

# Strategies for Population Health

## *Investing in the Health of Canadians*



*Prepared by the Federal, Provincial and Territorial  
Advisory Committee on Population Health*

for the

**Meeting of the Ministers of Health**

*Halifax, Nova Scotia*

*September 14-15, 1994*



# Strategies for Population Health

*Investing in the Health  
of Canadians*

Additional copies are available from:

Publications, Health Canada  
Communications Directorate  
Ottawa, Ontario  
K1A 0K9

© Minister of Supply and Services Canada 1994  
Cat. No. H39-316/1994E  
ISBN 0-662-22833-2

Également disponible en français sous le titre :  
*Stratégies d'amélioration de la santé de la population : Investir  
dans la santé des Canadiens*



*Printed on  
recycled paper*

---

# Preface

---

This discussion paper was prepared by the Federal/Provincial/Territorial Advisory Committee on Population Health, at the direction of the Federal/Provincial/Territorial Conference of Deputy Ministers of Health. The direction was to identify broad population health strategies on which the provincial, territorial and federal governments could collaborate and achieve significant results. The overall role of the Advisory Committee is to advise the Conference of Deputy Ministers on national and interprovincial strategies that should be pursued to improve the health status of the Canadian population and to provide a more integrated approach to health.

The population health framework and the strategic directions proposed in this discussion paper were adopted by the Federal/Provincial/Territorial Ministers of Health at their September 1994 meeting in Halifax. The Advisory Committee was directed by the Ministers to proceed with planning for implementation of the strategic directions, in collaboration with appropriate partners.

---

---

# Contents

---

<b>Executive Summary .....</b>	<b>1</b>
<b>Strategies for Population Health .....</b>	<b>9</b>
What is Population Health? .....	9
What are the Benefits of a Population Health Approach? .....	10
What Makes People Healthy? .....	11
<i>Income and Social Status</i> .....	12
<i>Social Support Networks</i> .....	16
<i>Education</i> .....	17
<i>Employment and Working Conditions</i> .....	18
<i>Physical Environments</i> .....	19
<i>Biology and Genetic Endowment</i> .....	20
<i>Personal Health Practices and Coping Skills</i> .....	21
<i>Healthy Child Development</i> .....	23
<i>Health Services</i> .....	25
Health Status Disparities .....	26
A Framework for Action on Population Health .....	28
<i>The Role of Information, Research and Public Policy</i> .....	29
<i>The Importance of Intersectoral Action</i> .....	31
<i>Benefits and Implications of Adopting the Framework</i> ....	32
Strategic Directions for National Action .....	34
Conclusion .....	38
<b>References .....</b>	<b>41</b>
<b>Members of the Federal/Provincial/Territorial Advisory Committee on Population Health .....</b>	<b>43</b>

---

---

# Executive Summary

---

This paper summarizes what we know about the broad determinants of health—the things that make and keep people healthy. It then presents a framework, based on these determinants, that could guide development by the federal, provincial and territorial governments of policies and strategies to improve population health. Finally, it proposes strategic directions upon which the provinces, territories and the federal government could collaborate. Health care reform is not specifically addressed, although the proposed population health strategies support one of the key principles of health system reform—that there is more to health than health care.

## What is a Population Health Approach?

A population health approach differs from traditional medical and health care thinking in two main ways.

- Population health strategies address the entire range of factors that determine health. Traditional health care focuses on risks and clinical factors related to particular diseases.
  
- Population health strategies are designed to affect the entire population. Health care deals with individuals one at a time, usually individuals who already have a health problem or are at significant risk of developing one.

Investing in a population health approach offers benefits in three main areas: increased prosperity, because a healthy population is a major contributor to a vibrant economy; reduced expenditures on health and social problems; and overall social stability and well-being for Canadians.

---

There is a growing body of evidence about the following determinants of health.

## **The Determinants of Health: What Makes People Healthy?**

***Income and Social Status.*** This is the single most important determinant of health. Many studies show that health status improves at each step up the income and social hierarchy. As well, societies which are reasonably prosperous and have an equitable distribution of wealth have the healthiest populations, regardless of the amount they spend on health care.

***Social Support Networks.*** Support from families, friends and communities is associated with better health. Some experts conclude that the health effect of social relationships may be as important as established risk factors such as smoking, physical activity, obesity and high blood pressure.

***Education.*** Health status improves with level of education, including self-ratings of positive health or indicators of poor health such as activity limitation or lost work days. Education increases opportunities for income and job security, and equips people with a sense of control over life circumstances — key factors that influence health.

***Employment and Working Conditions.*** Those with more control over their work circumstances and fewer stress related demands of the job are healthier. Workplace hazards and injuries are significant causes of health problems. And unemployment is associated with poorer health.

***Physical Environments.*** Physical factors in the natural environment such as air, water and soil quality are key influences on health. Factors in the human-built environment such as housing, workplace safety, community and road design are also important influences.

---



***Biology and Genetic Endowment.*** The genetic endowment of the individual, the functioning of various body systems, and the processes of development and aging are a fundamental determinant of health. Biological differences in sex, and socially constructed gender, influence health on an individual and population basis.

***Personal Health Practices and Coping Skills.*** Social environments that enable and support healthy choices and lifestyles, as well as people's knowledge, intentions, behaviours and coping skills for dealing with life in healthy ways, are key influences on health.

***Healthy Child Development.*** The effect of prenatal and early childhood experiences on subsequent health, well-being, coping skills and competence is very powerful. For example, a low weight at birth links with health and social problems throughout the lifespan. And mothers at each step up the income scale have babies with higher birthweights, on average, than those on the step below.

***Health Services.*** Health services, particularly those designed to maintain and promote health and prevent disease, contribute to population health.

## **A Framework for Action on Population Health**

Strategies to influence population health status must address the broad range of health determinants in a comprehensive and interrelated way. The determinants can be grouped into five categories making up a framework that could be adopted by the federal, provincial and territorial governments as the basis for strategies to improve population health.

***Social and Economic Environment.*** Income, employment, social status, social support networks, education, and social factors in the workplace.

***Physical Environment.*** Physical factors in the workplace, as well as other aspects of the natural and human-built physical environment.

***Personal Health Practices.*** Behaviours that enhance or create risks to health.

***Individual Capacity and Coping Skills.*** Psychological characteristics of the person such as personal competence, coping skills, and sense of control and mastery; as well as genetic and biological characteristics.

***Health Services.*** Services to promote, maintain and restore health.

Healthy child development is not included as a separate category of the framework, in spite of its crucial importance as a determinant of health. Rather, each of the categories includes factors known to contribute to healthy child development.

Collaboration across many sectors and the active support of the general public are essential for successful population health strategies. In applying the framework, the health sector cannot act alone, because most of the determinants of health fall outside its purview. Key sectors that need to be involved, in addition to health, include the economic, education, environmental, employment and social services sectors. Voluntary, professional, business, consumer and labour organizations should be participants, along with all levels of government. Representatives of populations living in disadvantaged circumstances and experiencing significant health disparities will be essential partners in initiatives to address their unique needs. As well, other groups such as communities of faith, ethnocultural organizations and organizations representing populations with special needs could be important participants.

## **The Importance of Intersectoral Collaboration**

---

## Benefits and Implications of Adopting the Framework

Having a common framework for action that is grounded on sound evidence about the major determinants of health would provide a consistent and rational basis for setting priorities, establishing strategies, making investments in actions to improve population health and measuring progress. Concerted efforts could be made by all partners to address common priorities that are known to have a significant influence on health. This should enable partners to pool their resources and expertise, reduce duplication, and get the best return on their investment. As well, adopting the population health framework would provide a common basis for setting research priorities and evaluating new approaches to improve population health.

The following are the major implications of formally adopting the framework.

- There will be a more balanced emphasis on and investment in all of the determinants of health, with less of a preoccupation with health care.
  - Difficult decisions will have to be made about reallocation of resources to address the full range of health determinants. A long term commitment will be needed, because the real payoffs of population health strategies will come in the middle to long term.
  - Complex issues such as unemployment and poor economic opportunities, environmental pollution and social stress will have to be addressed. Considerable development and testing of new approaches will be required.
  - It will be necessary to increase the understanding of other sectors about the ways in which their policies, decisions and actions impact population health; and their willingness and capacity to act on that understanding. Development of national population health strategies will need to involve all key partners right from the start, to ensure that common priorities are being addressed and all key partners are on board.
-

- 
- The general public and various special interest groups will have to better understand the broad determinants of health; support investment in actions that benefit the entire population; and have a direct involvement in and sense of ownership of initiatives to enhance individual, family and population health.

To move forward with population health strategies based on the determinants of health framework, the following directions are recommended by the Federal/Provincial/Territorial Advisory Committee on Population Health.

## Strategic Directions for National Action

**1** *Strengthen public understanding about the broad determinants of health, and public support for and involvement in actions to improve the health of the overall population and reduce health status disparities experienced by some groups of Canadians.*

Many members of the public already know there is more to health than health care. But there is little appreciation of the powerful links between prosperity, income distribution and health; or of the important role of education and economic development in fostering health. If there is to be broad public support for and participation in population health initiatives based on the determinants of health framework, greater public understanding will be needed. Such understanding will provide the foundation for informed public participation in the ongoing health debate, and in the setting of priorities that will have the most positive effects on the health of all Canadians.

---

---

**2** *Build understanding about the determinants of health, and support for the population health approach, among government partners in sectors outside health.*

The policies and actions of government departments in sectors outside health tend to be developed with insufficient consideration of the health impacts. Greater understanding among policy and decision makers in all government sectors of the crucial role of the broad determinants of health, and the strong relationship of health to prosperity, would be a starting point for ensuring their actions are more supportive of population health. As well, mechanisms to ensure better coordination of policy initiatives, with a central focus on health, could improve the situation. Greater attention to the health impacts of their policies and actions by all government ministries, and better coordination of their policies to address the broad determinants of health, should also have positive “spin-off” effects on their non-government partners and constituencies.

**3** *Develop comprehensive intersectoral population health initiatives for a few key priorities that have the potential to significantly impact population health.*

Concerted action by a range of sectors and partners, focused on a limited number of priority areas and capitalizing on current opportunities, should have a significant positive impact on population health. Such action would ensure that each priority area is addressed in a comprehensive fashion, based on the determinants of health in the population health framework. Reducing the disparities in health status experienced by some groups of Canadians would be a significant focus of action in any priority area. Collaborative initiatives on the priorities would help bring together existing initiatives of various partners, and use scarce resources more cost-effectively. As well, each priority area would provide a specific focus and opportunity to promote and implement wide intersectoral collaboration, so this strategy would link with the second strategy presented above.

---

Priority areas could be selected on the basis of criteria such as national significance, potential impact in improving population health and reducing health disparities, existence of sufficient knowledge and capacity to take action, and potential return on investment.

To pursue this strategic direction, the Advisory Committee would undertake further work to identify areas on which all jurisdictions would be prepared to collaborate. This should include consultation with key partners inside and outside government.

---

---

# Strategies for Population Health

---

The health field in Canada currently faces two key challenges. These are to:

- Apply the knowledge we already have about what makes and keeps people healthy, and at the same time learn more about how to foster the health of Canadians; and
- Ensure the health care system is as cost-effective as possible in delivering appropriate services needed by people with health problems.

This paper is about the first challenge. It summarizes what we know about the determinants of health—the things that make and keep people healthy. It then presents a framework, based on these determinants, for strategies to foster population health and reduce the health status disparities some groups of Canadians experience. Finally, it presents strategic directions and priorities on which the provinces, territories and the federal government can work together and collaborate with other partners to improve population health—by focusing on the broad determinants of health.

The paper does not focus on the second challenge of reforming the health care system. But the population health strategies proposed in the paper support one of the key principles of health system reform—that there is more to health than health care.

## **What is Population Health?**

A population health strategy focuses on factors that enhance the health and well-being of the overall population. It views health as an asset that is a resource for everyday living, not simply the absence of disease. Population health concerns itself with the living and working environments that affect people's health, the conditions that enable and support people in making healthy choices, and the services that promote and maintain health.

---

Population health has as its goal the best possible health status for the entire population. In contrast, health care has as its aim the treatment or rehabilitation of illness. A population health perspective differs from traditional medical and health care thinking in two main ways.

- Firstly, population health strategies address the entire range of individual and collective factors that determine health. Traditional health care focuses on risks and clinical factors related to particular diseases.
  
- Secondly, population health strategies are designed to affect whole groups or populations of people. Clinical health care deals with individuals one at a time, usually individuals who already have a health problem or are at significant risk of developing one.

Both population health and health care are important. Services for people with health problems are essential, and we devote most of our health resources to these services. To ensure that high quality health care continues to be available to all Canadians when they need it, at a cost the taxpayers can afford, we have many reform initiatives underway. But at the same time, there are significant benefits to be gained from the population health approach, benefits that are not yet being realized. This paper proposes strategic directions that should help us achieve those benefits.

Investing in population health offers benefits in three main areas: increased prosperity, reduced expenditures on health and social problems, and overall social stability and well-being for Canadians.

The prosperity of a nation and the health of its citizens are inextricably linked. Many studies have shown the most powerful indicator of population health is the prosperity of the society within which people live, with an equitable distribution of wealth. At the same time, a healthy population is a major contributor to a vibrant economy. An effective population health strategy will therefore make a significant contribution to Canada's agenda for economic prosperity.

## **What are the Benefits of a Population Health Approach?**



The more prosperous and healthy our population, the less need there will be for illness oriented health care services and the social safety net we are committed to maintaining. These are important social initiatives and will probably always be required to some degree. However, they currently consume a large part of our national resources. An effective strategy to foster population health and well-being should make some of these resources available for other more productive purposes.

Canada prides itself on having a society that values and offers its residents good health and quality of life. For example, social stability, economic well-being, safety and meaningful and satisfying work are assets Canadians value and expect. These are the same factors that an effective population health approach would emphasize, the very factors that contribute most to good health for individuals, groups and the entire population. So a population health approach is a natural and logical strategy for governments to adopt, as part of their obligation to citizens.

Although some of the benefits of a population health approach will accrue primarily in the longer term, there are also more immediate benefits to be realized. For example, there is increasing evidence that initiatives to promote health in the workplace and improve the quality of work life increase employee satisfaction and productivity almost immediately. And those effects tend to be sustained, so long as the positive working conditions are maintained. At the same time, such initiatives have long term beneficial effects on the health status of employees, effects that seem to result from reductions in stress and an increased sense of control, both of which are key determinants of health discussed later in this paper.

### **The Determinants of Health: What Makes People Healthy?**

There is a growing body of evidence about what makes people healthy. The Lalonde Report set the stage in 1974, by establishing a framework for the key factors that seemed to determine health status: lifestyle, environment, human biology and health services. Since then, much has been learned that supports, and at the same time refines and expands this basic framework. In particular, there is mounting evidence that the

---

contribution of medicine and health care is quite limited, and that spending more on health care will not result in further improvements in population health. On the other hand, there are strong and growing indications that other factors such as living and working conditions are crucially important for a healthy population.

The evidence indicates that the key factors which influence population health are income and social status, social support networks, education, employment and working conditions, safe and clean physical environments, biology and genetic make-up, personal health practices and coping skills, childhood development, and health services. Each of these factors is important in its own right. At the same time, the factors are interrelated.

The rest of this section gives an overview of what we know about the ways these factors influence health.

### ***Income and Social Status***

There is strong and growing evidence that higher socio-economic status is associated with better health. In fact, these two factors seem to be the most important determinants of health. People's perception of how healthy they are is linked to their income level, as shown in Figure 1.

There is extensive research that demonstrates the links between income and health status. One Canadian study found that men in the top 20% income bracket live on average six years longer than those in the bottom 20% and can expect 14 more years of life free of activity restrictions. Women in the top 20% can expect three more years of life than those in the bottom 20%, and eight more years free of activity restrictions.<sup>1</sup> Studies in provinces and cities in all parts of Canada consistently show that people at each step on the income scale are healthier than those on the step below. Figure 2 illustrates this with data from Winnipeg, where the rate of premature death (before age 65) decreases at each step of the income scale, from the bottom to the top 20%.

---

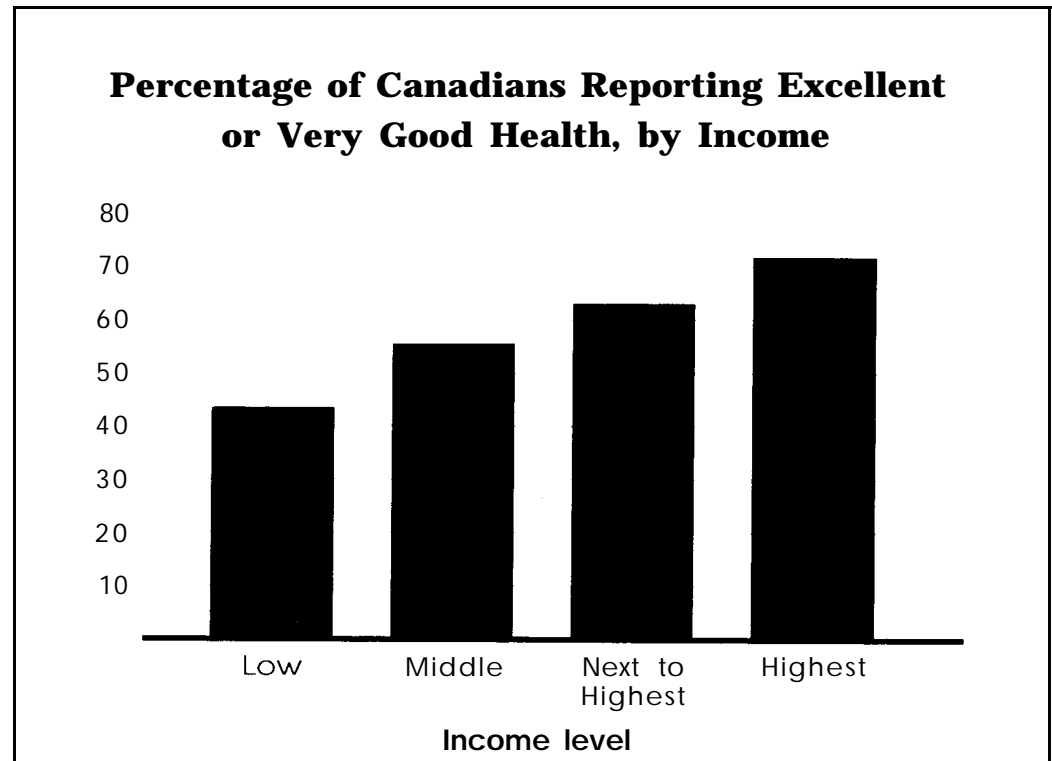


Figure 1. Source: Statistics Canada General Social Survey, 1991.

A recent World Bank report<sup>2</sup> concludes that “Economic policies conducive to sustained growth are among the most important measures governments can take to improve their citizens’ health.” As well, many studies demonstrate that the more equitable the distribution of wealth, the healthier the population. Japan provides a good example. Over a 30 year period, Japan has moved from being a country with high infant mortality rates and low life expectancy, to having some of the best health status indicators in the world. During the same period, the Japanese economy soared, and incomes increased significantly. As well, Japan now has a very equitable distribution of wealth, with the smallest relative difference in income between the top and bottom 20% of any OECD country. Interestingly, Japan spends only 6.8% of its GDP on health care, compared to about 10% in Canada.

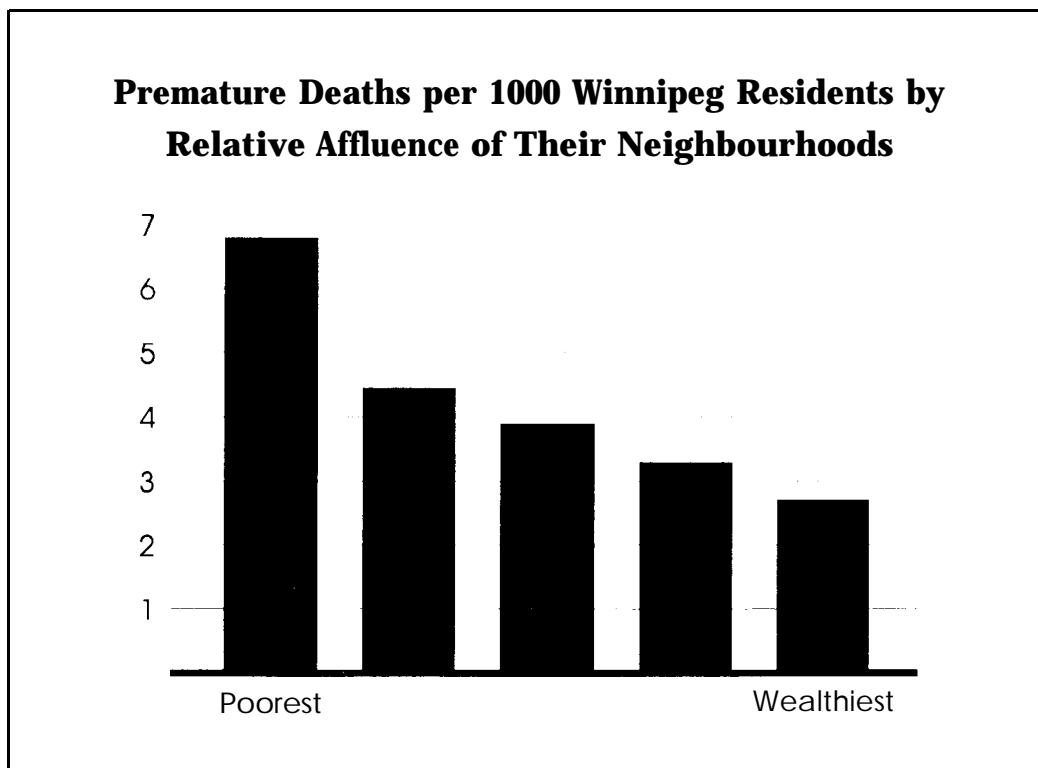


Figure 2. Source: Manitoba Centre for Health Policy and Evaluation, 1994

Social status is also linked to health. A major British study<sup>3</sup> of civil service employees found that, for most major categories of disease (cancer, coronary heart disease, stroke, etc.), health increased with job rank. This was true even when risk factors such as smoking, which are known to vary with social class, were taken into account. All the people in the study worked in desk jobs, and all had a good standard of living and job security, so this was not an effect that could be explained by physical risk, poverty or material deprivation. Health increased at each step up the job hierarchy. For example, those one step down from the top (doctors, lawyers, etc.) had heart disease rates four times higher than those at the top (those at levels comparable to deputy ministers). So we must conclude that something related to higher income, social position and hierarchy provides a buffer or defence against disease, or that something about lower income and status undermines defences.

A very important aspect of the evidence about income, social status and health is that the relationship persists, even though the causes of illness and death may change. The relationship holds for different diseases, for men and women, for people in different parts of the country and different parts of the world. Lower socio-economic status seems to underlie the prevalence of “something wrong” in a very general way, no matter what the specific health problem is.

Why are higher income and social status associated with better health? If it were just a matter of the poorest and lowest status groups having poor health, the explanation could be things like poor living conditions. But the effect occurs all across the socio-economic spectrum. Considerable research indicates that the degree of control people have over life circumstances, especially stressful situations, and their discretion to act are the key influences. Higher income and status generally result in more control and discretion. And the biological pathways for how this could happen are becoming better understood. A number of recent studies show that limited options and poor coping skills for dealing with stress increase vulnerability to a range of diseases through pathways that involve the immune and hormonal systems.

There is still much to be learned, but we now have sufficient knowledge to begin developing and testing interventions to improve population health by focusing on socio-economic status and related factors. Because women on average have lower incomes than men and are concentrated in lower status occupations, particular attention should be given to improving women’s health through action targeted at the social and economic environment. Improving people’s economic circumstances is one important type of intervention, and the involvement of the economic sector is clearly crucial. But economic development is not the only option. Changes that improve opportunities, for example through education and job training; and interventions that reduce stress and give people a greater sense of mastery and control over their lives at work, at home and in their communities will also be very important. To accomplish these changes, actions in the economic, education, employment, social services and other sectors will be needed. Because such changes are likely to have a positive effect across the entire spectrum of the socio-economic scale, even modest success has the potential for significant results in terms of improved overall population health status.

---

### ***Social Support Networks***

Support from families, friends and communities is associated with better health. An extensive study in California<sup>4</sup> found that, for men and women, the more social contacts people have, the lower their premature death rates. Other research supports these results. For example, another U.S. study found that low availability of emotional support and low social participation were associated with all-cause mortality.<sup>5</sup> And the risk of angina pectoris decreased with increasing levels of emotional support in a study<sup>6</sup> of male Israeli civil servants. As well, it has long been known that married people live longer than unmarried people, and that widowhood is associated with increased illness and death.<sup>7</sup> Some experts in the field have concluded that the health effect of social relationships may be as important as established risk factors such as smoking, physical activity, obesity and high blood pressure.<sup>8</sup>

Why do social support networks seem to improve health? The importance of effective responses to stress and good personal coping skills discussed above likely comes into play here. Support from family, friends and acquaintances could be very important in helping people solve problems and deal with adversity, as well as in maintaining a sense of mastery and control over life circumstances. As well, family and friends help provide basic support such as food and housing, look after one another when they are ill, and support one another in making lifestyle changes. The caring and respect that occurs in social relationships, and the resulting sense of satisfaction and well-being, seem to act as a buffer against health problems.

Population health interventions to strengthen social supports could include initiatives such as programs to maintain strong families; community development focused on making communities good places for social interaction; and initiatives that reduce discrimination and promote social tolerance.

---

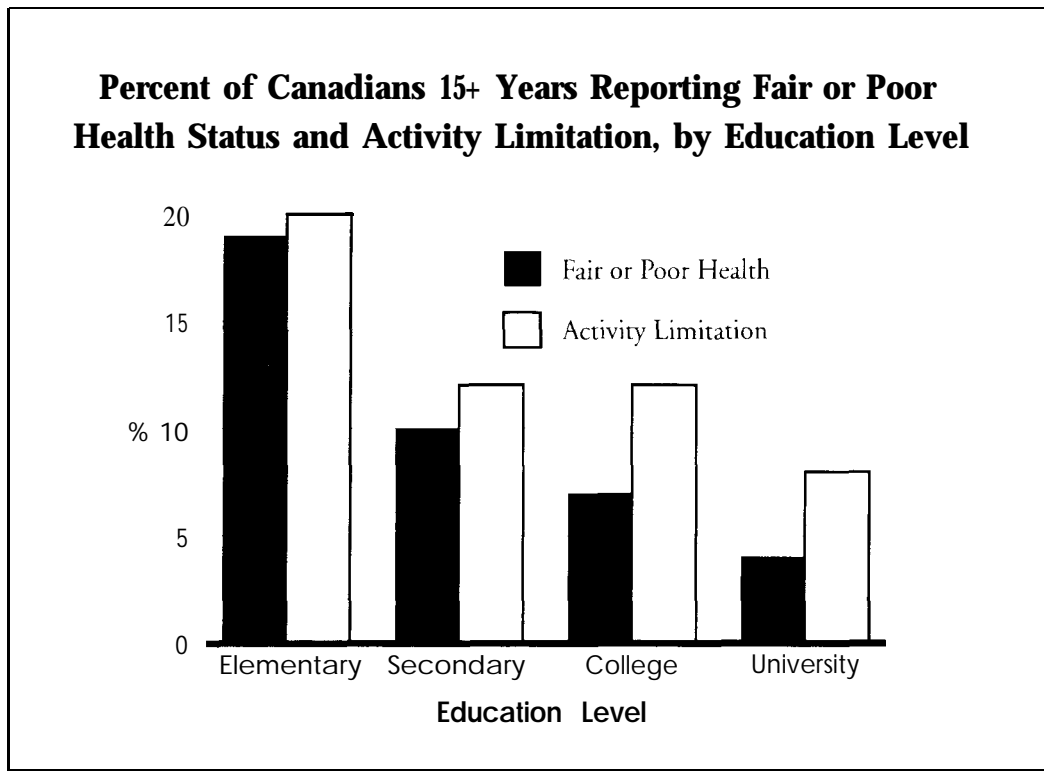


Figure 3, Source: Canada Health Promotion Survey, 1990.

### *Education*

Health status increases with level of education. For example, the 1990 Canada Health Promotion Survey found that as education increases, self rated health status improves, and activity limitation decreases. This is shown in Figure 3. The same survey found the number of lost workdays decreases with increasing education. People with elementary schooling lose about seven work days per year due to illness, injury or disability, while those with university education lose fewer than four days per year.

Education is closely tied to socio-economic status, and effective education for children and lifelong learning for adults are key contributors to health and prosperity for individuals, and for the country. Education contributes to health and

prosperity by equipping people with knowledge and skills for problem solving, and helps provide a sense of control and mastery over life circumstances. It increases opportunities for job and income security, and job satisfaction. And it improves people's ability to access and understand information to help keep them healthy.

Because initiatives to ensure access to effective education for children and youth and opportunities for life long learning must be part of an effective population health strategy, the involvement of the education sector is essential.

### ***Employment and Working Conditions***

The above discussion about the effect of job rank on health shows the importance of status in the workplace, and that those with more control over their work circumstances are healthier. But other factors are also important. Workplace social support, measured by the number and quality of interactions with co-workers, is associated with health. The more connections people have, the better their health. Health is also affected by stress related demands of the job such as the pace of work, the frequency of deadlines and reporting requirements. A recent study in Sweden<sup>9</sup> found that cardiovascular disease occurred most often among those with high job demands, low levels of control over their work, and low levels of social support at work.

Unemployment is associated with poorer health. One Canadian study found the unemployed have significantly more psychological distress, anxiety, depressive symptoms, disability days, activity limitation, health problems, hospitalization and physician visits than the employed.<sup>10</sup> People with lower incomes reported more anxiety and depressive symptoms, but most health problems seemed to be associated with the stress of unemployment, not with lack of income per se. A major review done for the World Health Organization found that high levels of unemployment and economic instability in a society cause significant mental health problems and adverse effects on the physical health of unemployed individuals, their families and their communities.”

---



---

Safe workplaces also contribute to population health. Workplace injuries and occupational illnesses exact a large toll on the health of Canada's workers, and most are preventable. Occupational injury rates rose by about one-third in Canada from 1955 to 1987, while rates were declining in most other OECD countries.<sup>12</sup>

Canadian adults spend about one-quarter of their lives at work. Initiatives to make the workplace a safe and healthy setting that promotes, supports and protects peoples' health will be a key element of an effective population health approach. Model programs that foster health in the workplace, by involving workers in identification of problems and solutions, are increasingly being implemented. The involvement of the employment and business sectors is essential to bring about changes to ensure that the workplace fosters good health.

### *Physical Environments*

Population health is critically dependent on the physical environments in which we live. The workplace as a key physical (and social) environment is discussed above. Other important aspects of the physical environment are our housing, the air we breathe, the water we drink and the safety of our communities.

Air pollution, including exposure to second hand tobacco smoke, has a significant association with health. A study in southern Ontario found a consistent link between hospital admissions for respiratory illness in the summer months and levels of sulphates and ozone in the air.<sup>13</sup> However, it now seems that the risks from small particles such as dust and carbon particles that are by-products of burning fuel may be even greater than the risks from pollutants such as ozone.<sup>14</sup> As well, research indicates that lung cancer risks from second hand tobacco smoke are greater than the risks from the hazardous air pollutants from all regulated industrial emissions combined.<sup>15</sup>

---

Safely designed homes, schools, roads and workplaces can help prevent the large number of injuries from motor vehicle accidents and other causes that occur in Canada. Safe and affordable housing is another aspect of the physical environment that contributes to population health. Reducing hazardous wastes that contaminate our ground and water, and more effective waste management, are further avenues for action. Population health strategies to impact the physical environment must address complex and interrelated systems. Actions in the environmental, economic, business, health and social sectors will be required, including public policy and regulatory action.

### ***Biology and Genetic Endowment***

The basic biology and organic make-up of the human body are a fundamental determinant of health. Included are the genetic endowment of the individual, the functioning of various body systems, and the processes of development and aging. As well, there are interactions between human biology and other key determinants of health.

There are complex relationships between individual experience and the development and functioning of key body systems. For example, an earlier section of this paper described how limited options and poor skills for coping with stress increase vulnerability to various diseases, through pathways that involve the immune and hormonal systems. There is also increasing evidence that adult brain structure can be strongly influenced, sometimes in an irreversible way, by experience in early life.

Males and females at all ages and of all socio-economic strata have different life expectancies. The age of onset and the types of diseases, illnesses and conditions that are the prime causes of morbidity, disability and mortality are different for women and men. Vulnerability to significant health risks such as physical and sexual violence, STDs, environmental hazards and inappropriate clinical interventions also varies between men and women. As well, the patterns of correlation between income gradations and health status are different for men and women. These differences are attributable only in part to biological sex. More importantly, they arise from differences in the traits, attitudes, values, behaviours and roles society ascribes to males and females.

---

Genetic endowment provides an inherited predisposition to a wide range of individual responses that affect health status. Although socio-economic and environmental factors are important determinants of overall health, in some circumstances genetic endowment appears to predispose certain individuals to particular diseases or health problems. Genetic knowledge therefore has an important place in population health. At the same time, genetic science is developing and changing rapidly, and may increasingly offer solutions for prevention or amelioration of certain genetic predispositions and conditions.

### ***Personal Health Practices and Coping Skills***

Personal practices such as smoking, use of alcohol and other drugs, healthy eating, physical activity, and other personal behaviours affect health and well-being. Many of Canada's most common health problems are linked to these practices.

Smoking is the leading cause of lung cancer and a major risk factor for cardiovascular disease. Although the number of Canadians who smoke has been gradually declining, a significant number still do, and the smoking rates are increasing for adolescents. About 30% of Canadians are still regular smokers.

Alcohol is used to some extent by a large proportion of Canadians. Although most people drink responsibly most of the time, alcohol misuse is a leading cause of premature death, injury and disability. It is primarily associated with injuries and deaths resulting from accidents and violence. Both smoking and alcohol use during pregnancy have been linked to lower birthweights and other negative birth outcomes.

Regular exercise has been shown to reduce the risk of cardiovascular disease, diabetes, obesity, back ailments and some cancers. It also slows the natural degeneration that accompanies the aging process. In addition, it contributes to positive well-being by reducing tension and anxiety. Many people feel that regular physical activity is a significant contributor to their overall physical and mental health. Research now shows that even very moderate levels of physical activity provide substantial benefits.

---

Poor nutrition and unhealthy eating habits are associated with diabetes, cardiovascular disease and cancer. Studies have found that school performance in children is linked to nutrition, body weight, and physical activity. During pregnancy, poor nutrition leads to insufficient weight gain for the mother and a low birthweight for the baby. An appropriate body weight, which is largely determined by diet and exercise, is a significant contributor to people's positive self-concept, which in turn has important effects on their mental health, sense of competence and control over life circumstances.

Coping skills, which seem to be acquired primarily in the first few years of life, are also important in supporting healthy lifestyles. These are the skills people use to interact effectively with the world around them, to deal with the events, challenges and stresses they encounter in their day to day lives. Effective coping skills enable people to be self-reliant, solve problems, and make informed choices that enhance health. These skills help people face life's challenges in positive ways, without recourse to risky behaviours such as alcohol or drug abuse. Research tells us that people with a strong sense of their own effectiveness and ability to cope with circumstances in their lives are likely to be most successful in adopting and sustaining healthy behaviours and lifestyles.

People's knowledge, intentions and coping skills are important in adopting and sustaining healthy behaviours. But their social environments are also extremely important. For example, in the 1990 Health Promotion Survey done by Health and Welfare, 48% of people said the support of friends and family was an important factor in making healthy decisions. Adequate incomes enable people to purchase the food they need for healthy diets for themselves and their children. Public policies also affect health practices—for example, seat belt legislation has significantly increased the number of people who use them.

The values and normative behaviours of peers and social networks are powerful influences on health practices. Social conditioning plays a crucial role in determining and sustaining health behaviours. For example, smoking is strongly linked with socio-economic status. As well, tobacco is an addictive substance, and a propensity to addictive behaviours seems to be

---

---

established early in life. Therefore, people do not simply “choose” to smoke, or to quit smoking. Population health strategies targeted at personal health practices must therefore focus more on environmental factors and social conditions, and less on individual factors, if they are to be successful.

### *Healthy Child Development*

There is accumulating evidence that the effect of prenatal and early childhood experiences on subsequent health, well-being and competence is more powerful and long lasting than had previously been understood. Many of the factors affecting childhood development are aspects of other determinants of health. But child development is so important to population health that it is presented here as a separate determinant of health.

A low weight at birth links with problems not just during childhood, but also in adulthood. The negative effects during infancy of low birthweight have long been known. Studies in Montreal found low birthweight babies have a 40 times greater chance of dying during their first four weeks of life. They also have more neurological deficits, congenital abnormalities and retarded development.<sup>16</sup> However, there is increasing evidence that the negative effects of low birthweight manifest themselves later in life as well. For example, a study in Britain using longitudinal data on men born between 1911 and 1930 found those with the lowest weights at birth and at one year of age had the highest premature death rates from ischemic heart disease.

Research shows a strong relationship between income level of the mother and the baby’s birthweight. This is illustrated in Figure 4 with data from Manitoba. The effect occurs not just for the most economically disadvantaged group. Mothers at each step up the income scale have babies with higher birthweights, on average, than those on the step below. This tells us the problems are not just those such as poor maternal nutrition and poor health practices most likely to be associated with disadvantage, although the most serious problems occur in the lowest income group. It seems that factors such as coping skills and sense of control and mastery over life circumstances, with their attendant biological pathways, also come into play.

---

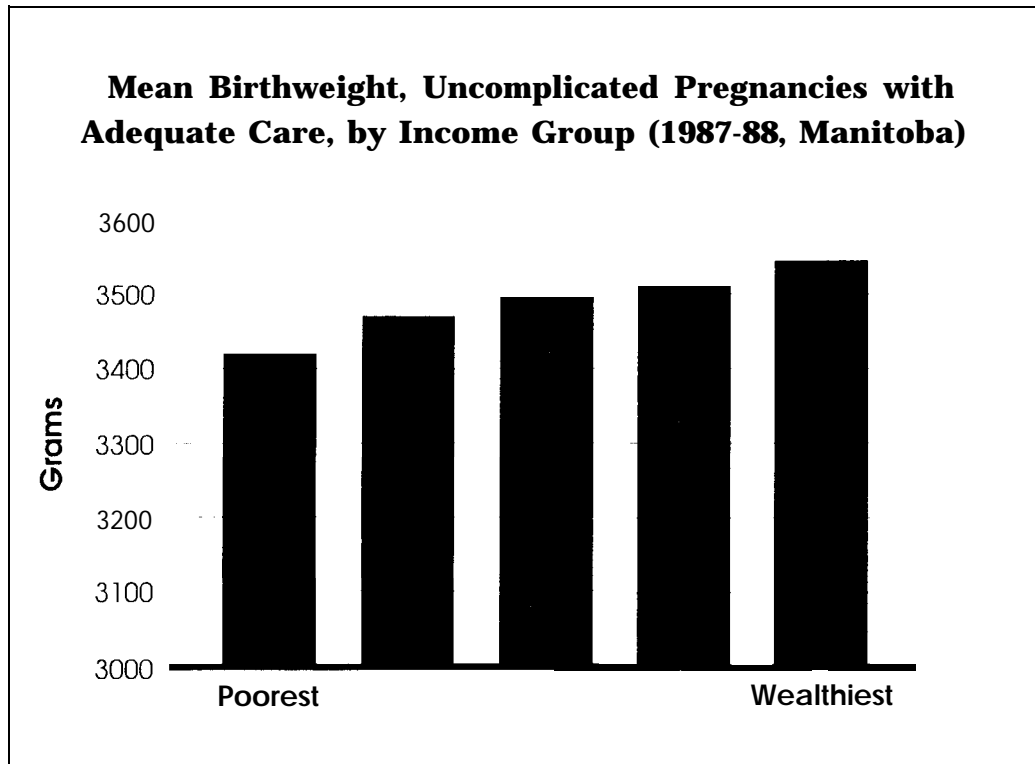


Figure 4. Source: Manitoba Centre for Health Policy and Evaluation, 1993.

Increasing evidence shows that the way children are cared for at an early age influences their coping skills and health for the rest of their lives.<sup>17,18</sup> A study on the Hawaiian island of Kauai found early childhood development problems caused by severe perinatal stress (problems of pregnancy, labour and delivery) were successfully counteracted over time in children from high and middle socio-economic status families, but not for those from low socio-economic status families. Something in the care received by children from more affluent families seems to not only protect them from health risks, but also be able to reverse the impact of problems that already exist.<sup>19</sup> There is also mounting evidence that poor prenatal care and complications at birth are linked to criminal behaviour later in life, and that children involved with the criminal justice system as adults are more likely to have experienced a variety of health and social problems since early childhood.<sup>20</sup>

Many studies have shown it is possible to reduce early childhood risks such as low birthweight. It is also possible to reduce the later life consequences of early childhood problems. For example, the “graduates” of a preschool enrichment program, provided in Michigan in the 1960s to low income children at significant risk of failing in school, are now 27 years of age. Compared to the control group that received no program, the program group have significantly higher earnings, are more, likely to own homes, completed more education, are less likely to have used social services, and had significantly fewer arrests. Females in the program had significantly fewer out of wedlock births. The researchers conclude that over the lifetime of the participants, the preschool program returns to the public \$7.16 for each dollar invested.<sup>21</sup>

There is increasing evidence that intervening at critical stages or transitions in the development of children and youth has the greatest potential to positively influence their later health and well-being. Key stages are the period before birth and early infancy, the period when the child begins school, the transition to adolescence, and the transition to adulthood. Focusing our interventions particularly on these periods should provide excellent results in improving child health, and overall population health.

### ***Health Services***

Health services, particularly those designed to maintain and promote health and prevent disease, contribute to population health. Preventive and primary health care services such as prenatal care, well baby clinics and immunization are very important for maternal and child health. Services that educate children and adults about health risks and healthy choices, and encourage and assist them to adopt healthy living practices, make a contribution. Services to help seniors maintain their health and independence are important as well. And community environmental health services help ensure the safety of our food, water and living environments.

Health care services designed to treat illness and restore health or functioning also make a contribution to keeping people healthy. However, as noted at the beginning of this paper, these services are not really part of a population health approach, because they focus essentially on individual disease and clinical risk factors.

By ensuring that health services are appropriate and cost-effective, we can ensure that they make the best possible contribution to health. At the same time, efforts to reform the health system should result in more resources being devoted to preventive and primary care services. As well, some resources now spent on inappropriate or ineffective health care should be freed up for other more productive purposes, including investment in the other determinants of health.

Some groups of Canadians have significantly lower health status than others. This is associated primarily with their very low income, socio-economic status, lack of education and other unfavourable living conditions. As well, women on average tend to have lower incomes and occupational status than men, and face significant stresses in balancing the demands of work and family life. The potential negative effects on women's health of these factors are intensified for women living in disadvantaged circumstances, for example, aboriginal and immigrant women.

### Health Status Disparities

Figure 5. Source: B.C. Provincial Health Officer's Annual Report (Draft), 1993.

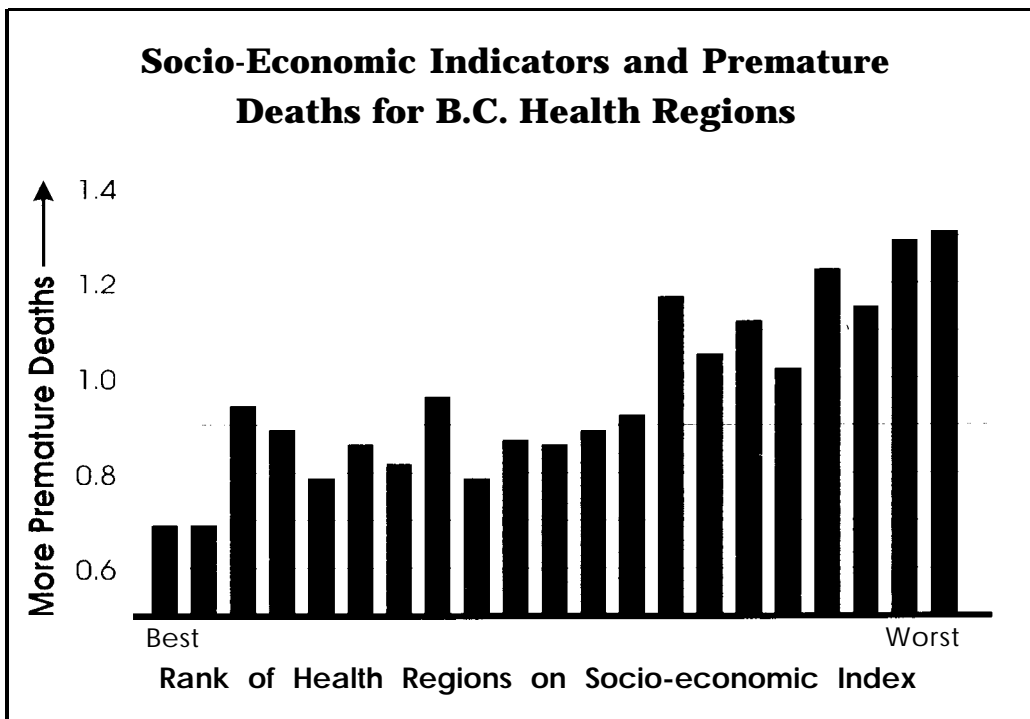
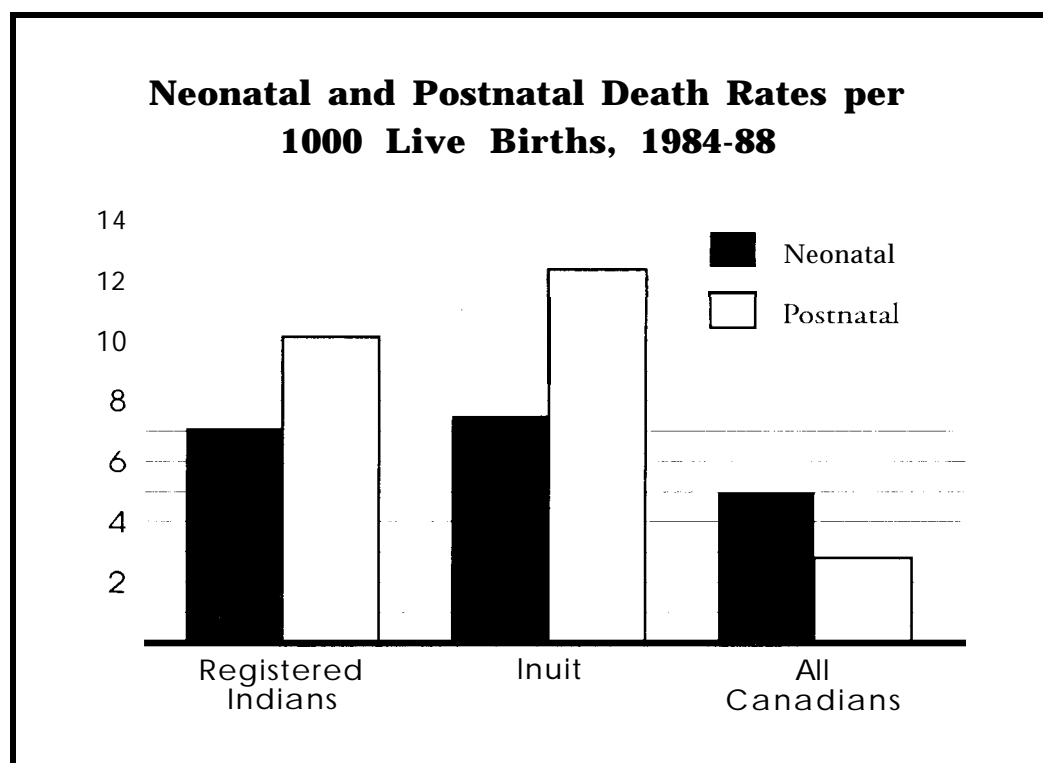




Figure 5 shows how different health regions in British Columbia have increasing rates of premature death according to increasing levels of socio-economic disadvantage. Premature death is measured by an index based on potential years of life lost (PYLL) from major diseases, and socio-economic disadvantage is measured by an index constructed from the percent of the region's population with less than Grade 9 education, the unemployment rate, the percentage of the population on social assistance, and the percentage of lone parent families.

Canada's Aboriginal peoples, as a group, are the most disadvantaged of our citizens, and have the poorest health status. Figure 6 shows the significantly higher infant death rates of registered Indians and Inuit, compared to the total Canadian population. Although the gap in infant mortality between Aboriginal peoples and other Canadians has been narrowing, it is still significant.

Figure 6. Source: Health Canada Medical Services Branch, 1990.



Tuberculosis rates are about eight times higher for registered Indians than for the total Canadian population. Diabetes rates are two to five times as high, and suicide rates are two to three times higher. There are similar disparities on many other indicators of health status. For example, in Manitoba, hospital morbidity (case rates) for infectious and parasitic diseases; endocrine, nutritional and metabolic diseases and immunity disorders; diseases of the respiratory and digestive systems; complications of pregnancy and childbirth; and injury and poisonings are at least twice as high for registered Indians than for other residents.

The major health problems of disadvantaged groups are a serious issue that must be attended to. However, they should not be the exclusive focus of a population health strategy, because resolving large problems of relatively small groups will not give us the overall results we are looking for in terms of improved health and prosperity of the entire population. But equitable opportunities for health for disadvantaged groups must be a special concern in a caring and democratic society that values the health of all its residents.

It is clear that strategies to influence population health status, if they are to be effective, must address a broad range of health determinants in a comprehensive and interrelated way. The determinants of health discussed in previous sections of this paper in fact establish a framework that could be adopted by the federal, provincial and territorial governments and other partners as the basis for development of strategies to improve population health.

The framework would consist of the following five categories. A comprehensive population health strategy would include policies and/or interventions to address several or all of these five categories, recognizing their interrelatedness.

***Social and Economic Environment:*** income, employment, social status, social support networks, education, and social factors in the workplace.

## **A Framework for Action on Population Health**

***Physical Environment:*** physical factors in the workplace, as well as other aspects of the natural and human-built physical environment.

***Personal Health Practices:*** behaviours that enhance or create risks to health.

***Individual Capacity and Coping Skills:*** psychological characteristics of the person such as personal competence, coping skills, and sense of control and mastery; and genetic and biological characteristics.

***Health Services:*** services to promote, maintain and restore health.

Healthy child development is not included as a separate category of the framework, in spite of its crucial importance as a determinant of health. Rather, each of the categories includes factors known to contribute to healthy child development.

### ***The Role of Information, Research and Public Policy***

Effective population health strategies must be built on a foundation of sound evidence about factors that determine health, and information about the potential impact of interventions and programs to address those determinants. Earlier sections of this paper show that we already have considerable evidence and information upon which to base our population health strategies and interventions. But there is still much we do not understand, and much more to be learned.

Support for research, particularly longitudinal research designed to better understand the long term effect of factors such as birthweight and early childhood experiences, will be an essential part of our population health strategies. As well, research to help understand the biological pathways through which the determinants express themselves is important. Because much of our existing research is based on men, there is also a need for gender specific studies about what makes and keeps men and women healthy. Applied research that tests and

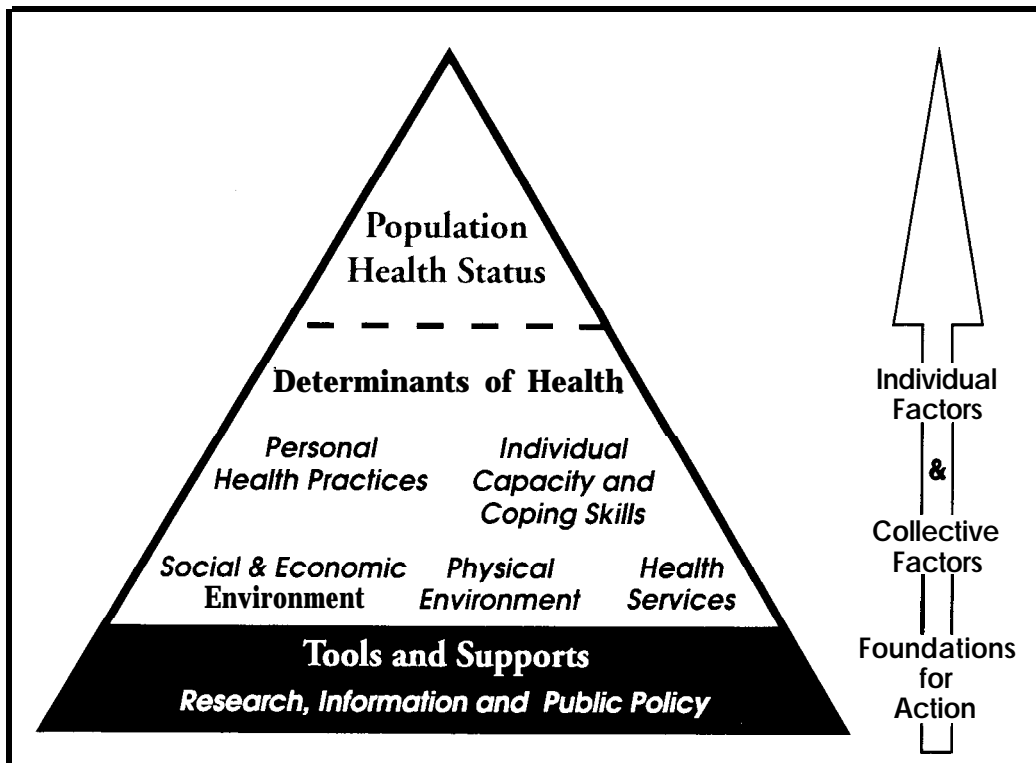
---

evaluates new population health approaches is needed, as is information to track the results and outcomes of our interventions on an ongoing basis. Therefore, research and information are key tools for addressing the determinants of health.

Public policy is another very important tool, since it affects almost all aspects of modern life. The influence of public policy on population health is not limited to the health sector. Policies in the economic, education, social services, transportation, housing, recreation and other public sectors are of crucial importance.

The diagram below illustrates the proposed framework for action, including the foundation of research, information and public policy. At the top of the pyramid is population health status, the ultimate purpose for our actions. The five categories of health determinants underpin health status. Determinants related essentially to the individual (health practices, capacity and coping skills) and those related to the “collective” conditions that support population health (supportive environments and services) are shown on two different levels, to convey the idea that the “collective” factors enable or provide the basis for the individual factors.

Framework for Population Health



### *The Importance of Intersectoral Action*

The population health framework presented earlier provides the basis for identifying and planning the content of our strategies for action—the “what.” But the “how” is also very important. Collaboration across many sectors, along with the active support of the general public, is the key. The health sector cannot act alone, because most of the determinants of health fall outside its purview.

Sectors that need to be involved, in addition to health, include the economic, education, environmental, employment and social services sectors. Voluntary, professional, business, consumer and labour organizations should be key participants, along with all levels of government. Representatives of populations living in disadvantaged circumstances and experiencing significant health disparities will be essential partners in initiatives to address their unique needs. As well, organizations representing other perspectives and special interests may be involved. For example, communities of faith, ethnocultural organizations and organizations representing populations with special needs could be important participants.

Intersectoral collaboration can occur at several levels. At the national level, the key players would be the federal, provincial and territorial governments and a range of national non-government organizations representing various sectors. Collaboration among government and non-government partners at the provincial, regional and community levels is also necessary. Some of the most successful experiences in intersectoral collaboration have occurred at the local community level. This argues for continuing to place major emphasis on collaboration at the community level, and at the same time, may offer lessons that could help in designing successful national intersectoral initiatives.

### ***Benefits and Implications of Adopting the Framework***

Adopting the population health framework and collaborative approach outlined above, as the basis for development of future health policies and strategies by federal, provincial and territorial governments, has great potential to improve the health of Canadians. Having a common framework for action that is grounded on sound evidence about the major determinants of health offers *significant benefits*. It would provide a consistent and rational basis for setting priorities, establishing strategies, making investments in actions to improve population health and measuring progress. Concerted efforts could be made by all partners to address common priorities that are known to have a significant influence on health. This should enable partners to pool their resources and expertise, reduce duplication, and get the best return on their investment. Various governments would be less likely to pursue their own separate initiatives in isolation from one another. And the public would see governments at various levels cooperating to address issues that are important to all Canadians.

As well, adopting the population health framework would provide a common basis for setting research priorities and testing and evaluating new approaches to improve population health. This should allow us to make significant strides in generating new knowledge, through the concentrated efforts of many partners.

Canada has been at the forefront in developing the concepts that underlie the population health approach. Adopting the proposed framework as the basis for research, policy and action would allow us to continue this leadership role, to the benefit of Canada and many other countries.

---

---

The following appear to be the main *requirements and implications* of formally adopting the framework as the basis for federal/provincial/territorial action.

- There will be a more balanced emphasis on and investment in all of the determinants of health, with less of a preoccupation with health care services. At the same time, health care reform will need to continue, since ensuring the most efficient and appropriate use of health care dollars should free resources to devote to the other determinants.
  - Difficult decisions will have to be made about reallocating resources to address the full range of health determinants, and about how to distribute resources among the various determinants.
  - A long term commitment will be needed. Although population health strategies offer some short term benefits, their real payoffs will come primarily in the middle to long term.
  - Difficult and complex issues such as unemployment and poor economic opportunities, environmental pollution and social stress will have to be addressed. As a society we are still struggling to find ways of dealing with these issues. Knowing that resolving or improving them will have positive effects on population health can provide additional motivation to persevere, but considerable development and testing of new approaches will be required.
  - It will be necessary to increase the understanding of other sectors about the ways in which their policies, decisions and actions impact population health. Furthermore, it will be necessary to bring about a willingness to act on that understanding, so their actions better support population health. A greater understanding in the economic and business sectors about the links between health and prosperity will be particularly crucial.
-

- ❑ Activities and mechanisms to stimulate and support the participation in collaborative population health initiatives of players from a wide range of sectors (not just the human services sectors that health usually collaborates with) will be needed. This will require representatives from those sectors to “see something in it for them.”
  
- ❑ The processes used to develop and implement national population health strategies will need to involve all key partners right from the start, to ensure that common priorities are being addressed and all key partners are on board.
  
- ❑ The general public, and various special interest groups, will have to better understand the broad determinants of health; support investment in actions that benefit the entire population; and have a direct involvement in and sense of ownership of initiatives to enhance individual, family and population health. Public education and participation activities will be required to bring this about.

The following three broad strategic directions are recommended, assuming that the population health framework is formally adopted by federal, provincial and territorial health ministries as the basis for future joint action. These directions were developed by the Federal/Provincial/Territorial Advisory Committee on Population Health, after a review of current knowledge on the determinants of health; consideration of the current public and political context; and a brief analysis of the population health goals, priorities and directions of each jurisdiction.

### **Strategic Directions for National Action**



---

*1 Strengthen public understanding about the broad determinants of health, and public support for and involvement in actions to improve the health of the overall population and reduce health status disparities experienced by some groups of Canadians.*

Research shows that many members of the public already know there is more to health than health care. When asked what is most important to their health, people tend to mention factors such as health practices (e.g. smoking and exercise), relative freedom from stress, and the quality of their work and family life, along with their access to health care. But at the same time, there is little appreciation of the powerful links between prosperity, income distribution and health; or of the important role of education and economic development in fostering health. If there is to be broad public support for and participation in population health initiatives based on the determinants of health outlined in this paper, as well as initiatives to address the health disparities experienced by some disadvantaged groups, greater public understanding will be needed. Such understanding will facilitate a sense of ownership of individual, family and community actions that enhance health. And it will provide the foundation for informed public participation in the ongoing health debate, and in the setting of priorities that will have the most positive effects on the health of all Canadians.

A few provinces have already developed public information materials to help inform the public about the broad determinants of health. A national initiative could use these as a starting point. The health goals being developed by most provinces will also make an important contribution to public awareness in this area, since the goals typically address the full range of health determinants. As well, development of national health goals, based on common directions in the provincial goals, is being considered by the Advisory Committee on Population Health. This Committee is also developing a national “report card” on the health of Canadians, which provides a further opportunity for communicating with the public about the health status of Canadians and the factors that influence their health.

---

## 2

*Build understanding about the determinants of health and support for the population health approach among government partners in sectors outside health.*

The policies and actions of government departments in sectors outside health tend to be developed with insufficient consideration of the health impacts, and when health impacts are considered, they are given little weight. Greater understanding among policy and decision makers in all government sectors of the crucial role of the broad determinants of health, and the strong relationship of health to prosperity, would be a starting point for ensuring their actions are more supportive of population health. As well, the vertical organization of government ministries often hinders the collaborative approach that is needed to address the broad determinants of health in an integrated fashion. Mechanisms to ensure linkage or coordination of policy initiatives, with a central focus on health, could improve the situation.

Some action to address these issues is already underway. For example, health impact assessment, as a formal requirement of the decision-making process, is now being developed by a few provincial governments. This should create the need for all sectors to become more informed about the determinants of health, and has the potential to ensure that health impacts are given due consideration. It provides an opportunity for health officials and ministers to educate their colleagues in other ministries about the determinants of health and advocate for the population health perspective. Cabinet or senior official level committees with responsibility for developing or coordinating government policy from the perspective of its impact on health are another mechanism being tried in some jurisdictions. These initiatives could provide the basis for development of models or approaches to be applied by governments across the country. As well, greater attention to the health impacts of their policies and actions by all government ministries, and better coordination of their policies to address the broad determinants of health, should have positive “spin-off” effects on their non-government partners and constituencies in the voluntary, professional and private sectors.

---

---

**3** *Develop comprehensive intersectoral population health initiatives for a few key priorities that have the potential to significantly impact population health.*

Concerted action by a range of sectors and partners, focused on a limited number of priority areas and capitalizing on current opportunities, should have a significant positive impact on population health. Such action would ensure that each priority area is addressed in a comprehensive fashion, based on the determinants of health in the population health framework. Reducing the disparities in health status experienced by some groups of Canadians would be a significant focus of action in any priority area. Collaborative initiatives on the priorities would help bring together existing initiatives of various partners, and use scarce resources more cost-effectively. As well, each priority area would provide a specific focus and opportunity to promote and implement wide intersectoral collaboration, so this strategy would link with the second strategy, presented above.

The Advisory Committee on Population Health suggests that the following *criteria* could be used to select one or more priority areas on which to focus.

**National significance:** will be seen by the public as, or would be explainable as, an area that is truly of national importance.

**Impact:** has clear potential, based on sound research evidence, to significantly improve population health and reduce health disparities.

**Common directions:** is consistent with the population health directions and priorities of provincial/territorial and federal governments.

**Capacity:** the capacity exists to take effective action on the strategy, at reasonable cost, e.g. sufficient knowledge to proceed, likelihood of sustained support, capacity to measure progress, good opportunities for intersectoral action.

---

**Return on investment:** could be accomplished with an affordable expenditure of resources, and offers the potential for a good return (in terms of improved health and related outcomes) on the investment.

**Flexibility:** provides flexibility for each jurisdiction and stakeholder to implement the strategy in their own way.

To pursue this strategic direction, the Advisory Committee would undertake further work to identify areas on which all jurisdictions would be prepared to collaborate. This should include consultation with key partners inside and outside government.

Actions to foster and improve the health of Canadians must address the full range of factors known to influence population health. Our living and working conditions, economic well-being, and personal sense of control over and skills for coping with the challenges and stresses of everyday living are key determinants of health. Population health strategies must take these into account, along with the factors we more often associate with health, such as healthy lifestyles and availability of health services.

## Conclusion

Adopting a framework based on the broad determinants of health presented in this paper, as the foundation for planning and action to improve population health, will significantly enhance our chances for success. The health sector cannot act alone, because most of the determinants of health fall partly or wholly outside its purview. Therefore, intersectoral collaboration is the key.

There are great benefits to be gained if partners inside and outside government from the health, economic, business, labour, education, social services, transportation, housing, recreation and other sectors can work together to improve population health. Having a common framework for action, based on the broad determinants of health, would mean concerted efforts could be made by all partners to address the factors known to have the most significant influences on health.

---

---

This should enable partners to more clearly see what their potential contribution could be, pool their resources and expertise when appropriate, reduce duplication and get the best return on their investment. As well, an effective population health strategy should be part of Canada's agenda for economic prosperity, since economic well-being is a key determinant of a healthy population, and a healthy population is a major contributor to a vibrant economy.

---



---

## References

---

- 1 Wilkins, Russell and Adams, Owen. *Healthfulness of Life*. Institute for Research on Public Policy, Montreal, 1978.
  - 2 The World Bank/International Bank for Reconstruction and Development. *World Development Report 1993: Investing in Health*, Oxford University Press, 1993.
  - 3 Marmot, M.G., Kogevinas, M.A. and Elston, M. Social/Economic Status and Disease. *Annual Review of Public Health*, 8:111-135, 1987.
  - 4 Berkman, L. and Syme, S.L. Social Networks, Host Resistance and Mortality: A Nine Year Follow-up Study of Alameda County Residents. *American Journal of Epidemiology*, 109(2), 186-204, 1979.
  - 5 Hanson, B. Ostergren, Social Networks, Social Support and Related Concepts — Towards A Model for Epidemiological Use. In *Social Support in Health and Disease*. Isacsson, S.O. ed., Almqvist & Wiksel Int., Stockholm, 1986.
  - 6 Groen, J.J. et al. Epidemiological Investigation of Hypertension and Ischemic Heart Disease with a Defined Segment of the Adult Male Population of Israel. *Israel Journal of Medical Science*, 4(2), 177-194, 1968.
  - 7 Rees, W.P. and Lutkins, S.G. Mortality and Bereavement. *British Medical Journal*, 4: 13-16, 1967.
  - 8 Mustard, Fraser J. and Frank, John. *The Determinants of Health*. Canadian Institute for Advanced Research Publication #5, Toronto, 1991.
  - 9 Johnson, J.V. and Hall, E.M. Job Strain, Work Place Social Support and Cardiovascular Disease. *American Journal of Public Health*, 78(10): 1336-1342, 1988.
  - 10 D'Arcy, Carl. Unemployment and Health: Data and Implications. *Canadian Journal of Public Health*, Vol. 77 Supp. 1, 1986.
-

- 11 Wescott, G. et al. *Health Policy Implications of Unemployment*. World Health Organization, Copenhagen, 1985.
  - 12 Organization for Economic Development and Cooperation. *The OECD Employment Outlook*. Paris, 1989.
  - 13 Bates, David and Sizto, Ronnie. Air Pollution and Hospital Admissions in Southern Ontario: The Acid Summer Haze Effect. *Environmental Research*, 43: 317-331, 1987.
  - 14 Cotton, Paul. Medical News and Perspectives: Best Data Yet Say Air Pollution Kills Below Levels Currently Considered Safe. *Journal of the American Medical Association*, 269(24): 3087-3088, 1993.
  - 15 Repace, J.F. A Quantitative Estimate of Nonsmokers Lung Cancer Risk from Passive Smoking. *Environment International*, 11:3-22, 1985.
  - 16 Pelchat, Yolande and Wilkins, Russell. *Report on Births: Certain Sociodemographic and Health Aspects of Mothers and Newborns in Metropolitan Montreal 1979-1983*. Montreal Association of Community Health Departments, 1987.
  - 17 Johnson, J.V. and Hall, E.M. Job Strain, Work Place Social Support and Cardiovascular Disease. *American Journal of Public Health*. 78(10): 1336-1342, 1988.
  - 18 Hertzman, C. and Wiens, M. *Child Development and Long-Term Outcomes: A Population Health Perspective and Summary of Successful Interventions*. University of British Columbia Department of Health Care and Epidemiology, 1994.
  - 19 Werner, E.E. and Smith, R.S. *Overcoming the Odds: High Risk Children from Birth to Adulthood*. Ithica, N.Y.: Cornell University Press, 1992.
  - 20 Thompson, A.H. and Bland, Roger. *System Pathways from Childhood to Adult Crime*. Alberta Health, 1993.
  - 21 Schweinhart, L.J., Barnes, H.V. and Weikart, D.P. *Significant Benefits of the High/Scope Perry Preschool Study Through Age 27*. High/Scope Educational Research Foundation Monograph Number 10, High/Scope Press, 1993.
-



---

## Members of the Federal/Provincial/Territorial Advisory Committee on Population Health

---

- Chairperson** ALBERTA  
Ms. Cecilie Lord, Director  
Intergovernmental Issues Secretariat  
Alberta Health  
10025 Jasper Avenue, 24th Floor  
Edmonton, Alberta  
T5J 2N3
- Vice  
Chairperson** HEALTH CANADA  
Mrs. Diane C. Kirkpatrick, Director General  
Health Services Directorate  
Health Programs and Services Branch  
Health Canada  
Room 600, Jeanne Mance Building  
Tunney's Pasture  
Ottawa, Ontario K1A 1B4
- Members** NEWFOUNDLAND  
Ms. Joan Dawe, Assistant Deputy Minister  
Community Health  
Department of Health  
Confederation Building  
Prince Phillip Drive, P.O. Box 8700  
St. John's, Newfoundland A1B 4J6
- PRINCE EDWARD ISLAND  
Department of Health and Social Services  
16 Fitzroy Street, Box 2000  
Charlottetown, P.E.I. C1A 7N8
- NOVA SCOTIA  
Mr. Merv Ungurain, Director of Administration  
Department of Health  
1690 Hollis Street, P.O. Box 488  
Halifax, Nova Scotia B3J 2R8
-

**NEW BRUNSWICK**

Mr. John Dicaire, Assistant Deputy Minister  
Public Health and Medical Services  
Department of Health and Community Services  
Carleton Place, P.O. Box 5 100  
Fredericton, New Brunswick E3B 5G8

**QUEBEC**

M. Marc Andre Maranda, Chef du service des Politiques et  
Orientations  
Direction générale de la Planification et de l'Évaluation  
Ministère de la Santé et des Services sociaux  
1075, chemin Ste-Foy, 2<sup>ième</sup> étage  
Quebec (Québec) G1S 2M1

**ONTARIO**

Ms. Celia Denov, Executive Director  
Community Health Programs  
Ministry of Health  
5700 Yonge Street, 8th Floor  
North York, Ontario M2M 4K5

**MANITOBA**

Ms. Sue Hicks, Assistant Deputy Minister  
Health Public Policy Programs Division  
Manitoba Health  
301 - 800 Portage Avenue  
Winnipeg, Manitoba R3G 0N4

**SASKATCHEWAN**

Ms. Maureen Yeske, Executive Director  
Health Planning & Policy Development Branch  
Saskatchewan Health  
T.C. Douglas Bldg.  
3475 Albert Street  
Regina, Saskatchewan S4S 6X6

---

---

**BRITISH COLUMBIA**

Dr. John S. Millar, Provincial Health Officer  
2nd Floor, 1810 Blanshard Street  
Victoria, B.C.  
V8V 1X4

**YUKON**

Mr. Ron Pearson, A/Director  
Health Programs  
Health and Social Services, Box 2703  
Whitehorse, Yukon Y1A 2C6

**NORTHWEST TERRITORIES**

Ms. Elaine Berthelet, Assistant Deputy Minister  
Health Services Development  
Department of Health and Social Services  
Government of the N.W.T.  
Centre Square Tower, 8th Floor  
Box 1320  
Yellowknife, N.W.T. X1A 2L9

---