

**THE IMPACT OF  
PHYSICAL ACTIVITY**

**AND**

**THE RENEWAL OF  
THE HEALTH CARE SYSTEM**



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## Weighing the Public Good

Stated simply, the goal of public health activities is to improve the health of all Canadians—to extend life, reduce disease and therefore increase quality of life and healthy life expectancy. Government is caught in the dilemma of whether or not this also makes good fiscal sense for the public purse. Health is determined by more than health care. Disease prevention measures, including physical activity interventions, have a significant impact on health status. To determine whether reducing inactivity is a role for government, the contribution of physical activity strategies to improving public health needs to be weighed against its potential for avoiding health care costs and the results of previous interventions.

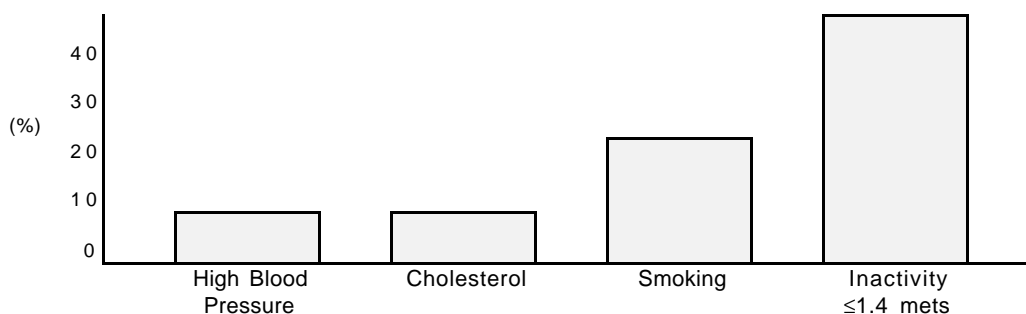
## Health Benefits of Physical Activity

Physical activity is a major risk factor of health and well-being facing 15 million Canadians. Substantial evidence exists that physical activity can increase average life expectancy by as much as 2 years<sup>1</sup>. Not many interventions have this type of impact. (For example, the increase in life expectancy per woman screened for breast cancer in the United States has been estimated at from 13 to 26 days<sup>2</sup>.) But would the public be well served if added years of life were spent in pain and suffering or resulted in costly procedures to treat chronic diseases? Fortunately, physical activity also reduces the risk of disease and in many cases assists in control and rehabilitation.

Physical activity reduces the risk of all-cause death, and Canada's number one killer: coronary heart disease. There are four recognized primary risk factors of coronary heart disease, namely high blood pressure, high blood cholesterol, cigarette smoking and physical inactivity. The U.S. Centre for Disease Control cites inactivity as the most significant risk factor for coronary heart disease, it is one that they — and other governments— have the ability to influence and one that has a substantial impact on public health<sup>3</sup>. Does this hold for Canada? What are the prevalences of these risk factors? Is a physical activity strategy cost effective?

## Relative Impact of a Physical Activity Strategy

Physical activity is associated with positive health outcomes, with improved physical fitness, and with physical, mental and social health. Physical inactivity is a key risk factor for all-cause death. Coronary heart disease is the leading cause of death in Canada and the largest source of direct and indirect health costs<sup>4</sup>. Sedentary living is the most prevalent risk factor for coronary heart disease regardless of how sedentary is defined. One in two Canadians expend less than 1.4 mets of energy daily, a level shown to have increased risk of all-cause mortality and coronary heart disease<sup>5</sup>. (This level is equivalent to less than 490 kilocalories weekly for an individual weighing 50 kilograms, less than 990, for people weighing 100 kilograms.) Almost 40% of Canadians are not active on a daily basis. Compared to this, 26% smoke cigarettes regularly<sup>6</sup>, and 11% have high blood pressure<sup>7</sup>. About 10% may have high blood cholesterol<sup>8</sup>.



The prevalence of inactivity as a risk factor is only one component of relative impact. The other is the risk of disease associated with inactivity compared to that of other risk factors. The prevalence and relative risks associated with key contributors to all-cause death are summarized below. These data are converted into their relative impact or risk for the community in terms of the percentage of people potentially affected. This is equivalent to the proportion of all-cause death that may be attributed to inactivity.

RISK FACTORS OF ALL CAUSE DEATH	Prevalence (%)	Relative Risk	Community Risk (%)
Low versus high fitness quintile <sup>9</sup>	20	3.4	32.4
Men		4.7	42.5
Women			
Min. acceptable fitness <sup>10, 11</sup> (stopped CHFT before third bout)	33	1.6	16.5
Sedentary (<2000kcal, equivalent to ≤2.9 mets) <sup>12</sup>	69	1.31	17.6
Sedentary (<1000kcal, equivalent to ≤1.4 mets) <sup>13</sup>	45	1.40	15.3
Cigarette smoking <sup>14</sup>	26	1.76	16.5
High cholesterol <sup>15</sup>	7	2.2	7.7
Men	9	2.7	13.3
Women			
Hypertension (Systolic ≥140 mmHg) <sup>16</sup>	11	1.73	7.4

The relative risk associated with low physical fitness levels exceeds that of all the other factors included in the investigations. Blair and colleagues state that a brisk walk of 30 to 60 minutes each day is sufficient to produce the optimal fitness standard. Moreover, because the prevalence of physical inactivity is high, the relative impact directly attributable to inactivity for Canadians is high. These calculations illustrate that a physical activity strategy could have greater relative impact on Canadians than a smoking strategy or blood cholesterol reduction strategy.

### Potential for Avoiding Health Care Costs

In determining where to make public expenditures, the long-term investment in health promotion and disease prevention strategies is increasingly being weighed against health care costs and potential cost savings. Cost avoidance is a key issue to be balanced against increased quality of life.

Hatziafreu et al explored the cost-effectiveness of physical activity under several assumptions<sup>17</sup>. Physical activity was found to be cost effective for ischaemic heart disease, if the cost of the individual's time spent exercising was not included along with direct costs like equipment. This is an appropriate assumption for governments—who do not compensate individuals for such time—and for individuals who enjoy or value physical activity. The analysis resulted in an estimated direct cost of \$1,395 (1988 U.S. dollars) per quality adjusted year of life gained (QALY). Example costs of other coronary heart disease interventions were quoted at \$5,000 for bypass graft surgery per QALY and \$40,000 per QALY for mild angina. It should be noted that Hatziafreu's analysis included all costs of physical activity, but examined only the related costs associated with ischaemic heart disease. Extra health benefits are also associated to the cost of physical activity, so physical activity is not just cost effective for coronary heart disease, but may be viewed as cost effective in general.

The analysis of Keeler et al<sup>18</sup> concurs with the cost-effectiveness of physical activity. They calculated discounted lifetime costs like medical care and sick leave and included lost revenues like taxes on earnings. Increasing physical activity was found to 'save' an average of \$1,900 (U.S.) per person.

This argues for attention to physical activity as a component in Canada's health system, as the potential savings outweigh costs at both the individual level and at the community level. Being active saves almost twice as much per person as being a non-smoker<sup>19</sup>. Moreover, about 1.7 times the number of people are inactive compared to those who smoke. It is recognized that there are differences in costs between Canada and the United States. However, even used as only a very crude indicator, the potential cost savings is still impressive. The lifetime estimate of costs avoided could amount to \$18 billion from inactive persons compared to \$5.7 billion from those who smoke. Most of these costs are borne during the last part of people's lives.

### **The Success of Physical Activity as a Strategy**

Physical activity is an effective prevention strategy for the renewal of Canada's Health Care System. Inactivity is the most prevalent risk factor and, through its reduction, has the greatest potential for overall cost savings for the government. Yet, one might ask can progress truly be made? The answer is yes.

The first national survey to examine the prevalence of physical activity based on a definition of health risk was the 1981 Canada Fitness Survey. Mortality data shows that a person's energy expenditure is related to their risk of all cause death. In 1981, 24% of adults were active enough to lower their relative risk based on their typical energy expenditure. The General Social Survey measures energy expenditure using a modified approach. However, it results in the same trend. The picture painted by these surveys is clear. The proportion of active Canadians is increasing.



What does this mean in terms of potential cost avoidance? During the period 1981 to 1988 a 7% increase was achieved in the percentage of Canadians over the age of 15 who were active. This corresponds to an estimated 2.9 billion dollars in costs avoided over the lifetime of these Canadians. From 1988 to 1991, an additional 1% of Canadians became active, resulting in an additional long-term savings of over 4 00 million dollars.

Canada's physical activity strategy is paying off. A total of 3.4 billion dollars in costs have been avoided due to the successful increase in the rate of physical activity over the 10 year period. These represent dollars that do not have to be spent from the public purse, allowing the money to be spent in other activities essential to the growth of our economy.

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  - <sup>3</sup> Monahan, T (1987). Is 'activity' as good as exercise? *The Physician and Sportmedicine*. **15(10)**, 181-186
  - <sup>4</sup> Wigle, D.T., Mao,Y., Wong, T., et al (1991). Economic Burden of Illness in Canada, 1986. *Chronic Diseases in Canada*. **12(3)** Supplement. Ottawa:Minister of Health and Welfare.
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