DIABETES IN ATLANTIC CANADA: SNAPSHOT 2011

Public Health Agency of Canada

Atlantic Regional Office

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Canada

Note to reader:

Diabetes in Atlantic Canada: Snapshot 2011 is derived from *The Burden of Diabetes in Atlantic Canada,* a report published by the Public Health Agency of Canada in February 2011.

A variety of data sources using different methodologies were used to create this document. Values that were collected using survey data are referred to in this document as self-reported in order to differentiate from measured data and data from provincial registries.

Ce document est également disponible en français.

Abbreviations and Acronyms

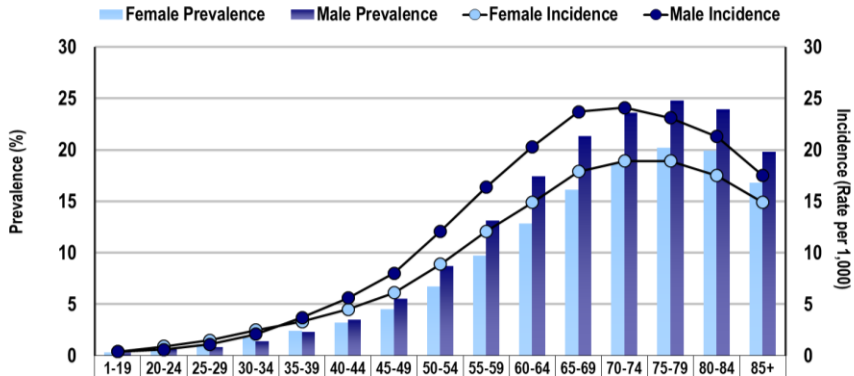
BMI	Body Mass Index	NL	Newfoundland and Labrador
CCHS	Canadian Community Health Survey	NS	Nova Scotia
NB	New Brunswick	PEI	Prince Edward Island
NDSS	National Diabetes Surveillance System		

Who is most at risk?

Many people believe that diabetes is an older person's disease. Even though about one in five Canadians over the age of 65 are living with diabetes, an increasing number of people in mid-life and younger are diagnosed with the disease (Figure 1).

Atlantic Canadians in New Brunswick (NB), Nova Scotia (NS), and Newfoundland and Labrador (NL) have higher rates of diabetes than people living in other parts of Canada. Men over the age of 50 have the highest rates of diabetes in all four Atlantic Provinces. Women over the age of 60 living in NL have much higher rates of diabetes compared with women in the other Atlantic Provinces (Figure 2).

Figure 1. Prevalence and incidence of diagnosed diabetes among people aged one year and older by age group and sex in Canada*, 2006-2007



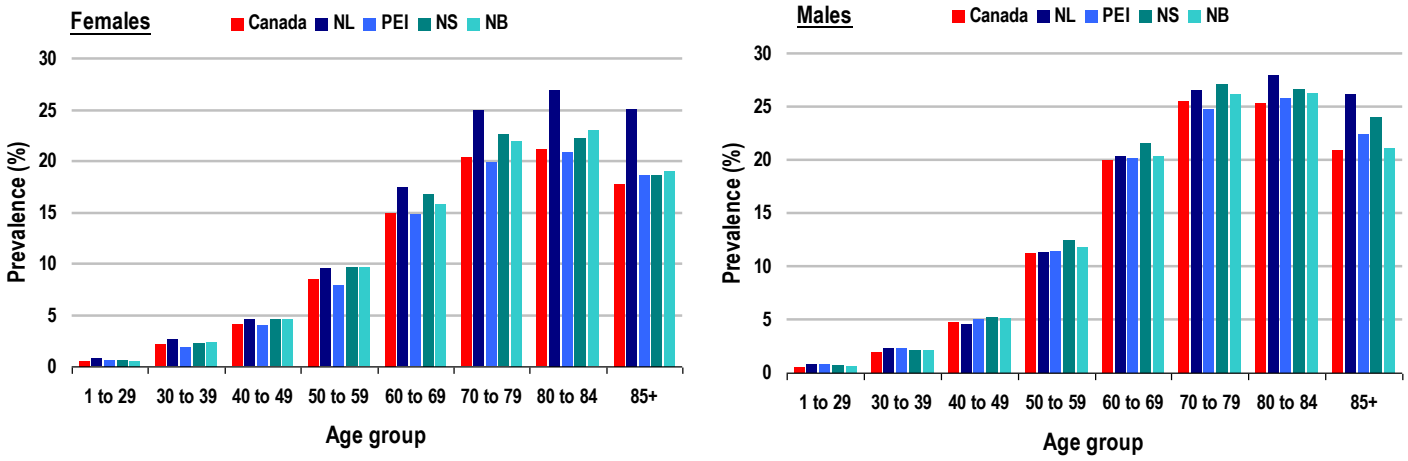
	1-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+
Female Prevalence	0.3	0.7	1.1	1.7	2.4	3.2	4.5	6.7	9.7	12.8	16.1	18.7	20.2	19.9	16.8
Male Prevalence	0.3	0.6	0.8	1.4	2.3	3.5	5.5	8.7	13.1	17.4	21.3	23.6	24.8	23.9	19.8
Female Incidence	0.4	0.9	1.5	2.5	3.3	4.5	6.1	8.9	12.1	14.9	17.9	18.9	18.9	17.5	14.9
Male Incidence	0.4	0.6	1.1	2.1	3.7	5.6	8.0	12.1	16.4	20.3	23.7	24.1	23.1	21.3	17.5

*Data for Nunavut were unavailable
Source: Public Health Agency of Canada, using NDSS data files contributed by provinces and territories, as of April 2009

From 2002 to 2007, the number of new cases of diabetes in Canada rose by 9%.[1] If this trend continues, 1.9 million Canadians will likely be living with the disease by 2017.[2]

Although a greater percentage of people over the age of 65 have diabetes compared to people aged 45-65, the actual number of cases is similar for these two groups. This is because there are more people in the 45-65 age group. As the baby boomer generation ages, we will likely see a dramatic increase in the number of older Canadians with diabetes.

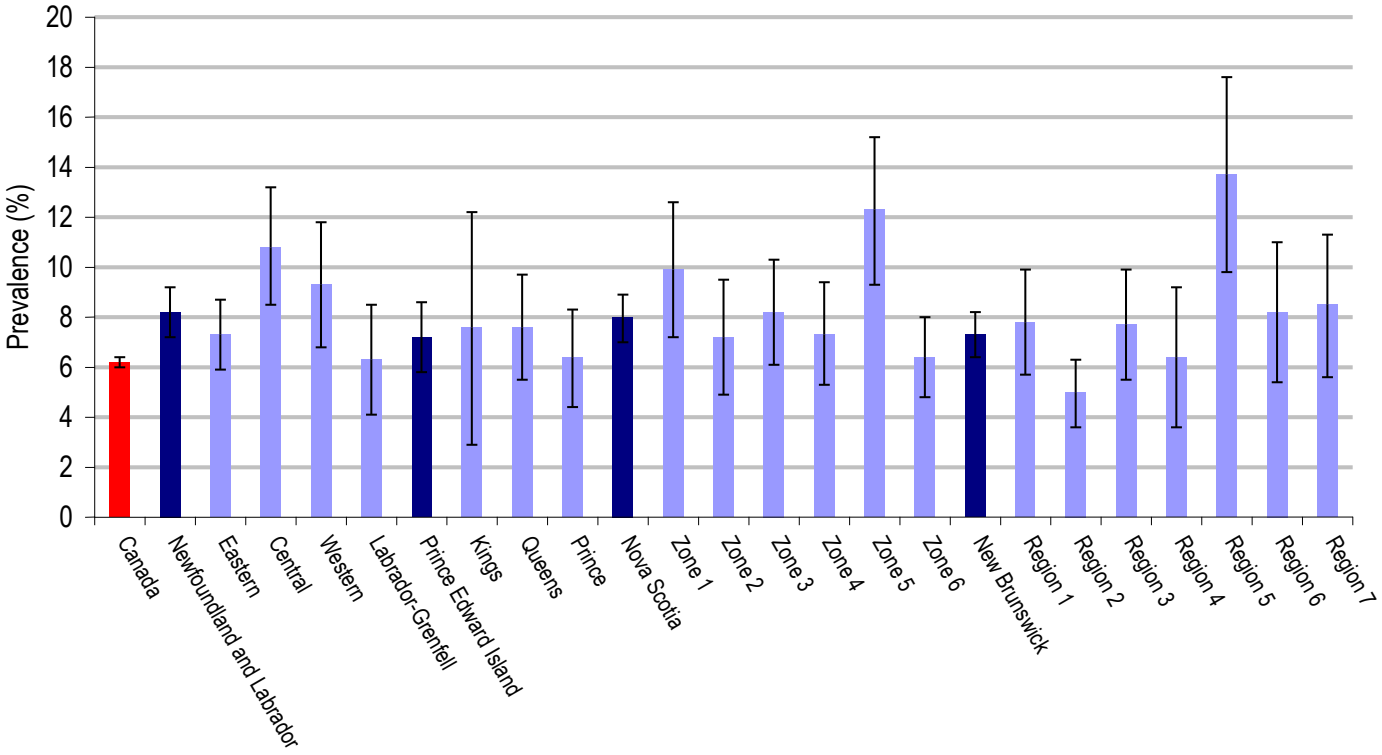
Figure 2. Prevalence of diagnosed diabetes among people aged one year and older in Canada* and the Atlantic Provinces by sex and age group, 2006-2007



*Data for Nunavut were unavailable
Source: Public Health Agency of Canada, using NDSS data files contributed by provinces and territories, as of April 2009

Health regions[a] with the highest rates of diabetes are Central, NL, Zone 1 (Yarmouth/South Shore), NS, Zone 5 (Cape Breton), NS, and Region 5 (Campbellton), NB (Figure 3). Prevalence in Zone 5, NS, and Region 5, NB, was significantly higher compared with prevalence in Canada and the Atlantic Provinces.

Figure 3. Prevalence of diagnosed diabetes among people aged 12 years and older in Canada, the Atlantic Provinces, and health regions[a], 2009-2010



Bars represent the 95% confidence interval
Source: Canadian Community Health Survey, 2009-2010, Self-reported data

Did you know?

- The percentage of women and men diagnosed with diabetes has been shown to **double** between the ages of 45 and 65 in Canada.
- Women above the age of 60 living in NL have much higher rates of diabetes compared with women in the other Atlantic Provinces.
- As the baby boomer generation ages we may see a dramatic increase in the number of older Canadians living with diabetes.

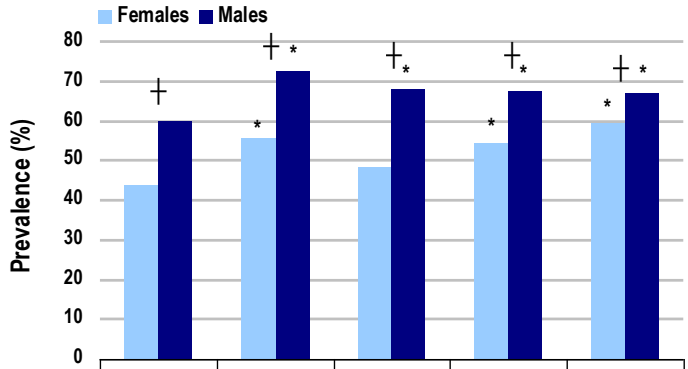
Risk factor # 1: Weight

Excess body weight is an important risk factor for type 2 diabetes. A greater percentage of both women and men in each of the Atlantic Provinces report being overweight or obese compared with Canada (Figure 4)[b, c]. However, men in each of the four Atlantic Provinces are much more likely to report being overweight or obese than women.

All health regions[a] in Atlantic Canada have a significantly higher prevalence of self-reported overweight or obesity relative to Canada with the exception of Queens County, Prince Edward Island (PEI), Zone 4, NS, and Region 4, NB (Figure 5).

Obesity remains a key risk factor for type 2 diabetes in the Atlantic Region.

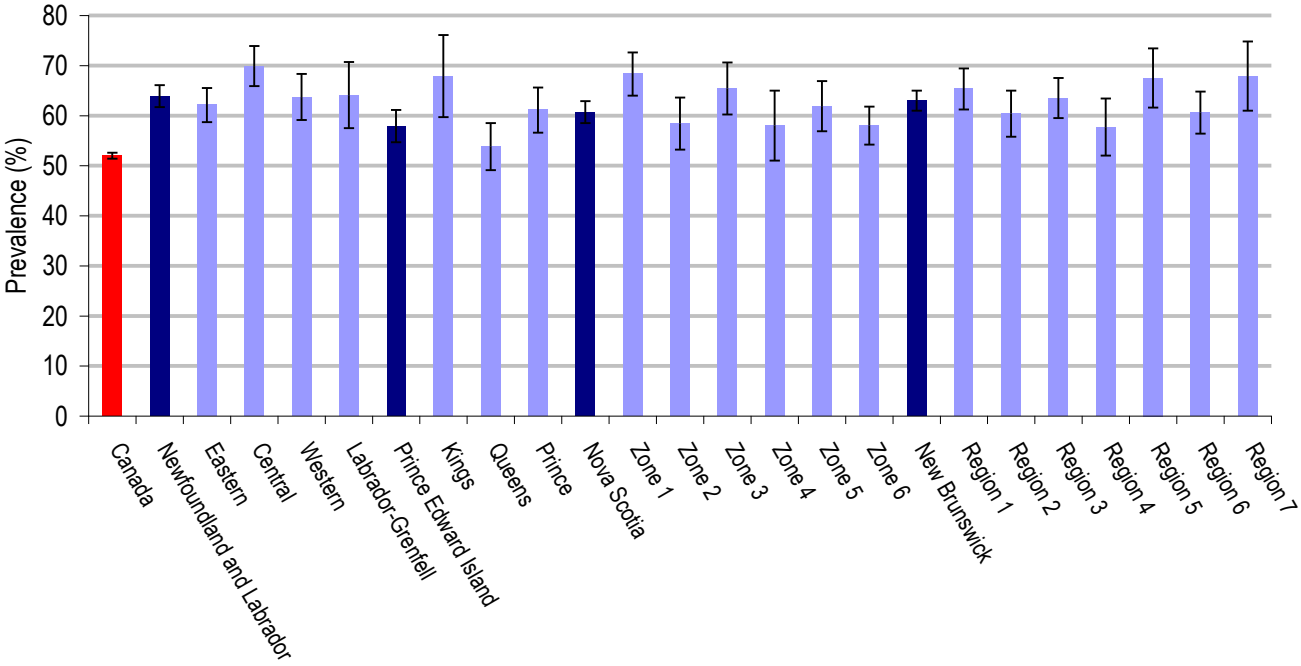
Figure 4. Prevalence of self-reported overweight or obesity among those aged 18 years and older by sex in Canada and the Atlantic Provinces, 2009-2010



	Canada	NL	PEI	NS	NB
Females	43.8	55.7	48.2	54.3	59.4
Males	60	72.4	67.8	67.4	66.8

* significantly greater than Canada based on confidence intervals (not shown)
\+ significant difference between males and females based on confidence intervals (not shown)
Source: Canadian Community Health Survey, 2009-2010

Figure 5. Prevalence of self-reported overweight or obesity among those aged 18 years and older in Canada, the Atlantic Provinces and Health Regions[a], 2009-2010

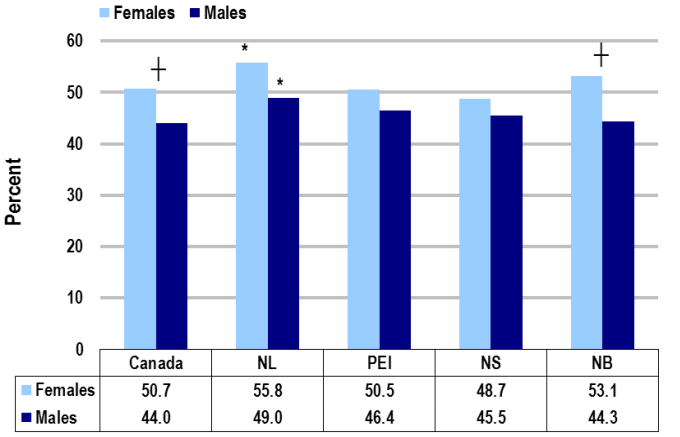


Bars represent the 95% confidence interval
Source: Canadian Community Health Survey, 2009-2010, Self-reported data

Risk factor # 2: Physical Activity

Physical inactivity can increase the risk of type 2 diabetes. In all four Atlantic provinces, a higher percentage of women than men report being physically inactive during their free time (Figure 6). The gap is widest in NB, where the difference between the percentage of women and men reporting inactivity is greater than 10%. People in NL report the highest rates of inactivity in the Atlantic Region.

Figure 6. Percentage of individuals aged 12 years and older in Canada and the Atlantic Provinces who reported being inactive during their leisure time, 2009-2010

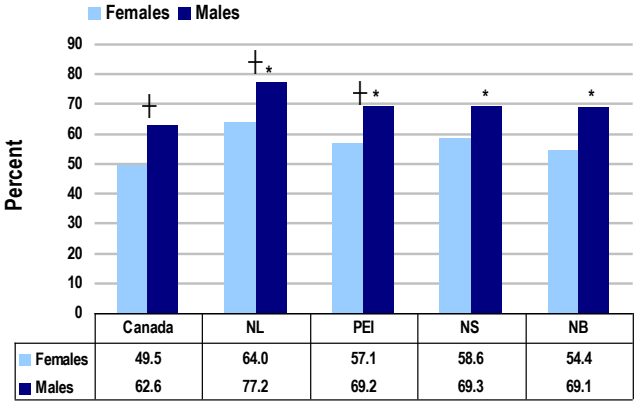


* significantly greater than Canada based on confidence intervals (not shown)
\+ significant difference between males and females based on confidence intervals (not show
Source: Canadian Community Health Survey, 2009-2010

Risk factor # 3: Diet

An unhealthy diet can contribute to the development of type 2 diabetes. Compared with men in other parts of Canada, a greater percentage of men in all four Atlantic Provinces report eating less than the recommended five daily servings of fruits and vegetables (Figure 7). A greater percentage of men than women report eating less than the recommended daily servings in each of the Atlantic Provinces. The gap between men and women is widest in NB (almost 15%).

Figure 7. Percentage of individuals aged 12 years and older in Canada and the Atlantic Provinces who reported consuming less than the recommended five servings of fruits and vegetables per day, 2009-2010



* significantly greater than Canada based on confidence intervals (not shown)
\+ significant difference between males and females based on confidence intervals (not shown)
Source: Canadian Community Health Survey, 2009-2010

Did you know?

- A greater percentage of men than women report being overweight or obese in each of the Atlantic Provinces.
- Women are much more likely to report being physically inactive than men in the Atlantic Provinces.
- A lower percentage of men in the Atlantic Provinces report eating the daily recommended servings of fruits and vegetables than do women.

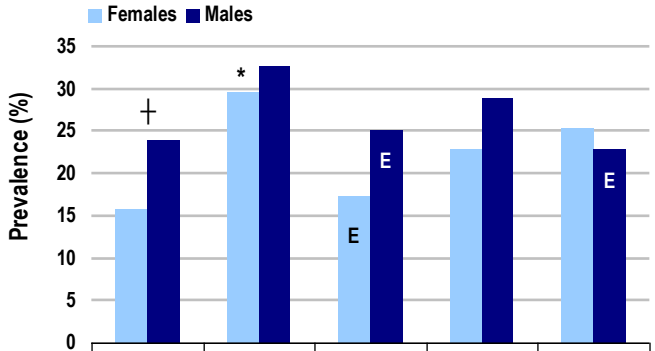
Children and Youth Are At Risk

Type 2 diabetes used to be thought of as a disease that only occurred in older adults. However, the rate of type 2 diabetes may be increasing in children and youth.[3] A recent report from the National Diabetes Surveillance System (NDSS) predicts that by 2012, almost 28,000 children and adolescents in Canada will be living with type 1 or 2 diabetes – an overall increase of about 10% from 2007.[1]

Obesity rates also appear to be increasing among children and youth[4]. This is a known risk factor for diabetes. Rates of self-reported overweight or obesity in youth are generally higher in boys than in girls (Figure 8)[a, b]. However, girls aged 12-17 in NL have double the Canadian rate of self-reported overweight and obesity in this age group, and are more likely to be overweight or obese than girls in the other Atlantic Provinces.

A healthy diet and increased physical activity reduces the risk of type 2 diabetes. Male youth aged 12-19 in NL, NS and PEI are less likely to report eating the recommended five daily servings of fruits and vegetables than youth in the rest of Canada (Figure 9).

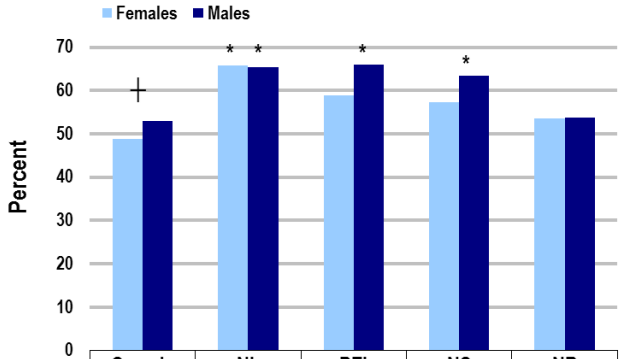
Figure 8. Prevalence of self-reported overweight or obesity among youth aged 12 to 17 years, 2009-2010



	Canada	NL	PEI	NS	NB
Females	15.7	29.7	17.3	22.9	25.4
Males	23.9	32.7	25	28.8	22.9

* significantly greater than Canada based on confidence intervals (not shown)
\+ significant difference between males and females based on confidence intervals (not shown)
E: Interpret with caution, estimates are less precise because of the sampling methods used
Source: Canadian Community Health Survey, 2009-2010

Figure 9. Percentage of youth aged 12-19 years consuming less than five servings of fruits and vegetables per day, self-reported, 2009-2010



	Canada	NL	PEI	NS	NB
Females	48.8	65.9	59.0	57.3	53.6
Males	53.1	65.4	66.0	63.4	53.8

* significantly greater than Canada based on confidence intervals (not shown)
\+ significant difference between males and females based on confidence intervals (not shown)
Source: Canadian Community Health Survey, 2009-2010

Did you know?

- Youth aged 12-19 in NL are much more likely to report being overweight or obese when compared with youth in the other three Atlantic Provinces.
- Teenage girls aged 12-19 in NL report double the Canadian rate of overweight and obesity for this age group.
- Male youth aged 12-19 in NL, NS and PEI are less likely to report eating the recommended five daily servings of fruit and vegetables than youth in the rest of Canada.

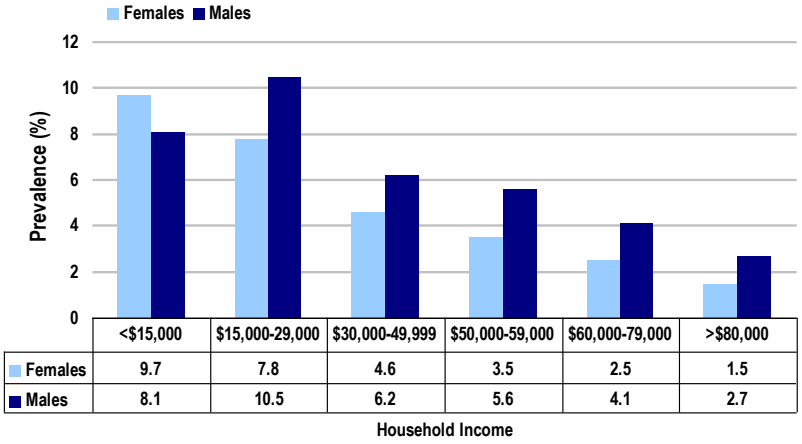
Diabetes Prevalence is Tied to Income and Education

There appears to be a connection between type 2 diabetes and socioeconomic status. Results from an analysis of the 2005 Canadian Community Health Survey (CCHS) found that type 2 diabetes rates are **four times higher** in low-income groups than in higher income groups (Figure 10). [5] Diabetes rates were reported to be higher in men in all income groups except for the lowest income group, possibly reflecting a disproportionate number of women who are low-income earners.

The relationship between income and education, and the risk factors for diabetes is likely more complex. Data from a recent report suggests that the number of new cases of type 2 diabetes is greatest for men with the highest income, while the opposite trend is true for women. Women in low-income groups have both the highest number of new cases and the greatest risk.[2]

According to a recent survey by the Canadian Fitness and Lifestyle Research Institute, the income and education level of parents can influence child participation in sport (Figure 11). Lack of physical activity may put children at risk for developing type 2 diabetes later in life.

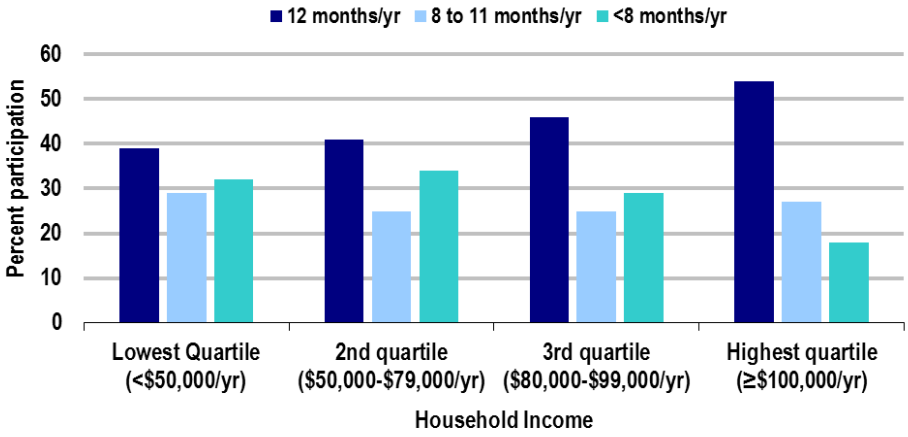
Figure 10. Prevalence of type 2 diabetes by income group and sex, 2005



	<$15,000	$15,000-29,000	$30,000-49,999	$50,000-59,000	$60,000-79,000	>$80,000
Females	9.7	7.8	4.6	3.5	2.5	1.5
Males	8.1	10.5	6.2	5.6	4.1	2.7

Adapted from: S. Dinca-Panaitescu et al. / Health Policy 99 (2011) 116–123
Source: Canadian Community Health Survey, 2005

Figure 11. Duration of child participation in sport by household income, 2010



Sport is defined as physical activities that involve competition and rules, and that develop specific skills.
Source: Physical Activity Monitor, CFLRI, 2010

Populations Most At Risk

Recent studies show that certain populations in Canada, such as Aboriginal peoples, South Asians, Chinese, African-Canadians and some new immigrant populations, have a higher risk of developing type 2 diabetes.[2, 6] One study found that current Body Mass Index (BMI) cut-off points may not apply to these groups.[6] South Asian, Chinese and African-Canadians may develop diabetes at a higher rate, at an earlier age and at **lower BMI ranges** than other populations (Figure 12).

These findings are important given recent population changes in the Atlantic Provinces, especially due to immigration. In a three year-period (2006-2009) the number of registered immigrants to PEI doubled, from 857 to 1517. Most of them arrived from China (78% in 2009-2010).[7] In NB, the largest group of newcomers in 2006 was from the Middle East and Asia (38%).[8]

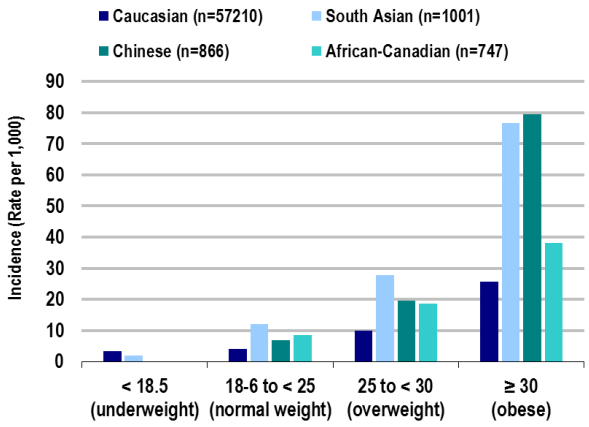
China was in the top three source countries of immigrants to NS from 2005-2009.[9] These newcomer populations may face a greater burden of diabetes if not reached early on.

Aboriginal Identity

Estimates of the rate of diabetes in Aboriginal populations can be three times higher for men and **five times higher for women** compared to the Canadian population as a whole.[10] In 2002-2003, 20% of First Nations adults living on-reserve reported being diagnosed with diabetes. From the age of 18, the rate of diabetes doubled each decade to a high of nearly one in three adults 50 years and older (Figure 13). More First Nations women than men reported a diagnosis of diabetes. This is the opposite of the overall Canadian rates for women and men. First Nations and Métis adults living off-reserve are also likely to have higher rates of diabetes when compared with non-Aboriginal populations.[11]

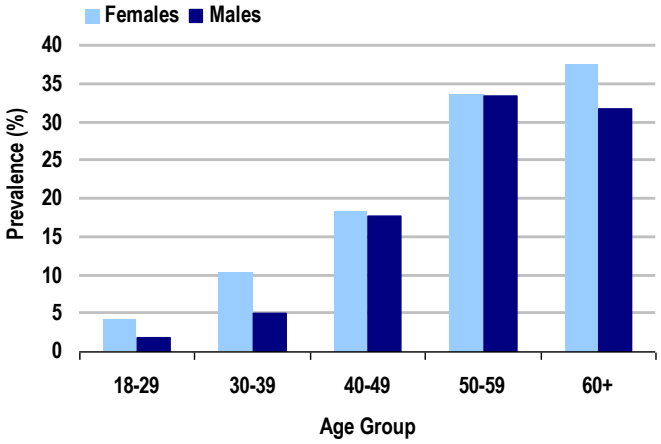
Aboriginal peoples in Atlantic Canada make up an important part of the population (Table 1). Even though the information about this population is limited, it is likely that Aboriginal peoples in Atlantic Canada are more affected by diabetes overall.

Figure 12. Diabetes incidence rates (per 1000) for subjects (Ontario residents) aged ≥ 30 years by BMI category



Source: Selected Data from Chiu et al. Diabetes Care. 2011 Aug;34(8):1741-8 Data were derived from the Ontario components of Statistics Canada's National Population Health Survey and Canadian Community Health Survey,

Figure 13. Percentage of self-reported diabetes among First Nations adults living on-reserve by selected age group and sex, Canada, 2002-03



Source: Information Governance Committee, First Nations. First Nations Regional Longitudinal Health Survey, Selected Results from RHS Phase 1

Table 1. Number of self-identified Aboriginals living in the Atlantic Provinces, 2006

Province	Total	Male	Female
Newfoundland and Labrador	23,450	11,520	11,925
Prince Edward Island	1,730	760	970
Nova Scotia	24,175	11,770	12,405
New Brunswick	17,655	8,645	9,005

Source: Statistics Canada, 2006 Census of Population

African-Canadian Identity

African-Canadians (or Blacks as referred to in Statistics Canada census data) are an important minority population in the Atlantic Region (Table 2), particularly in NS. In the Halifax Regional Municipality, African-Nova Scotians represent 3.6% of the population, or almost half (48%) of the visible minority inhabitants in the municipality.

Table 2. Number of self-identified Blacks living in the Atlantic Provinces, 2006

Province	Total	Male	Female
Newfoundland and Labrador	900	500	400
Prince Edward Island	645	315	325
Nova Scotia	19,225	9,150	10,080
New Brunswick	4,455	2,290	2,160

Source: Statistics Canada, 2006 Census of Population

Although national data suggest that African-Canadians may be at a greater risk for diabetes, information about how diabetes affects African-Canadians in the Atlantic Region is limited. One 2008 study found that the rate of newly diagnosed cases (incidence) in the primarily African-Nova Scotian community of Preston was roughly 40% higher than similar communities with predominantly Caucasian populations.[12]

It is, therefore, possible that African-Canadians in the Atlantic Region are more affected by diabetes than the majority of the population.

Diabetes is Associated with Other Health Problems

Diabetes is tied to many serious health problems that affect a person's well-being and quality of life. People with diabetes are two to four times more likely to have a heart attack, stroke, heart failure or heart disease, seven times more likely to have kidney disease and almost 19 times more likely to have a lower limb amputation compared with people without diabetes.[1] Mortality rates for people with diabetes over the age of 20 are twice as high as those for people without diabetes in the same age group.

Did you know?

- Certain populations in Canada, such as Aboriginal peoples, South Asians, Chinese, African-Canadians and some new immigrant populations appear to be at a higher risk of developing diabetes.
- BMI cut-off points that place individuals in a high-risk category for diabetes may be too low for populations other than Caucasian.
- One in three Aboriginal people living on-reserve report having diabetes by the age of 50.

What does this mean?

The face of diabetes is changing in Atlantic Canada. More people are being diagnosed before they reach middle age, or sooner. There are clear signs that the general population is headed in the wrong direction when it comes to diet, weight and physical activity, three important risk factors for type 2 diabetes. No one is immune to the disease; however, some groups of people are more affected than others. This document profiles the distribution of prevalence and risk factors across population groups, with a view to improving knowledge of the burden of the disease in the four Atlantic Provinces.

Data Sources:

Aggregate data from the **National Diabetes Surveillance System (NDSS)** (Public Health Agency of Canada, 2006-2007) was used to report on the prevalence of diabetes in Canada and the Atlantic Provinces. Sources for this data include physician claims, administrative hospital records and insurance coverage files. This data set includes both type 1 and type 2 diabetes, but excludes gestational diabetes. The minimum requirement was at least one hospitalization or two physician claims, with a diabetes specific billing code(s), over a two-year period.

Data from the **Canadian Community Health Survey (CCHS)** (Statistics Canada, 2009-2010) was used to report on risk factors for adults and youth. This data is self-reported using a survey. The target population of the CCHS is all Canadians aged 12 and over. Excluded from the sampling frame are individuals living on Indian Reserves and on Crown Lands, institutional residents, full-time members of the Canadian Forces, and residents of certain remote regions. This data set includes type 1, type 2 and gestational diabetes.

Notes:

[a] A map of Canada's health regions can be found on the Statistics Canada website at the following link: http://www.statcan.gc.ca/pub/82-583-x/2011001/article/11587-eng.pdf.

[b] BMI is calculated as follows: weight in kilograms divided by height in metres^2. According to the World Health Organization (WHO) and Health Canada guidelines, the index for body weight classification is: less than 18.50 (underweight); 18.50 to 24.99 (normal weight); 25.00 to 29.99 (overweight); 30.00 to 34.99 (obese, class I); 35.00 to 39.99 (obese, class II); 40.00 or greater (obese, class III).

[c] These statistics are based on self-reported weight and height. Research has demonstrated that in general, self-reported height is overestimated and self-reported weight is underestimated compared to measured height and weight. (S. Connor Gorber, M. Tremblay, D. Moher and B. Gorber, *A comparison of direct vs. self-reported measures for assessing height, weight and body mass index: a systematic review,* Obesity Review 2007 8(4); 307-326) .

References:

[1] Diabetes in Canada: A report from the National Diabetes Surveillance System, 2009.

[2] Manuel DG, Rosella LCA, Tuna M, Bennett C. *How many Canadians will be diagnosed with diabetes between 2007 and 2017? Assessing population risk*. ICES Investigative Report. Toronto: Institute for Clinical Evaluative Sciences, 2010.

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[4] *Obesity in Canada*, Public Health Agency of Canada/ Canadian Institute for Health Information, 2011.

[5] Dinca-Panaitescu S, Dinca-Panaitescu M, Bryant T, Daiski I, Pilkington B,Raphael D. *Diabetes prevalence and income: Results of the Canadian Community Health Survey.* Health Policy. 2011 Feb;99(2):116-23.

[6] Chiu M, Austin PC, Manuel DG, Shah BR and Tu JV. *Deriving ethnic-specific BMI cutoff points for assessing diabetes risk*. Diabetes Care. 2011 Aug;34(8):1741-8.

[7] PEI Association for Newcomers to Canada, Annual Report, 2009/2010.

[8] Census Data, 2006, Statistics Canada.

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[10] Young KT, Reading J, Elias B and O'Neil J. *Type 2 diabetes mellitus in Canada's First Nations: status of an epidemic in progress, CMAJ 2000 163(5); 561-6.*

[11] Garner R, Carrière G, Sanmartin C and The Longitudinal Health and Administrative Data Research Team. *The Health of Inuit, Métis and First Nations Adults Living Off-Reserve in Canada: The Impact of Socio-economic Status on Inequalities in Health*. Health Research Working Paper Series, Statistics Canada (82-622-X, Number 4).

[12] Kisely S, Terashima M, Langille D. *A population-based analysis of the health experience of African Nova Scotians*. CMAJ. 2008 September 23;179(7):653-8.