomes, to ensure the interventions continue to be relevant and effective. A discussion of indicators and surveillance strategies that have been used in Canada is described in Chapter 4.

Environments for positive child and youth development

Interventions to promote positive child and youth development can take place in a number of environments. Although interventions can be effective in family and community settings, schools are a common setting to facilitate positive child and youth development, in part because young people spend most of their day in the school setting. Previous research has established that risk factors are often interrelated, and that interventions may be required in multiple domains to influence a specific behaviour. Protective factors can influence a variety of different risk behaviours, and programs may benefit from intervening at the school, family, and community level (Komro & Stigler, 2000).

Blum et al. (2002) developed an ecological model that identifies the risk and protective factors that can influence behaviour, which subsequently influences healthy development. At the macro level, there are environmental factors that can influence the individual, such as policy and history. The macro level can both influence, and be influenced by, the immediate social environment. The social environment both affects the individual, and three key influences on the individual: school, family, and peers.

Recent evidence from British Columbia (MacKay, 2007) indicates that protective factors have an additive effect, that is, when children have more protective factors, they are more likely to report positive outcomes and healthy development. At the same time, not all assets or protective factors are equal: family connectedness and school connectedness are two of the strongest protective factors in predicting healthy child and youth development, as has been shown in other studies among BC children and youth (Saewyc, Wang, Chittenden, Murphy, & the McCreary Centre Society, 2006). Other protective factors, such as participation in extra-curricular activities, volunteering, and peers with healthy values, do contribute above and beyond these two, but given the

strength of family and school connectedness as protective factors, there are a relatively few evaluated interventions aimed at fostering family or school connectedness.

> *Not all assets or protective factors are equal: family connectedness and school connectedness are two of the strongest protective factors in predicting healthy child and youth development.*

In each environment there are both risk and protective factors that have been identified to foster positive child and youth development. In the social environment, risk factors include arrests, poverty, exposure to violent media or advertising, access to tobacco, alcohol, drugs, and firearms, fertility rate, and television watching. Social protective factors include school enrolment, educational attainment, health care facilities and utilization, religious institutions, role models, and pro-social media. The risk factors at school are the size of the school, absenteeism, suspension, retention, and poor academic performance. The contrasting protective factors include connectedness to school, high GPA, consistency in schools attended, and school policy. Within the family, low parental education, family mental illness, maternal stress, large family size, overcrowding, poverty, access to weapons, authoritarian or neglectful parents, and exposure to family violence are all risk factors. Family protective factors include connectedness, parental presence and values, having two parents, fewer siblings, family cohesion, and authoritative parents. Among peers, prejudice, perception of threat, social isolation, and participation in deviant culture are all risk factors, while fair treatment, low-risk friends, and pro-social norms are all protective. There are also individual risk factors, such as biological vulnerability, intellectual impairment, asynchronous maturation, aggressive temperament, impulsivity, affective disorder, attention-deficit hyperactivity disorder (ADHD), aggressive behaviour, stress reactivity, and perception of risk. Individual protective factors include spirituality, social skills, average intelligence, late maturation, higher self-image and self-efficacy, and perceived importance of parents (Blum, McNeely, & Nonnemaker, 2002).

Similarly, Komro & Stigler (2000) identified protective factors in three social environments. Within families, it is important for interventions to facilitate family support and communication, family boundaries, parental involvement, and the creation of role models. At school, protective factors for young people include commitment to school, and high expectations. The school should be a caring environment that includes positive adult role models and has clear boundaries and rules. Finally, healthy communities include supportive adults, who are also role models. The accessibility of youth programs has also been identified as a protective factor.

**Different population-focused or public health strategies for
healthy child and youth development:**

There are a number of population-focused strategies that have been used by public health professionals for promoting healthy child and youth development; the list below were identified in the search for evidence of effective interventions. Some of these interventions have been used to foster success at specific developmental tasks, for example, only for healthy sexual development, or healthy growth and development. Others have been implemented and evaluated in a number of different areas of healthy child and youth developmental tasks. All of these interventions have the potential to be effective in any area, but the evidence of their effectiveness, and the areas where they have been more commonly used, vary widely.

Education interventions to alter knowledge: Education interventions have as their primary aim to increase young people's knowledge and awareness about health issues. Such interventions are not necessarily just "lectures," but may use a variety of active and engaging strategies to convey the information content, and need not only take place in schools. Strategies to increase young people's knowledge about health have frequently been a popular focus for health promotion strategies. It used to be thought that once young people learned more about the health risks or benefits of behaviours, they would change their behaviours in response. However, the link between education and behaviour change has been questioned, and some evaluations of education-based interventions have yielded null results (Fink, 2005; Kemper et al., 2002). Although some programs have demonstrated an effect on the intentions of participants (Dunn, Ross, Caines, & Howorth, 1998), a growing body of research has shown changes in knowledge and intentions do not necessarily lead directly to actual changes in behaviour. As a result, purely education-based interventions have become less common, and interventions that aim to increase knowledge will often be augmented with other components.

Education interventions to alter social norms and attitudes: In response to concerns about the usefulness of knowledge-based education programs, interventions began to include components designed to change the attitudes and beliefs of participants. Although there is still support for the theory that attitudes and intentions are strong indicators for later behaviours, the pathway between attitude change and behaviour change is not always direct. Interventions that have combined attitude change with other intervention goals have been more successful. For example, both the Go Grrls and TARGETS programs were found to promote psychosocial development and self-esteem through facilitating attitude change among adolescent girls (LeCroy, 2004; Kerr & Robinson Kurpius, 2004). Many interventions aimed at promoting healthy sexual development include attitude change components.

Skill-building interventions: Skill-building is a strategy that is used across the widest number of developmental tasks, and is frequently used in tandem with education components. Some of the most common skill-building interventions aim to foster healthy physical development through increasing the frequency of physical activity (e.g.: McKenzie et al., 2004). Many interventions aimed at facilitating emotional and cognitive

growth are also based in skill-building, and can be designed to develop specific competencies, such as conflict-resolution skills, communications skills, and emotion-regulation techniques. When multiple strategies are combined, skill-building interventions can be effective at promoting positive development.

Mentorship programs: Mentorship programs tend to be one-to-one programs whereby one program worker or volunteer is paired with a young person to serve as social support, a role model or tutor. One of the most successful examples of a mentoring intervention is the Big Brothers/Big Sisters program. It may not be immediately apparent how mentoring programs can be public health interventions, but most programs are targeted to specific populations at risk, for example, adolescent mothers, or children of single parents, and usually have goals focused on addressing social determinants of health. Although these programs tend to produce strong results, they can be time-consuming and expensive to implement (Tierney, Grossman, & Resch, 1995). Program staff are often required to make a long-term commitment to the program, and can only work with one young person at a time. Some school-based interventions (Pedro-Carrol, Alpert-Gillis, & Cowen, 1992) also include a mentoring component, but it can be difficult to provide enough staff for school-based mentorship programs. Despite these drawbacks, the long term positive effects in fostering the social determinants of health and their broad role in primary prevention may still make mentorship programs a cost-effective intervention option.

Social marketing interventions to alter social norms and attitudes, and encourage healthy development: There have been few if any tested interventions aimed at positive child and youth development that use social marketing techniques, although the number of such interventions seem to be growing, for example, campaigns around increasing physical activity, or improving fruits and vegetable consumption. In general, social marketing strategies are difficult to evaluate, so the lack of evidence around the use of social marketing for healthy youth development may actually be lack of evaluation or testing, rather than lack of the use of this strategy.

Community development, coalition-building, and policy interventions: Community development and coalition-building are two strategies of community organizing, bringing people and groups together within communities to solve problems, often through systems or policy change (Minnesota Department of Health, 2001). Although policy change can have a strong influence over the lives of young people (Joyce, Kaestner, & Colman, 2006), it is rarely used as the only strategy in healthy child and youth development interventions. Healthy nutrition programs most frequently aim to make policy changes, such as changing the selection of foods that are available in schools or other aspects of the school environment, in tandem with other educational or behavioural components (e.g. Lytle et al., 2004, 2006). Similarly, the Child Development Project (Battistich, Schaps, & Wilson, 2004) promotes school connectedness by changing both school policy and curriculum. Community development programs that aim to improve physical fitness or improve the school environment often include a number of stakeholders and focus on attitude change as well as policy change. Due to their scale, community development programs, coalition-building and policy interventions can be difficult to implement and evaluate effectively.

In sum, this review explores the research evidence for potential public health interventions that promote positive child and youth development across a variety of developmental tasks of childhood and adolescence. Studies focused on these sorts of interventions are much less common than studies focused on risk reduction or risk prevention. Indeed, some of the studies we reviewed frame their measures and outcomes both as risk prevention and healthy development. This created a complex search and screening process for identifying studies and evaluating them, but the literature review and screening processes yielded evidence about several interventions that could be implemented in British Columbia, as well as evidence for those that may not be appropriate or effective as strategies in this province.

Chapter 2. The Context of Healthy child and youth development

The Core Functions Framework was developed by the Ministry of Health, with input from public health stakeholders in British Columbia, to help ensure consistent program delivery. This framework identifies the core public health programs, the public health strategies that serve as the basis for implementing the core programs, the population and inequality lenses that take into account the needs of specific populations, and the system capacity to implement the core programs. The core programs have been categorized into four groups: health improvement, disease, injury, and disability prevention, environmental health, and health emergency management. The public health strategies include health promotion, health protection, preventive interventions, and health assessment and disease surveillance.

> *Healthy child and youth development programs are grouped with the other health improvement core programs that promote healthy communities, healthy schools, and population-level reproductive and mental health.*

Healthy child and youth development interventions generally fit within the Health Improvement core program, as shown below. Healthy child and youth development programs are grouped with the other health improvement core programs that promote healthy communities, healthy schools, and population-level reproductive and mental health. They are aimed at fostering positive development rather than preventing disease, injuries, or disability. Although positive child and youth development strategies may be implemented to reduce behavioural risks for disease and injury, those tend to be focused on particular single risks. The focus of this evidence review is on the interventions whose outcome is the healthy child and youth development itself. The full range of public health strategies can be used to promote healthy child and youth development; examples of the kinds of interventions within each strategy are described below.

Core Programs		Population & Inequalities Lenses	Public Health Strategies			
			Health Promotion	Health Protection	Preventive Interventions	Health Assessment & Disease Surveillance
	Health Improvement		X	X	X	X
	Disease, Injury, & Disability Prevention					
	Environmental Health					
	Health Emergency Management					

Health Promotion

Across the developmental tasks and types of interventions, the majority of healthy child and youth development programs are based on health education and health promotion strategies. Programs designed to facilitate healthy physical growth are commonly oriented towards positive child and youth development through promoting physical activity or healthy nutrition, for example. Physical activity programs most often include skill-building and education components, as participants learn new skills in physical education classes and are taught about the importance of physical fitness in elementary or middle-school (Sallis et al., 1997; McKenzie et al., 2004), or take part in more intense physical activity curricula in high school (Ewart, Young, & Hagberg, 1998). Physical activity programs can also use community development strategies, as school environments are changed to promote more physical activity (Pate et al., 2005). Nutrition interventions tend to use similar knowledge-building strategies by increasing health education in school curriculum (Fardy et al., 1996; Townsend, Johns, Shilts, & Farfan-Ramirez, 2006).

Healthy sexual development is often the aim of health promotion interventions. Most sexual health programs are based on health education to improve knowledge and foster changes in attitudes and beliefs, while some also include skill building for interpersonal communication, healthy relationships, or safe sex practices. Evaluated education programs have focused on providing factual information about sexually transmitted infections and HIV (Dunn et al., 1998), on encouraging safe sexual behaviour and open communication with parents (Hubbard, Giese, & Rainey, 1998), and on promoting preventive health care seeking among adolescents (VanDevanter et al., 2005).

The other most common developmental task for health promotion interventions is healthy emotional and cognitive development. As with interventions for other developmental tasks, there are a number of education-based interventions in this area that provide health-related information, in this case to facilitate early detection of emotional difficulties (Santor, Poulin, LeBlanc, & Kusumakar, 2007), or to improve participants' body image (O'Dea & Abraham, 2000). Programs based on attitude change include interventions aiming to improve female participants' body image and self-efficacy (LeCroy, 2004), and their interest in math and science careers (Kerr & Robinson Kurpius, 2004). There have also been skill-building programs that promote arts development (Wright et al., 2006), positive interaction among peers and emotional development (Garaigordobil, 2004), and problem-solving and decision-making skills (Nota & Soresi, 2004). Finally, the Big Brothers/Big Sisters program aims to encourage healthy emotional and cognitive development through a mentoring strategy (Tierney, Grossman, & Resch, 1995).

Health promotion programs have also been used to foster other developmental tasks, but there have been far fewer empirical evaluations of the programs. Among interventions to promote school as a positive environment for healthy child and youth development, programs most often include a community development component, through teacher training (Hawkins, Catalano, Kosterman, Abbott, & Hill, 1999), promoting a sense of inclusion (Patton et al., 2006), or fostering protective factors among students (Battistich, Schaps, & Wilson, 2004). The Fourth R is an education and skill-building intervention to promote healthy peer relationships through relationship

knowledge and facilitating peer-interaction skills. The only well-evaluated intervention to promote healthy moral development used skill-building and attitude change techniques to facilitate identity development (Ferrer-Wreder et al., 2002). Education and skill-building components are also included in programs to promote healthy social development and community engagement through mobilizing the church community (Johnson et al., 1996), and longitudinal school-based interventions (Catalano et al., 2003).

Health Protection

Although they are not as common as health promotion programs, there are some healthy child and youth development policy interventions aimed at health protection. However, policy development that facilitates the healthy development of young people, such as traffic laws or food safety regulations, is rarely in place solely for children or adolescents, and most health protection is focused more on prevention of disease, injury and disability. Policy-based interventions that are designed to facilitate healthy child and youth development are often outside the jurisdiction of the public health sector, but public health can advocate for the inclusion of effective policies, provide evidence to support the adoption of specific policies, or warn about the unintended health consequences of policies developed in other sectors. For example, within education, policy interventions have been evaluated that have changed the curriculum of health, nutrition, or physical education courses (Pate et al., 2005; Manios, Moschandreas, Hatzis, & Kafatos, 1999), the availability of healthy foods in school cafeterias (Lytle et al., 2006), or other elements of the school environment (Haerens et al., 2007).

Health protection through policy and law might be an effective tool for promoting healthy child and youth development, but sometimes health promotion strategies can work against health protection strategies, or there can be unforeseen side-effects that lead to negative outcomes. For example, if parks are equipped with more recreational facilities in an effort to increase physical activity, such as climbing rocks or obstacle courses (health promotion), will there be a corresponding increase in injuries? Would new regulations about safety and access to such facilities be required (health protection) that might in turn reduce their use?

Preventive Interventions

A large number of healthy child and youth development interventions are used as strategies for prevention of specific risk factors, with the intention of reducing rates of disease, injury or death. While these may be the long-term effects of healthy child and youth development, interventions that only measure the change in the risk factors, or the reduction in the rates of disease, without also documenting the health improvement itself, cannot provide specific evidence about how to effectively foster healthy development. For example, since youth who are strongly connected to school are less likely to smoke or drink, if an intervention is designed to promote school connectedness but only measures rates of smoking and alcohol use, did it actually foster school connections, or was some other element of the intervention responsible for changes in tobacco and alcohol use? Such interventions have been evaluated in the other evidence reviews focused on

prevention, but the final outcome measured is the disease or injury prevented, and there may be no evidence that the healthy development that was the strategy actually occurred.

Similarly, general preventive public health programs, such as immunizations, indirectly contribute to positive child and youth development through reducing the risk of disease and disability, but the primary goal of these interventions is to reduce the occurrence of a negative outcome, not to facilitate positive growth per se, and they do not strictly qualify as healthy child and youth development programs. However, these programs are important, and many of them have been covered in other core evidence reviews on Healthy Communities, Healthy Living, and Unintentional Injury Prevention.

Health Assessment & Surveillance

The development of health assessment and surveillance strategies is a key component of promoting healthy child and youth development. There are a great number of tracking and surveillance tools that measure negative outcomes, such as injury, communicable disease, or death, or risk factors that can derail healthy development, such as alcohol or drug use, or violence exposure, but there are few programs that monitor either positive outcomes or protective factors that support healthy child and youth development, such as family and school connectedness, or peer support. Although the Canadian government collects data on the number of adolescents who have contracted sexually transmitted infections or HIV, there is no national surveillance of healthy sexual behaviours (Maticka-Tyndale, Barrett, & McKay, 2000). While there are some surveillance programs in place for monitoring the weight and height of young people (Flynn et al., 2005), there are few measures in place that evaluate the subsequent developmental outcomes.

> *In order to fully understand program effects, it is important that surveillance programs are not limited to outcome measures, instead monitoring the mechanisms of change and evaluating what predicts and promotes healthy behaviours.*

Information collected on the healthy behaviours of young people can be useful in monitoring the implementation and effectiveness of existing interventions, ensuring that programs are continuing to meet the needs of the population, and planning new programs. Additionally, in order to fully understand program effects, it is important that surveillance programs are not limited to outcome measures, instead monitoring the mechanisms of change and evaluating what predicts and promotes healthy behaviours. Surveillance programs that are broadly implemented and promote the use of consistent measures may help evaluate population-level interventions, including policy changes.

What is the Evidence? Methods

Compiling a detailed body of research on which to base the evidence review was a two-step process. First, the McCreary Centre Society librarian conducted a structured search of all applicable research indexes for positive child and youth development research published since 1992. The project team then evaluated and ranked all research that was judged appropriate for the current review through a formal screening process. The scores given to each intervention research report were used to prioritize it in the evidence review.

Search Strategy

In order to collect an extensive range of literature, the search strategy used a variety of keyword searches in multiple research indexes. The most common keyword searches were "positive youth development," "healthy youth development," "child and youth development," "child health," "adolescence," "adolescent health," "adolescent development," "intervention," "evaluation," "public health," "health promotion," "health research," with "interventions," or "public health," and combinations of the above. These keyword searches were also modified based on the academic focus of the research index. The indexes that were used included Academic Search Premier, CINAHL, Cochrane EBM, Medline, CBCA Complete, PsychInfo, Sociological Abstracts, Canadian Periodical Index, Social Services Abstracts, and Web of Science. Some searches were limited to English language results, or "school-age" or adolescent age groups. All identified abstracts were compiled.

The above search yielded a high percentage of results that were not applicable to the current project. An initial review by the McCreary librarian and the project team discarded any results that were not relevant to the current project. However, this filtering process was very liberal, in order to ensure that any potentially useful research would advance to the formal screening tool. The complete articles were then retrieved for all abstracts that were to be included in the next screening process. A search through government report indexes and sites was also conducted, in an effort to capture reports about interventions that may have been formally evaluated but have not been published in the professional literature.

Finally, unstructured searches were carried out to follow-up on research conducted by known experts in positive child and youth development, and to locate research that may have been published too recently to be included in the research indexes.

Evidence Screening

A screening tool was created to evaluate the quality of the research identified by the initial search. The screening process was broken down into three components: methodological rigour, research context, and relevance to the population of British Columbia.

Methodological Rigour: The most strongly weighted of the three screening components, this section evaluates the strength of the research methodology. Research

characteristics, such as sample size, research instruments, analyses conducted, and effect sizes are all graded, as is the research design, and description given by the authors. A separate set of scoring criteria are in place for reviews and meta-analyses.

Research Context: This component was given the least weight in the overall screening process. It includes evaluations of the principal investigators, and how current the research is. There are also separate evaluations for research based on source. Government publications are screened for the level of government and the government agency that commissioned the research. Reviews and meta-analyses are graded on the quality of their sources and the thoroughness of the review. Finally, journal articles are screened based on the status of the journal in the field, and how stringent the requirements for publication are.

Relevance to British Columbia: The final screening component evaluates the feasibility and applicability of the interventions described in the research. The interventions are scored on how simple it would be to incorporate the interventions into the British Columbia public health system, the availability of British Columbia public health staff to carry out the interventions, and the cost-effectiveness of the interventions. Furthermore, the research is screened based on where the intervention was initially carried out, and how similar that location is to British Columbia on a number of demographic characteristics.

Scores from the three sections of the screening tool were summed to create a total score for each piece of research. Research that received a higher score was prioritized in the evidence review.

Chapter 3. The Evidence from Interventions to Promote Healthy Child and Youth Development

While there are a variety of studies and interventions that have been developed to reduce risk behaviours, and some fewer to promote aspects of healthy child and youth development, far fewer are population-focused interventions that would fall within the mandate of the core functions in public health, or have strong enough evidence on which public health professionals could base advocacy efforts for other sectors. The body of evidence is in the early stages, and population-based interventions focused on healthy child and youth development and fostering protective factors, rather than risk reduction or risk prevention, are still relatively new. However, the current evidence does offer some promising interventions, and guidance around likely strategies for developing and tailoring specific approaches to local communities. The evidence will be summarized in this chapter, with examples of programs that address the various tasks of adolescent development, although most of the specific interventions are focused on only one or two developmental tasks.

There are several different strategies that are used in population interventions to promote healthy development, some used singly, but more commonly, assembled in various combinations to address a specific developmental area. The benefit of multiple-strategy approaches would seem to be obvious: individuals may respond differently to the various strategies, so using several different proven strategies can allow for greater reach and effectiveness. Multiple-strategy interventions also pose challenges, however; they are generally more costly than individual approaches, and their effects may not be large enough to justify such a cost. Further, unless the study is carefully designed, it is difficult to determine which elements of the program were the most effective in promoting healthy development, which were necessary to its success, and whether some elements contributed to nothing but additional cost. We will review the evidence for specific single interventions, then for programs that use multiple strategies, and provide a set of recommendations.

It should be noted that the majority of interventions take place in school settings, or link with families via schools. This may be because school attendance is mandatory for children and youth up to at least age 16, and the majority of the population's day is spent in this single setting, providing the easiest population-level access to children and youth for both intervention and for evaluation. However, education is one of the social determinants of health, school connectedness is a strong protective factor in healthy child and youth development, and public health nurses and other public health professionals can be effective advocates for positive child and youth development programs in schools. There is also some evidence supporting out-of-school interventions carried out by Public Health Nurses or other agencies (Wright et al., 2006).

In our search there were no population-based interventions that have been evaluated that focused on building healthy family relationships or supportive family environments for children and youth; the majority of programs appear to be individually-focused, rather than at community or population levels. The family environment, although the most potent protective factor for positive child and youth development, has received far less attention in community health approaches and interventions than programs to foster healthy schools and healthy communities.

> *In our search there were no population-based interventions that have been evaluated that focused on building healthy family relationships or supportive family environments for children and youth; the majority of programs appear to be individually-focused, rather than at community or population levels.*

As discussed previously, the literature search process favoured evaluations of Canadian programs, with a strong emphasis on research in British Columbia. However, there has been very little healthy child and youth development intervention and policy research conducted in Canada, and it was often necessary to include the best examples of evaluation research from the United States and Europe.

The Interventions and Evidence of Effectiveness

Health Education Programs

By far the most commonly conducted and evaluated single-strategy programs focus on health education, to increase knowledge or foster changes in attitude. This is in part because these are relatively inexpensive, can be implemented broadly through schools or community groups, and can be offered in systematic, modular formats that can be implemented in a number of different places. Health education programs have been developed to foster healthy physical growth and development through trying to improve knowledge about nutrition and physical activity (Kemper et al., 2002; Cason & Logan, 2006); healthy sexual development through improving knowledge and changing attitudes about sexual behaviours (Kirby, Barth, Leland, & Fetro, 1991; Dunn et al., 1998); as well as healthy cognitive and emotional development through improving self-esteem and body image (LeCroy 2004; Kerr & Robinson Kurpius, 2004).

Unfortunately, although commonly used and often rigorously evaluated, as a sole strategy, health education has limited effectiveness in fostering healthy child and youth development. In the area of physical growth and development, for example, a review by Kahn (2002) showed that a number of information-based, predominantly classroom programs increased health and exercise knowledge, but in most instances had no effects on actual physical activity, and in some programs, they actually decreased physical activity. Fink (2004) was unable to identify any effects for two out-of-school education-based nutrition programs for low-income youth: Health and Nutrition from the Garden, and Exploring the Food Pyramid with Professor Popcorn. These programs included instruction in good nutrition, and allowed participants to experience an assortment of healthy foods. It should be noted the evaluation was carried out with a small convenience sample, and did not include a control group, which makes it difficult to draw any conclusions about the usefulness of the interventions. Belansky and colleagues (2006) found improvements in knowledge and attitudes related to healthy nutrition and physical activity, but no changes in actual levels of physical activity.

Sexual health education has some effectiveness as a lone strategy. Kirby (1991) evaluated a classroom curriculum, Reducing the Risk, that was designed to encourage discussing abstinence and birth control with parents, and avoiding unprotected sex. Participants attended 15 in-school lessons that took the place of regular sexual education classes. The program documented increased communication with parents about birth control and abstinence, but not other topics, such as pregnancy and sexually transmitted infections. The role-playing component of the intervention program led to significant increases in knowledge, and knowledge retention at an 18-month follow-up. The program also led to delays in onset of sexual behaviour for those participants who were not yet sexually active, but was less successful in influencing behaviours in participants who were already sexually active. Ten years later Kirby completed a systematic review of a variety of North American interventions that were implemented both in schools and the community (2001). Sexual education programs in schools were more likely to be successful when they were theory-based and provided a clear message that was regularly reinforced. It was also found that programs should be culturally relevant, include a variety of teaching methods, be long in duration, and include members from the target group in developing them. Another brief 2-session program implemented in Ontario schools focused on changing attitudes about risky sexual behaviour and including both public health nurses and peer educators found the intervention changed students' intentions around sexual behaviours, but it did not measure actual behaviours (Dunn et al., 1998).

Health education programs have shown some positive effects in fostering healthy emotional and cognitive development, although again, the majority of effects are on knowledge and attitudes, not necessarily on behaviours. Two programs designed to foster improved self-image, self-esteem, and self-efficacy for girls (LeCroy, 2004; Kerr & Robinson Kurpius, 2004) demonstrated the expected improvements. Similarly, a web-site education program that encourages early identification and help-seeking among youth with emotional difficulties, increased the likelihood youth would seek help for specific problems, although it did not have an impact on the overall health of participants.

Health education interventions to increase knowledge or change attitudes are more often paired with other kinds of strategies, such as skill building. When these two strategies are combined, outcomes are much stronger, and are more likely to include behaviour change, as has been tested across most of the dimensions of healthy child and youth development. For example, two rigorously evaluated programs in Australia (Patton et al., 2006) and Seattle (Hawkins et al., 1999) that were designed to foster greater school connectedness, and social and emotional competence, demonstrated strong reductions in risk behaviours, although they did not include solid measures of school connection or emotional self-regulation in the evaluations. The Raising Healthy Children program for Grades 1 and 2 in Washington State is a skills-building program for teachers, parents, and students that found long-term school commitment, improved social competence, and academic performance for youth (Catalano, 2003). Similarly, sexual education programs that include skill-building components significantly delay sexual debut, increase parent-child communication about sexual behaviours, and increase condom use (Kim, 1997; Kirby, 2001; Kirby, 2007). Physical growth and development programs that include actual exercise training and practice in addition to health education have been particularly effective in motivating behaviour change in several different countries (Danielzik, Pust,

Landsberg, & Mu ller, 2005; Townsend et al., 2006; Ewart, Young, & Hagberg, 1998; Vandongen et al., 1995). The Fourth R, a Canadian health education and skill building program to teach relationship knowledge and foster healthy peer interactions has been rigorously evaluated in Ontario, with additional evaluation in process in cities across Canada, and has documented increases in knowledge and skills in communication, negotiating conflict and peer relationships, as well as healthier attitudes towards risk behaviours. Roots of Empathy is a well evaluated Canadian school-based program for children and young adolescents based on previous research that has shown that academic achievement in Grade 8 is better predicted by early emotional competence than early academic results. The key program activity is regular classroom visits of an infant and parent, and an instructor who explains the baby's development and needs. The students ask questions and learn about the emotional bond between the parent and child, and attempt to apply the lessons to their own relationships. A 2001 evaluation found that students who took part demonstrated significant increased emotional knowledge, social understanding, and pro-social peer behaviours (Schonert-Reichl, Smith, Zaidman-Zait, & Hertzman, 2003).

Skill building

This intervention is seldom used alone, but even as a single strategy, it has been shown to be an effective approach for improving peer relationships and emotional self-regulation among young adolescents in Spain (Garaigordobil 2004), and improving problem-solving skills among junior high school students in Italy (Nota & Soresi, 2004). There is evidence this strategy can be used in public health interventions that promote positive child and youth development.

In concert with supportive groups, skill building has been an effective strategy for promoting positive child and youth development through an arts program implemented in multiple communities across Canada. Wright et al. (2006) evaluated the yearlong program that took place for three hours a week outside of school for young people aged 9 to 15. Although participants who maintained their involvement throughout the program were less likely to be lower class, there were still high attendance rates from low-income communities. Furthermore, participants demonstrated both artistic and social development, reporting improvements in communication, cooperation, conflict resolution, and teamwork skills over matched controls. These improvements were correlated with a decrease in emotional problems. The development of a new social environment for young people that is supportive and non-competitive, and is run by non-judgmental adults, appears to have strong potential for positive child and youth development programs in Canada. Another program that combined skill building and social support for children of divorced parents (Pedro-Carroll, Alpert-Gillis, & Cowen, 1992) found it improved both school and family adjustments, even compared to children whose parents had not divorced.

Mentoring Programs

In contrast to other strategies that are used in combination, mentoring programs commonly appeared to be stand-alone programs, but most clearly focused on positive

child and youth development through fostering social support and connectedness with caring adults. There have been a few systematic reviews of mentoring programs that provide strong evidence of their effectiveness in enhancing youth development (Sipe, 2002; Grossman & Bulle, 2006). One example of such a mentoring program is Big Brothers Big Sisters (BBBS), which matches children from single-parent families with suitable older volunteers who can provide guidance and support. Volunteers are required to complete training before being matched to an appropriate youth, and then commit to meeting with their young person two to four times every month, for at least a year. The BBBS program has been in place for ninety years in the United States, but a high-quality, thorough evaluation had not been conducted until the mid-1990s (Tierney, Grossman, & Resch, 1995). Eight of the 500 BBBS agencies were selected based on caseload and geographic diversity. As young people became eligible for the BBBS program, they were randomly assigned to become immediately eligible to be paired with a mentor, or placed on an 18-month waiting list. All participants completed a series of measures immediately, and again following 18 months. At post-test, intervention participants reported improved attendance and performance in school, and improved relationships with their family. It is thought that the latter finding was the result of an increase in trust and communication for participants with a Big Brother or Sister. Intervention participants also reported improved peer relationships and fewer had started using drugs or alcohol. Key elements of the program that were identified were (a) the one-to-one nature of the interaction, which allows the intervention to be carried out with regular contact from someone who the participant views as a friend, and (b) the program infrastructure, which screens inappropriate volunteers and encourages appropriate matches between participant and volunteer. Although the number of strong volunteers that are available, and the financial constraints of supporting each match, may limit the program, the long-term savings for the public health system of this form of public health intervention to promote healthy child and youth development should be considered (Catalano, 2007).

Policy Development

Public health core functions are seldom in the position of enacting policy, but may be involved in advocating for or developing health-related policies, or in analyzing the health effects of various policies enacted in other sectors. While we could find no studies that evaluated the effectiveness of public health advocacy around policy to promote healthy child and youth development, there is some evidence that documents the effectiveness of policies themselves. Unfortunately, this evidence is limited, and although there are numerous policies implemented that might promote healthy child and youth development (bicycle helmet laws, seatbelt laws, age of consent, etc.), most are focused on preventing harms (i.e., helmet and seatbelt laws to prevent injury), and few evaluations actually measure the effects of the policy on the health of young people.

Policies are often developed in direct response to a problem or crisis, and so policies are more likely to focus on injury and disease prevention (e.g., seatbelt laws or immunization policies), rather than on positive child and youth development, or enhancing protective factors and environmental assets. Similarly, studies evaluating the effects of policies are often easier to conduct when measuring injuries and illness.

Governments often already track such information, but are less likely to regularly monitor levels of assets or protective factors. Because of policies' widespread population-level effects, they are often difficult to evaluate, as so many other influences may contribute to the changes they are designed to foster, and population-level monitoring and surveillance can be difficult and costly. Even when policies are enacted specifically to promote healthy development, evaluations may focus on downstream outcomes, such as underage drinking or changes in crime rates, rather than measuring their effects on the protective factors or assets they are designed to enhance. Policies in response to controversial issues, with competing political perspectives about their causes and solutions, may or may not draw upon scientific evidence for how to address the issues effectively. Indeed, such policies may have unintended or opposite effects.

      As an example, the U.S. state of Texas introduced two policies within the last decade whose purposes were to increase parent-youth communication around sexual health and health care, in order to reduce unwanted pregnancies, abortions, and sexually transmitted infections. These two policies required a) parental notification for girls under age 18 prior to having an abortion, b) parental consent for prescribed contraception, and c) health care providers to disclose the identity of any minor they believed to be sexually active. Evaluations conducted by Joyce, Kaestner, and Colman (2006) and Franzini and colleagues (2004) found the policies did not appear to increase parent-teen communicatio as intended, but also did not prevent or alter risky behaviour: rates of second-trimester abortions, teen pregnancy, and sexually transmitted infections increased, and the new laws had an estimated economic cost of $43.6 million a year to the state of Texas. Although these policies do not mirror current BC legislation or practice approaches, there are policy discussions at the federal level in Canada about changing the age of sexual consent, and occasional challenges to laws protecting the ability of youth to access confidential health care, and so it is important to be consider the evidence of health effects of similar policies in other jurisdictions.

      In contrast to this example, a policy that has had positive influence on healthy child and youth development in a number of areas, including community engagement, has been mandating community service or service-learning involvement as part of educational requirements to graduate from high school (Martin, Neal, Kielsmeyer & Crossley, 2006). A nationally-representative study of young adults in the U.S. compared youth who had no service requirement in school to those with community service experiences and service-learning experiences (these are community service experiences with a reflective or self-evaluation component). They found that students with service components were significantly more likely to demonstrate community engagement as young adults, including voting, volunteering for further community service, spending time with diverse populations within the community, valuing the importance of treating others with respect, and giving financial support to charities. Those with community service or service-learning were also more likely to report higher educational aspirations and greater satisfaction with most areas of their lives, including work, school, family relationships, and friendships.

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Community Development and Coalition Building

Community development and coalition building are two population-level public health interventions for health promotion that fall within the scope of public health nurse practice (Minnesota Department of Health, 2001; Stamler & Yiu, 2005). Community development, also sometimes called community organizing, community building, or community engagement, is a process of bringing together community groups to "identify common problems or goals, mobilize resources, and develop and implement strategies for reaching goals they have collectively set" (Minnesota Department of Health, 2001, p. 235). Coalition building is a form of community organizing that focuses on bringing together organizations and institutions, not just community members. Both strategies are often focused on risk reduction or injury and disease prevention, such as a community coalition to address the issue of sexual exploitation among young adolescents in an ethnic minority community (Saewyc, Solsvig, & Edinburgh, 2008). However, community development and coalition building have also been used for fostering healthy child and youth development in communities. They are seldom stand-alone strategies, but are often incorporated with health education, skill building, or policy development in creating supportive environments and motivating healthy behaviours. Community development is one of the strategies that has been implemented with good evidence of effectiveness for several different areas of healthy development, including supporting growth and development through improved nutrition and physical activity (Lytle et al., 2006; Pate et al., 2005; Haerens et al., 2007); social development and community engagement (Johnson et al., 1996; Riser, Mesler, Tallon, & Birkhead, 2006); and creating positive school environments (Patton et al., 2006; Battistich, Schaps & Wilson, 2004).

One of the most rigorously evaluated programs that used community development approaches is the Assets Coming Together (ACT) for Youth. Developed by the New York State Department of Health, it is a public health initiative designed to "fund projects that demonstrate the effectiveness of community-based partnerships to promote positive youth development and improve health outcomes for youth" (Riser et al., 2006). The projects were all designed to create and maintain community partnerships, increase youth services and youth engagement through new community opportunities, and assist in the promotion of youth development principles in the organization and policies of community institutions. There were a number of successful community development partnerships, including a community that created a youth coalition, a community that started an alternative middle school with a very high retention rate, and a community that opened a rural youth centre. The authors were able to make a number of conclusions regarding promoting youth development and community change. Successful programs should include diverse sectors of the community, and the partnerships between

communities and groups must be regularly reinforced. Programs should be planned with input from both adults and youth, and should be designed for all youth, not just at-risk populations. Strong leadership and active and vocal youth are also key components of successful community partnerships. Finally, change occurs gradually, and any programs require time to become institutionalized (Riser et al., 2006).

Another high-quality evaluation of a community development and health education intervention focused on healthy growth and development. Haerens et al. (2007) evaluated a middle school program in Belgium that changed the "physical environment by creating more opportunities to be physically active during breaks, at noon, or after school hours." The program also included computer feedback during class time for all students, and parental involvement for some students. The high quality evaluation used a clustered randomized control design, and data were collected using validated existing measures and accelerometers. Students in the intervention condition reported an increase in school-related physical activity. Furthermore, there was both a decrease in light physical activity, and an increase in moderate and vigorous physical activity. However, even the inclusion of parents in one condition was not enough to increase leisure time physical activity.

More thorough research around fostering school connectedness has been conducted by Battistich and his colleagues (1996, 2004) on the Child Development Project (CDP). The CDP is a community development and skill building program designed to expand schools into "caring communities of learners" by focusing on the social, ethical, and intellectual development of younger children. These schools are characterized by positive relationships between students, parents, and staff, a common purpose and sense of values, an appropriate curriculum, and an environment that accommodates for the developmental and sociocultural needs of its students. A series of evaluations concluded with a recent follow-up study evaluating the long-term outcomes of the program. Early evaluations found an increase in sense of school community and mild decreases in some negative behaviours. Four years later, students who had been enrolled in a high implementation condition of the program were still more engaged in school and were reporting fewer problem behaviours. There was also a positive relationship between program participation and academic performance.

Multiple Strategy Approaches

As noted above, a variety of population-level interventions to foster healthy child and youth development use a combination of strategies to reach their effects. The combinations vary widely, even in similar areas of youth development, and so it is quite difficult to compare the relative effectiveness of different combinations. As well, there are limited numbers of studies evaluating interventions to promote positive child and youth development in areas such as community engagement, moral development, or cognitive and emotional development, and only two, the Fourth R and Roots of Empathy, have been implemented in Canada. In general, multiple strategy approaches show stronger effects and longer-term improvements than individual strategies in every area of healthy child and youth development that has implemented them, especially when compared to health education as a stand-alone strategy. However, one must weigh the increased cost of multiple-strategy approaches against the size of effect carefully, to

determine if the additive effect of combining different strategies is strong enough to justify the increased complexity and expense.

One example of this issue is the Teens Eating for Energy and Nutrition at School (TEENS) program, developed and rigorously evaluated by Lytle et al. (2001, 2004, 2006). The TEENS study included classroom education and skill building as well as family-based health education components, plus community development and policy advocacy to make school-wide changes in food available to students. Sixteen middle schools in Minnesota were randomly assigned to intervention or delayed intervention conditions in matched pairs. The emphasis of the TEENS intervention was on changes in school food services. With consultation from food service directors, fruits and vegetables were more heavily promoted in school lunches, and healthier à la carte options became significantly more available. Parents of the students who were taking part in the intervention condition also received behavioural coupons and information-based newsletters. The coupons described changes that families could make to include healthier foods at home. Families received gift certificates for completing the tasks described on the coupons. This carefully tested intervention showed preliminary changes in knowledge and attitudes among young people. As well, adding healthier foods to those foods offered for sale at school did improve the sales of healthier foods. Unfortunately, the increase in sales was not significant, and positive changes in fruit and vegetable consumption were not sustained into the second year of the intervention (Lytle et al., 2004, 2006). Given the expense of such a multi-strategy intervention in schools, this raises doubts about its specific cost-effectiveness as an intervention.

In contrast, another multi-strategy intervention in BC schools that was focused on increasing physical activity has had far stronger impact, although incorporating many similar strategies. Action Schools! BC, incorporated coalition-building, intersectoral collaboration, policy development, school community development, health education, and skills building, in developing a province-wide program to increase physical activity and related healthy growth outcomes (such as bone density and cardiovascular fitness) among elementary school children (Naylor, Macdonald, Reed & McKay, 2006). Although the province-wide implementation of the program is still underway, and long-term evaluation is not yet possible, the initial elements of intersectoral collaboration, coalition-building, policy development, and early pilots of the school-level health educations and community development approaches have been rigorously evaluated. The results to date have documented changes in government policy, resourcing, and commitment to promoting increased physical activity among elementary school students (Naylor, et al., 2006a); increases in levels of physical activity education delivered in schools (Naylor, Macdonald, Zebedee, Reed, & McKay, 2006b); and actual increases in physical activity levels, cardiovascular fitness, and bone density among children in the intervention vs. comparison schools without loss of academic performance (Reed, Manske, Warburton & McKay, 2006; Macdonald, Kontulainen, Khan & McKay, 2006; Ahamed et al., 2005; Ahamed et al., in press). This multi-level, multi-sectoral, multi-strategy population approach appears to be a promising intervention to promote healthy growth and development among school-age children.

Other multi-strategy approaches have had positive effects in domains related to social or cognitive development or fostering protective factors like school connectedness. For example, Catalano et al. (2003) conducted a good quality evaluation of the Raising

Healthy Children (RHC) program that was implemented in schools in Washington State. RHC was developed in response to some of the shortcomings of previous positive child and youth development programs, which lacked generalizability, were curriculum-based, had only short-term evaluations, and were restricted to particular age groups or populations. In contrast, RHC aimed for school-wide application of a social development model that would both increase encouraged behaviours, while reducing the frequency of negative behaviours, and intervene at the teacher, parent, and student level. RHC also gave teachers flexibility in developing their own program curriculum, reducing the need for stringent program implementation. Participating teachers took part in training on classroom management, and parents attended workshops on parenting and in-home problem-solving. The evaluation was initially conducted on the outcomes of Grade 1 and 2 students in ten matched schools. Following one and a half years, there were some positive results. As reported by both parents and teachers, students who had taken part in the intervention had shown significant increases in academic performance, school commitment, and school competency over control participants.

In general, programs that include a community development or policy/ environment change component as part of their multiple strategies, as well as programs that include active skill building components, appear to have stronger effects, and more lasting effects, than those focused more on knowledge and attitude change alone. Action Schools! BC is a clear example. Similarly, Kirby (2001) completed a systematic review of a variety of North American interventions that were implemented both in schools and the community to foster sexual health among youth. Although sexual education programs in schools were the most common interventions, school-based health centres and condom-availability programs tended to be successful in increasing contraception use in adolescents. Community health clinics that provided information, engaged young people in discussion about their sexual behaviours, and dispensed contraception, also tended to increase condom use. School clinics yielded higher rates of contraception use when coupled with strong messages about contraception and abstinence. Community-wide education and attitude change programs that were reviewed were more successful when maintained over a long period of time, but tended to have few long-term effects following the conclusion of the programs. Finally, positive sexual health outcomes were found for service learning programs, suggesting that it is possible to influence healthy sexual development through positive growth in other domains.

Summary Conclusions

Although the evidence base for population-focused interventions to promote healthy child and youth development is still limited, and most interventions incorporate measures of risk reduction or prevention rather than actual measures of protective factors or healthy development, the evidence does suggest a number of strategies are effective:

1. Family connectedness is a strong protective factor that has been the focus of very little intervention research. Interventions to promote family connectedness and positive family environments for children and youth should be developed or, where they already exist, should be rigorously evaluated.

2. Single-strategy interventions, especially health education strategies focused on increasing knowledge and/or changing attitudes, are common but not consistently effective in achieving behavioural change or positive child and youth development outcomes.

3. Mentorship programs are one of the few single-strategy interventions with consistently positive effects on healthy child and youth development in a variety of developmental task areas.

4. Interventions should incorporate skill building for more effective and sustained behaviour change.

5. Policy approaches to promote healthy child and youth development should be evidence-based; not just evidence for the outcome the policy aims for, but also that the mechanism implemented in the policy has scientific evidence of its effectiveness in achieving the stated aims. More policy evaluations are needed to document intended and unintended consequences of health policy and laws.

6. Multi-strategy approaches, especially those which incorporate environmental change strategies such as community development/coalition building, intersectoral collaboration, and policy development, appear to be more effective than single strategies, although it is important to weigh the cost and complexity against expected gains.

Chapter 4 - Surveillance and Monitoring of Healthy Child and Youth Development

The Need For Surveillance Programs

As more social programs develop a healthy child and youth development perspective, existing surveillance techniques that focus on risks and problems are inadequate, and must be modified to measure changes in positive growth in individuals and across populations. It is important to actually measure the outcomes healthy child and youth development interventions are designed to ensure. It is not enough to measure reductions in risks after implementing an intervention to increase family connectedness, for example, but evaluations must include measures to determine whether family connectedness actually increased. Continually monitoring and collecting developmental data from young people will ensure that interventions remain applicable and appropriate to the needs of the population, while identifying potential new areas for growth. Surveillance data can also be used to monitor the implementation of interventions, and ensure that program components are still being carried out as originally designed (Cameron et al., 2007). Designing surveillance programs that are put into practice across populations, or with consultation from a number of sources, can also promote consistency in data collection and information sharing (Surko, Pasti, Whitlock, & Benson, 2006).

An excellent example of the importance of surveillance programs is the longitudinal follow-up assessment conducted by Hoelscher et al. (2004) of the Child and Adolescent Trial for Cardiovascular Health (CATCH). The CATCH program was a broadly implemented multi-component school-based health education program that included classroom lessons, a new physical education program, changes in food availability, and parental involvement. An initial evaluation found positive results for lower fat consumption and higher self-reported physical activity among program participants (Luepker et al., 1996, as cited in Hoelscher et al., 2004). There were also institutional changes that were maintained over the short-term, including an increase in the amount of time spent in moderate or vigorous physical activity during physical education class, and the amount of fat available in school lunches. The institutionalization study was conducted to measure the maintenance of the program, five years after initial implementation. Although the 57 intervention schools maintained some significant improvements over the control schools, the overall institutionalization was low. The intervention components that were based on policy change, such as foods available in the cafeteria, were more likely to be maintained than those that required continual upkeep and reinforcement, such as classroom curriculum. By conducting surveillance research, it was possible to identify the components of the program that were still effective, and those that needed to be updated or reinforced.

> *Intervention components based on policy change, such as foods available in the cafeteria, were more likely to be maintained than those that required continual upkeep and reinforcement, ie., classroom curriculum.*

A key element of monitoring healthy development is identifying the healthy outcomes that are desirable. Surko et al. (2006) identified a number of outcome indicators for use in a positive child and youth development initiative in New York State. Adopting a pre-determined

set of outcome indicators facilitates the development of universal measurement tools, allows for consensus and information sharing among different communities and organizations, and encourages the use of positive child and youth development language in research and funding requests. After consulting a number of youth development experts and other stakeholders, a cluster analysis revealed fifteen indicators of positive child and youth development: having caring relationships within family, having goals and aspirations, having caring relationships within school, feeling safe in their neighbourhood, saying no to things that seem wrong or make you uncomfortable, learning from their mistakes, having high expectations in school, having parents have knowledge of youth's activities, being able to problem-solve, believing that standing up for their beliefs is important, having peers that follow prosocial norms, engaging in meaningful participation in school, believing that telling the truth is important, having caring relationships with peers, and having caring relationships with family members.

Existing Healthy Child and Youth Development Surveillance Strategies in Canada

In British Columbia, The McCreary Centre Society has led the way in conducting province-wide adolescent health surveys that include healthy behaviours and protective factors in addition to the more commonly tracked risk behaviours. Since 1992, the BC Adolescent Health Survey has been conducted approximately every 5 years with students in Grades 7 to 12, and allows both population-level estimates and monitoring trends over time (Tonkin, Murphy, Lee & Saewyc, 2005). The cluster-stratified survey of classrooms is designed to be representative at the provincial level, as well as at the regional health authority level, and the smaller health service delivery area level. The most recent survey occurred in 2003, when more than 30, 000 young people from 1,559 classrooms in British Columbia completed the survey. Many of the protective factors and indicators of positive child and youth development identified by Surko et al. (2006) are measured in the BC AHS, along with healthy sexual behaviours, protective behaviours such as seatbelt and helmet use, physical activity, measures of community engagement and volunteering, and school aspirations. For example, the AHS includes an 11-item measure of family connectedness that has been psychometrically evaluated, is sensitive to change over time, and is appropriate for evaluation, and a 6-item measure of school belonging and teacher supportiveness that has also been psychometrically validated. The AHS also monitors other indicators of healthy development, an assessment of Body Mass Index based on self-reported height and weight, physical activity, self-esteem, volunteering, extra-curricular activities, seatbelt use, bicycle helmet use, sexual behaviour and condom use, spirituality, the presence of an adult family-member to talk to about problems, the presence of an unrelated adult to talk to about problems, parental presence at key times of the day, and healthy peer attitudes.

Many of these same measures have also been incorporated into their surveys of special populations, such as youth in custody, or street-involved youth. The findings from the various surveys have been used by school districts, public health nurses, and health authorities in further planning youth development programs and interventions, as well as in monitoring the effectiveness of initiatives. The survey results are also presented to young people who take part in Next Steps workshops to develop action plans for promoting healthy youth. The McCreary Centre Society is currently preparing for the fourth wave of data collection, to be completed in spring 2008 (Tonkin, Murphy, Lee, Saewyc, & McCreary Centre Society, 2005).

In Calgary, Alberta, a pre-existing weight surveillance initiative has successfully incorporated an intervention component. Public health nurses in the city had already developed a

program that required young people to have their weight and height recorded during vaccinations. With parental consent, the data taken from the measurements was then used to calculate whether the child was at risk for being overweight or underweight. Children who were identified as high risk were given educational materials to take home about healthy eating and exercise, and extreme situations were also recommended to consult with their doctor (Flynn et al., 2005). Although the data collected does not include outcome information, this is a strong example of a surveillance program that was easily included in a pre-existing service, making it a cost-effective method of maintaining information on healthy child and youth development.

The School Health Actions Planning and Evaluation System (SHAPES) is a data-collection and feedback tool that has been implemented in Canada by the Canadian Cancer Society and the National Cancer Institute of Canada. Although it was originally envisioned to accumulate data on tobacco use, the SHAPES system is easily adjustable to monitor a number of different behaviours, and variations have since been developed that monitor healthy eating and physical activity. The goal of the SHAPES program is to collect data that can be used to plan future public health programs, to support public health research, and to enable superior public health evaluations. The data that has been collected to date can be used in concert with other resources that have been developed in Canada, to help individual communities identify outcomes that require the most immediate attention, and access intervention resources (Cameron et al., 2007).

Maticka-Tyndale, Barrett, & McKay (2000) described the strong need for a system of tracking the sexual health behaviours of young Canadians. Although some individual provinces have developed province-wide youth indicator measures to include in their surveys, for example in the BC AHS, and more recently, in the drug use surveys of the Atlantic Provinces (Dr. Christiane Poulin, Dalhousie University, personal communication), there has been limited standardization across measures, making it difficult to identify national trends. In comparison to other developed nations, Canada has inferior systems for monitoring adolescent sexual behaviour, making it difficult to identify national trends in age of sexual debut, and condom use or contraceptive use among sexually active adolescents.

In conclusion, positive youth surveillance programs are gradually developing in response to the promotion of healthy child and youth development programs. However, there is still consistently more data being collected on risk factors and negative behaviours, than on protective factors or attaining healthy development outcomes. Thorough data collection tools, such as the BC Adolescent Health Survey and Calgary's healthy weight monitoring program should be encouraged, as they regularly provide feedback on the development of young people, while identifying needs for potential future interventions. Consistency in measures across surveys at the national, provincial, and even local level and in both surveillance and intervention outcome measures, will help provide comparisons across groups and regions, and facilitate national level reporting.

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TABLES OF EVALUATED INTERVENTIONS

Study	Design	Intervention	Key Outcomes	Strength	Strategy					Developmental Task						
					Health Education	Policy Development	Community	Skill Building	Mentorship/Support	Physical Development	Emotional/Cognitive	Sexual Development	Social/Community	Peer Relationships	Moral Development	School Connectedness
Sipe, C. L. (2002)	Critical review	Mentoring (one-on-one or school-based)	Positive benefits of mentoring; keys to effective mentoring programs; keys to recruiting mentors	Strong												
Catalano et al.(1998)	Review	Community and school based interventions	Characteristics of effective programs	Strong												
Roth et al. (1998)	Synthesis of evaluations	Youth development programs		Strong												
Kahn et al. (2002)	Systematic Review	Changes in physical activity and aerobic capacity	Informational, behavioural, social, and environmental interventions were effective	Strong						X						
Summerbell et al. (2005)	Cochrane Review	Interventions for preventing obesity in children	Dietary and physical activity programs tended to lead to small, positive results	Strong						X						

| Study | Design | Intervention | Key Outcomes | Strength | Strategy | | | | | Developmental Task | | | | | | |
					H.E	P.D.	Comm.	S.B.	Ment.	P.D.	E./C.	S.D.	S./C.	P.R.	M.D.	S.C.
Belansky et al. (2006)	Quasi-experimental	Integrated Nutrition and Physical Activity Program: school-based program to improve attitudes, knowledge, and self-efficacy related to healthy eating, and physical activity.	Better outcomes across the board, with the exception of physical activity.	Strong	X					X						
Cason & Logan (2006)	Quasi-experimental	Jump Into Foods and Fitness: school-based educational curriculum to develop healthier lifestyles through nutrition and physical activity	Significant changes in knowledge, food consumption, food-related behaviours, and physical activity behaviours.	Weak	X					X						
Danielzik et al. (2005)	Longitudinal cohort with comparison group; Quasi-experimental	Kiel Obesity Prevention Study: (a) School based curriculum (b) Family-based consultations	Limited results for (a): slight decrease in the prevalence of overweight. (b) normalized student growth	Moderate	X			X		X						
Fink (2005)	Quasi-experimental	Evaluated two curricula outside of school	Null results.	Weak	X					X						
Pate et al. (2003)	Quasi-experimental	Active Winners: After-school and summer physical activity. Community-wide intervention	No significant results, program may not have been effectively implemented.	Weak			X	X		X						

* Indicates that the study was conducted in Canada.

Study	Design	Intervention	Key Outcomes	Strength	Strategy					Developmental Task						
					H.E	P.D.	Comm.	S.B.	Ment.	P.D.	E./C.	S.D.	S./C.	P.R.	M.D.	S.C.
Kelder et al. (1993)	long-term follow-up	Minnesota Heart Health Program: Community-wide physical fitness intervention that started in Grade 6.	Hours/week of physical activity were higher in the intervention communities.	Moderate			X	X		X						
Lytle et al. (2004)	matched-pair - random assignment	Teens Eating for Energy and Nutrition at School: Classroom nutrition education, family newsletters and changes in the food available at schools	The only significant impact at follow-up was in food-choice, which was subject to response-bias.	Strong	X	X				X						
Lytle et al. (2006)	matched-pair - random assignment	Teens Eating for Energy and Nutrition at School: Family newsletters and changes in the food available at schools	Schools offered healthier food, and students purchased it. Parents learned about healthier choices, but there was no impact on buying healthy foods	Strong	X	X	X			X						
Townsend et al. (2006)	Randomized control design	Expanded Food and Nutrition Education Program: group education on food preparation and tasting.	Improvements in variety of foods, nutrition knowledge, food selection, and food preparation skills and safety practices	Strong	X			X		X						

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					H.E	P.D.	Comm.	S.B.	Ment.	P.D.	E./C.	S.D.	S./C.	P.R.	M.D.	S.C.
McKenzie et al. (2004)	Randomized control design	Middle School Physical Activity and Nutrition: Intervention to increase level of activity during Physical Education classes	Increased moderate to vigorous physical activity cumulatively through years	Strong				X		X						
Kemper et al. (2002)	Longitudinal comparison	Amsterdam Growth and Health Longitudinal Study: Repeated measures for biological risk factors over 20 years. Included information on personal results and healthy growth	Null results.	Moderate	X					X						
Ewart, Young, & Hagberg (1998)	Randomized control design	Project Heart: One semester of aerobic exercise class in place of regular physical education for students at risk of high blood pressure	Significant improvements in aerobic fitness, but only a moderate reduction in resting blood pressure	Moderate	X			X		X						
Manios et al. (1999)	Randomized control design	School-based intervention (health and nutrition, and physical fitness components) and parent seminars	Increase in health knowledge and physical activity. BMI increased less.	Moderate	X	X				X						

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Vandongen et al. (1995)	Randomized control design	Evaluation of fitness, school nutrition, and home nutrition programs	Fitness programs were most effective with girls. Positive dietary changes were also seen	Strong	X			X		X						
Sallis et al. (1997)	Quasi-experimental	SPARK: A physical education and self-management program that was either specialist or teacher led.	More time being physically active at school, no impact on activity outside of school, and limited changes in health-related fitness outcomes.	Moderate	X			X		X						
Harrell et al. (1999)	Randomized control design	Cardiovascular Health in Children Study: Classroom-based intervention based on knowledge and activity, and a similar risk-based intervention.	The classroom-based approach yielded greater results, and was more cost-effective, than the individual risk-based intervention.	Strong	X			X		X						
Fardy et al. (1996)	Randomized control design	PATH: Health promotion curriculum consisting of exercise and health behaviour lectures	Health knowledge improved, and girls showed significant improvement in dietary habits, reduced cholesterol, and cardiovascular fitness	Moderate	X			X		X						

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Hopper et al. (1996)	Randomized control design	School/home intervention: in-class instruction and activities related to healthy nutrition and exercise.	Knowledge of fitness and nutrition improved, but not physical fitness levels	Weak	X			X		X						
Pate et al. (2005)	matched-pair - random assignment	LEAP: A physical activity intervention for girls that modified instructional practices and school environment	Increase in reported vigorous physical activity	Strong	X	X	X			X						
Haerens et al. (2007)	Randomized control design	A physical activity intervention that modifying the school environment.	After nine months there was a significant increase in healthy physical activity	Strong	X	X	X			X						
Murphy et al. (2006)	Randomized control design	Girls were asked to take part in regular exercise, including body resistant circuit sessions, and aerobic exercise.	There was a positive change in health behaviours.	Strong	X			X		X						
Tierney, Grossman, & Resch (1995)	Randomized control design	Big Brothers/Big Sisters: mentoring intervention in the community domain.	Improved family relationships, school performance, peer relationships	Moderate					X		X		X		X	

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Grossman & Bulle (2006)	Systematic Review	Interventions aimed at promoting connectedness between youth and nonparental adults	Identified positive qualities of mentoring programs, and other interventions.	Strong							X					
LeCroy (2004)	Randomized control design	Go Grrrls: A 12-session school-based program promoting healthy psychosocial development in adolescent girls.	Significant improvements in acceptance of body image, self-liking, assertiveness, competence, and self-efficacy.	Strong	X						X					
Kerr & Robinson Kurpius (2004)	Longitudinal cohort study	TARGETS: a one-day program aimed at girls who were at risk for not following through on their potential.	An effect on participants' interest in math and science oriented careers. Participants also reported significant increases in self-esteem, and self-efficacy.	Strong	X						X					
Wright et al. (2006)*	Case-control	An arts program that promotes positive youth development through the creation of a non-judgmental environment.	There was strong attendance, even from low-income communities. Participants demonstrated both artistic and social development.	Strong				X	X		X					

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Santor et al. (2007)*	Longitudinal cohort study	YooMagazine: A website that provides health information and encourages early detection and help seeking for emotional difficulties.	Students were likely to seek further help, but there was no impact on the overall health of participants.	Strong	X						X					
O'Dea & Abraham (2000)	Randomized control design	Everybody's Different: An in-school intervention aiming to improve participants' body image and eating attitudes by building self-esteem.	Participants reported increased body satisfaction, and changed weight loss behaviours and opinions of physical appearance.	Moderate	X						X					
Garaigordobil (2004)	Randomized control design	The program was based on promoting positive interactions among peers to facilitate emotional development.	Participants reported decreases in anxiety, and increases in emotional awareness and empathy towards peers.	Strong				X			X					
Nota & Soresi (2004)	Randomized control design	Difficult: No Problem!: A school-based intervention designed to improve problem-solving and decision-making skills among participants.	Students were more likely to be vigilant, gather information, identify possible solutions, assume responsibility, and ask for help when problem solving.	Weak				X			X					

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Pedro-Carroll, Alpert-Gillis, & Cowen (1992)	Repeated measures, pre-post	Children of Divorce Intervention Program: The program creates a safe environment for participants, before teaching problem-solving skills to promote resilience and self-esteem.	Improvement in adjustment in both family and school environments over control groups comprised of wait-list students and students whose parents did not divorce.	Moderate				X	X		X					
McKay (2000)	Systematic Review	Interventions to prevent sexually transmitted infections	Changing frequency of condom use appears to be the most easily influenced behaviour related to positive sexual health.	Strong								X				
Kirby (2001)	Systematic Review	Interventions aiming to reduce teen pregnancy	Identified the factors that can lead to the strongest effect for sexual education programs, and community and school-based health clinics.	Strong								X				
Kirby, Laris, & Rolleri (2007)	Systematic Review	Sexual education programs	Identified factors that yielded the strongest results among sexual education programs	Strong								X				

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Kim et al. (1997)	Systematic Review	AIDS-Risk Reduction Interventions	Identified characteristics that were common among successful interventions aimed at reducing risky behaviour and promoting condom use	Strong								X				
Dunn et al. (1998) *	Randomized control design	Two sessions aimed at providing factual information about AIDS and HIV, and changing attitudes about sexual behaviour.	This program was successful in changing participants' intended sexual behaviours.	Moderate	X							X				
Kirby et al. (1991)	Randomized control design	Reducing The Risk: An education curriculum to encourage avoiding unprotected sex, and discussing abstinence and birth control with parents.	A significant increase in communication with parents about birth control and abstinence, and significant increases in knowledge, at an 18-month follow-up. The program delayed onset of sexual behaviour for participants who were not yet sexually active.	Moderate	X							X				

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Joyce, Kaestner, & Colman (2006)	Repeated measures pre/post	Enforcement of a law requiring all minors who are seeking an abortion, to notify their parent or guardian.	Lowered reported rates of abortion and childbirth among minors. Older minors demonstrated an increased birth rate, and an increase in second trimester abortions at age 18.	Moderate		X								X		
Schonert-Reichl, Smith, Zaidman-Zait, & Hertzman (2003)	Repeated measures pre/post	Roots of Empathy: A school-based program that brings infants and parents into the classrooms to foster empathy, and develop emotional literacy.	Program participants reported significant increases in emotional knowledge, and did not demonstrate the raise in aggression seen in comparison participants.	Strong	X			X			X			X		
Franzini et al. (2007)	Repeated measures pre/post	Enforcement of a law requiring parental consent for minors to receive prescribed contraception and requiring health care providers to disclose the identity of any minors who are sexually active.	The projected cost of the change in policy was $43.6 million a year	Strong		X						X				

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Riser et al. (2006)	Review published in refereed journal	Assets Coming Together For Youth: A public health strategy to promote positive youth development through community building.	A number of key implementation requirements were identified, including strong leadership, accessibility, and involvement of all members of a community	Moderate									X			
Johnson et al. (1996)	Randomized control design	Creating Lasting Connections: Through mobilizing the church community, the program was designed to improve resiliency and delay the onset of discouraged behaviours	Some significant improvements in community and family resiliency.	Weak	X		X	X					X			
Catalano et al. (2003)	Randomized control design	Raising Healthy Children: A longitudinal school-based program fostering positive development, while reducing risk factors. The program included parent, teacher, and student components	Participation in the program was associated with increases in social competency and academic performance, and delayed onset of antisocial behaviours.	Strong	X			X					X			

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The Fourth R (2007) *	Randomized control design	The Fourth R: A school-based health curriculum that aims to teach relationship knowledge and peer-interaction skills.	Students reported healthier attitudes and behaviours, and learned more than students taking part in traditional health curriculum.	Moderate	X			X						X		
Ferrer-Wreder et al. (2002)	A quasi-experimental pre-post with matched comparisons	Making Life Choices Program: a school-based intervention to promote positive identity development.	Gains in the development of positive skills, knowledge and attitudes, and a reduction of negative attitudes and identity commitment.	Strong	X			X							X	
Mukoma & Flisher (2004)	Systematic Review	Health promoting schools	There is some evidence to support the development of health supporting schools	Strong												X
Hawkins et al. (1999)	Quasi-experimental with long-term follow-up	Teacher training, parenting classes, and social competence training for students	Significant improvements in school commitment and attachment, as well as academic achievement.	Moderate	X			X								X

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Patton et al. (2006)	Randomized control design	The Gatehouse Project: An intervention to improve the school environment through promoting a sense of inclusion and belonging in students, and increasing commitment to education.	At long-term follow-up, there a reduction of risk factors. Positive outcomes were not measured.	Strong	X		X	X								X
Battistich et al. (1996)	Case-control	The Child Development Project: An intervention to develop elementary schools that are "caring communities of learners," through fostering protective factors.	Among high intervention participants, there were increases in sense of community. There were also moderate reductions in negative behaviours	Moderate	X		X									X
Battistich, Schaps, & Wilson (2004)	Follow-up	The Child Development Project: An intervention to develop elementary schools that are "caring communities of learners," through fostering protective factors.	Four years following the intervention, some strong effects remained. Students who received an intensive version of the intervention were still displaying marginal effects in two thirds of the original outcomes	Strong	X		X									X

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Naylor et al. (2006b)*	Randomized school-level intervention	Increased PE curriculum, teacher training, school supports to promote more physical activity in schools	Intervention showed increased levels of physical activity among students in schools, changes in awareness of importance of activity	Strong	X		X	X		X			X			
Naylor et al. (2006a)*	Prospective case study	Action Schools BC community participatory process to change policy, practices in schools around physical activity	Community engagement increased, policy changes, increased funding support for physical activities, changes in curriculum	Strong		X	X	X		X			X			
Martin et al. (2006)	Retrospective random national sample	Community service or service learning in high schools curriculum	Increased community engagement, moral behaviour, attitudes about charitable giving	Moderate	X	X		X			X		X	X	X	

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