



The economic impact of obesity and overweight

TOPO Summaries by the Nutrition-
Physical Activity-Weight Team

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In this issue

- Information that clarifies the economic impact of obesity

And answers to the following questions:

- What is the economic impact of obesity and overweight
- Why do estimates of the economic costs of obesity vary from one study to the next?
- How is the economic impact of obesity calculated?

The **TOPO collection** disseminates knowledge to inform practitioners and decision makers on the prevention of weight-related issues. Each publication addresses a theme combining a critical analysis of the relevant scientific literature with observations or illustrations in order to help use this knowledge in the Québec context.

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Obesity and overweight are risk factors linked to the appearance of a number of chronic diseases such as diabetes and cardiovascular disease. However, obesity also has an economic impact. Indeed, studies that have quantified the economic burden of obesity in Canada and abroad observe that the problem engenders significant costs for society. Such costs are not confined to those stemming from broader recourse to health services. Costs related to absenteeism, disability and other productivity losses that obesity engenders are at least as high as costs related to health care. Accordingly, studies of the economic burden reveal that the rise in overweight and obesity is not a source of concern solely for interveners working in the health field. Indeed, health problems linked to obesity affect several sectors of the economy and the resulting economic burden. Investing in the prevention of obesity thus offers benefits not only for the health of the population(16) but also for Québec's economic vitality.

While scientific studies almost always note that obesity and overweight are linked to a considerable economic burden, significant differences are occasionally observed between them from the standpoint of the estimated costs. Depending on the method used, cost assessments do not always take into account the same factors. In this issue of TOPO, we discuss the factors that explain why cost estimates vary from one study to the next. We also present estimates of the economic burden that obesity engenders in Canada and information on the measurement in the population of obesity and overweight.

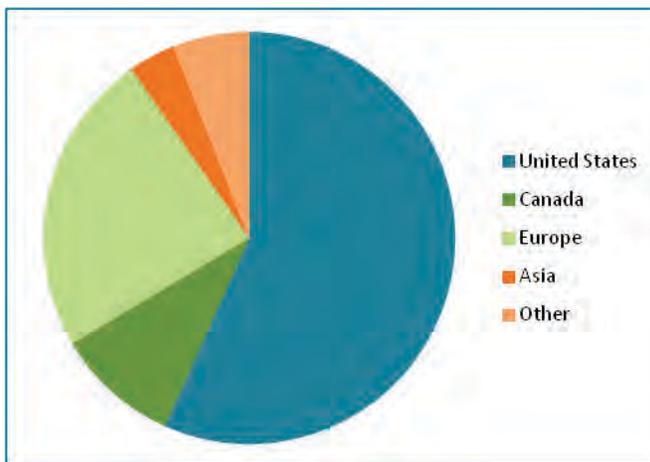
Obesity engenders significant economic costs

An examination of 129 studies conducted the world over that quantify the economic impact of obesity and overweight reveals that obesity and overweight engender significant costs.⁽¹⁾

On the other hand, researchers produce highly variable estimates for a given country. For example, one study concludes that, on average, annual medical expenses incurred for an obese American are \$2741 higher than those for an American of normal weight.⁽²⁾ In contrast, what is more, another study estimates the difference at \$620.⁽³⁾ Similarly, a study commissioned by the House of Commons in the UK estimates that the health care costs associated with obesity in the country account for between 2.3% and 2.6% of all public health spending,⁽⁴⁾ while another study estimates at 4.6% the resources that the problem monopolizes.⁽⁵⁾

Our survey of the literature encompasses

129 studies, mainly from North America and Europe



What costs are considered?

Studies of the economic burden of obesity do not always examine the same kinds of costs. Some studies focus on direct costs, while others examine indirect costs, or both kinds. **Direct costs** refer to health service delivery to treat obesity-related health problems. The cost of hospitalization, medical consultations in outpatient clinics and the consumption of medications are direct costs that have received the most attention in the scientific literature.

Indirect costs refer to lost productivity when individuals must temporarily (absenteeism) or permanently (disability or premature mortality) leave work for health reasons. Such costs are based on the contribution that the individuals would have made to the economy were they not affected by health problems. Certain researchers also examine the reduction in the productivity of workers in the workplace whose performance is impaired by their illness. Among indirect costs, some economic consequences are only rarely recognized. For example, account is often not taken of the loss of the contribution of individuals whose work is not remunerated, such as parents or grandparents who take care of children full time.

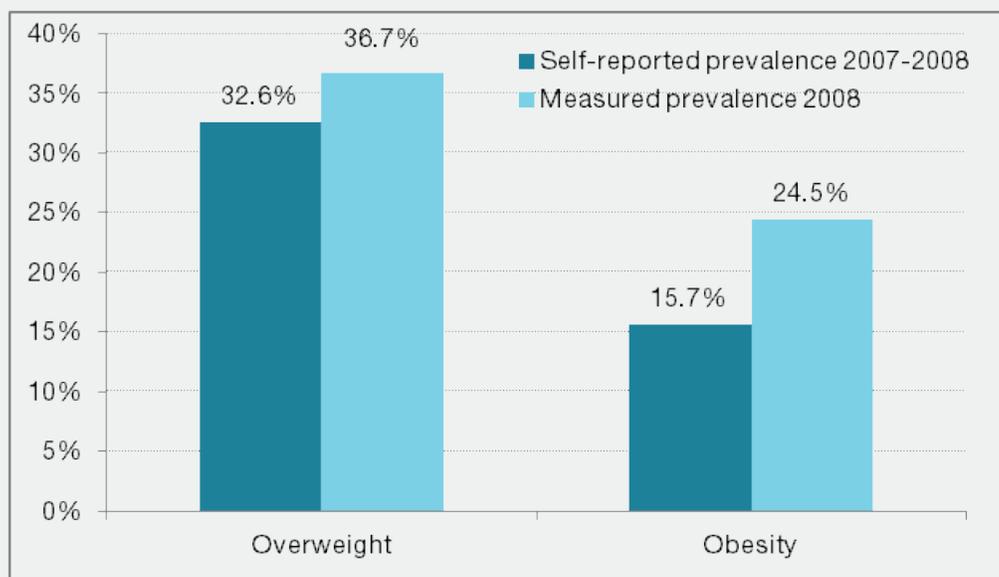
How are obesity and overweight defined?

Overweight and obesity are usually defined according to the classification system of the World Health Organization (WHO), based on the body mass index (BMI). BMI is equivalent to the individual's weight (in kilograms) divided by height (in metres) squared. Thus, an individual who weighs 100 kg and whose height is 1.85 m has a BMI of 29.2 kg/m² and falls into the overweight category.

Weight categories	BMI (kg/m ²)
Obesity	30 or over
Overweight	Between 25 and 29.9
Normal weight	Between 18.5 and 24.9
Underweight	Less than 18.5

In the vast majority of studies devoted to the economic burden in Canada, information on body mass index (BMI) comes from individual respondents during national surveys. A systematic review of the validity of self-reported measurements reveals that we underestimate our weight and, to a lesser extent, overestimate our height.⁽¹⁴⁾ The differences between individuals' declared and actual weights are such that, in 2008, the prevalence of obesity in Québec was estimated at 24.5% when based on measured values, instead of 15.7% based on self-reported data. Since the measured data are rarely available, researchers nonetheless use self-reported BMIs in their studies, although they emphasize the limitations of this measurement. Consequently, the estimates produced on the economic burden of obesity and overweight are usually conservative.

Prevalence of self-declared and measured weight categories, population 18 years of age or over, Québec



Source: Reference (17).

What explanation is there for the differing estimated costs in the studies?

To properly use the findings of studies devoted to the economic burden of obesity, it is important to grasp the differences between cost estimates, which stem, above all, from the inclusion by researchers of different kinds of costs in each study and their adoption of different cost estimation methods. Four questions clarify in practical terms how such differences explain the variability of the findings.

Question 1: What costs are included in the estimates?

We must ascertain whether only costs related to hospitalization have been examined or whether the costs of medications and outpatient clinic consultations have also been included. We must also ascertain whether the figures submitted include indirect costs, since most studies cover only direct costs.

Question 2: Are the costs of overweight estimated in addition to the costs of obesity?

The inclusion or exclusion of overweight in the research design can significantly alter the findings, since overweight is more prevalent than obesity. While from the standpoint of the individual the difference in costs engendered by an overweight individual compared with someone of normal weight is often small, from the standpoint of the entire population the differences can have significant economic consequences.

Question 3: What methodological approach have the researchers adopted?

Two approaches are used in most cases to study the economic burden of obesity. Modelling studies begin with a list of diseases linked to obesity and estimates of the costs that treating such diseases engenders. Next, the proportion of cases attributable to obesity is calculated for each disease, based on what is known of obesity-related risks. Accordingly, if we know that 90% of type II diabetes cases are attributable to obesity, 90% of the cost of treating diabetes is attributed in a given population. The costs are then tallied for each disease pinpointed. This is the approach adopted most frequently in Canadian studies. One weakness of this approach is that it produces highly variable results, depending on the diseases included in the estimates. The longer the list, the higher the costs. Another important limitation of this approach is that it does permit control for confounding factors, i.e. other factors that can explain the association between excess weight and excess costs.

The second methodological approach, **based on databases**, makes it possible to link the weight of individuals to the costs that they engender. Such costs may stem from their use of services, level of absenteeism, or premature deaths. The studies compare obese or overweight individuals with those of normal weight. The objective is to establish whether they rely more extensively on health services, have a higher level of absenteeism or die earlier. The studies often present their findings at the individual level. For example, an obese German male displays a level of absenteeism 74% higher than that of a man of normal weight.⁽⁶⁾ However, in some cases, the authors present cost estimates for an entire population by multiplying the results obtained at the individual level by the prevalence of obesity in the country.

The two methodological approaches, modelling studies and studies based on data banks, can be conducted in a **transversal or longitudinal perspective**. In the first instance, the costs attributable to obesity are calculated for a given year. In a longitudinal perspective, a group of obese individuals is linked to a given year and the attendant costs are calculated starting in the year and until the end of their lives, or over a period of several years. The choice of perspective affects the scope of the estimated costs. In the case of obesity, several years may elapse between the onset of obesity and the appearance of diseases. Longitudinal studies are, therefore, better adapted to evaluate the overall costs that excess weight engenders.

Question 4: What sources of data are used to produce the estimates?

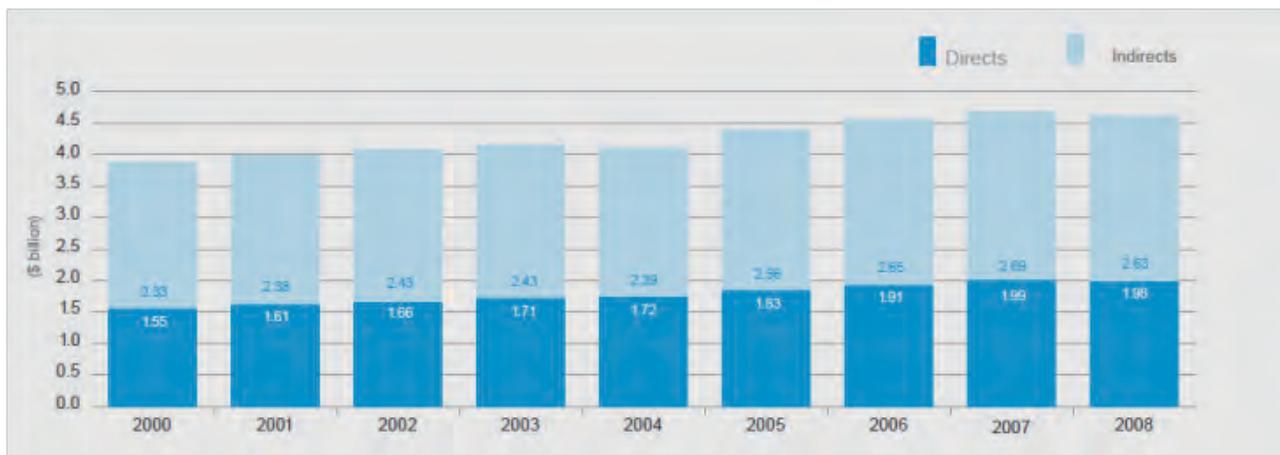
If a study is based on national surveys, the information is often self-reported. For example, individuals are asked how many times they consulted a physician in the previous year. However, the respondents do not always remember the exact number of visits. Indeed, studies show that individuals often underestimate the number of medical consultations received.^(7,8) On the other hand, if a study uses administrative data from organizations that pay the costs of such visits, such as the Régie de l'assurance-maladie du Québec or private health insurance companies in the United States, the number of visits and, accordingly, the costs, will be higher, since the data are more accurate.

In Canada, obesity and overweight engender significant direct and indirect costs

Studies that focus on the economic burden of obesity and overweight in Canada conclude, as do studies in other industrialized nations, that excess weight has significant economic consequences. Accordingly, by means of a modelling study, the Public Health Agency of Canada (PHAC) estimates that, in 2008, obesity engendered direct costs of nearly \$2 billion (see table below).⁽⁹⁾ Using a similar modelling approach, Anis et al. calculated direct costs of \$6 billion for 2006.⁽¹⁰⁾ Why is there such a difference between the findings? Anis et al. include the costs of overweight in addition to the costs stemming from obesity in their calculation and they cover 18 diseases associated with excess weight, while the PHAC confined itself to obesity and only eight diseases.

The two studies also measured indirect costs. Anis et al. have estimated that obesity- and overweight-related absenteeism and disability led to productivity losses on the order of \$5 billion in 2006. The PHAC study, by adding losses stemming from premature mortality, concludes that such losses stand at \$2.63 billion for 2008 as regards obesity alone. The two studies, like a number of others, remind us of the importance of including indirect costs in an evaluation of the economic impact of obesity. They are often as high as or even higher than expenditures related to health services. A study conducted in Alberta made the same observation when estimating the costs of overweight and obesity.⁽¹¹⁾ In 2005, indirect costs stood at \$644 million and direct costs, \$630 million.

Estimated direct and indirect annual obesity-related costs in the population 18 years of age or over in Canada, in billions of dollars, produced by the Public Health Agency of Canada



Direct Indirect (Billions of \$)

Source: Reference (9).

The cost of obesity in Québec

Our literature review covered only one study on the cost of obesity in Québec. Since the findings of the study are over 15 years old and are based on the modelling method, which, as we noted, implies significant methodological limitations, the INSPQ has undertaken a study to estimate the economic burden of obesity in Québec. Based on data from the *Enquête nationale sur la santé de la population* conducted between 1994 and 2011, the study findings will be published in 2014.

Conclusions

Studies of the economic burden of obesity do not provide an assessment of the efficacy of measures aimed at preventing and reducing the prevalence of obesity, nor do they analyze the costs and benefits of such measures. Furthermore, the adoption of preventive measures and public policies aimed at reducing the prevalence of obesity stems primarily from a desire to enhance the health of the population and not for reasons of an economic nature.

The assessments of the economic impact of obesity can nonetheless be useful in decision-making in the realm of public health. First, by demonstrating the non-health consequences of the deterioration in the health of a population, they can heighten awareness among a broader array of interveners, including those working outside the health sector, to the relevance of investing in the prevention of obesity. Second, combined with studies of the health burden, they can help to weigh up the impact of various risk factors such as smoking and drinking, and to prioritize the allocation of resources for prevention or research activities.

Lastly, the studies can suggest possible measures to be adopted to curb the most decisive sources of excess costs. For example, certain studies of the economic burden indicate that medications are the key source of excess direct costs engendered by obesity. Accordingly, as a short-term strategy to complement a long-term obesity prevention strategy, decision-makers could adopt measures to reduce the price of the medications most commonly used to treat obesity-related health problems. In order for studies of the economic burden to play this role, they must adopt, when possible, a methodological approach based on data banks, not on modelling.⁽¹⁵⁾

Key messages

- The economic impact of obesity is not confined to health service delivery. Productivity losses stemming from more widespread absenteeism and disability affect several economic sectors.
- It has been noted in all countries that obesity engenders significant direct and indirect costs. In Canada, the additional health care costs stemming from overweight and obesity were estimated at \$6 billion in 2006, to which must be added \$5 billion from loss of productivity.
- To properly use the estimates of the economic burden, we must know which costs have been included in the analysis, which estimating method was adopted, and the sources of the data used. The choices that researchers make explain, by and large, the differences in the findings from one study to another.
- Generally speaking, database studies using a longitudinal approach is preferable to a modelling study, which provides fairly theoretical estimates, while the former is based on data at the individual level, which directly link the BMI of individuals to their health care spending or loss of productivity.

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