INSPQ INSTITUT NATIONAL DE SANTÉ PUBLIQUE DU QUÉBEC

Obesity and Overweight: What Are the Economic Impacts in Québec?

TOPO Summaries by the Nutrition–Physical Activity–Weight Team

Issue 11 – March 2016

IN THIS ISSUE

Answers to the following questions:

- What is the impact of obesity and overweight on the number of medical consultations, hospitalizations and medication use among the Québec population?
- What is the annual cost in Québec? What proportion of annual health care expenditures does it represent?
- To what extent are obesity and overweight associated with a greater occurrence of disability in the Québec population?
- What are potential solutions for decision makers?

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.

The TOPO collection may be found at **www.inspq.qc.ca/english/topo**

Introduction

Analyses of the economic burdens related to various health issues affecting a population makes it possible to compare their relative significance. By documenting the costs linked to the use of health services and to productivity losses among individuals with health issues, these studies are invaluable to the decision makers who determine health priorities.

Studies on the economic burden of obesity and overweight carried out in Canada and other industrialized countries, clearly demonstrate that the increased incidence of overweight generates additional costs in terms of the use of health services, and impacts the economic health of these societies.

This TOPO provides an estimate of the economic consequences of obesity and overweight in Québec. The Institut national de santé publique du Québec (INSPQ) has studied the evidence on this issue from an economic perspective. In it, we describe the behaviour of Québec adults. This is an overview of the three publications derived from this analysis (Blouin et al., 2014, Blouin et al., 2015a, Blouin et al., 2015b).

Québec

Summary of the previous TOPO on the economic impact of obesity

The INSPQ previously published, in the TOPO collection, an issue addressing the economic impact of obesity and overweight (**Issue 9**) in April 2014 (Blouin, 2014). We then highlighted that the consequences of obesity and overweight are not limited to health problems only. The work which quantified the economic burden linked to this risk factor has demonstrated that it generates significant costs for society. In this TOPO, we addressed the factors that explain why the estimates on the economic costs linked to obesity and overweight vary from one study to the next. We noted, at the time, the absence of studies on the economic burden of obesity in Québec.

How are obesity and overweight defined?

Overweight and obesity are 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 the height (in metres) squared. Thus, a person weighing 100 kilograms and 1.85 metres tall would have a BMI of 29.2 kg/m^2 and fall into the overweight category.

Weight categories	IMC (kg/m^2)
Obese	30 or over
Overweight	Between 25 et 29.9
Normal weight	Between 18.5 et 24.9
Underweight	Less than 18.5

Direct costs

Studies on the economic consequences of obesity most often estimate direct costs, i.e., those generated by delivering health services. In this INSPQ project, we have reviewed three main types of direct costs: medical consultations, hospitalization, and medication use. These are the most studied direct costs in the scientific literature addressing the economic consequences of obesity.

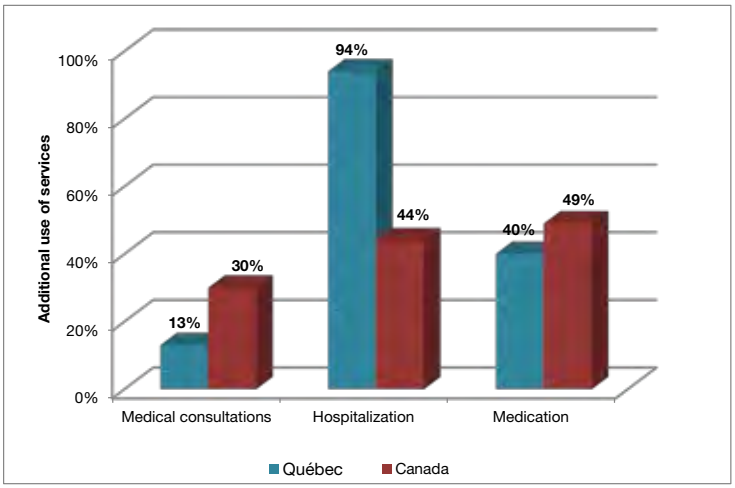
We used data from a longitudinal survey carried out by Statistics Canada, the National Population Health Survey (NPHS), which surveyed more than 14 000 Canadians aged 18 and over, including 2 000 Québec residents, between 1994 and 2011. We divided this sample into three groups based on their weight categories in 1994. We compared obese and overweight adults with adults of normal weight, to verify if there was a difference in their use of health services during the survey period.

Among obese individuals, we observed a significant difference in the three types of costs studied. The number of nights of hospitalization for those in the obese category was 94% higher than that of individuals in the normal category. In terms of the number of consultations, the difference was over 13% whereas for the amount of medication used, it reached 40% (see Graph 1). As for overweight individuals, only medication use proved to be different than that of individuals with a normal weight, with 17% greater use.

In general, our estimates for Québec are similar to those found in studies on the economic burden of obesity in Canadian provinces and other countries (Blouin, 2014). In almost all of these studies, we observed a higher use of health services by obese individuals. In addition, most of the studies comparing overweight individuals to individuals with a normal weight also observed a higher use of services. The extent of the difference varies from one study to the next, due to the variations caused by the methods used.

We also applied our statistical model to the Canadian sample of the NPHS. In Québec, the greater use of medical consultations seems lower than that observed in the Canadian population (13% in Québec as compared to 30% in Canada). However, the hospitalization rate seems higher (94% in Québec vs. 44% in Canada) (see Graph 1). The Canadian sample shows a difference in service use between overweight individuals and individuals with a normal weight that turns out to be statistically significant for medical consultations (8% more use in overweight Canadians than in Canadians with a normal weight) and medication use (17% higher medication use among overweight Canadians than among those with a normal weight).

Graph 1 **Additional use of health services by obese adults in Québec and Canada, compared to adults of normal weight, 1994-2011**



Source: Blouin, C. et al., 2015a and 2015b. Confidence intervals are also found in this source.

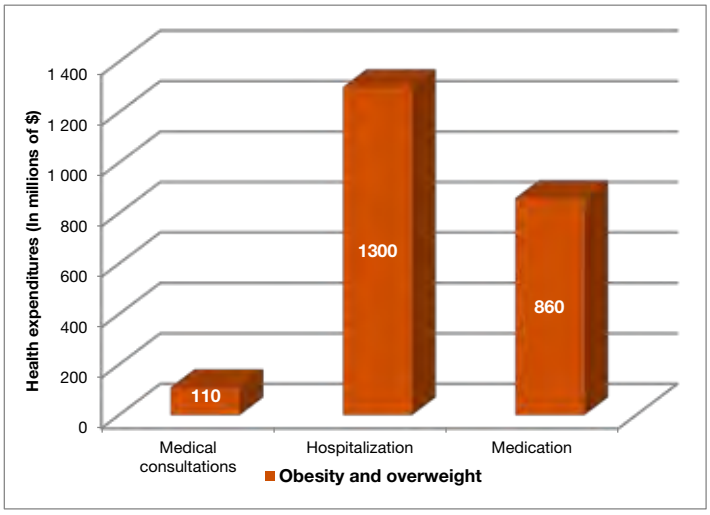
Note: We have not conducted a statistical test to examine the differences between the Canadian and Québec samples or the estimates generated based on these samples.

What is the cost of this additional use of services?

According to the *National Health Expenditure Database*, for Québec adults in 2011, total expenditures for medical consultations were $4.7B; expenditures for hospitalization $10.5B, and expenditures for medications $7.5B.

By applying our results in terms of surplus use, we have estimated direct costs linked to overweight and obesity for 2011 at $2.27B. Most of these additional costs are incurred by hospitalization and medication use (see Graph 2). This amount of $2.27B represents approximately 10% of these three types of health care expenditures, which are the three most significant budget items in health care. It should be noted that these results are likely conservative, as they are based on underestimated data for weight and the use of certain health services (see *Methods for calculating our estimates*).

Graph 2 **Medical consultations, hospitalization, and medication: additional costs linked to overweight and obesity in 2011 for Québec adults (in millions of dollars)**



Indirect costs

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 these individuals would have made to the economy, were they not affected by health issues.

Given the limitations in terms of the survey data used and the completion timeframe, the INSPQ study only considered one type of indirect cost: disability-related costs. Once again, we divided the Québec adult sample in the Statistics Canada survey into three groups, based on their weight category in 1994. We compared the number of weeks of disability declared each year through the duration of the survey (1994-2011). Since disability is defined as a long-term absence from the labour force for health reasons, we have excluded individuals aged 65 and over from our sample for this calculation, which reduced our sample to 1564 people.

When Québec individuals who are obese are compared with those in the normal weight category, a difference of 40% in the risk of disability is observed, but this difference is not statistically significant. The small size of the sample may explain this result. However, Canadian data derived from the same survey reveal a risk in the same order of magnitude, but this time it is statistically significant. In light of this finding, we have decided to include disability in our calculation of economic consequences. In Québec, the burden linked to disability was $630M in 2011.

Methods for calculating our estimates

Data sources

- The main source of data for this project was the National Population Health Survey (NPHS). It is a longitudinal survey carried out by Statistics Canada. The survey initiated in 1994 was carried out every two years with individuals living in private households from the 10 Canadian provinces. The NPHS had 9 cycles and the last data collection took place in 2011.

- To calculate the annual costs linked to the higher use of health and disability services, we used complementary data sources. For example, the Canadian Institute for Health Information's *National Health Expenditure Database* (NHEX) provided us with data on the total annual expenditures in Québec for physician consultations, hospitalization, and medication. The diagram below shows the different data sources used in carrying out the project.

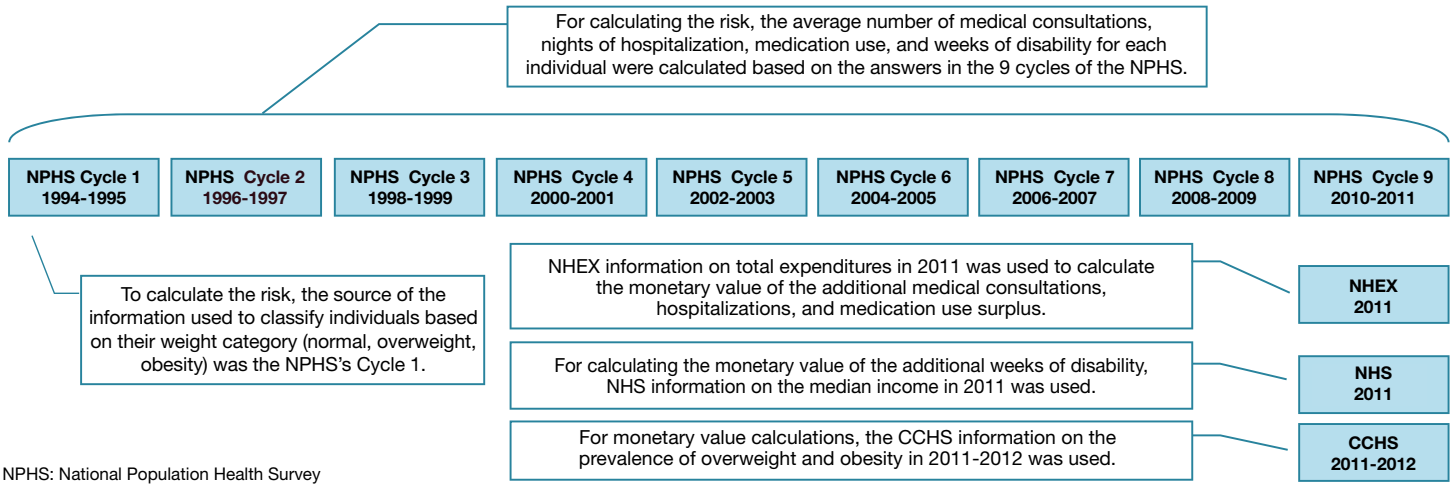
Self-reported and measured data

- The NPHS information on weight, height, use of health services, and disability status, is information provided by the respondents as part of the survey. It was not measured or validated independently. The researchers had previously noted that individuals in the overweight or obese body mass index (BMI) categories tended to overestimate their height and underestimate their weight.

- People who frequently consult a physician tend to underestimate the number of consultations they have had over the previous year. This recall bias is not as significant in the case of hospitalization or medication use. To work around this problem, researchers often use administrative data such as the statistics from insurance companies. In this instance, we were not able to use the data from the Régie de l'assurance-maladie du Québec (RAMQ) [Québec's provincial health insurance board], given our timeframe and resource limitations.

- Thus, we would like to point out once more that our results are likely conservative, because they are based on data on weight and the use of certain health services that is likely underestimated.

Data sources used to estimate the economic impacts of overweight and obesity in Québec



NPHS: National Population Health Survey
NHEX: National Health Expenditure Database
NHS: National Household Survey
CCHS: Canadian Community Health Survey

A healthier, more productive population and less pressure on public expenditures

Public health expenditures in Canada and Québec increased much faster than inflation between the years 2000 and 2010 (CIHI, 2014). Since 2011, the increase in health expenditures has been slowing down, but the ranking of health care costs in public expenditures and their impact on Québec's prosperity remain a major challenge (CIHI, 2014; Marchildon and Di Matteo, 2015). In 2013, more than 42% of public expenditures in Québec fell within the realm of health care (Clavet et al., 2013).

Such growth cannot persist without jeopardizing the health care system and affecting the public resources available for other government objectives. The adoption of measures with a better cost-effectiveness ratio to prevent chronic disease and the implementation of public policies to promote healthy eating and physical activity can help slow down the increase of health care costs, while enhancing the quality of life of residents (Conference Board of Canada, 2014; Bounajm et al., 2014).

The improvement of the population's health does not only influence health-related expenditures. It can also lead to productivity increases in terms of Québec's economy, in particular by reducing costs linked to disability (Tomba, 2002). Consequently, the implementation of effective measures to promote healthy life habits can also have a positive impact on economic growth.

How to reduce the economic impact of obesity?

How can we effectively prevent obesity? First, by acknowledging the complexity of this health issue and by letting go of the idea of a one-size-fits-all solution. Everyone who has looked for ways to reach conclusive results in this area has stressed the need to invest in diverse efforts. Whether it is the WHO, the Institute of Medicine in the U.S., or global consulting firm McKinsey, the message is the same (WHO, 2009; Institute of Medicine, 2012; Dobbs et al., 2014). Each government must adopt a portfolio of measures that incorporate both educational interventions and changes in the built, sociocultural, economic, and political environments to make them more conducive to physical activity and healthy eating (see the summary box on the next page).

The social changes that led to the economic burden currently associated with obesity have taken decades to occur; current efforts will thus need to be intensified to create environments that make healthy choices easier to make.

Examples of changes in physical and sociocultural environments

The planning of neighbourhoods, streets, and roads to optimize walkability has been identified in scientific literature as an effective way to increase the population's level of physical activity (Keener et al., 2009; CDC, 2011a; Mozzafarian et al., 2012). When examining the situation in Québec municipalities, we find that higher walkability is associated with greater use of active transportation (Robitaille and Bergeron, 2015).

Walkability is high in most central neighbourhoods in Québec towns and cities, but it is not the case in peri-urban areas. To create physical environments more conducive to active transportation in peri-urban sectors, walkability should be increased, and the development of pedestrian and cycling infrastructure should be promoted. In rural sectors and smaller towns, interventions such as developing a denser municipal core, redesigning crosswalks, and enhancing the public transit offering should be considered (Robitaille and Bergeron, 2015).

The features of a neighbourhood's physical food environment can also be associated with healthier eating habits. For instance, studies have shown significant links between the nutrition and body weight of young people and the proximity of fast food restaurants and convenience stores around schools (Lalonde and Robitaille, 2014). In Québec, most public schools are located near such establishments (Lalonde and Robitaille, 2014). Interventions relating to changing the food offering within certain businesses and the use of zoning by-laws to restrict the presence of certain businesses could prove promising in creating physical environments that are more conducive to healthy eating (CDC, 2014; Gittelsohn, Rowan, and Gadhoke, 2012).

The interior layout of schools also influences healthy eating; significant variations were observed from one school to another (Fredrichs et al., 2015; Morin et al., 2015). Research on the nutrition of Québec students stresses the importance of creating school lunch spaces that foster sociability (Baril et al., 2014). In addition to the physical environment, the sociocultural environment of young people should be addressed, because it often conveys contradictory messages regarding nutrition, emanating from the family, school, and commercial marketing. Greater consistency in this area would be more conducive to healthy eating (Baril et al., 2014).

Points to remember

1. The economic costs associated with overweight and obesity in Québec reached nearly $3B in 2011 for the four types of costs addressed by the INSPQ's studies: medical consultations ($110M), hospitalizations ($1.3B), medication ($860M) and disability ($630M).

2. These results do not include all costs associated with overweight and obesity. For instance, productivity losses linked to absenteeism and premature mortality were excluded from the calculation.

3. As in Québec, obesity and overweight are associated with significant economic costs in other Canadian provinces and industrialized countries.

4. To reduce the economic burden of obesity, each government must adopt a portfolio of measures that incorporate both educational interventions and changes in the built, sociocultural, economic, and political environments to make them more conducive to physical activity and healthy eating.

5. The adoption of such measures will lead to better health within the population, which will also lessen the pressure exerted by health-related expenditures on Québec's budget and result in productivity increases for the economy.

6. The social changes that led to the economic burden currently associated with obesity have taken decades to occur; current efforts will thus need to be intensified to create environments that make healthy choices easier to make.

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