

# DIABETES AND OBESITY

## Highlights

### Overweight

- Currently, about three in five children, one in two adolescents and four in five adults are overweight.
- Nearly half of children, females and residents of Zones 2, 3 and 4 are obese.
- Overweight people tend to have more chronic health conditions, such as diabetes, heart disease, and musculoskeletal and endocrine-metabolic disorders.

### Diabetes

- The prevalence of diabetes has remained fairly stable in recent years. This disease is almost absent in children and adolescents, remains rare in young adults, but affects nearly one in four middle-aged adults and two in five elders.
- In non-diabetic individuals, there is a high prevalence of Type 2 diabetes risk factors, including overweight (in the general population) and obstetric history (among females).
- A significant proportion of diabetics smoke cigarettes, a behavior that greatly increases the risks of complications of diabetes.
- Diabetics tend to have a larger number of chronic health problems. They are also exposed to a number of complications of diabetes.
- One in two people with diabetes had experienced at least one complication of diabetes at the time of the survey.



## CONTEXT

This booklet was developed to facilitate the implementation of effective prevention and treatment strategies for obesity and diabetes in First Nations communities in Quebec, with a focus on health behaviors such as diet, physical activity and smoking.<sup>[1-2]</sup> The data collected in the framework of the Regional Health Survey (RHS) reaffirms the seriousness of the problems related to diabetes and obesity, and the urgency to continue efforts to facilitate the prevention, diagnosis and management of these problems using approaches that are appropriate to the culture, values and needs of First Nations in Quebec.

## OVERWEIGHT AND OBESITY

### BOX 1

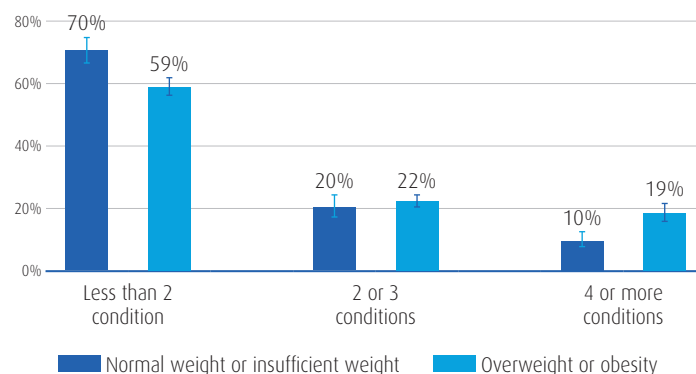
#### Overweight

Overweight is a chronic health condition defined as excessive accumulation of body fat that can lead to health risks (e.g., heart disease and musculoskeletal disorders, cancer).<sup>[3]</sup> Body mass index (BMI) is generally used to estimate the degree of overweight in a person, calculated by dividing the person's weight (in kilograms) by the square of their height (in meters × meters). In adults, "healthy weight" corresponds to a BMI of 18.5 to 24.9; **overweight**, to a BMI of 25.0 to 29.9; and **obesity**, to a BMI of 30.0 or more. The calculation method is a bit more complex for children and adolescents, since overweight measures vary based on age (the precise calculation method is available online).<sup>[3]</sup>

## Health conditions associated with overweight

According to the 2015 RHS data, it is possible to contrast the number of chronic health conditions people have based on whether or not they are overweight. **FIGURE 1** indicates that the proportion of individuals with at least four chronic health conditions is about twice as high in overweight or obese individuals as in those with normal weight or insufficient weight.

**FIGURE 1**  
Number of chronic health conditions, based on BMI<sup>†</sup>

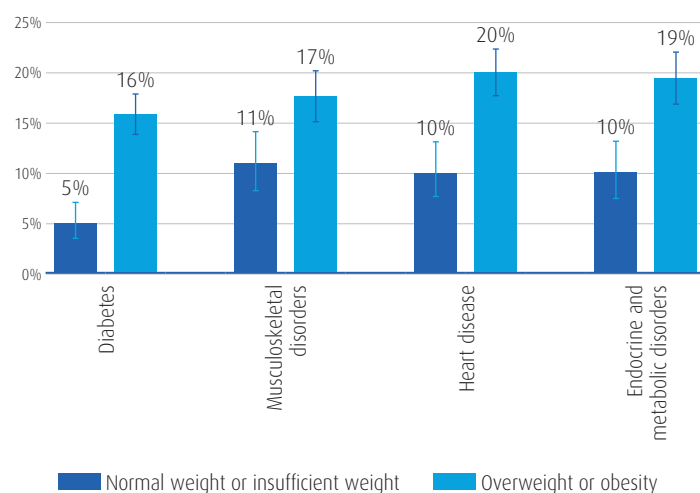


<sup>†</sup>The health conditions reported here do not include obesity, gestational diabetes, or preeclampsia. Pregnant women are not included because the measure of overweight – BMI – does not apply during pregnancy.



FIGURE 2 shows that overweight is associated with higher prevalences of diabetes, heart disease and musculoskeletal and endocrine-metabolic disorders.

**FIGURE 2**  
**Prevalence of chronic health conditions, based on BMI†**

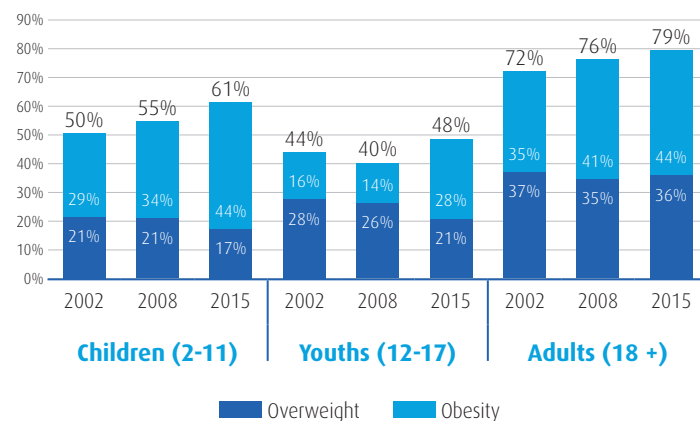


†The health conditions reported here do not include obesity, gestational diabetes, or preeclampsia. Pregnant women are not included because the measure of overweight – BMI – does not apply during pregnancy. Diabetes and osteoporosis – which is counted among musculoskeletal disorders – have not been included in the category of endocrine-metabolic disorders.

## Evolution in the prevalence of overweight and obesity

FIGURE 3 shows the evolution in the prevalence of overweight and obesity in different age groups since RHS 2002, showing that the magnitude of the problem has not decreased. Even among adolescents, where the prevalence of overweight is the lowest, about one in two is overweight or obese. The most worrying trend is seen in children. While one in two children was overweight when the RHS was conducted in 2002, nearly one in two is now obese and about three out of five are overweight. In adults, the prevalence of overweight and obesity is stable, but very high. About four in five adults are overweight or obese and nearly one in two is obese. Many adults are therefore at high risk of developing Type 2 diabetes during their lifetime.

**FIGURE 3**  
**Evolution in the prevalence of overweight and obesity since RHS 2002, based on age**



- **Significant increase in the proportion of obese children [95% CI]**, rising from 34% [30%-39%] to 44% [39%-49%] from RHS 2008 to RHS 2015.
- **Significant increase in the proportion of obese adolescents [95% CI]**, rising from 14% [11%-17%] to 28% [24%-32%] from RHS 2008 to RHS 2015.
- **Significant increase in the proportion of obese adults [95% CI]**, rising from 35% [33%-38%] to 44% [40%-47%] from RHS 2002 to RHS 2015.

FIGURE 4 shows the evolution in the prevalence of overweight and obesity among males and females 18 years and over. Although the prevalence of overweight does not vary significantly based on gender, obesity particularly affects females: about one in two are obese, according to the data of RHS 2015.

**FIGURE 4**  
**Evolution in the prevalence of overweight and obesity among adults since RHS 2002, based on gender**

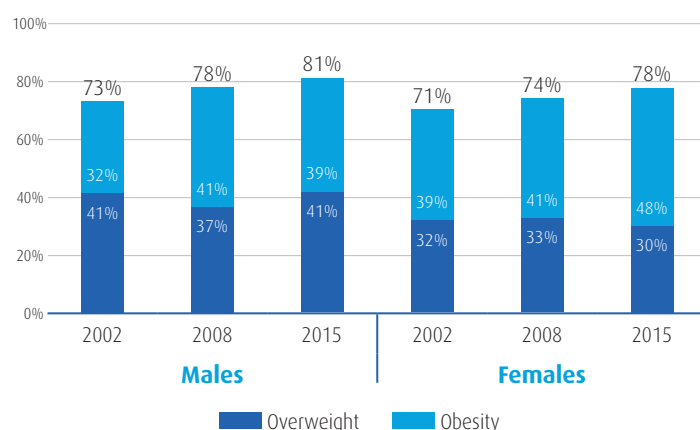
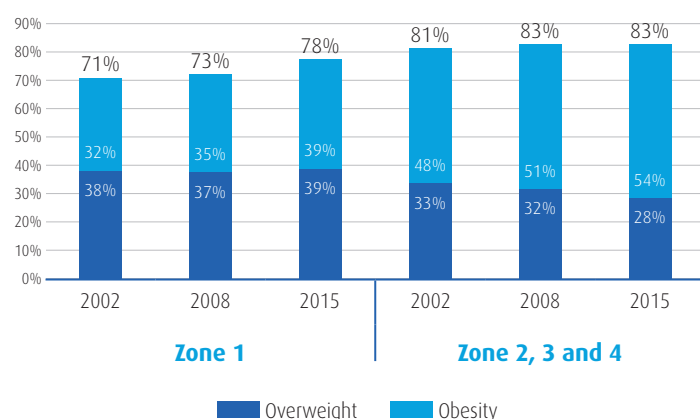


FIGURE 5 demonstrates the evolution of the prevalence of overweight based on geographic zone. Despite similar prevalences among different zones for overweight in general, obesity tends to be more prevalent among residents of Zones 2, 3 and 4 than among those in Zone 1.

**FIGURE 5**  
**Evolution in the prevalence of overweight and obesity among adults since RHS 2002, based on geographic zone**



– **Significant difference in the proportions of obese adults [95% CI] by zone:** 39% [36%-42%] in Zone 1, compared to 54% [45%-64%] in Zones 2, 3 and 4 .

In sum, the strong prevalences of obesity and overweight are alarming, since they are associated with higher risks of developing many chronic health conditions, such as Type 2 diabetes.

## DIABETES

### BOX 2 Diabetes<sup>[4-15]</sup>

Diabetes is a chronic disease resulting from inadequate production of or insensitivity to insulin. Insulin is secreted by the pancreas and regulates the concentration of glucose (sugar) in the blood. There are several types of diabetes:

- **Gestational diabetes** is characterized by an increase in the concentration of sugar in the blood that appears during pregnancy. This type of diabetes is often diagnosed during prenatal screening. Women with gestational diabetes are more likely to experience complications during pregnancy or childbirth (including giving birth to a baby weighing more than 9 pounds or 4.1 kilograms). They are also more at risk – like their children – of developing Type 2 diabetes during their lifetime.<sup>[4, 7-9, 11-15]</sup>
- **Type 1 diabetes**<sup>[4, 9]</sup> is characterized by insufficient insulin production. People with Type 1 diabetes must therefore inject insulin every day.<sup>[9]</sup> The specific causes of this type of diabetes remain unclear, but based on the current state of knowledge, it is not considered preventable.
- **Type 2 diabetes**<sup>[4-15]</sup> results from a poor use of insulin by the body. Long known as “adult-onset diabetes,” it now affects a growing number of children and adolescents.<sup>[12-15]</sup> Globally, the increase in the prevalence of Type 2 diabetes coincides with the increase in the prevalence of obesity. **Obesity** (especially abdominal obesity) is one of the major risk factors for Type 2 diabetes.

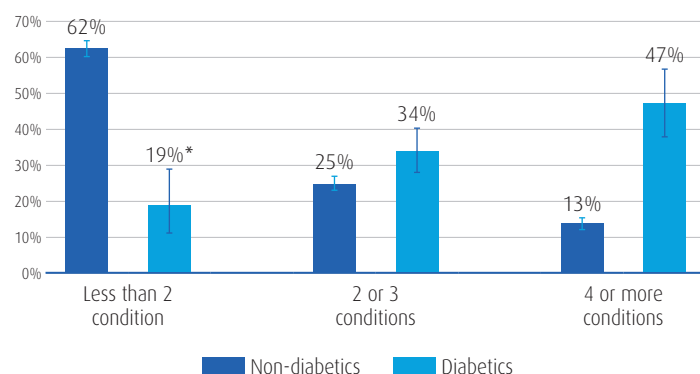
Type 2 diabetes and obesity share several modifiable risk factors, such as poor eating habits and sedentary lifestyle, which is why they are often targeted by the same prevention measures. Other factors are associated with the development of Type 2 diabetes, such as age, family history, and the presence of cardiovascular conditions.<sup>[5-8]</sup>

It is recommended that people are tested for Type 2 diabetes every three years from the age of 40 years old (but earlier and more often among people with multiple risk factors). People with diabetes are advised to make certain lifestyle changes, including to stop smoking, since smoking increases the risk of complications of diabetes.<sup>[5-8]</sup>

## Diabetes and health conditions

FIGURE 6 compares the health status of people according to whether they declared themselves to be diabetic or not when the RHS was conducted in 2015. It seems that diabetics have more health conditions than the rest of the population.

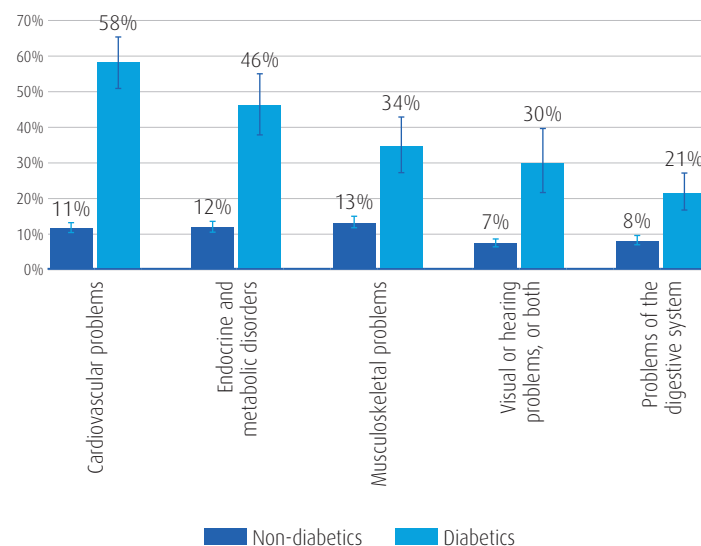
**FIGURE 6**  
**Number of chronic health conditions, among diabetics and non-diabetics†**



†Health conditions reported here do not include diabetes (of any type) or preeclampsia. Pregnant women are not included in this figure, since the measure of overweight – BMI – cannot be applied rigorously during pregnancy.

FIGURE 7 shows that chronic health conditions associated with diabetes affect several dimensions of health. In fact, despite the extent of health conditions associated with obesity (FIGURE 2), it appears that diabetes is associated with an even wider range of problems. Complications of diabetes, such as retinopathy, can account for the significance of visual problems. On the other hand, the prevalence of these problems – like that of diabetes – increases significantly with age. This figure is not intended to establish a causal link between diabetes and chronic health conditions, but only to emphasize that diabetics have more chronic health conditions. In addition, the need for care and health services tends to be greater for diabetics than for the rest of the population.

**FIGURE 7**  
**Prevalence of chronic health conditions, among diabetics and non-diabetics†**



†Health conditions reported here do not include diabetes (of any type) or preeclampsia. Osteoporosis, counted among musculoskeletal disorders, was not included in the category of endocrine-metabolic disorders. Pregnant women are not included in this figure, since the measure of overweight – BMI – cannot be applied rigorously during pregnancy.



## Complications of diabetes

FIGURE 8 compiles the complications people with diabetes reported having when the RHS was conducted in 2015. About one diabetic in two reported having at least one complication and nearly one in three reported having at least two. Most of the complications affect the nervous system, lower limbs, circulatory system or eyesight.

## Management of diabetes

To reduce the risks of complications of diabetes, regular medical monitoring and adherence to the treatment plan are essential. The treatment plan generally combines lifestyle changes (smoking cessation, balanced diet and regular physical activity) with the pharmacological approach (hypoglycemic agents or daily insulin, or both).<sup>[9-10]</sup> For First Nations in Quebec, the use of traditional methods is also conceivable.

As shown in FIGURE 9, the pharmacological approach is adopted by a majority of diabetic respondents, while traditional methods are rarely used. Regardless of the elements of their treatment plan, about three in four diabetics report having changed their lifestyle after receiving their diagnosis. Nevertheless, it is found that the proportion of smokers is substantially the same in people with diabetes (35%) as in non-diabetics (37%).

FIGURE 8  
Number and type of complications of diabetes

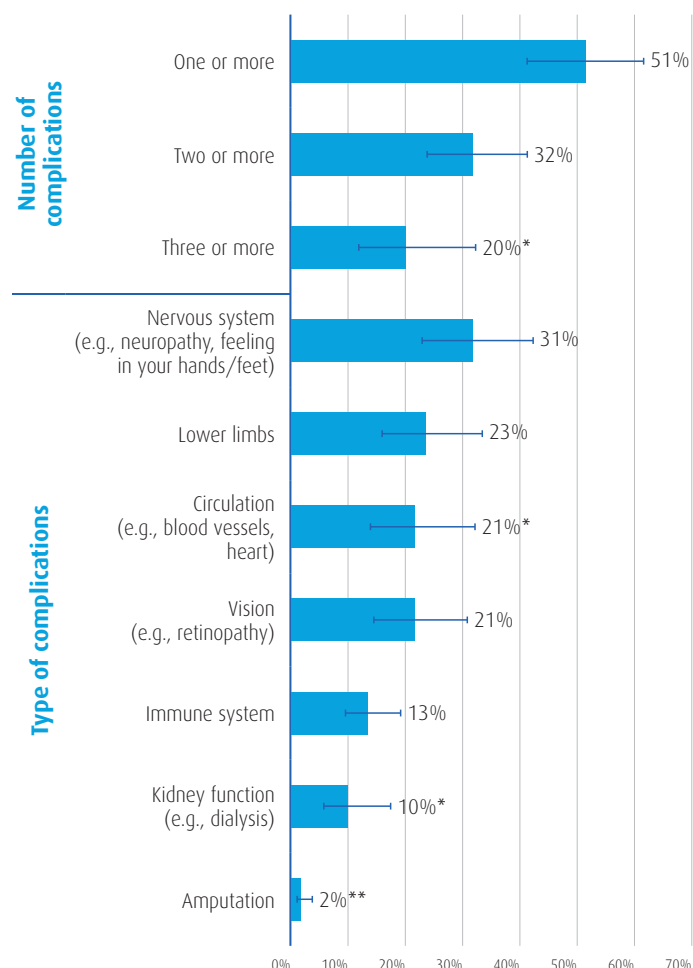
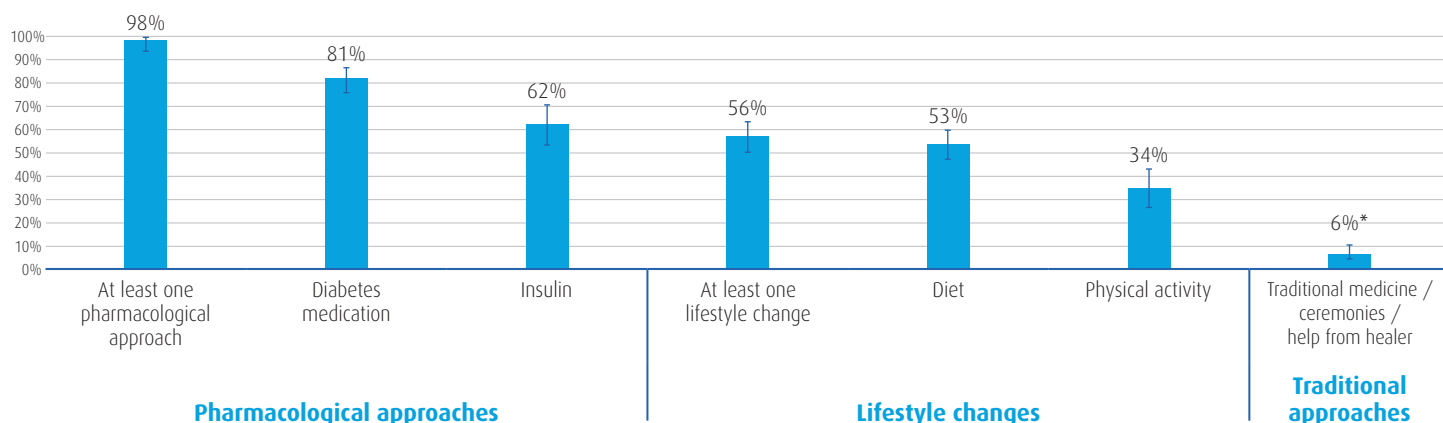


FIGURE 9  
Treatments used by people with diabetes

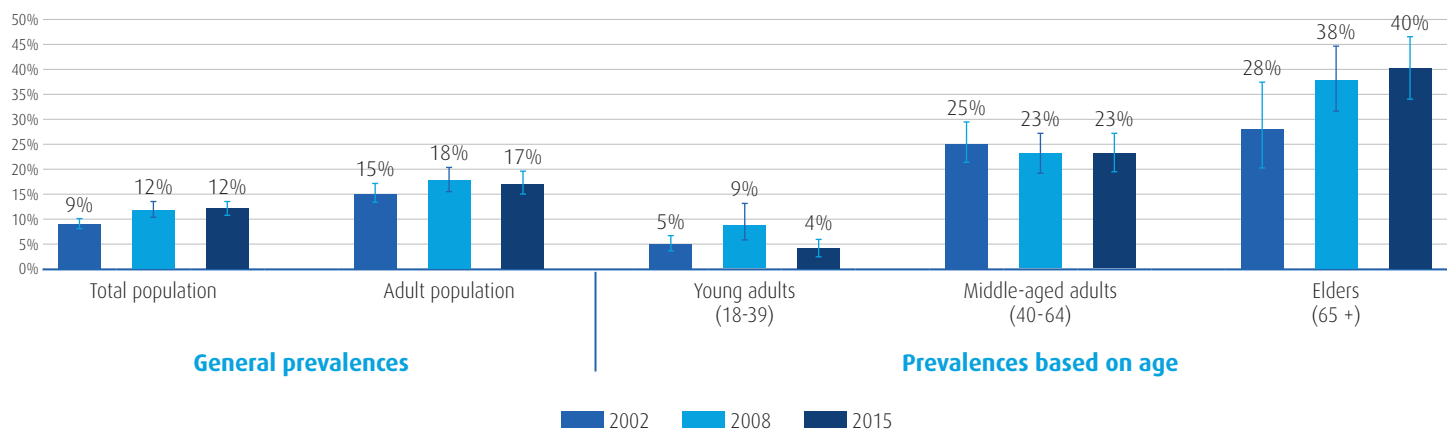




## Evolution of the prevalence of diabetes

FIGURE 10 suggests that the proportion of individuals with diabetes has remained stable since RHS 2002, although it varies greatly from one age group to another. Diabetes remains virtually absent in children and adolescents and is rather rare among young adults, but affects about one in four middle-aged adults and two in five elders.

**FIGURE 10**  
**Evolution of the prevalence of diabetes since RHS 2002, based on age**



The prevalence of diabetes does not vary significantly based on gender, geographic zone or income level, but tends to differ according to education, smoking and obstetric history.

- **Significant difference in the prevalence of diabetes [95% CI] based on education:** 19% [16%-22%] among respondents with no post-secondary education compared to 12% [8%-16 %] among respondents with a college or university degree.
- **Significant difference in the prevalence of diabetes [95% CI] based on smoking:** 21% [18%-24%] among daily smokers and ex-smokers, compared to 11% [8%-14%] among people who never smoked on a daily basis.
- **Significant difference in the prevalence of diabetes [95% CI] according to obstetric history:** 23% [20%-27%] among mothers, compared to 7%\* [3%-13%] among females who have never had children.



## Risk factors for Type 2 diabetes

FIGURE 11 presents the prevalence of certain risk factors for developing Type 2 diabetes among non-diabetic adults. Although adults under 40 are generally at low risk of developing Type 2 diabetes, the portrait of lifestyles and overweight suggests that a significant proportion of them – if they do not change their habits – may develop Type 2 diabetes when they are older.

**FIGURE 11**  
Prevalence of certain risk factors for developing Type 2 diabetes among non-diabetic adults, based on age

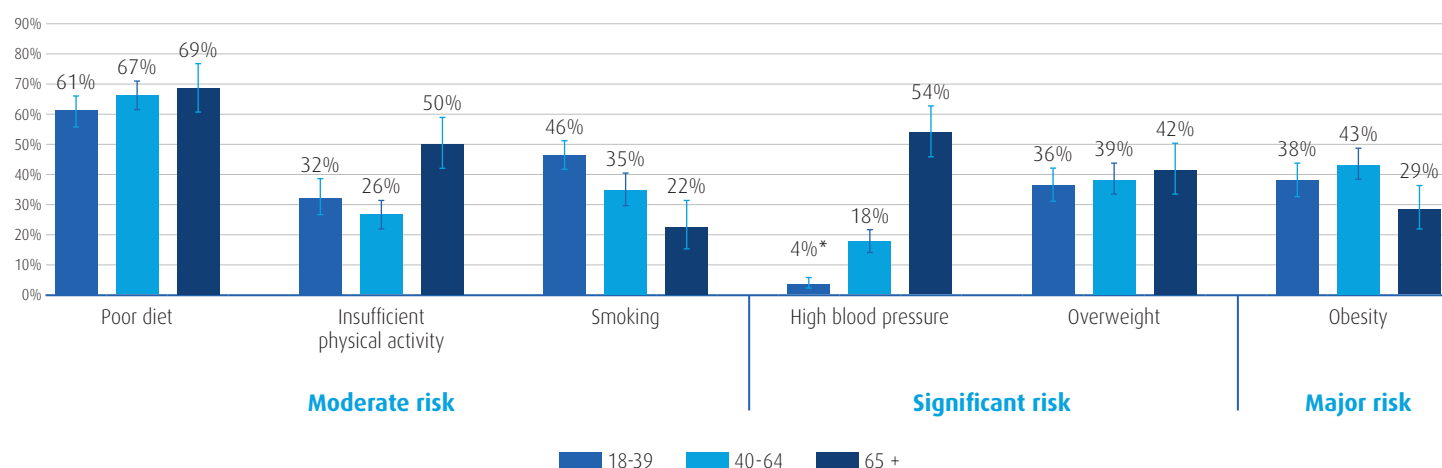
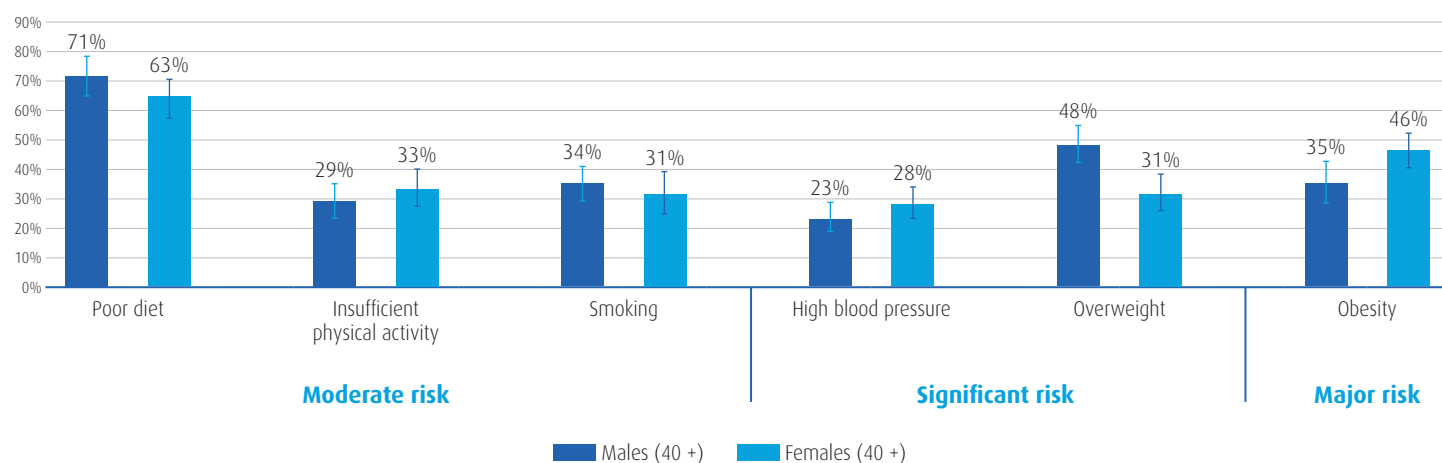


FIGURE 12 shows the prevalence of these same risk factors in non-diabetic adults 40 years and over, based on gender.<sup>[4, 8]</sup> Overall, overweight is a major problem affecting about eight in ten adults. Nevertheless, males are usually overweight, whereas females tend to be obese.

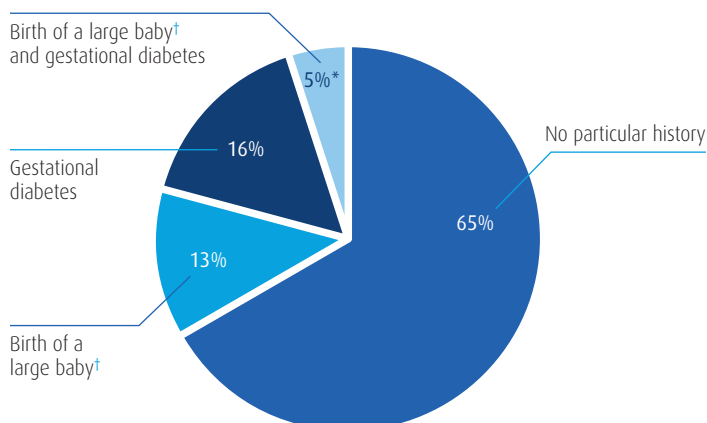
**FIGURE 12**  
Prevalence of certain risk factors for developing Type 2 diabetes among adult non-diabetics 40 years and over, based on gender





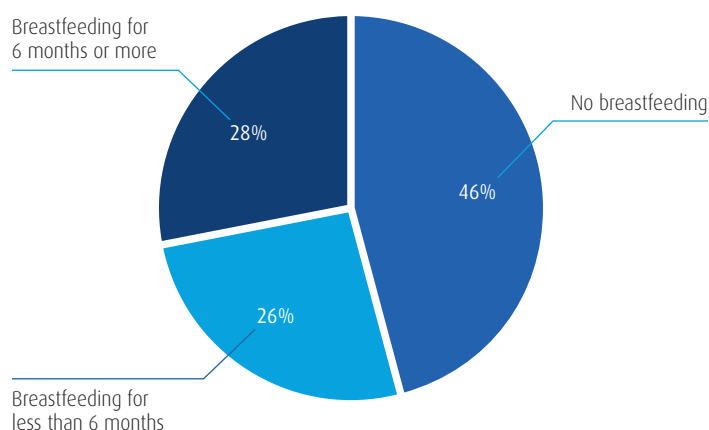
According to the data presented in **FIGURE 13**, an obstetric history that influences the risk of developing Type 2 diabetes occurs in one in three pregnancies (based on data collected among children 5 years and under). About one in five pregnancies can be associated with gestational diabetes, which is a high risk factor for developing Type 2 diabetes later. Fortunately, mothers' breastfeeding practices have improved in recent years, so that by the time the RHS was conducted in 2015, about half of young children had been breastfed and one-quarter had been breastfed for six months or more (**FIGURE 14**). These trends are encouraging, as breastfeeding tends to decrease the risks of developing diabetes for both the mother and her child.

**FIGURE 13**  
**Prevalence of an obstetric history that influences the development of Type 2 diabetes among all pregnancies (based on data collected among children 5 years and under)**



†Large baby = baby weighing more than 9 pounds or 4.1 kilograms at birth.

**FIGURE 14**  
**Prevalence of breastfeeding among young children (0-5 years old)**



## CONCLUSION

The prevalence of overweight and obesity is very high among all First Nations in Quebec. In recent years, the prevalence of obesity has increased significantly among children and adolescents and is significantly higher among residents of Zones 2, 3 and 4 than among those in Zone 1. The prevalence of diabetes has remained substantially the same. However, the proportion of non-diabetics with risk of developing diabetes is very high. Females seem particularly vulnerable, on the one hand, because about half of them are obese, and secondly, because their risk profile is strongly influenced by their obstetric history. Half of the diabetic population had at least one complication of diabetes at the time of the survey. To prevent such complications, adherence to the treatment plan is essential. However, the elements of the treatment plan related to diet, physical activity and smoking are not always respected. The proportion of smokers is similar among diabetics and non-diabetics. However, the risks of complications of diabetes are much higher among smokers than non-smokers.

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## MÉTHODOLOGIE EN BREF

The third phase of the First Nations Regional Health Survey (RHS) aims to describe the health status of the population in First Nations communities in Quebec. It was conducted from February 2015 to May 2016 in 21 communities from eight nations and reached 3,261 people (825 children aged 0 to 11 years, 769 adolescents aged 12 to 17 years and 1,667 adults aged 18 years and over) who responded to an electronic questionnaire submitted by field agents.

Data followed by the “\*” sign have a coefficient of variation of 16.6% to 33.3% and should be interpreted with caution. The sign “\*\*\*” indicates a coefficient of variation greater than 33.3%. This data is not published, except for estimates below 5%, which must be interpreted with caution. The lines presented in the bar or line charts are the confidence intervals calculated using a 95% confidence level.

In certain cases, the data are presented according to the geographic zone of the community of the respondents. These zones are defined as follows:<sup>1</sup>

- Zone 1 (urban): less than 50 km from a service centre with road access;
- Zone 2 (rural): between 50 and 350 km from a service centre with road access;
- Zone 3 (isolated): more than 350 km from a service centre with road access;
- Zone 4 (difficult to access): no road.

Service centre: The nearest access to suppliers, banks and government services.

In the context of the RHS, the term “community” is used to represent “Indian reserves.”

For more details, please refer to the *Methodology* booklet of the RHS.

The RHS report consists of 20 thematic booklets. All the booklets can be consulted at the FNQLHSSC documentation center: <https://centredoc.cssspnql.com>.

<sup>1</sup> INAC, <http://fnppn.aandc-aadnc.gc.ca/fnp/main/Definitions.aspx?lang=eng> [accessed 2018-01-03].

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