

THE OBESITY EPIDEMIC IN CANADA

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THE CANADIAN OBESITY EPIDEMIC

INTRODUCTION

In 2004, approximately 6.8 million Canadian adults ages 20 to 64 were overweight, and an additional 4.5 million were obese.⁽¹⁾ Roughly speaking, an adult male is considered overweight when his body weight exceeds the maximum desirable weight for his height, and obese when his body weight is 20% or more over this desirable weight. A similar guideline holds true for women, but at a threshold of 25% rather than 20%. Dramatic increases in overweight and obesity among Canadians over the past 30 years have been deemed to constitute an “epidemic.”

Similar trends occur worldwide: the World Health Organization (WHO), which refers to the escalating global epidemic of obesity as “globesity,” estimates that there are more than 1 billion overweight adults globally, of whom at least 300 million are obese. Recognizing that overweight and obesity can have tremendous negative health implications, a group of health and nutrition experts assembled by the WHO in 1997 concluded that:

Without societal changes, a substantial and steadily rising proportion of adults will succumb to the medical complications of obesity; indeed, the medical burden of obesity already threatens to overwhelm health services. The spectrum of problems seen in both developing and developed countries is having so negative an impact that obesity should be regarded as today’s principal neglected public health problem.⁽²⁾

This paper provides information on the phenomenon of overweight and obesity in Canada in terms of measurement, prevalence, causes, health implications and economic burden.

(1) Statistics Canada, *Canadian Community Health Survey*, 2004, <http://www.statcan.ca/english/research/82-620-MIE/2005001/tables.htm>.

(2) *Obesity: Preventing and Managing the Global Epidemic*, Report of a WHO Consultation on Obesity, 3-5 June 1997, Executive Summary, p. 2, http://www.who.int/nutrition/publications/obesity_executive_summary.pdf.

MEASUREMENT

Body mass index (BMI), which is calculated by dividing weight (in kilograms) by height (in metres) squared, is perhaps the most commonly used measure for classifying weight and evaluating health risks associated with both overweight and underweight. Both Canada and the WHO use a weight classification system based on the BMI for evaluating overweight and obesity among adults. Table 1 below describes this system, including the various categories of BMI and the associated levels of health risks.

Table 1: Body Weight Classification for Adults

Body Mass Index (in kg/m ²)	Classification	Risk of Developing Health Problems
< 18.5	Underweight	Increased risk
18.5 to 24.9	Normal weight	Least risk
25.0 to 29.9	Overweight	Increased risk
≥ 30.0:	Obese:	
30.0 to 34.9	Obese Class I	High risk
35.0 to 39.9	Obese Class II	Very high risk
≥ 40.0	Obese Class III	Extremely high risk

Source: Health Canada, *Canadian Guidelines for Body Weight Classification in Adults*, Ottawa, 2003, p. 3.

It is important to note that because BMI does not take into account body composition or fat distribution on the body, it may not be an accurate predictor of health risk for certain groups, including: youth who have not reached their full height, adults who are naturally very lean or muscular, pregnant women, and the elderly. Research has shown that waist circumference (excess fat in the abdominal area) is a supplementary measure that is useful for identifying additional health risk, particularly among those with BMI measurements between 18.5 and 34.9. More precisely, waist circumferences equal to or greater than 102 cm (40 inches) for men and 88 cm (35 inches) for women are associated with increased risk of illness.⁽³⁾

The weight classification system described above is intended only for adults. BMI in childhood changes substantially with age, and there is currently no definition of

(3) A discussion of the limitations of the BMI is contained in: Health Canada, *Canadian Guidelines for Body Weight Classification in Adults*, Ottawa, 2003, http://www.hc-sc.gc.ca/fn-an/alt_formats/hpfb-dgpsa/pdf/nutrition/weight_book-livres_des_poids_e.pdf; and Kim D. Raine, *Overweight and Obesity in Canada: A Population Health Perspective*, Ottawa, 2004, http://secure.cihi.ca/cihiweb/dispPage.jsp?cw_page=GR_1130_E.

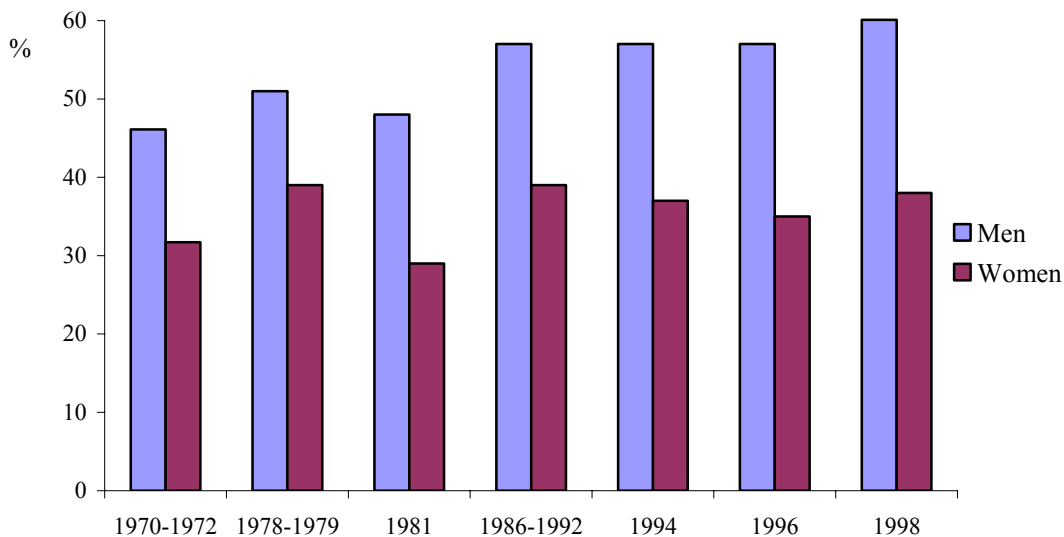
overweight and obesity for children that is consistently used internationally. The International Obesity Task Force is working on the development of a standard weight classification system for children and youth.⁽⁴⁾

PREVALENCE

The following is an overview of an historical study and more recent survey results on the prevalence of overweight and obesity among Canadians. Regardless of the specific studies or surveys used, the statistics are consistent in showing increasing rates of overweight and obesity in Canadian society over time.

Between 1970-1972 and 1998, the proportion of Canadian adults considered overweight or obese increased from 40.0% to 50.7%. Figures 1A and 1B depict the results of a series of seven surveys conducted between 1970 and 1998, which show an increase in the share of Canadian men and women, respectively, who are considered overweight and obese.⁽⁵⁾

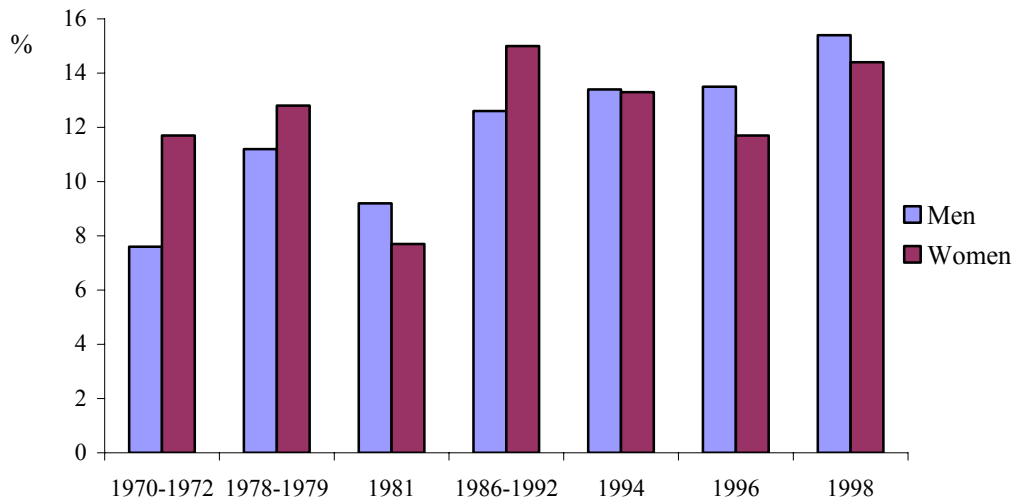
Figure 1A: Prevalence of Overweight, Including Obesity



(4) Recent work published in this area includes: T. J. Cole *et al.*, “Establishing a Standard Definition for Child Overweight and Obesity Worldwide: International Survey,” *British Medical Journal*, Vol. 320, Issue 7244, 2000, pp. 1240-1243.

(5) Peter T. Katzmarzyk, “The Canadian Obesity Epidemic: An Historical Perspective,” *Obesity Research*, Vol. 10, No. 7, July 2002, pp. 666-674, <http://www.obesityresearch.org/cgi/reprint/10/7/666>.

Figure 1B: Prevalence of Obesity



Notes: Overweight is defined as BMI ≥ 25 kg/m²; obesity is defined as BMI ≥ 30 kg/m². Statistics presented are for Canadian men and women, ages 20 to 64. In the last three surveys (1994, 1996 and 1998), BMI is based on self-reported rather than measured data. Katzmarzyk (2002) notes that, given the tendency for people to over-report their stature and under-report their body mass, the increasing trends for overweight and obesity should be considered conservative estimates.

Source: Based on Katzmarzyk (2002), p. 670.

Results from the *Canadian Community Health Surveys* in 2000-2001, 2003 and 2004, presented in Table 2, indicate that approximately 58.8% of Canadian adults – 65.2% of men and 52.4% of women – were either overweight or obese in 2004, not including those survey participants who did not reveal their BMI. Between the 2000-2001 and 2004 surveys, the prevalence of overweight (including obesity) among Canadian adults appears to have increased by more than 11 percentage points, while the prevalence of obesity alone increased by more than 8 percentage points. It is likely, however, that a portion of this change is attributable to the difference in survey methodology described in the note to Table 2. One could hypothesize that the 2000-2001 and 2003 survey results under-represented the actual prevalence of overweight and obesity because the data were self-reported.

**Table 2: Prevalence of Overweight and Obesity
Among Canadian Adults (%)**

	Overweight, Including Obese			Obese		
	2000-2001	2003	2004	2000-2001	2003	2004
Total	47.4	48.5	58.8	14.9	15.4	23.4
Men	55.6	58.1	65.2	16.0	16.6	23.7
Women	39.0	38.6	52.4	13.8	14.1	23.2

Note: Statistics presented are for Canadian adults, ages 20 to 64. BMI in the 2000-2001 and 2003 surveys is based on self-reported data, whereas BMI in the 2004 survey is based on measured heights and weights.

Source: Statistics Canada, *Canadian Community Health Survey*, 2000-2001, 2003, and 2004, <http://www.statcan.ca/english/freepub/82-221-XIE/2005001/hlthstatus/conditions1.htm> and <http://www.statcan.ca/english/research/82-620-MIE/2005001/tables.htm>.

Another report released by Statistics Canada in early 2005 presents an alarming outlook for overweight and obesity in Canada should current trends continue. The study found that approximately one-third of people who were classified as normal weight in 1994-1995 had become overweight by 2002-2003, and nearly one-quarter of those who were initially overweight were classified as obese after the eight-year period. Conversely, only 10% of those who were overweight in 1994-1995 had progressed to a normal weight range by 2002-2003.⁽⁶⁾

The rising prevalence of overweight and obesity in Canada is not restricted to the adult population; data for children mirror the trend among adults. Although prevalence data for children may vary due to the use of multiple methodologies in the literature, the trends are consistent in showing rapidly increasing rates of overweight and obesity among Canadian children.⁽⁷⁾ According to one methodology, rates of overweight (including obesity) among children ages 7 to 13 increased by 200%-300% between 1981 and 2001, though they appear to have stabilized somewhat in recent years (see Table 3).

(6) Christel Le Petit and Jean-Marie Berthelot, *Obesity: A Growing Issue*, Findings from the National Population Health Survey, 2005, <http://www.statcan.ca/english/research/82-618-MIE/2005003/pdf/82-618-MIE2005003.pdf>.

(7) Raine (2004) and Canadian Institute for Health Information (CIHI), *Improving the Health of Canadians*, Ch. 5, "Obesity," September 2004, pp. 106-147, http://secure.cihi.ca/cihiweb/products/IHC2004_ch5_e.pdf.

**Table 3: Prevalence of Overweight and Obesity
Among Canadian Children (%)**

	Overweight, Including Obese			Obese		
	1981	1995-1996	2000-2001	1981	1995-1996	2000-2001
Boys	10.6	32.6	29	2.0	10.2	9
Girls	13.1	26.6	27	1.7	8.9	10

Notes: Statistics are for Canadian children, ages 7 to 13 years. Age- and sex-specific BMI cut-off points that correspond to the adulthood categories were used to define overweight and obesity for children (as published in Cole *et al.*, 2000). BMI in the 1981 survey is based on measured heights and weights, whereas BMI in the 1995-1996 and 2000-2001 surveys is based on parental- or self-reported data.

Sources: Raine (2004), pp. 8-9; CIHI (2004), p. 111.

More recent results from the 2004 *Canadian Community Health Survey*, which are based on measured heights and weights, indicate that 18.1% of children ages 2 to 17 are overweight, and an additional 8.2% are obese.

In terms of regional differences in the prevalence of obesity, results from the 2004 *Canadian Community Health Survey* suggest that obesity rates did not vary greatly by province in 2004, with the following exceptions.⁽⁸⁾ Prevalence of obesity among men was significantly higher than the national rate in both Newfoundland and Labrador (33.3%) and Manitoba (30.4%). For women, the prevalence of obesity significantly exceeded the national rate in Newfoundland and Labrador (34.5%), Saskatchewan (32.9%) and Nova Scotia (30.3%). For children ages 2 to 17, the prevalence of obesity was significantly higher than the national rate in Newfoundland and Labrador (17%) and New Brunswick (13%). Raine notes, however, that "... surveillance of behavioural determinants of obesity in Canada is currently unable to explain the regional variations in prevalence."⁽⁹⁾

CAUSES AND HEALTH IMPLICATIONS

What factors influence body weight, and in particular overweight and obesity? At the most fundamental level, overweight and obesity result from an imbalance between caloric

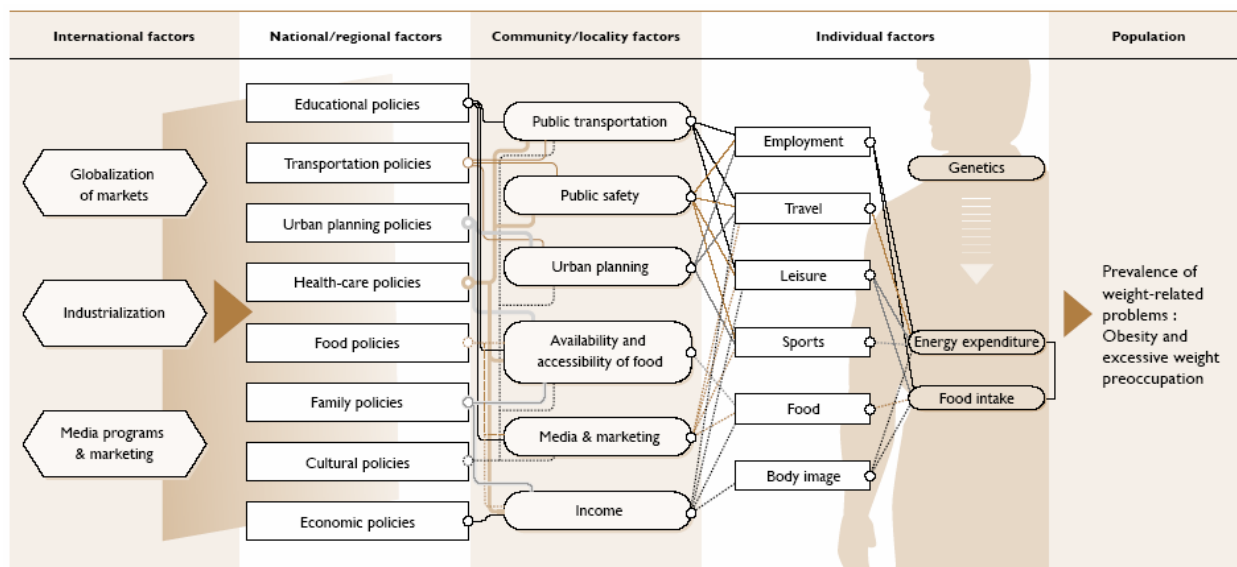
(8) Michael Tjepkema, *Adult Obesity in Canada: Measured Height and Weight*, Statistics Canada, 2005, <http://www.statcan.ca/english/research/82-620-MIE/2005001/pdf/aobesity.pdf>; and Margot Shields, *Overweight Canadian Children and Adolescents*, Statistics Canada, 2005, <http://www.statcan.ca/english/research/82-620-MIE/2005001/pdf/cobesity.pdf>. Note that the results presented in Tjepkema (2005) are for adults ages 18 and over.

(9) Raine (2004), p. 7.

intake and usage. In support of this perspective, health and nutrition experts cite increasingly sedentary lifestyles resulting from urban planning and technological changes in the way we work; they also point to increasing portion sizes and the poor availability of nutritional food choices in schools and workplaces. However, “there is no consensus as to whether the current obesity epidemic in North America is primarily the result of high levels of physical inactivity or high dietary intake of energy-dense foods, and it is likely that both dietary intake and physical inactivity have played a role in the increasing prevalence of overweight and obesity.”⁽¹⁰⁾

In fact, the root causes of overweight and obesity are much more complex and numerous. Research has shown that environmental, behavioural, social, cultural and genetic factors all contribute to the development of overweight and obesity. As a result, experts in the field have constructed more sophisticated taxonomies for their causes (see, for example, Figure 2). This suggests that the problem of overweight and obesity should be framed in the context of a population health approach which considers and acts upon the broad range of factors and conditions that have a strong influence on body weight.

Figure 2: Causal Web of Factors Influencing Weight-related Problems



Source: *Weight Problems in Québec: Getting Mobilized*, Groupe de travail provincial sur la problématique du poids, October 2004, p. 12, <http://www.aspq.org/dl/gettingmob.pdf>.

(10) Peter T. Katzmarzyk and Ian Janssen, “The Economic Costs Associated With Physical Inactivity and Obesity in Canada: An Update,” *Canadian Journal of Applied Physiology*, Vol. 29, No. 1, 2004, p. 104.

Numerous scientific studies have linked overweight and obesity with increased risk for a broad range of illnesses, including: Type 2 diabetes, dyslipidemia, insulin resistance, gallbladder disease, obstructive sleep apnea and respiratory problems, cardiovascular disease (e.g., coronary heart disease and ischemic stroke), hypertension, osteoarthritis, some types of cancer (e.g., breast, endometrial, colon, prostate and kidney), psychosocial problems, functional limitations and impaired fertility.⁽¹¹⁾

ECONOMIC BURDEN

Costing the economic burden of overweight or obesity requires the application of the cost of illness methodology, which seeks to estimate the impact of an illness or condition in monetary terms. Such research may use either a prevalence- or an incidence-based approach: the former is an estimation of the total cost of overweight or obesity in a given year; the latter is an estimation of the lifetime costs of cases first diagnosed in a given year. The majority of studies in the literature, including those presented here, follow a prevalence-based approach.

The costs of overweight or obesity may be grouped into two categories: direct and indirect costs.⁽¹²⁾ Simply put: “direct costs are those for which payments are made, and indirect costs are those for which resources are lost.”⁽¹³⁾ Direct costs, referred to as “Inputs” in Figure 3, include the cost of treatment, care and rehabilitation for illnesses associated with overweight or obesity. Indirect costs, referred to as “Negative Outputs / Welfare Losses,” include reductions in economic productivity stemming from the poorer health, absenteeism, disability and premature mortality that are a result of overweight or obesity. Welfare losses, resulting from increased pain and suffering for example, are also considered indirect costs though they are rarely measured.⁽¹⁴⁾

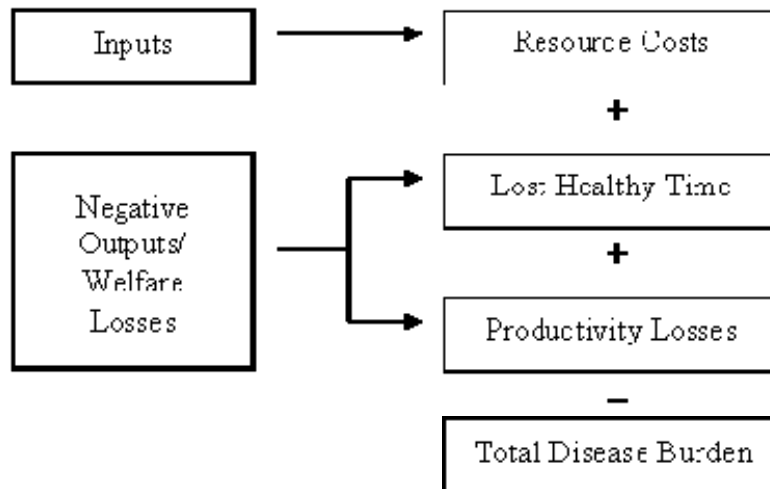
(11) Health Canada, *Canadian Guidelines for Body Weight Classification in Adults*, Ottawa, 2003, Table 1, p. 7. Also see: F. Xavier Pi-Sunyer, “The Obesity Epidemic: Pathophysiology and Consequences of Obesity,” *Obesity Research*, Vol. 10, Supp. 2, December 2002, pp. 97S-104S.

(12) While not discussed here, obesity has positive economic spin-off impacts on businesses that provide weight loss and related products and services.

(13) Dorothy P. Rice, “Cost of Illness Studies: What Is Good About Them,” *Injury Prevention*, Vol. 6, 2000, p. 177.

(14) Larissa Roux and Cam Donaldson, “Economics and Obesity: Costing the Problem or Evaluating Solutions?” *Obesity Research*, Vol. 12, No. 2, February 2004, pp. 173-179.

Figure 3: Costs of Overweight and Obesity



Source: Roux and Donaldson (2004), p. 175.

Because indirect costs are inherently more difficult to measure and involve a greater number of assumptions, their full or partial inclusion in studies can be somewhat contentious. That being said, to the extent that these indirect impacts exist, their monetary estimation is crucial in order to obtain a full picture of the impacts of overweight or obesity.

The seminal work on the cost of obesity in Canada, published in the *Canadian Medical Association Journal* in 1999, estimated the total direct cost of obesity in Canada in 1997 to be approximately \$1.8 billion, or 2.4% of the total health care expenditures for all diseases in Canada. Table 4 compares the results of this and other studies of the cost of obesity and physical inactivity in Canada, noting key variations in the parameters used.⁽¹⁵⁾ While the results vary depending on the types of costs included, the specific health impacts considered and the definitions used, it is clear that the impact of relatively high levels of obesity and physical inactivity are not inconsequential.

(15) The cost of physical inactivity studies follow a similar methodology to the cost of obesity studies, and are included here because of their relevance to the discussion of overweight and obesity. Katzmarzyk *et al.* (2000) suggest that “it is unlikely that the costs attributable to inactivity and obesity are simply additive; the relative contributions of physical inactivity and caloric intake to obesity have not been determined. More research is needed to determine the total costs attributable to physical inactivity, taking into account the overlapping costs of inactivity-related obesity” (p. 1438).

Table 4: Comparison of Studies on the Costs of Obesity and Physical Inactivity in Canada

Reference	Costs Included	Health Impacts Considered	Definitions Used	Estimate
Birmingham et al. (1999)	<u>Direct cost</u> of obesity, including the cost of hospital care, physician services, services of other health professionals, drugs, other health care, and health research.	Coronary artery disease, stroke, hypertension, colorectal cancer, postmenopausal breast cancer, Type 2 diabetes, gallbladder disease, endometrial cancer, hyperlipidemia and pulmonary embolism (10).	Obesity = BMI \geq 27 kg/m ² .	\$1.8 billion (1997\$).
Katzmarzyk et al. (2000)	<u>Direct cost</u> of physical inactivity, including the cost of hospital care, physician care, drugs and research.	Coronary artery disease, stroke, hypertension, colon cancer, breast cancer, Type 2 diabetes and osteoporosis (7).	Physical inactivity = expending <12.6 kJ per kilogram of body weight per day.	\$2.1 billion (1999\$).
Katzmarzyk and Janssen (2004)	<u>Total direct and indirect cost</u> of obesity. Direct costs include the cost of hospital care, drugs, physician care, care in other institutions, and additional direct health expenditures. Indirect costs are measured in terms of the value of years of life lost due to premature death and the value of activity days lost due to short- and long-term disability.	Coronary artery disease, stroke, hypertension, colon cancer, postmenopausal breast cancer, Type 2 diabetes, gallbladder disease and osteoarthritis (8).	Obesity = BMI \geq 30 kg/m ² .	\$4.3 billion (2001\$). • \$1.6 billion in direct costs. • \$2.7 billion in indirect costs.

Reference	Costs Included	Health Impacts Considered	Definitions Used	Estimate
	<p>Total <u>direct and indirect cost</u> of physical inactivity.</p> <p>Same direct and indirect cost components as in obesity section.</p>	<p>Coronary artery disease, stroke, hypertension, colon cancer, breast cancer, Type 2 diabetes and osteoporosis (7).</p>	<p>Physical inactivity = expending <6.3 kJ per kilogram of body weight per day. For the average person, this level of physical activity equates to walking approximately 1.6 km per day.</p>	<p>\$5.3 billion (2001\$).</p> <ul style="list-style-type: none"> • \$1.6 billion in direct costs. • \$3.7 billion in indirect costs.

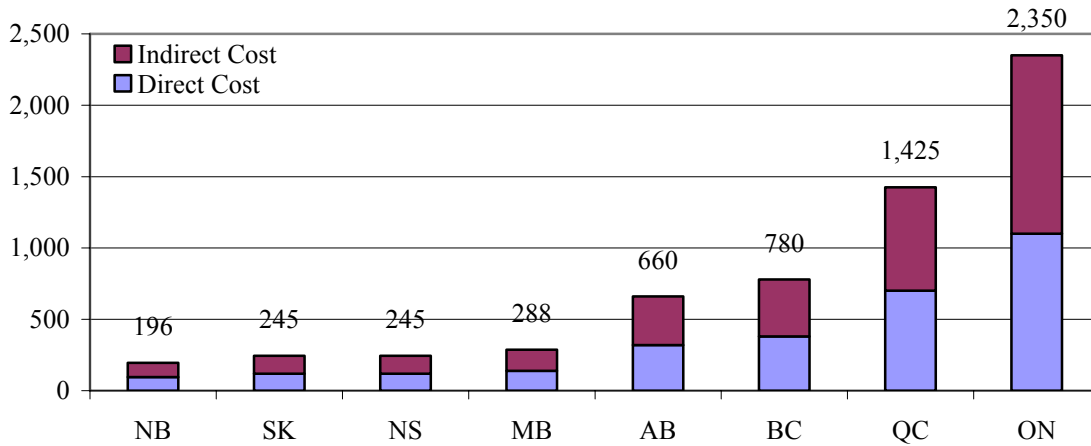
Note: All studies consider the cost of obesity and physical inactivity among adults only.

Sources: C. Laird Birmingham *et al.*, "The Cost of Obesity in Canada," *Canadian Medical Association Journal*, Vol. 160, No. 4, February 1999, pp. 483-488; Peter T. Katzmarzyk, Norman Gledhill, and Roy J. Shephard, "The Economic Burden of Physical Inactivity in Canada," *Canadian Medical Association Journal*, Vol. 163, No. 11, November 2000, pp. 1435-1440; and Katzmarzyk and Janssen (2004), pp. 90-115. Table prepared by the Library of Parliament.

In addition to studies focused on the cost of obesity and inactivity nationwide, GPI Atlantic commissioned a series of reports between 2000 and 2001 that estimated the direct and indirect costs of obesity in individual provinces.⁽¹⁶⁾ Figures 4 and 5 present comparative results from the eight provincial reports produced. In absolute terms, the less-populated provinces tended to have lower costs of obesity, as one might expect. However, Figure 5 demonstrates that these same provinces also tended to spend a larger share of their provincial health care budgets on obesity-related expenditures.

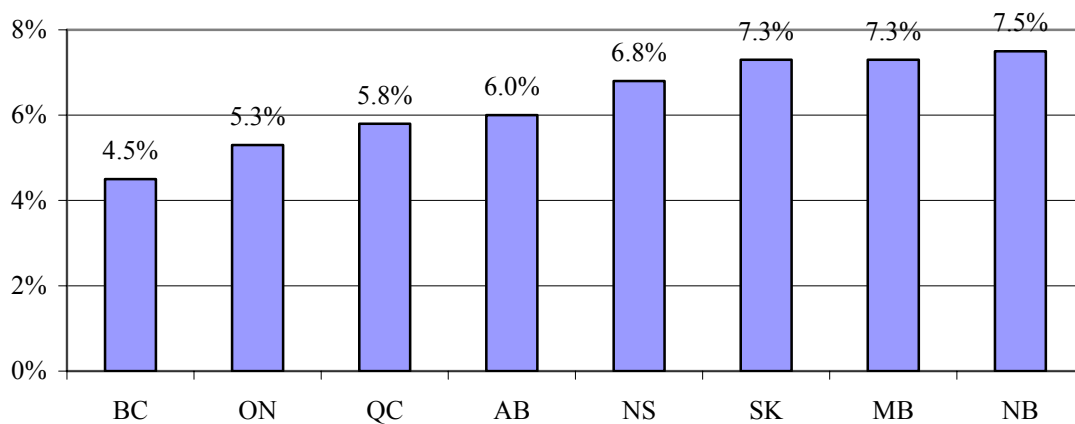
(16) GPI Atlantic is a non-profit research organization founded in 1997 that is dedicated to quality of life research, www.gpiatlantic.org/.

Figure 4: Average Annual Cost of Obesity in Selected Canadian Provinces, in \$Millions



Source: Based on figures provided in the GPI Atlantic *Cost of Obesity* reports for each province, prepared by Ronald Colman, <http://www.gpiatlantic.org/publications/health.shtml#obesity>. Some calculations by the Library of Parliament.

Figure 5: Direct Cost of Obesity as a Percentage of the Provincial Health Care Budget



Source: Based on figures provided in the GPI Atlantic *Cost of Obesity* reports for each province, prepared by Ronald Colman, <http://www.gpiatlantic.org/publications/health.shtml#obesity>. Compiled by the Library of Parliament.

CONCLUSION

There have been dramatic increases in overweight and obesity among Canadians over the past 30 years, and many experts fear it to be an epidemic. This growing health problem has translated into a large economic burden, reaching approximately \$4.3 billion annually by most recent estimates. The factors that lead to overweight and obesity are numerous, complex and intertwined, which has led several experts to suggest a population health approach for addressing overweight and obesity in Canada. In a July 2005 news release, the Canadian Minister of State (Public Health) stated: “Encouraging and supporting healthy weights will require cooperative action across all sectors and levels of government ... Social, economic, physical and environmental factors must be addressed to create environments that will support Canadians in making healthy choices.”⁽¹⁷⁾

(17) Health Canada, “The Government of Canada Reaffirms Its Commitment to Combat Canada’s Rising Obesity Levels,” News Release, 6 July 2005, http://www.hc-sc.gc.ca/ahc-asc/media/nr-cp/2005/2005_74_e.html.