New Nouveau Brunswick
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Diabetes in New Brunswick

1998 - 2007

Office of the Chief Medical Officer of Health

November 2010

New Nouveau Brunswick

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MESSAGE FROM THE CHIEF MEDICAL OFFICER OF HEALTH

Reflecting on information contained in *Diabetes in New Brunswick: 1998 – 2007*, I am reminded of the river parable that is often quoted by Public Health professionals because of its “upstream” message. The parable follows: Imagine a large, raging river with a high waterfall that flows through a peaceful village. At the bottom of this waterfall a few villagers are working frantically trying to save those who have fallen into the river and have fallen down the waterfall, many of them drowning. The villagers organize themselves quickly, setting up watchtowers and training teams of swimmers who could resist the swift waters and rescue people. Each day the number of people floating down the river and over the waterfall increased. One day, a rescuer looks up and sees a seemingly never-ending stream of people falling down the waterfall and begins to run upstream. One of other rescuers hollers "where are you going? There are so many people that need help here." To which the man replied, "I'm going upstream to find out why so many people are falling into the river.

If we equate the findings of this diabetes report to the parable, there can be no doubt that a number of New Brunswickers have fallen into the proverbial river; having been diagnosed with diabetes. Diabetes surveillance initiatives can be equated to the watch towers in the story. New Brunswick health care providers, hospitals, community agencies, and family members are the many expert rescuers; pulling people from the river, treating and caring for them.

But what of the person who heads upstream to learn why people are falling into the river and finding solutions to prevent them from falling in? Much work has been done nationally and internationally to learn what puts people at risk for diabetes. The literature clearly identifies factors known to increase a person’s risk of acquiring diabetes. Some of these risk factors include obesity, physical inactivity, and smoking. How can we mitigate these risks? I suggest that each of us has a role to play in heading upstream; whether we have opportunities to influence public policy or a personal need to examine our own health behaviours. Specifically, I believe we need to do a better job at ensuring all New Brunswickers have access to and choose to eat a healthy, balanced diet, we need to increase our physical activity levels, and we need to continue working with our young people to ensure they choose not to begin using tobacco. As such, I encourage and challenge you to reflect on how you might influence healthy public policy aimed at reducing the burden of diabetes in our province. Whether it is by modifying your own health behaviours or becoming involved within your community or government departments in the establishment of healthy public policy.

MESSAGE FROM THE CHIEF MEDICAL OFFICER OF HEALTH

In closing, I would like to express my sincere gratitude to all those involved in producing this report. In particular, I would like to acknowledge BaoGang Fei, Biostatistician; Maurice Collette, Scientific Research Officer; Wilfred Pilgrim, Scientific Research Officer; and Kimberley Blinco, Senior Program Advisor. They have done an exceptional job at pulling this report together. Thank you.

Regards,

Dr. Eilish Cleary

Chief Medical Officer of Health

EXECUTIVE SUMMARY

Diabetes has become one of the major causes of premature illness and death in Canada, mainly through the increased risk of cardiovascular disease. Every hour, more than 20 Canadians are diagnosed with diabetes and the projected increase in prevalence has significant clinical, economic and humanistic consequences.[1]

According to a 2005 diabetes report[5] published by the Canadian Diabetes Association, the rate of undiagnosed diabetes could be as high as 30%. As the prevalence and severity of diabetes increase with age, the aging of the population will likely increase the economic burden of the consequences of diabetes to our province and its residents.

Individuals with diabetes generally have a much higher disease burden than those without diabetes, resulting in their relatively greater use of health care services[3], which adds increased pressure on an already constrained health care system. Hospital costs represent about 50% of total costs of managing individuals with diabetes.[4] By 2016, the estimated costs of health care for New Brunswickers living with diabetes will be $198 million per year, a 66.4% increase from 2000.[2]

Type 2 diabetes has been associated with an aging population, a dramatic rise in the prevalence of obesity and a more sedentary lifestyle.[6,7] The number of overweight/ obese New Brunswickers is on the rise and occurs at a younger age. In parallel, the number of individuals who are physically inactive is growing.

Action is thus required to reduce the burden of diabetes on our health care system while improving the individual health of people living with the disease.

This report presents descriptive statistics on diabetes in New Brunswick, aimed primarily at decision-makers and health care professionals working in the areas of diabetes prevention and control. It does not attempt to explain the findings or try to reach conclusions that extend beyond the immediate data alone.

The report covers the period 1998-99 to 2007-08 and includes information about diabetes prevalence, incidence, mortality and health care use, as well as about gestational diabetes and co-morbidities of diabetes.

The key limitations of this report were: 1) the Canadian Chronic Disease Surveillance System (CCDSS) was unable to differentiate between type 1 and type 2 diabetes

because the health insurance claims database does not make distinction between different types of diabetes; 2) risk factors for diabetes such as obesity and physical inactivity were not captured in the administrative databases and therefore could not be used to try and explain some of the findings; and 3) data were for New Brunswickers with Medicare insurance and could not be broken down according to ethnic groups such as the First Nations considered at higher risk of developing diabetes.

QUICK FACTS

The following are the key findings of the report. Unless indicated, results are for fiscal years 2003-04 to 2007-08.

POPULATION STATISTICS OF DIABETES

- In 2007-08, 1 in 13 New Brunswickers was living with diagnosed diabetes and it is predicted that by 2012-13 it will be 1 in 10.
- The age-standardized prevalence rate of diagnosed diabetes in New Brunswick was statistically higher than the Canadian average.
- 68% of New Brunswickers with diagnosed diabetes were 50 to 79 years of age.
- The five-year age-specific prevalence rate of diagnosed diabetes was statistically higher than for the previous five years in the 1-19 to 85+ year age groups.
- The age-standardized prevalence rates of diagnosed diabetes were statistically higher in health regions 2 (Saint John area), 5 (Campbellton area) and 7 (Miramichi area) and statistically lower in health regions 1 (Moncton area) and 4 (Edmundston area) than the provincial rate.
- Prevalence and incidence rates of diagnosed diabetes were statistically higher in males than females in the older age groups.
- On average, 4,887 new cases of diabetes were diagnosed in the province each year and 2/3 of these cases were 45 to 74 years old.
- The age-standardized incidence rates of diagnosed diabetes in health regions 5, 6 (Bathurst/Acadian Peninsula area) and 7 were statistically higher than the provincial average.
- The age-standardized mortality rate in adults with diagnosed diabetes was twice that of those without the disease.

HEALTH CARE UTILIZATION

- About 1 in 4 visits to a family physician by individuals 65 years and older involved someone with diabetes.
- The rate of visits to family physicians was 1.7 times higher in individuals with diabetes than those without the disease.
- About 3 in 10 visits to specialists by individuals 60 to 84 years old involved someone with diabetes.
- The rate of visits to specialists was 2.4 times higher in individuals with diabetes than those without the disease.
- Individuals with diabetes were 3.3 times more likely to be hospitalized and stayed in hospital about 3.4 times longer than those without the disease.
- Diabetics accounted for about 27% of total hospital care days.

CO-MORBIDITIES OF DIABETES

Percentage of hospitalizations with selected co-morbidities of diabetes that involved someone with diagnosed diabetes:

- Cardiovascular disease - 33.8%
- Chronic kidney disease - 52.2%
- Lower limb amputation - 64.2%

Compared to the general population, individuals with diagnosed diabetes were about:

- 3 times more likely to be hospitalized with cardiovascular disease.
- 7 times more likely to be hospitalized with chronic kidney disease.
- 15 times more likely to be hospitalized with lower limb amputations.

GESTATIONAL DIABETES

- Gestational diabetes occurred in 3.6% to 4.2% of pregnancies.
- The age-standardized incidence rate of type 2 diabetes in females who were previously diagnosed with gestational diabetes (12.4 cases per 1,000 population) was statistically higher than females in the general population (5.4 cases per 1,000 population).

- About 1 in 9 females between 20 and 39 years old when first diagnosed with gestational diabetes developed type 2 diabetes within five years and 1 in 5 developed diabetes within nine years.

DIABETES IN CHILDREN AND ADOLESCENTS

- In 2007-08, about 620 New Brunswick children and adolescents were living with diagnosed diabetes, a 12% increase from 2002-03.
- The prevalence of diagnosed diabetes in New Brunswick's children and adolescents was on the rise.
- On average, 78 new cases of diabetes were diagnosed each year among New Brunswickers aged 1 to 19 years.

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INTRODUCTION

Diabetes has become one of the major causes of premature illness and death in Canada, mainly through the increased risk of cardiovascular disease. Every hour, more than 20 Canadians are diagnosed with diabetes and the projected increase in prevalence of this disease has significant clinical, economic and humanistic consequences.[1]

The proportion of the total Canadian population with diabetes is expected to increase to 7.3% in 2010 (4.2% in 2000) and then to 9.9% by 2020. If the current trends continue, both the number of individuals with diabetes and the health care costs in Canada will increase by more than 70% from year 2000 to 2016. The costs will increase most in the 55 to 69 and 80+ year age groups where the greatest increase in the number of individuals with diabetes will occur.[2]

The Canadian Diabetes Cost Model shows that the economic burden of diabetes in Canada is expected to be approximately $12.2 billion in 2010 (an increase of $5.9 billion from 2000), and the cost of the disease is expected to rise by another $4.7 billion by 2020.[1] This represents an increase of more than $10 billion from 2000, and the number of Canadians diagnosed with diabetes will have nearly tripled during this 20-year period.

Individuals with diabetes generally have a much higher disease burden than those without diabetes, resulting in their relatively greater use of health care services[3], which adds increased pressure on an already constrained health care system.

Hospital costs represent about 50% of total costs of managing individuals with diabetes.[4] By 2016, the estimated costs of health care for New Brunswickers living with diabetes will be $198 million per year, a 66.4% increase from 2000.[2]

According to a 2005 diabetes report[5] published by the Canadian Diabetes Association, the rate of undiagnosed diabetes could be as high as 30%. As the prevalence and severity of diabetes increase with age, the aging of the population will likely increase the economic burden of the consequences of diabetes to our province and its residents.

Type 2 diabetes has been associated with an aging population, a dramatic rise in the prevalence of obesity, and a more sedentary lifestyle.[6,7] The number of overweight/ obese New Brunswickers is on the rise and occurs at a younger age. In parallel, the

number of individuals who are physically inactive is growing. Action is thus required in this province to reduce the burden of diabetes on our health care system while improving the individual health of people living with the disease.

This report presents descriptive statistics on diabetes in New Brunswick, aimed primarily at decision-makers and health care professionals working in the areas of diabetes prevention and control. It does not attempt to explain the findings or try to reach conclusions that extend beyond the immediate data alone.

The report covers the period 1998-99 to 2007-08 and includes information on diabetes prevalence, incidence, mortality and health care utilization, as well as on gestational diabetes and co-morbidities of diabetes.

SECTION 1. METHODS

BACKGROUND

Formerly known as the National Diabetes Surveillance System (NDSS), the Canadian Chronic Disease Surveillance System (CCDSS) is a collaborative network of provincial and territorial chronic disease surveillance systems that was developed (and is supported) by the Public Health Agency of Canada (PHAC) in partnership with provincial and territorial departments of health, non-government organizations, clinicians and researchers. The CCDSS uses administrative databases to provide a passive surveillance of chronic diseases. Data are processed at the provincial/territorial level and submitted to the PHAC as aggregate data for national comparisons and further study. Currently, diabetes and hypertension are included in the CCDSS, and more chronic diseases will be added to the system in the future. CCDSS v2010 was used in this report to analyze the data.

SECTION 1. METHODS

1.1 Data sources

This report uses the following data sources:

Medicare resident registry: It contains demographic information on all New Brunswickers registered with Medicare. The fields used for the CCDSS included Medicare number, date of birth, date of death, sex and health region of residence.

Health insurance claims database: From this database, CCDSS uses the text field that captures reason of visit, diagnoses and/or services reported by physicians, as well as the fields containing Medicare numbers and physician specialties.

Hospital discharge abstract database: The hospital discharge abstract database (DAD) collects information on acute care, day surgery, chronic care and rehabilitation from medical facilities.[8] The CCDSS used the following fields: Medicare number, hospital admission and discharge dates, hospital procedures/ interventions and diagnoses. For fiscal years 1995-96 to 2002-03, ICD-9-CM[9] was used for both procedure and diagnosis fields. For the period 2003-04 to 2007-08, ICD-10-CA[10,11] was used for the diagnosis fields and CCI (Canadian Classification of Health Interventions), a companion classification system to ICD-10-CA, was used for the procedure/intervention fields.

Vital statistics database: Birth events are registered as vital events in the vital statistics database and include live births and stillbirths that occurred among female New Brunswickers.

The first three administrative databases are maintained by the New Brunswick Department of Health and were linked using encrypted Medicare numbers. Demographic information for residents aged one year and older was extracted from the Medicare resident registry for the calculation of rates and other statistics. Diabetes records were extracted from the health insurance claims database and the acute care data in the DAD. Hospitalization rates for co-morbidities of diabetes were calculated using the acute care data in the DAD.

To obtain the number of pregnancies, data on birth events were extracted from the vital statistics database maintained by Service New Brunswick.

SECTION 1. METHODS

This report presents information on diabetes and co-morbidities of diabetes for fiscal years 1998-99 to 2007-08. The reader is to exercise caution when comparing results with the previous report[12] for the following reasons:

- The ICD codes recorded in the DAD switched from ICD-9-CM to ICD-10-CA in 2003-04.
- Before 2003-04, hospitalizations and hospital care days were not differentiated according to health care levels (acute care, chronic care, rehabilitation, etc.). Results in this report are for acute care only.
- The case definition for diabetes differs from the first report in that a) it includes the population aged 1 to19 years and b) the date of diagnosis used in the CCDSS for the non-hospitalized diabetes cases is the most recent date of diagnosis of the first two diagnoses made within a two-year period.
- Age-standardized rates were used in this report instead of crude rates to calculate rate ratios.

1.2 Case definitions

1.2.1 Diabetes*: In the CCDSS, a person at least one year old with a valid Medicare number was defined as a diabetes case (based on diagnosis information captured in the DAD and/or in the health insurance claims database):

- if there was a single hospitalization with an ICD-9-CM code of 250 or an ICD-10-CA code of E10, E11, E13 or E14 in one of the diagnosis fields. The hospital admission date was considered the (diabetes) case date.

or

- if there were two or more health insurance claims from physicians within a two-year period in which diabetes was recorded as one of the diagnoses. The most recent date with a diagnosis of diabetes was considered the case date.

1.2.2 Gestational diabetes mellitus: A gestational diabetes mellitus (GDM) case was defined as a) a person with diabetes as defined above (Section 1.2.1) with a diagnosis date within 120 days preceding or 90 days following a pregnancy related hospital admission or b) a GDM case that was identified in the DAD or the health insurance claims database.

**Excludes GDM.*

1.3 Data preparation

The diagnosis fields in the health insurance claims database were in descriptive text. The CCDSS required data to be in either ICD-9-CM or ICD-10-CA codes. To achieve this, a set of keywords and abbreviations in both French and English were used to identify records with a diagnosis of diabetes. SAS® (Statistical Analysis Software) was used to complete this task.

1.4 Data processing

The CCDSS software (Version v2010) runs on SAS which was also supplied by the PHAC and customized for New Brunswick. Data for fiscal years 1995-96 to 2007-08 were fed into the software to calculate diabetes prevalence, incidence and mortality rates, as well as hospital separations, hospital care days, physician visits and the number of individuals hospitalized with co-morbidities of diabetes.

1.5 Definitions for calculations

1.5.1 Prevalence rate: The proportion of the population with the disease during a specific period of time.

$$\text{Prevalence rate (per 1,000 population)} = \frac{\text{Total number of diagnosed cases in specified fiscal year (prevalent cases)}}{\text{Total number of individuals with Medicare insurance during that fiscal year}} \times 1{,}000$$

The five-year prevalence rate per 1,000 population was the sum of prevalent cases in individual fiscal years divided by the sum of the population in individual fiscal years, then multiplied by 1,000.

$$\text{5-year prevalence rate (per 1,000 population)} = \frac{Prev1 + Prev2 + Prev3 + Prev4 + Prev5}{Pop1 + Pop2 + Pop3 + Pop4 + Pop5} \times 1{,}000$$

1.5.2 Incidence rate: The proportion of the population newly diagnosed with the disease during a specific period of time. In this report, the incidence rate per 1,000 population refers to the total number of newly diagnosed cases in a specified fiscal year divided by the total population at risk during that year, then multiplied by 1,000.

$$\text{Incidence rate (per 1,000 population)} = \frac{\text{Total number of newly diagnosed cases (incident cases) in specified fiscal year}}{\text{Total population with Medicare insurance - (prevalent cases - incident cases) in specified fiscal year}} \times 1{,}000$$

The five-year incidence rate per 1,000 population refers to the sum of incident cases over the five-year period divided by the sum of population at risk in individual fiscal year, then multiplied by 1,000.

$$\text{5-year incidence rate (per 1,000 population)} = \frac{\text{Total number of incident cases over the 5-year period}}{\text{(Pop1 + Pop2 + Pop3 + Pop4 + Pop5) at risk}} \times 1{,}000$$

1.5.3 Mortality rate: The mortality rate of individuals with (or without) diabetes refers to the total number of individuals with (or without) diagnosed diabetes that died (from all causes) per 1,000 population with (or without) diabetes during a specified fiscal year.

$$\text{Mortality rate (per 1,000 population)} = \frac{\text{Total number of deaths from all causes among Individuals with (or without) diabetes in specified fiscal year}}{\text{Total number of individuals with (or without) diabetes in specified fiscal year}} \times 1{,}000$$

The five-year mortality rate for individuals with (or without) diagnosed diabetes refers to the total number of deaths from all causes among individuals with (or without) diabetes over the five-year period divided by the sum of prevalent cases (or individuals without diabetes) in each fiscal year, then multiplied by 1,000.

$$\text{5-year mortality rate (per 1,000 population)} = \frac{\text{Total number of deaths among prevalent cases (or individuals without diabetes) over the 5-year period}}{\text{Prev1 + Prev2 + Prev3 + Prev4 + Prev5 (or Pop1 + Pop2 + Pop3 + Pop4 + Pop5 without diabetes)}} \times 1{,}000$$

The mortality rate ratio for diabetes refers to the mortality rate from all causes in individuals with diabetes during a specified period of time divided by the mortality rate from all causes in individuals without diabetes during the same period of time.

$$\text{Mortality rate ratio} = \frac{\text{Mortality rate for individuals with diabetes}}{\text{Mortality rate for individuals without diabetes}}$$

1.5.4 Life expectancy: The remaining number of years an individual is expected to live at a given age as determined by mortality rates. In this report, life expectancy was used to compare the years of life remaining for populations with and without diabetes. The CCDSS uses the Chiang[13] method to generate period life tables for populations with and without diabetes.

1.5.5 Hospital separation rate: In this report, the hospital separation rate for individuals with (or without) diabetes refers to the total number of times inpatients leave the hospital as a result of being discharged, transferred to another facility or deceased during a fiscal year divided by the total number of individuals with (or without) diabetes during the specified fiscal year, then multiplied by 1,000.

$$\text{Hospital separation rate (per 1,000 population)} = \frac{\text{Total number of hospital separations among individuals with (or without) diabetes during specified fiscal year}}{\text{Total number of individuals with (or without) diabetes during specified fiscal year}} \times 1{,}000$$

The proportion of individuals hospitalized with co-morbidities of diabetes was calculated as follows:

$$\text{Proportion of individuals with (or without) diabetes hospitalized with selected co-morbidity of diabetes (per 1,000 population)} = \frac{\text{Total number of individuals with (or without) diabetes hospitalized with selected co-morbidity of diabetes with at least one hospital separation in specified fiscal year}}{\text{Total number of individuals with (or without) diabetes in specified fiscal year}} \times 1{,}000$$

All available diagnosis and procedure fields were used to search the database for hospital separations with co-morbidities of diabetes. When more than one co-morbidity was recorded in one of the major cardiovascular disease categories (e.g., ischemic heart disease, hypertensive disease and cerebrovascular disease), the case was counted only once under the broader “cardiovascular disease” category. Similarly, myocardial infarction was only counted once under the broader “ischemic heart disease” category.

The five-year average proportion of individuals hospitalized with a co-morbidity of diabetes was calculated as follows:

$$\text{5-year average proportion of individuals hospitalized with a co-morbidity of diabetes (per 1,000 population)} = \frac{\text{Sum of individuals with (or without) diabetes in each fiscal year hospitalized with diagnosis of selected co-morbidity of diabetes with at least one hospital separation}}{\text{Sum of individuals with (or without) diabetes in each fiscal year}} \times 1{,}000$$

The ratio of proportions of individuals hospitalized with a co-morbidity of diabetes was calculated as follows:

$$\text{Ratio of proportions of individuals with and without diabetes hospitalized with co-morbidity of diabetes} = \frac{\text{Proportion of individuals with diabetes hospitalized with selected co-morbidity of diabetes}}{\text{Proportion of individuals without diabetes hospitalized with selected co-morbidity of diabetes}}$$

1.5.6 Use of health care services: The use of health care services was measured by looking at the total number of visits to family physicians and specialists, as well as the total number of hospital care days.

The rate of visits to family physicians (or specialists) by individuals with (or without) diabetes was calculated as follows:

$$\text{Rate of visits to family physicians or specialists (per 1,000 population)} = \frac{\text{Total number of visits to family physicians (or specialists) by individuals with (or without) diabetes in specified fiscal year}}{\text{Total number of individuals with (or without) diabetes in specified fiscal year}} \times 1{,}000$$

The five-year rate of visits to family physicians (or specialists) was calculated as follows:

$$\text{5-year rate of visits (per 1,000 population)} = \frac{\text{Total number of visits to family physicians (or specialists) by individuals with (or without) diabetes over the 5-year period}}{\text{Sum of individuals with (or without) diabetes in each fiscal year}} \times 1{,}000$$

The rate ratio of visits to family physicians (or specialists) for diabetes was calculated as follows:

$$\text{Rate ratio of visits to family physicians (or specialists)} = \frac{\text{Rate of visits for individuals with diabetes}}{\text{Rate of visits for individuals without diabetes}}$$

The rate of hospital care days for individuals with (or without) diabetes was calculated as follows:

$$\text{Rate of hospital care days (per 1,000 population)} = \frac{\text{Total number of hospital care days for individuals with (or without) diabetes in specified fiscal year}}{\text{Total number of individuals with (or without) diabetes in specified fiscal year}} \times 1{,}000$$

The five-year rate of hospital care days for individuals with (or without) diabetes was calculated as follows:

$$\text{5-year rate of hospital care days (per 1,000 population)} = \frac{\text{Sum of hospital care days for individuals with (or without) diabetes in each fiscal year}}{\text{Sum of individuals with (or without) diabetes in each fiscal year}} \times 1{,}000$$

The rate ratio of hospital care days for diabetes was calculated as follows:

$$\text{Rate ratio of hospital care days for diabetes} = \frac{\text{Rate of hospital care days for individuals with diabetes in specified fiscal years}}{\text{Rate of hospital care days for individuals without diabetes in specified fiscal years}}$$

1.5.7 Gestational diabetes rate: The GDM rate refers to the proportion of GDM cases among pregnancies resulting in live or still births, expressed as a percentage.

$$\text{GDM rate (\%)} = \frac{\text{Total number of GDM cases during specified period of time resulting in live or still births}}{\text{Total number of pregnancies resulting in live or still births during specified period of time}} \times 100$$

1.5.8 Gestational diabetes survival curve: A survival curve was used to measure the proportion of women with GDM that developed type 2 diabetes within five and nine years following their first diagnosis of GDM. A life table method was used to prepare the survival curve, with time intervals set at three months.

1.6 Statistical significance

Statistical significance was set at a p-value of <0.05 or when two 95% confidence intervals were not overlapping. It does not necessarily imply an important difference or a difference with practical significance.

1.7 Precision of measures

Coefficient of variation (CV) was used to measure the precision of estimates (rates and proportions). A CV value between 0.0% and 16.5% was considered a precise estimate; a value between 16.6% and 33.3% meant less precision but the estimate can be used with caution; if the CV was ≥33.4% the estimate was considered too unreliable to be released in the report.

1.8 Age standardization of rates

The direct age standardization method was used to control for the age differences among different populations. The standard population used was the 1991 Canadian population distribution from the final postcensal estimates. The 95% confidence intervals of age-standardized rates were calculated using an inverse gamma distribution when the rate was greater than zero.[14,15]

1.9 Limitations

The lack of a standard coding system for the diagnosis field in the health insurance claims database presented a challenge. As discussed in Section 1.3, an alternate method of capturing diabetes records had to be developed. The descriptive text field used for diagnosis in the health insurance claims database contained information on patients in different kinds of writing styles that may have led to misinterpretation and cause difficulty in cleaning the data. Also, some records may not have been extracted due to misspells or if the text field was empty.

The CCDSS was unable to differentiate between type 1 and type 2 diabetes because the health insurance claims database does not make distinction between different types of diabetes.

Risk factors for diabetes such as obesity and physical inactivity were not captured in the administrative databases and therefore could not be used to explain some of the findings.

Data were extracted for New Brunswickers with a valid Medicare number and could not be broken down according to ethnic groups such as the First Nations considered at higher risk of developing diabetes.

Fee-for-service physicians submit their claims directly to Medicare and some salaried physicians remit their services through shadow billing. Therefore, the claims data did not include all diagnosis information required for the CCDSS.

Undiagnosed individuals with diabetes were not captured in the hospital DAD and the health insurance claims database. As a result, these diabetes cases were not counted in the CCDSS which led to underestimated prevalence and incidence rates.

In the data used to produce this report, there were records (about 1%) where information on the health region of residence was either missing or unknown. These cases were only included in the provincial data. The impact of this discrepancy, however, was deemed minimal, regional rates being slightly inflated.

Data from the vital statistics database, the hospital DAD and the health insurance claims database were extracted to calculate pregnancy rates. Not included were live births and stillbirths of New Brunswickers that occurred outside the province's accredited hospitals, medical clinics and community health centres, as well as therapeutic abortions performed outside the province, abortions performed in private clinics and spontaneous abortions or other fetal losses.

1.10 Confidentiality

To ensure that individuals could not be identified, a unique encrypted Medicare number was assigned to each individual, not to be re-assigned to another person even if this individual died or moved outside the province. This encryption method was used in all four datasets (i.e., the health insurance claims database, the DAD, the Medicare resident registry and the vital statistics database) so that the databases could be linked via encrypted Medicare numbers.

SECTION 2. POPULATION STATISTICS OF DIABETES

KEY FINDINGS

- In 2007-08, 1 in 13 New Brunswickers was living with diagnosed diabetes and it is predicted that by 2012-13 it will be 1 in 10.
- The age-standardized prevalence rate of diagnosed diabetes in New Brunswick was statistically higher than the Canadian average.
- 68% of New Brunswickers with diagnosed diabetes were 50 to 79 years of age.
- The five-year age-specific prevalence rate of diagnosed diabetes was statistically higher for the period 2003-04 to 2007-08 compared to the previous five years in the 1-19 to 85+ year age groups.
- The age-standardized prevalence rates of diagnosed diabetes were statistically higher in health regions 2 (Saint John area), 5 (Campbellton area) and 7 (Miramichi area) and statistically lower in health regions 1 (Moncton area) and 4 (Edmundston area) compared to the provincial rate.
- Prevalence and incidence rates of diagnosed diabetes were statistically higher in males compared to females in the older age groups.
- On average, 4,887 new cases of diabetes were diagnosed in the province each year and 2/3 (67%) of these cases were 45 to 74 years old.
- The age-standardized incidence rates of diagnosed diabetes in health regions 5, 6 (Bathurst/Acadian Peninsula area) and 7 were statistically higher than the provincial average.
- The age-standardized mortality rate in adults with diabetes was twice that of those without the disease.

BACKGROUND

According to the National Diabetes Surveillance System, about 2 million Canadians aged 1 year and older were living with diagnosed diabetes in 2006-07.[16] This represents about 1 in 16 Canadians (6.2%); 6.6% of males and 5.9% of females. By 2012, the number of Canadians living with diagnosed diabetes is expected to increase to almost 2.8 million, an overall increase of about 25% from 2007 (or 6% per year). Canadian adults aged 20 years and older with diabetes are twice as likely to die prematurely than those without the disease and also more likely to have other health problems. This section describes the prevalence, incidence, mortality and life expectancy of New Brunswickers with diagnosed diabetes.

2.1 Prevalence

The prevalence of diabetes is the number of individuals living with diabetes in the population during a specific time period; it includes both new and pre-existing diabetes cases and excludes those that died.

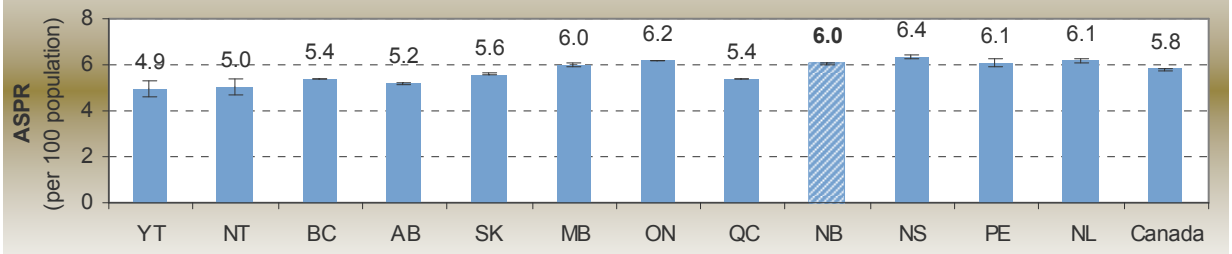
2.1.1 Percentage of the New Brunswick population with diagnosed diabetes in 2007-08

In 2007-08, 1 in 13 New Brunswickers aged 1 year and older was living with diagnosed diabetes (7.8% or 29,047 males and 7.2% or 27,396 females). About 68% of these cases were 50 to 79 years old (see Appendix 5a).

2.1.2 Comparison of prevalence rates of diagnosed diabetes with other Canadian provinces and territories, 2006-07

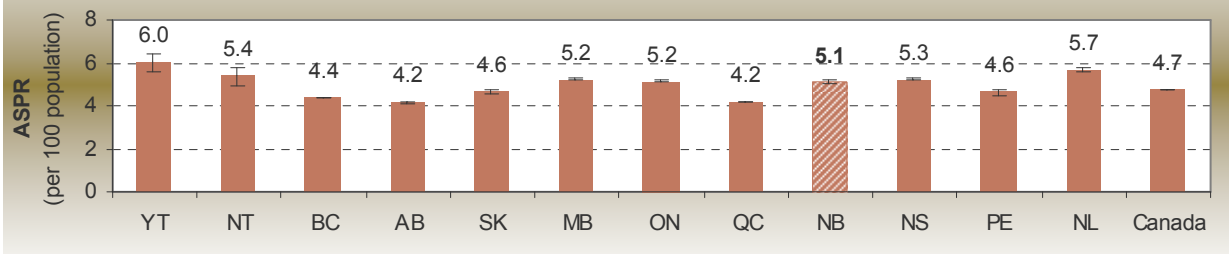
According to a recent publication by the PHAC[16], in 2006-07 New Brunswick and Manitoba had the 5th highest age-standardized prevalence rate of diagnosed diabetes among Canadian males (ASPR: 6.0%) and New Brunswick females ranked 7th (ASPR: 5.1%) compared to other Canadian jurisdictions (Figures 1 and 2).

Figure 1. Age-standardized prevalence rates† (per 100 population) of diagnosed diabetes in males ≥1 year old, by province and territory, Canada, 2006-07



†Age-standardized to 1991 Canadian population.

Figure 2. Age-standardized prevalence rates† (per 100 population) of diagnosed diabetes in females ≥1 year old, by province and territory, Canada, 2006-07

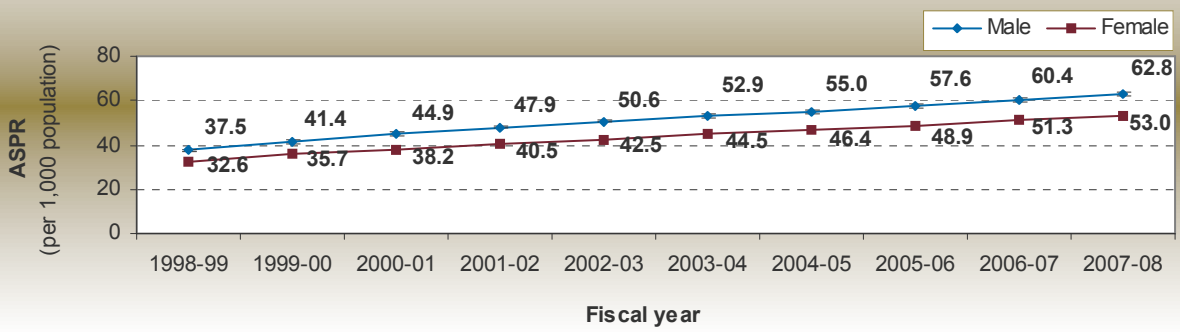


†Age-standardized to 1991 Canadian population.

2.1.3 Age-standardized prevalence rates of diagnosed diabetes by sex and fiscal year, 1998-99 to 2007-08

During the period 1998-99 to 2007-08, the ASPR of New Brunswickers living with diagnosed diabetes increased from 37.5 to 62.8 per 1,000 population for males and from 32.6 to 53.0 per 1,000 population for females (Figure 3).

Figure 3. Age-standardized prevalence rates† (per 1,000 population) of diagnosed diabetes in individuals ≥1 year old, by sex and fiscal year, New Brunswick, 1998-99 to 2007-08

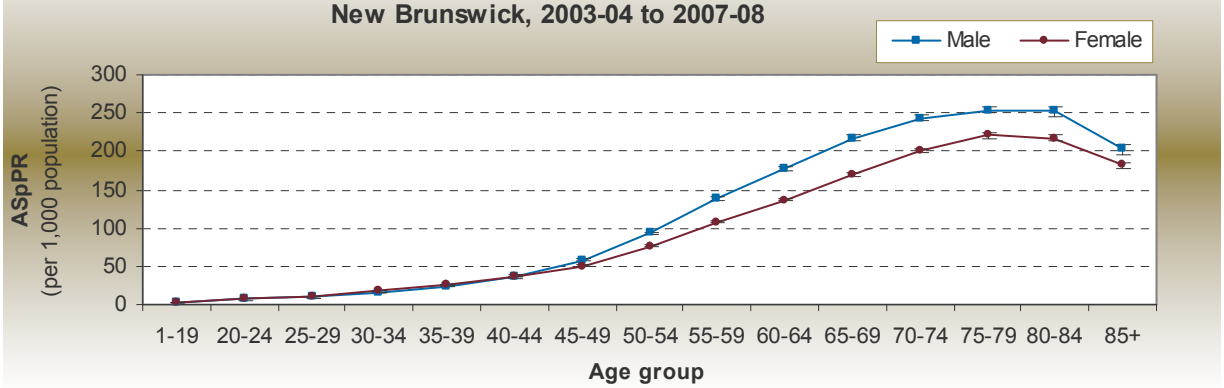


†Age-standardized to 1991 Canadian population.

2.1.4 Age-specific prevalence rates of diagnosed diabetes by sex, 2003-04 to 2007-08

During the period 2003-04 to 2007-08, the age-specific prevalence rate (ASpPR) of diagnosed diabetes increased with age in both sexes up to the 75-79 year age group and then decreased in the older age groups; 1 in 4 males and 1 in 5 females 70 to 84 years old lived with diagnosed diabetes (Figure 4). The ASpPRs were statistically higher in males compared to females in the 20-24 and 40-44 to 85+ age groups and statistically lower in males compared to females in the 30-34 age group.

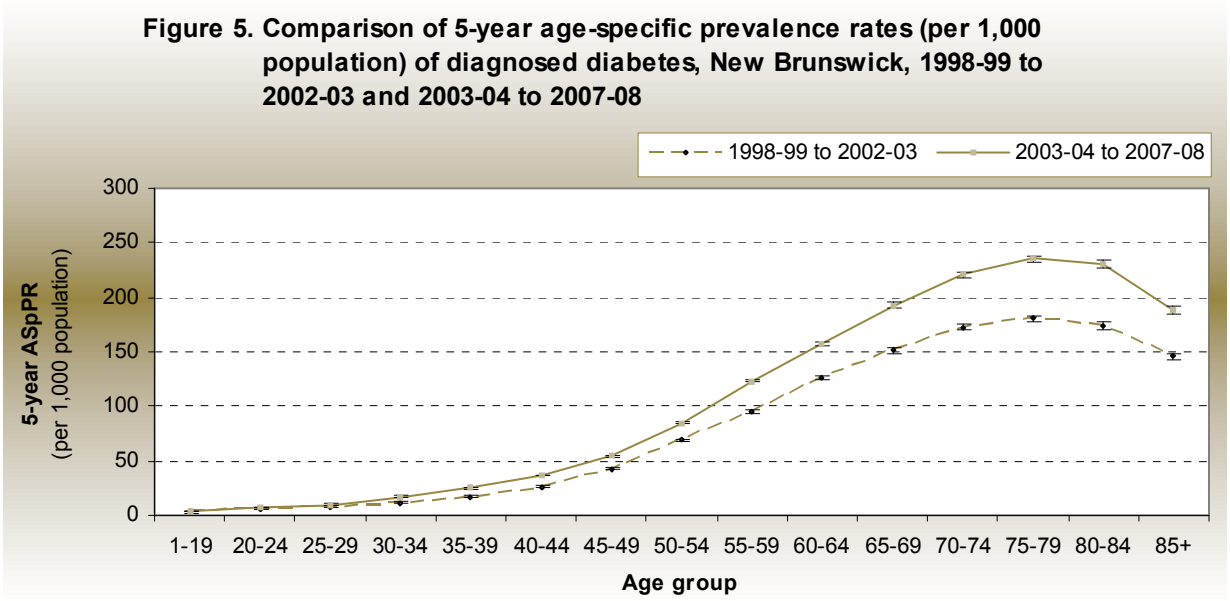
Figure 4. Age-specific prevalence rates (per 1,000 population) of diagnosed diabetes in individuals ≥1 year old, by sex, New Brunswick, 2003-04 to 2007-08



2.1.5 Comparison of five-year age-specific prevalence rates of diagnosed diabetes, 1998-99 to 2002-03 and 2003-04 to 2007-08

The five-year ASpPR of diagnosed diabetes was statistically higher for the period 2003-04 to 2007-08 than for 1998-99 to 2002-03 in all age groups. This means that, in each age group, more people were living with diagnosed diabetes during the period 2003-04 to 2007-08 compared to the previous five years (Figure 5).

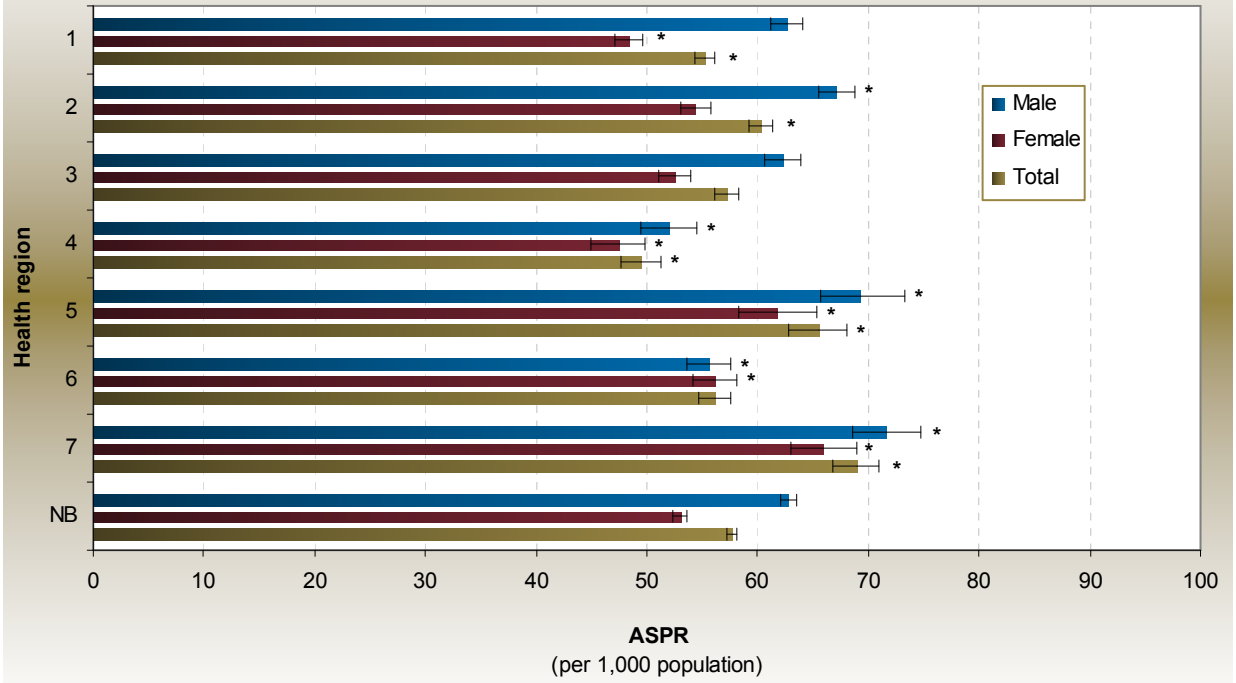
Figure 5. Comparison of 5-year age-specific prevalence rates (per 1,000 population) of diagnosed diabetes, New Brunswick, 1998-99 to 2002-03 and 2003-04 to 2007-08



2.1.6 Age-standardized prevalence rates of diagnosed diabetes by sex and health region, 2007-08

In fiscal year 2007-08, the ASPRs of diagnosed diabetes in males were statistically higher in health regions 2, 5 and 7 and statistically lower in health regions 4 and 6 compared to the provincial rate of 62.8 cases per 1,000 population (Figure 6). In females, the ASPRs of diagnosed diabetes were statistically higher in health regions 5, 6 and 7 and statistically lower in health regions 1 and 4 compared to the provincial rate of 53.0 cases per 1,000 population. When both sexes were combined, the ASPRs were statistically higher in health regions 2, 5 and 7 and statistically lower in health regions 1 and 4 compared to the provincial rate of 57.7 cases per 1,000 population. The ASPRs were statistically higher in males compared to females in health regions 1, 2, 3 and 5 and statistically insignificant in the other health regions.

Figure 6. Age-standardized prevalence rates† (per 1,000 population) of diagnosed diabetes in individuals ≥1 year old, by sex and health region, New Brunswick, 2007-08

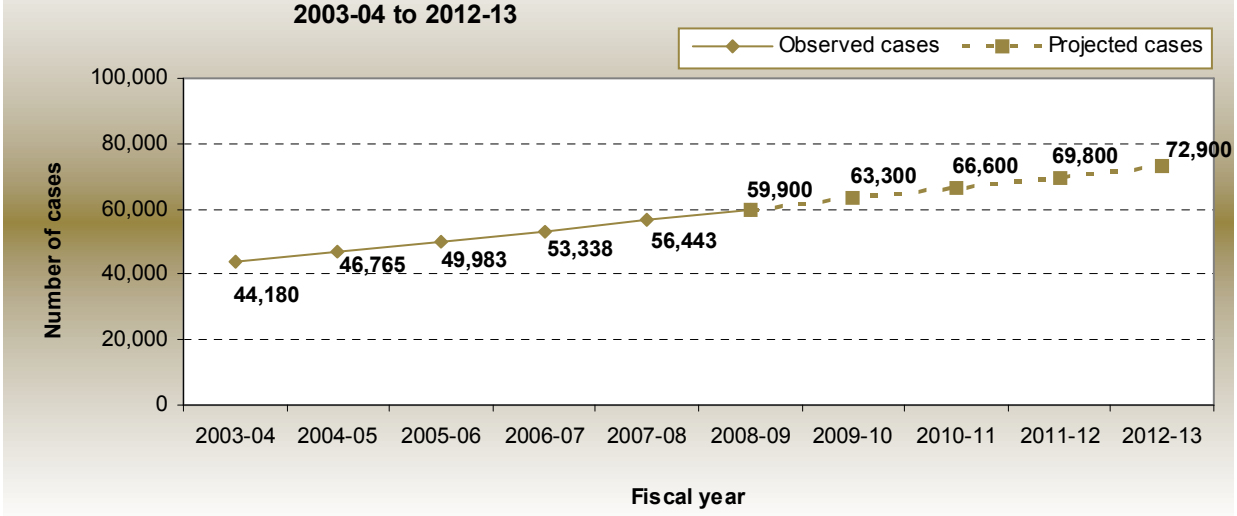


†Age-standardized to the 1991 Canadian population
*Regional rate statistically different from provincial rate at 95% confidence level

2.1.7 Projections of diagnosed diabetes prevalence, 2008-09 to 2012-13

By fiscal year 2012-13, an estimated 72,900 New Brunswickers will be living with diagnosed diabetes, a 29% increase from 2007-08 (Figure 7).

Figure 7. Observed and projected number of individuals ≥1 year old living with diagnosed diabetes, by fiscal year, New Brunswick, 2003-04 to 2012-13



2.2 Incidence

The incidence of diabetes is the number of newly diagnosed cases arising in the population during a specific time period.

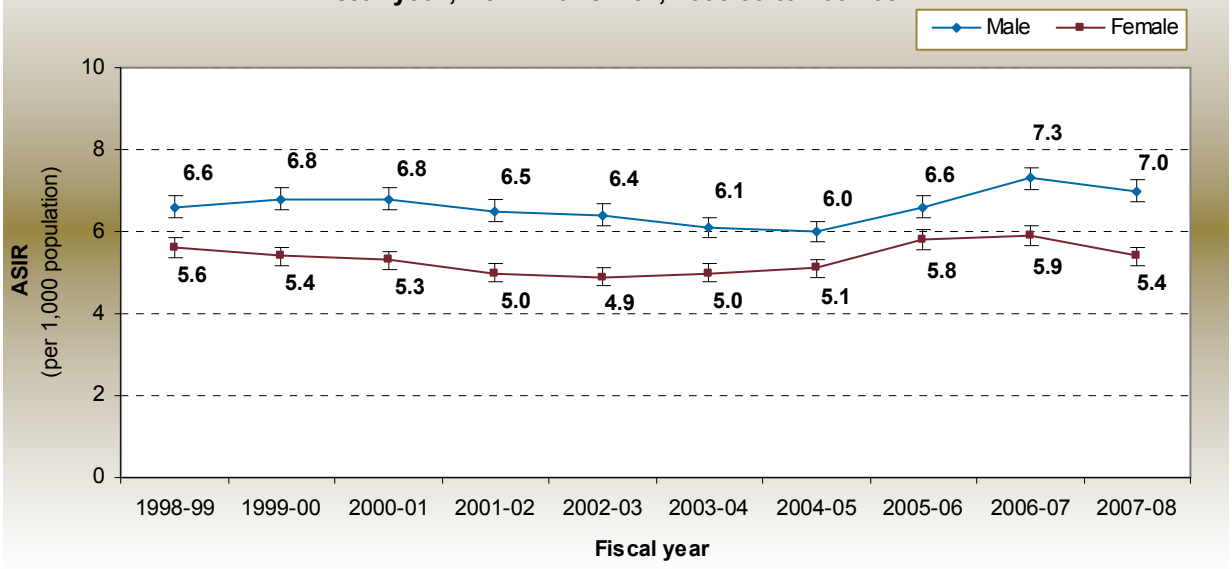
2.2.1 Average number of newly diagnosed diabetes cases per year, 2003-04 to 2007-08

During the period 2003-04 to 2007-08, an average of 4,887 new cases of diabetes were diagnosed each year among New Brunswickers one year and older; 2/3 (67%) of these cases were between 45 and 74 when first diagnosed with the disease (see Appendix 5b).

2.2.2 Age-standardized incidence rates of diagnosed diabetes by sex and fiscal year, 1998-99 to 2007-08

During the 10-year period 1998-99 to 2007-08, the age-standardized incidence rates (ASIRs) of diagnosed diabetes in New Brunswick were between 6.0 and 7.3 per 1,000 population for males and between 4.9 and 5.9 per 1,000 population for females. Rates were statistically higher in males than females in each of the fiscal years (Figure 8).

Figure 8. Age-standardized incidence rates† (per 1,000 population) of diagnosed diabetes in individuals ≥1 year old, by sex and fiscal year, New Brunswick, 1998-99 to 2007-08

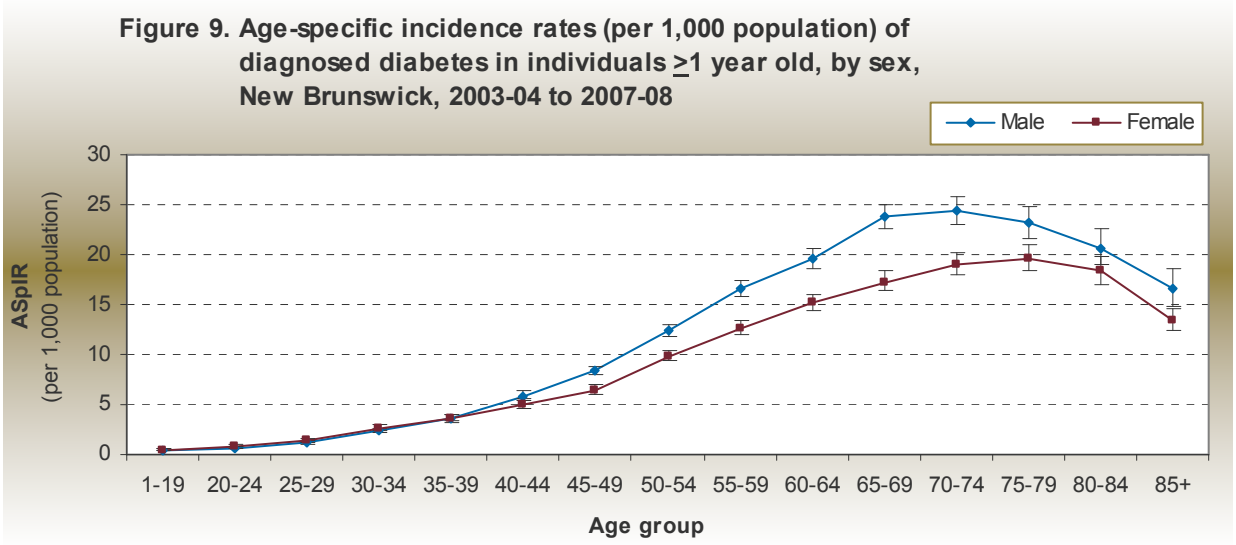


†Age-standardized to the 1991 Canadian population

2.2.3 Age-specific incidence rates of diagnosed diabetes by sex, 2003-04 to 2007-08

Over the period 2003-04 to 2007-08, the age-specific incidence rates (ASpIRs) of diagnosed diabetes increased with age in both males and females. Rates were highest in the 70-74 year age group for males (24.4 new cases per 1,000 population) and the 75-79 year age group for females (19.7 new cases per 1,000 population) (Figure 9). ASpIRs were statistically higher in males compared to females in the 40-44 to 75-79 as well as the 85+ year age groups. Rate differences in the other age groups were statistically insignificant.

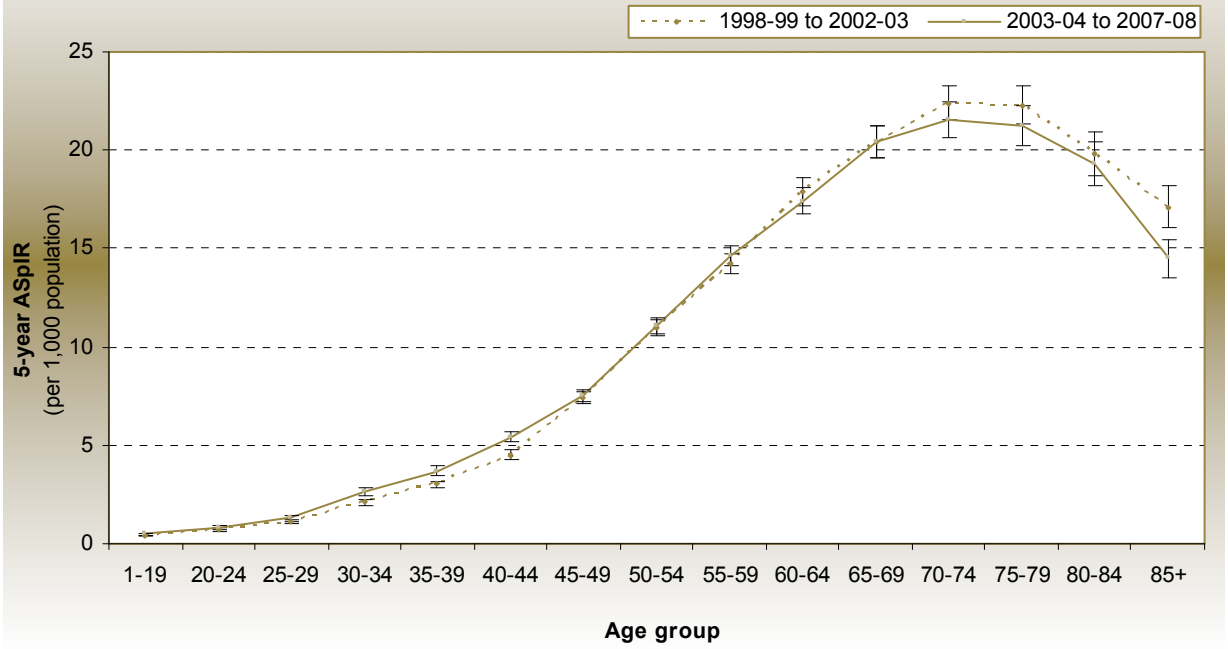
Figure 9. Age-specific incidence rates (per 1,000 population) of diagnosed diabetes in individuals ≥1 year old, by sex, New Brunswick, 2003-04 to 2007-08



2.2.4 Comparison of five-year age-specific incidence rates of diagnosed diabetes, 1998-99 to 2002-03 and 2003-04 to 2007-08

The five-year ASpIRs of diagnosed diabetes were statistically higher in 2003-04 to 2007-08 compared to the previous five years in the 30-34, 35-39 and 40-44 year age groups and statistically lower in the 85+ year age group (Figure 10).

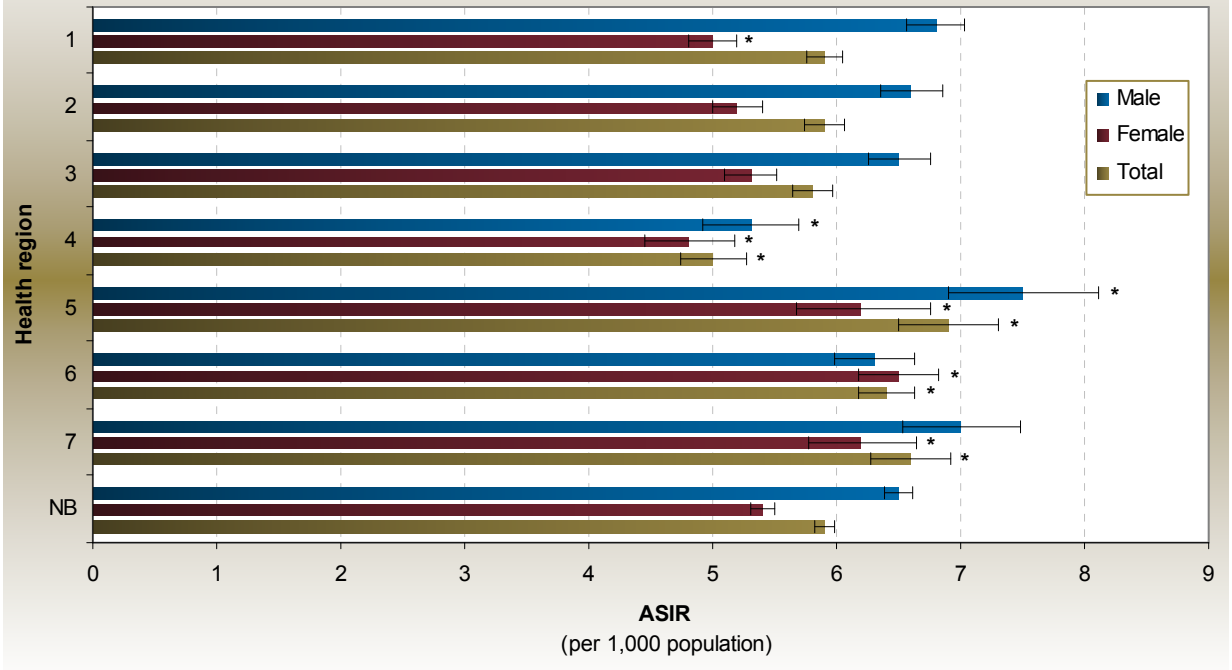
Figure 10. Comparison of 5-year age-specific incidence rates (per 1,000 population) of diagnosed diabetes, New Brunswick, 1998-99 to 2002-03 and 2003-04 to 2007-08



2.2.5 Age-standardized incidence rates of diagnosed diabetes by sex and health region, 2003-04 to 2007-08

The five-year ASIR of diagnosed diabetes represents the average number of new cases of diagnosed diabetes each year per 1,000 population over the period 2003-04 to 2007-08. The ASIRs of diagnosed diabetes in males were statistically higher in Health Region 5 and statistically lower in Health Region 4 compared to the provincial rate of 6.5 new cases per 1,000 population. In females, ASIRs of diagnosed diabetes were statistically higher in health regions 5, 6 and 7 and statistically lower in health regions 1 and 4 compared to the provincial rate of 5.4 new cases per 1,000 population. When both sexes were combined, the 5-year ASIRs of diagnosed diabetes were statistically higher in health regions 5, 6 and 7 and statistically lower in Health Region 4 compared to the provincial rate of 5.9 cases per 1,000 population (Figure 11). ASIRs were statistically higher in males compared to females in health regions 1, 2, 3 and 5 and statistically insignificant in the other health regions.

Figure 11. Age-standardized incidence rates† (per 1,000 population) of diagnosed diabetes in individuals ≥1 year old, by sex and health region, New Brunswick, 2003-04 to 2007-08



†Age-standardized to the 1991 Canadian population
*Regional rate statistically different from provincial rate at 95% confidence level

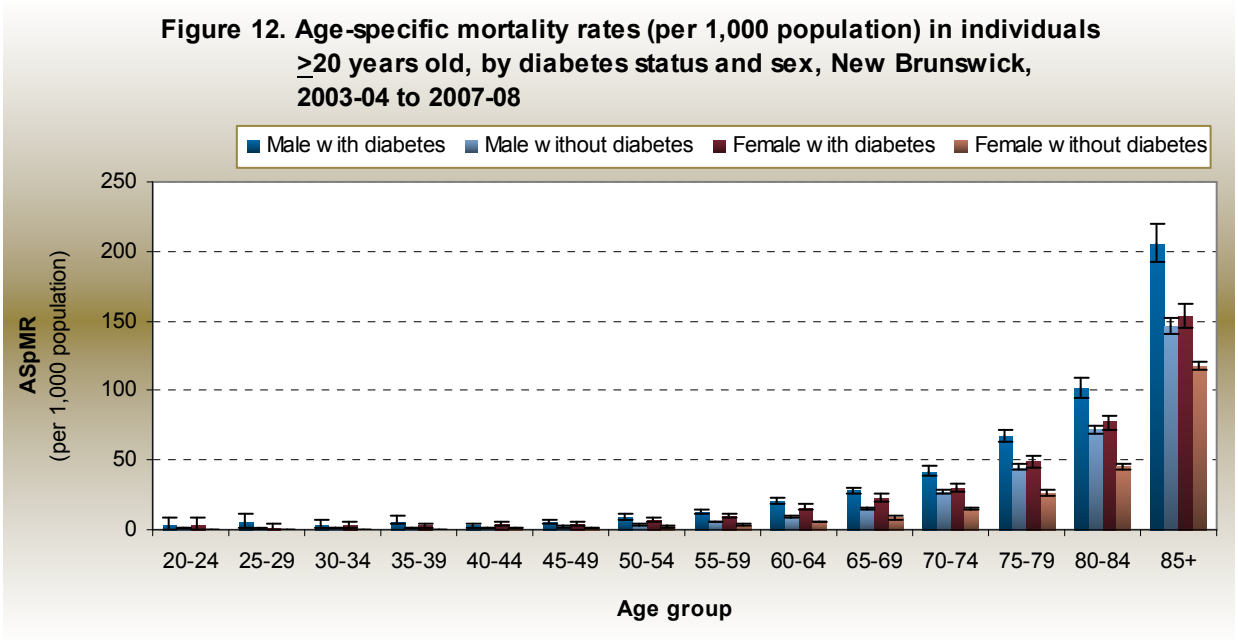
2.3 Mortality

Major complications associated with diabetes include heart disease, stroke, chronic kidney disease, blindness and nerve damage. Individuals with diabetes who have one or more of these complications (or co-morbidities) of diabetes are at increased risk of premature death.

2.3.1 Age-specific mortality rates in individuals ≥ 20 years old by diabetes status and sex, 2003-04 to 2007-08

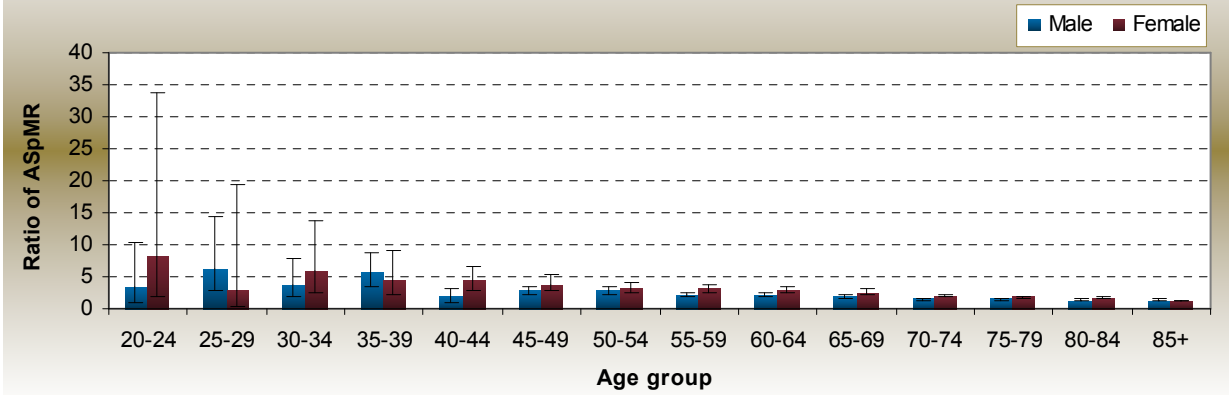
During the period 2003-04 to 2007-08, the age-specific mortality rates (ASpMRs) in individuals 20 years and older with or without diagnosed diabetes increased with age. Among those with diagnosed diabetes, ASpMRs were statistically higher in males compared to females in the 60-64 to 85+ year age groups (Figure 12).

Figure 12. Age-specific mortality rates (per 1,000 population) in individuals ≥20 years old, by diabetes status and sex, New Brunswick, 2003-04 to 2007-08



In males, the ratio of ASpMRs between individuals with and those without diagnosed diabetes was consistently statistically higher than 1 in all age groups, which means that males with diagnosed diabetes were more likely to die than those without the disease across age groups. Similarly, females with diagnosed diabetes were more likely to die than those without diabetes in all age groups except for the 25-29. The ratio of ASpMRs was statistically lower in males compared to females in the 65-69, 70-74 and 80-84 year age groups (Figure 13).

Figure 13. Ratio of age-specific mortality rates comparing individuals ≥20 years old with diagnosed diabetes to those without diabetes, by sex, New Brunswick, 2003-04 to 2007-08

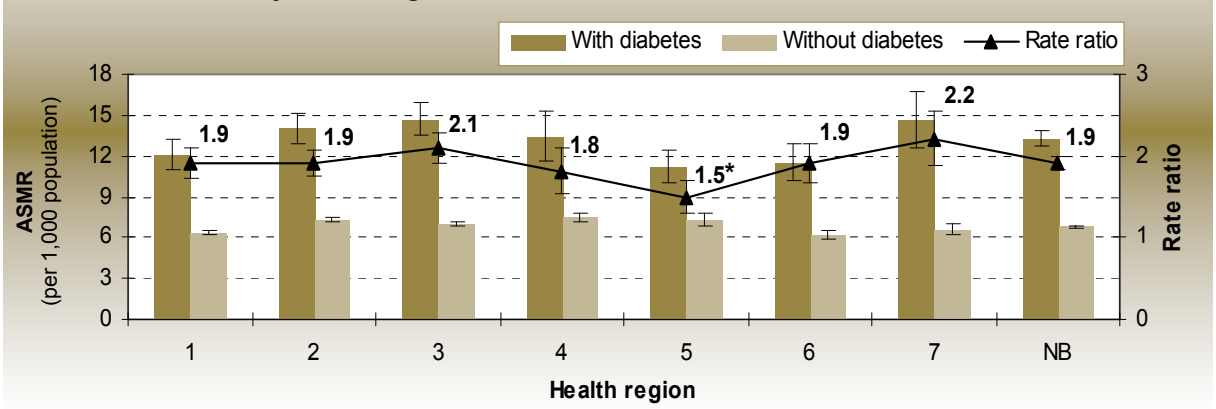


2.3.2 Age-standardized mortality rates in individuals ≥20 years old by diabetes status and health region, 2003-04 to 2007-08

During the period 2003-04 to 2007-08, the age-standardized mortality rate (ASMR) for all causes of death in individuals with diagnosed diabetes was statistically lower in Health Region 5 (11.2 deaths per 1,000 population) compared to the provincial rate of 13.3 deaths per 1,000 population (Figure 14).

The ratio of ASMRs for New Brunswick was 1.9, which means that during the five-year period, after controlling for the age effect, individuals with diagnosed diabetes were 1.9 times more likely to die than those without the disease. In Health Region 5, the rate ratio (1.5) was statistically lower than the provincial rate ratio.

Figure 14. Age-standardized mortality rates† (per 1,000 population) for all causes of death in individuals ≥20 years old, by diabetes status, and rate ratios, by health region, New Brunswick, 2003-04 to 2007-08



†Age-standardized to the 1991 Canadian population

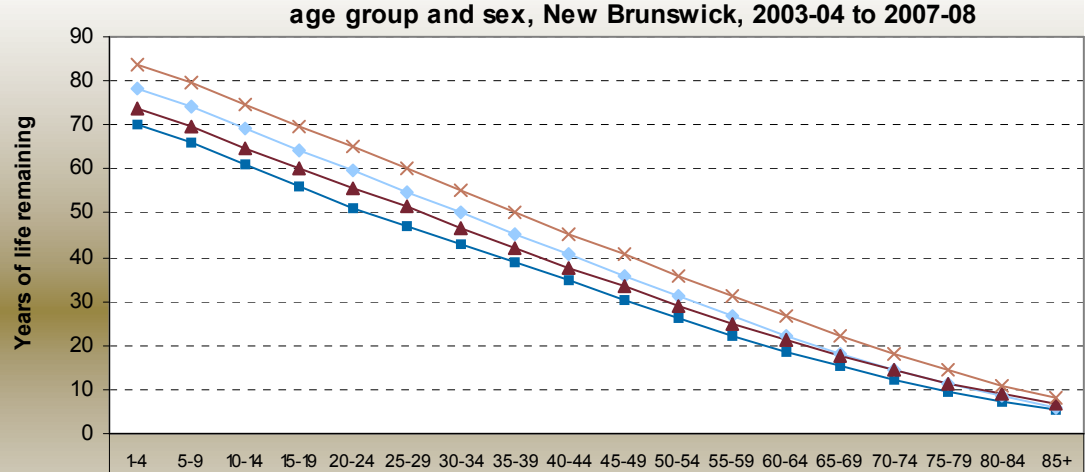
*Regional rate ratio statistically different from provincial rate ratio at 95% confidence level

2.3.3 Life expectancy of New Brunswickers by diabetes status, age group and sex, 2003-04 to 2007-08

Individuals with diabetes usually do not live as long as those without the disease because of the co-morbidities associated with diabetes that lead to premature death.

For example, during the five-year period 2003-04 to 2007-08, individuals who were diagnosed with diabetes when they were 1 to 14 years old were expected to live on average 8 years less (males) and 10 years less (females) than those without the disease (Figure 15).

Figure 15. Life expectancy for individuals ≥1 year old, by diabetes status, age group and sex, New Brunswick, 2003-04 to 2007-08



	1-4	5-9	10-14	15-19	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+
Male with DM	70.1	66.1	61.1	56.1	51.1	46.9	43.1	38.8	34.9	30.3	26.2	22.3	18.5	15.2	12.2	9.4	7.2	5.4
Male without DM	78.1	74.2	69.2	64.3	59.5	54.8	50.0	45.3	40.5	35.8	31.2	26.7	22.3	18.3	14.5	11.2	8.4	6.0
Female with DM	73.5	69.5	64.5	60.3	55.8	51.4	46.6	42.2	37.6	33.4	29.1	25.0	21.1	17.7	14.5	11.4	8.9	6.9
Female without DM	83.6	79.7	74.7	69.8	64.9	60.0	55.1	50.2	45.3	40.5	35.7	31.1	26.6	22.3	18.1	14.3	11.0	8.2

SECTION 3. HEALTH CARE UTILIZATION

KEY FINDINGS

- About 1 in 4 visits to a family physician by individuals aged 65 and older involved someone with diabetes.
- The rate of visits to family physicians was 1.7 times higher in individuals with diabetes than those without the disease.
- About 3 in 10 visits to specialists by individuals 60 to 84 years old involved someone with diabetes.
- The rate of visits to specialists was 2.4 times higher in individuals with diabetes than those without the disease.
- Individuals with diabetes were 3.3 times more likely to be hospitalized and stayed in hospital about 3.4 times longer than those without the disease.
- Diabetics accounted for about 27% of total hospital care days.

BACKGROUND

People with diabetes are more likely to have multiple health problems for which they will consume more health care resources, which increases pressure on an already constrained health care system. Hospital costs represent about 50% of total costs of managing individuals with diabetes.[4] In 2006-07, Canadian adults aged 20 to 29 with diagnosed diabetes were hospitalized on average 5 to 6 times longer and those 35 to 49 years old were hospitalized almost 5 times longer compared to those without the disease. By 2016, the estimated costs of health care for New Brunswickers living with diabetes will be $198 million per year, a 66.4% increase from 2000.[2] This section of the report provides information about visits to family physicians and specialists, hospital separations and hospital care days.

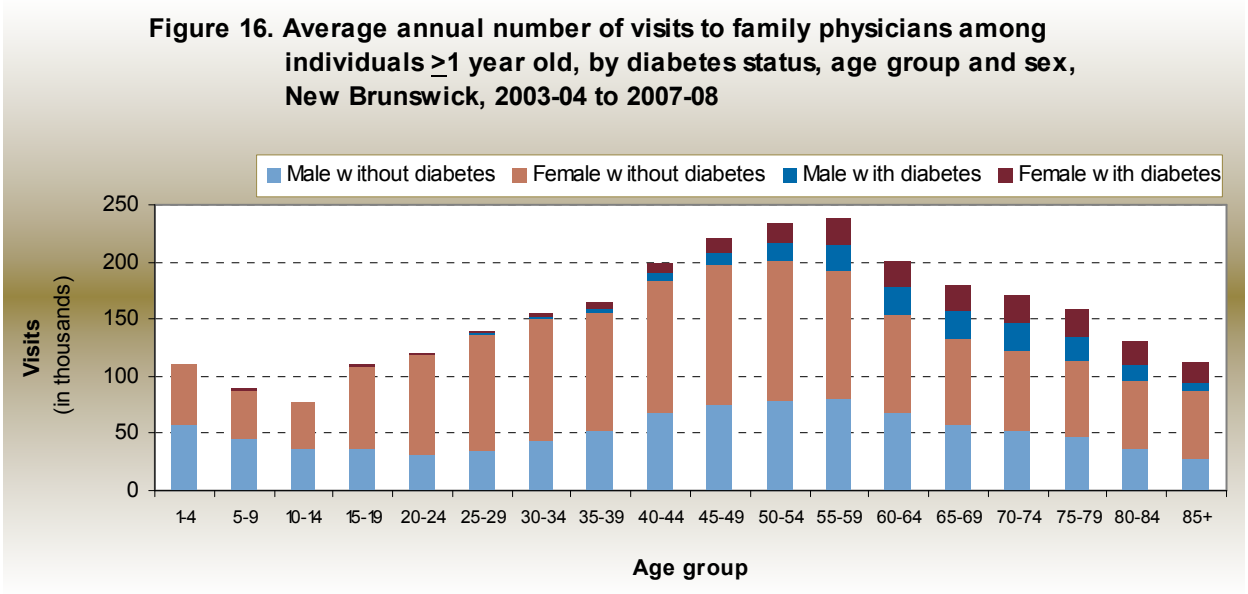
3.1 Visits to family physicians

The number of visits to family physicians is one of the indicators of health care utilization.

3.1.1 Average annual number of visits to family physicians by diabetes status, age group and sex, 2003-04 to 2007-08

During the period 2003-04 to 2007-08, the average annual number of visits to family physicians were highest in the 45-49 to 55-59 year age groups and accounted for 24.7% of physician visits (Figure 16). About 1 in 4 visits (26.8%) to family physicians from individuals in the 65-69 to 85+ year age groups involved someone with diagnosed diabetes.

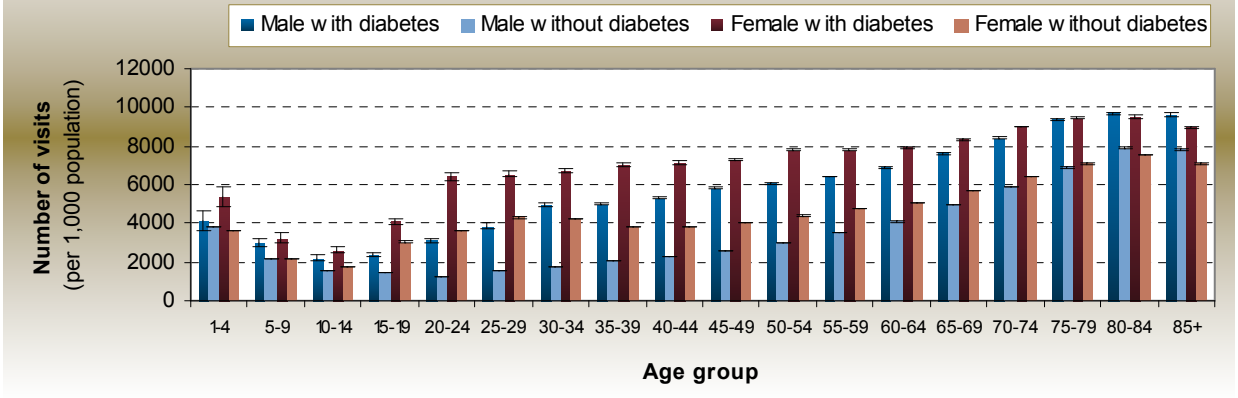
Figure 16. Average annual number of visits to family physicians among individuals ≥1 year old, by diabetes status, age group and sex, New Brunswick, 2003-04 to 2007-08



3.1.2 Age-specific rates of visits to family physicians by diabetes status and sex, 2003-04 to 2007-08

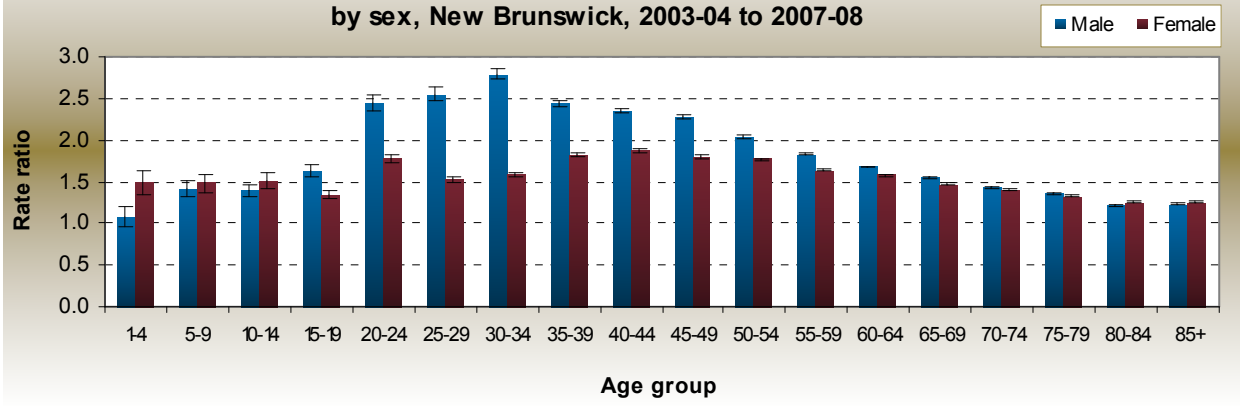
During the same five-year period, the age-specific rates of visits to family physicians by individuals with diagnosed diabetes increased with age from the 10-14 to 80-84 year age groups. Rates were statistically higher in females than males in the 1-4 and 10-14 to 70-74 year age groups and statistically lower in females than males in the 80-84 and 85+ year age groups (Figure 17).

Figure 17. Age-specific rates (per 1,000 population) of visits to family physicians among individuals ≥1 year old, by diabetes status and sex, New Brunswick, 2003-04 to 2007-08



The rate ratio of visits to family physicians was statistically higher in males than females in the 15-19 to 75-79 year age groups and statistically lower in males than females in the 1-4, 80-84 and 85+ year age groups (Figure 18).

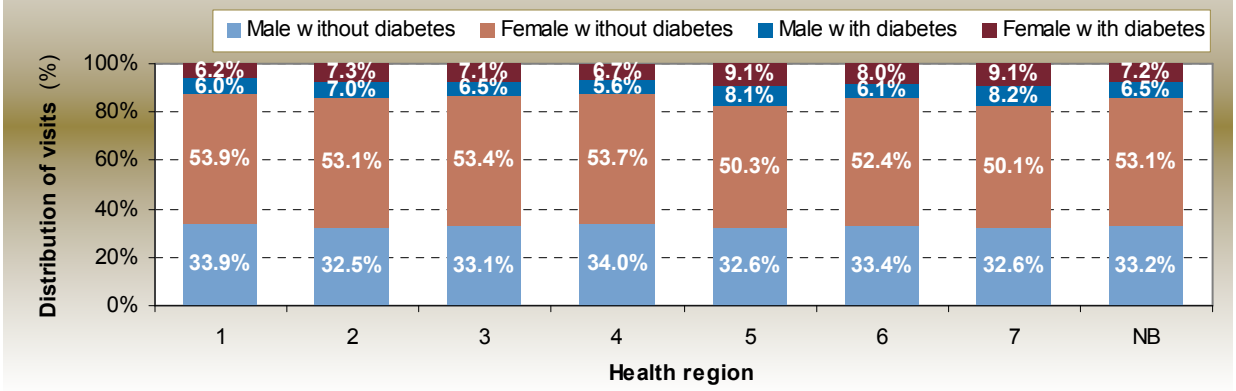
Figure 18. Ratio of age-specific rates of visits to family physicians comparing individuals ≥1 year old with diagnosed diabetes to those without diabetes, by sex, New Brunswick, 2003-04 to 2007-08



3.1.3 Distribution of visits to family physicians by diabetes status, sex and health region, 2003-04 to 2007-08

During the period 2003-04 to 2007-08, an average of 13.7% of total visits to family physicians were from individuals with diagnosed diabetes. There were slight variations in the percentage distribution of visits according to diabetes status and sex amongst the 7 health regions (Figure 19).

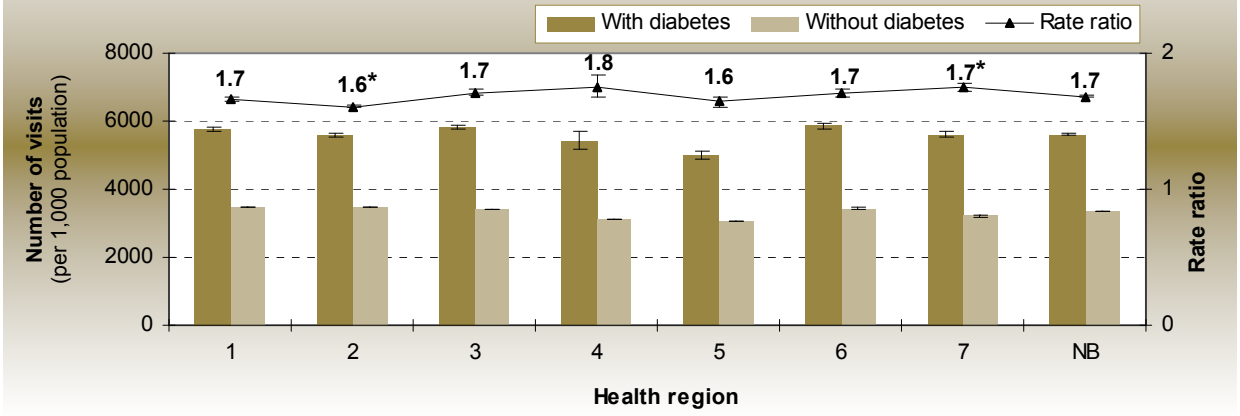
Figure 19. Distribution of visits to family physicians among individuals ≥1 year old, by diabetes status, sex and health region, New Brunswick, 2003-04 to 2007-08



3.1.4 Age-standardized rates of visits to family physicians by diabetes status and health region, 2003-04 to 2007-08

During the same five-year period, the age-standardized rates of visits to family physicians from individuals with diagnosed diabetes were statistically higher in health regions 1, 3 and 6 and statistically lower in Health Region 5 compared to the provincial rate of 5,616 visits per 1,000 population (see bar graph in Figure 20). The age-standardized rate of visits to family physicians was 1.7 times higher in New Brunswickers with diagnosed diabetes compared to those without the disease.

Figure 20. Age-standardized rates† (per 1,000 population) of visits to family physicians in individuals ≥1 year old, by diabetes status and health region, and rate ratios, New Brunswick, 2003-04 to 2007-08



† Age-standardized to the 1991 Canadian population
* Regional rate ratio statistically different from provincial rate ratio at 95% confidence level

Note: Rounding of rate ratios in health regions may have lead to same rate ratios but statistically different than the provincial rate ratio.

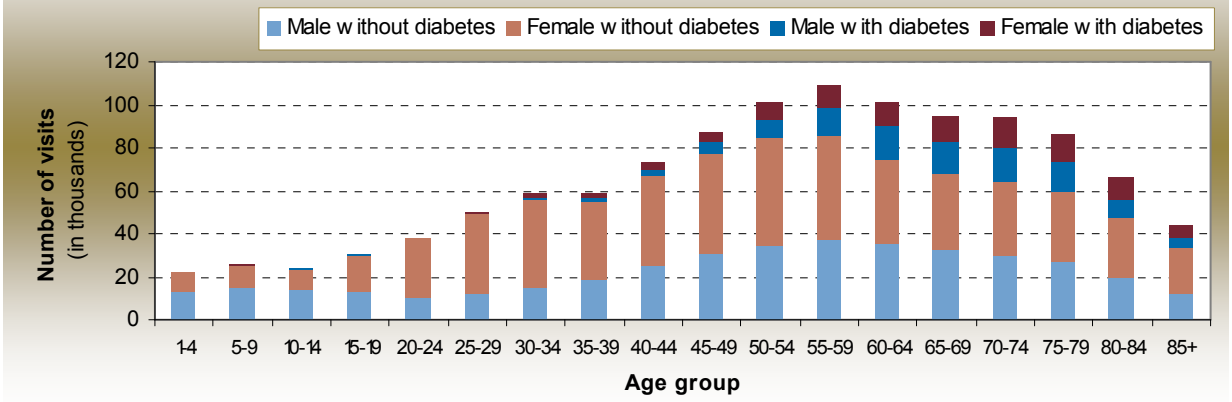
3.2 Visits to specialists

The number of visits to medical and surgical specialists is also an indicator of health care utilization.

3.2.1 Average annual number of visits to specialists by diabetes status, age group and sex, 2003-04 to 2007-08

During the period 2003-04 to 2007-08, New Brunswickers 50 to 64 years old accounted for 26.8% of total visits to specialists each year and those aged 65 to 84 accounted for another 29.2% (Figure 21). About 3 in 10 (29.3%) visits from individuals in the 60-64 to 80-84 year age groups involved someone with diagnosed diabetes. Among New Brunswickers with diagnosed diabetes, the average number of visits to specialists each year was higher in males than females in the 5-9, 10-14, and 45-49 to 75-79 year age groups and lower in males than females in the other age groups.

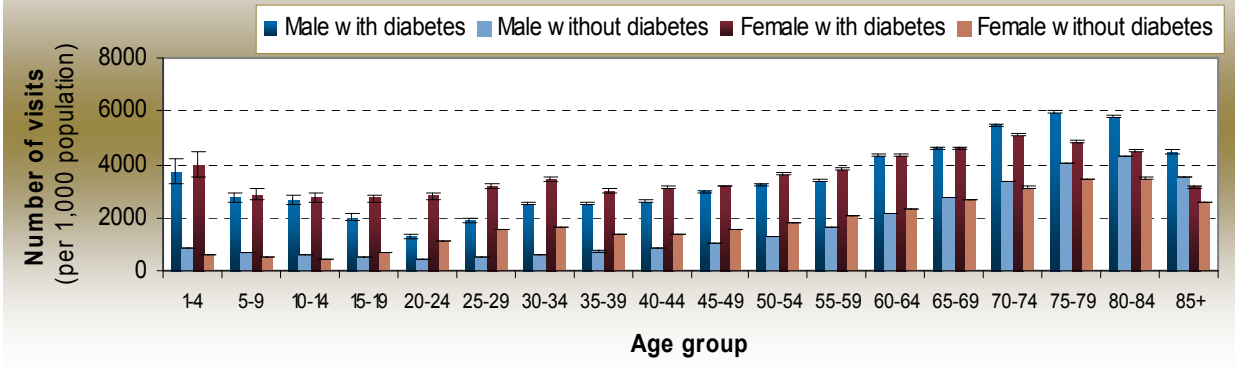
Figure 21. Average annual number of visits to specialists among individuals ≥1 year old, by diabetes status, age group and sex, New Brunswick, 2003-04 to 2007-08



3.2.2 Age-specific rates of visits to specialists by diabetes status and sex, 2003-04 to 2007-08

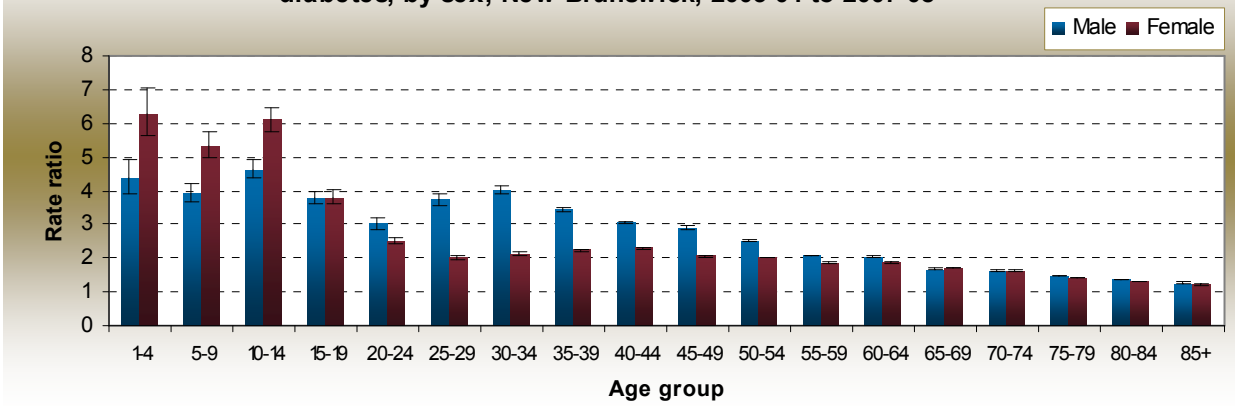
During the same five-year period, the age-specific rates of visits to specialists among individuals with diagnosed diabetes increased with age from the 35-39 to 75-79 year age groups. Rates were statistically higher in males than females in the 70-74 to 85+ year age groups and statistically lower in males than females in the 14-19 to 55-59 year age groups. In both sexes and all age groups, rates of visits to specialists were statistically higher in individuals with diagnosed diabetes compared to those without the disease (Figure 22).

Figure 22. Age-specific rates (per 1,000 population) of visits to specialists among individuals ≥1 year old, by diabetes status and sex, New Brunswick, 2003-04 to 2007-08



The rate ratio of visits decreased with age and was statistically higher in males than females in the 20-24 to 60-64 and 75-79 to 85+ year age groups and statistically lower in in males than females in the 1-4 to 10-14 year age groups (Figure 23).

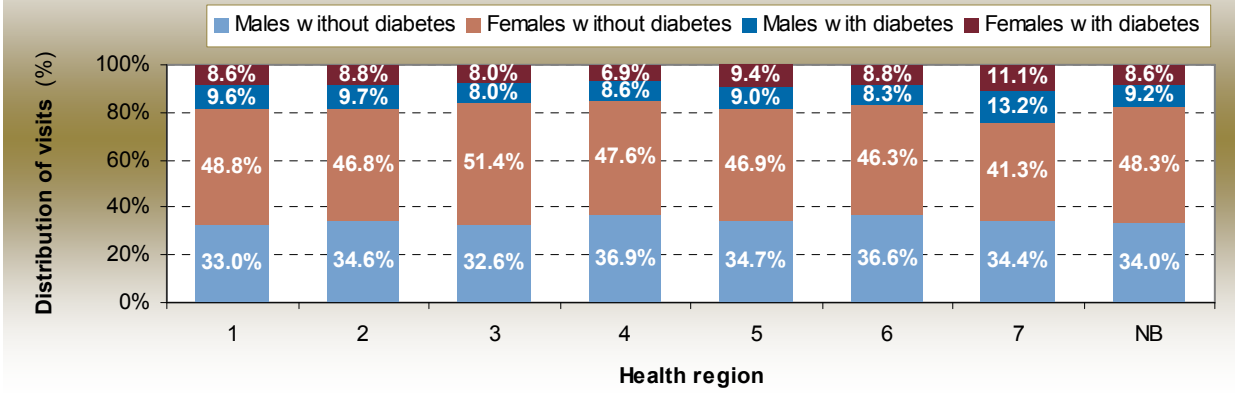
Figure 23. Ratio of age-specific rates of visits to specialists comparing individuals ≥1 year old with diagnosed diabetes to those without diabetes, by sex, New Brunswick, 2003-04 to 2007-08



3.2.3 Distribution of visits to specialists by diabetes status, sex and health region, 2003-04 to 2007-08

During the period 2003-04 to 2007-08, New Brunswick females accounted for 56.8% of total visits to specialists and males accounted for 43.2%. A total of 17.8% of visits to specialists were from New Brunswickers living with diagnosed diabetes (Figure 24).

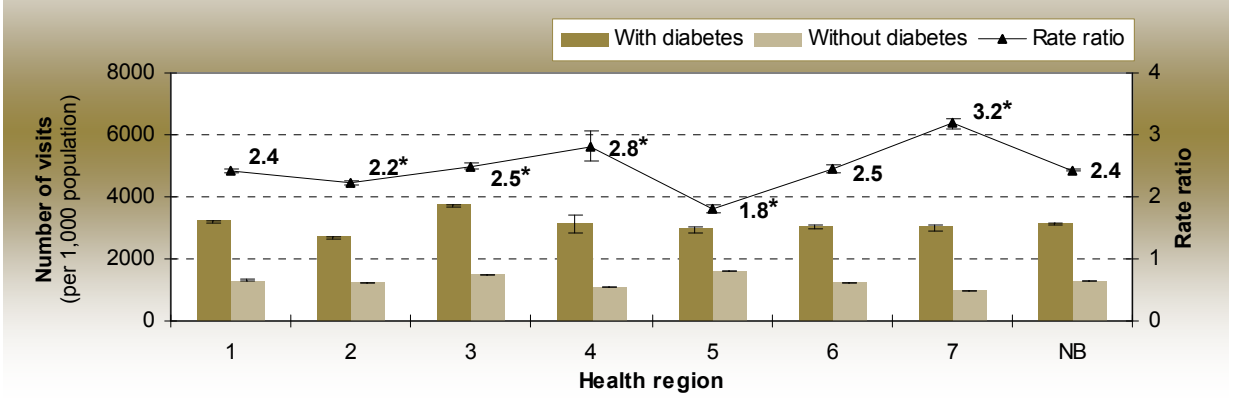
Figure 24. Distribution of visits to specialists among individuals ≥1 year old, by diabetes status, sex and health region, New Brunswick, 2003-04 to 2007-08



3.2.4 Age-standardized rates of visits to specialists by diabetes status and health region, 2003-04 to 2007-08

During the same five-year period, the age-standardized rates of visits to specialists were statistically higher in Health Region 3 and statistically lower in health regions 2, 5 and 7 compared to the provincial rate of 3,151 visits per 1,000 population (see bar graph in Figure 25). The age-standardized rate of visits to specialists was 2.4 times higher in New Brunswickers with diagnosed diabetes compared to those without the disease.

Figure 25. Age-standardized rates† (per 1,000 population) of visits to specialists among individuals ≥1 year old, by diabetes status and health region, and rate ratios, New Brunswick, 2003-04 to 2007-08



†Age-standardized to the 1991 Canadian population
* Regional rate ratio statistically different from provincial rate ratio at 95% confidence level

Note: Rounding of rate ratios in health regions may have lead to same rate ratios but statistically different than the provincial rate ratio.

3.3 Hospital Separations

A hospital separation occurs when an inpatient leaves the hospital as a result of being discharged, transferred to another facility or because the patient has died.

3.3.1 Average percentage of hospitalized individuals with at least two hospital separations within a fiscal year by diabetes status, age group and sex, 2003-04 to 2007-08

New Brunswickers with diagnosed diabetes were more likely to be hospitalized more than once during a fiscal year. During the period 2003-04 to 2007-08, the average percentage of hospitalized individuals with diagnosed diabetes who had at least two hospital separations within a fiscal year was statistically higher than those without diabetes in all age groups except for the 25-29 age group in males and the 20-24 and 30-34 age groups in females (Figures 26).

Figure 26. Average percentage of hospitalized individuals ≥1 year old with at least two hospital separations within a fiscal year, by diabetes status, age group and sex, New Brunswick, 2003-04 to 2007-08

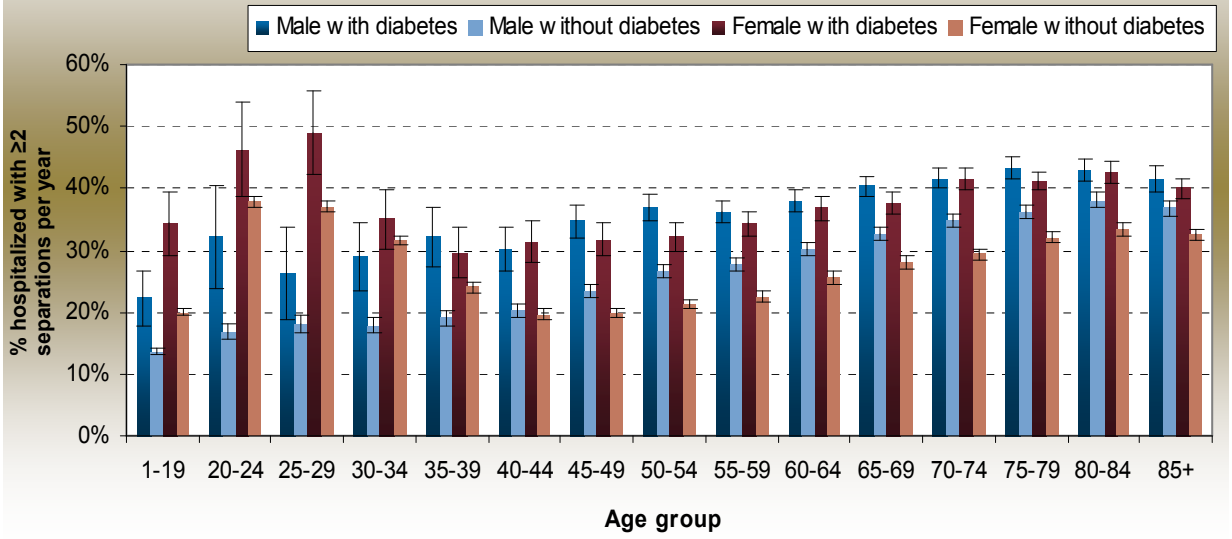


Table 1 is a summary of the five-year average percentage of hospitalized individuals with multiple yearly hospital separations. A total of 17.5% of hospitalized males with diagnosed diabetes had an average of at least three hospital separations per year during the period 2003-04 to 2007-08 compared to 9.4% for those without the disease. Similarly, 16.6% of hospitalized females with diagnosed diabetes had an average of at least three hospital separations per year compared to 8.3% for those without the disease.

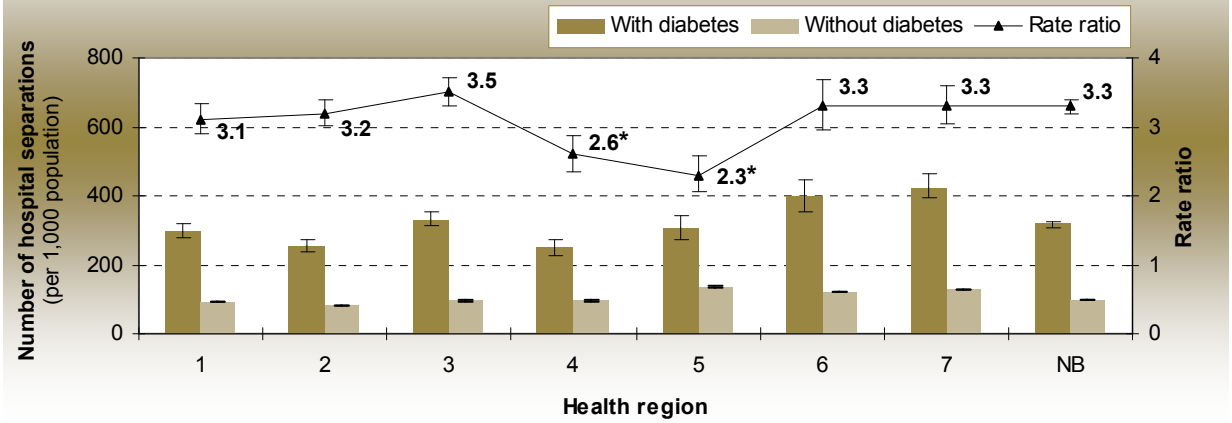
Table 1. Average percentage of hospitalized individuals ≥1 year old with multiple yearly hospital separations, by number of hospital separations, diabetes status and sex, New Brunswick, 2003-04 to 2007-08

	Male				Female			
	Without Diabetes		With Diabetes		Without Diabetes		With Diabetes	
Number of separations	Number of individuals	Percentage	Number of individuals	Percentage	Number of individuals	Percentage	Number of individuals	Percentage
1	14,289	73.6%	3,161	60.7%	21,260	71.8%	3,275	61.6%
2	3,288	16.9%	1,131	21.7%	5,889	19.9%	1,156	21.7%
3	1,054	5.4%	484	9.3%	1,580	5.3%	475	8.9%
4+	782	4.0%	429	8.2%	900	3.0%	412	7.7%
Total	19,413	100.0%	5,205	100.0%	29,629	100.0%	5,318	100.0%

3.3.2 Age-standardized hospital separation rates by diabetes status and health region, 2003-04 to 2007-08

Hospital separation rate refers to the average annual number of times inpatients leave the hospital as a result of being discharged, transferred to another facility or because the patient has died per 1,000 population. During the period 2003-04 to 2007-08, the age-standardized hospital separation rates for individuals with diagnosed diabetes were statistically higher in health regions 6 and 7 and statistically lower in health regions 2 and 4 than the provincial rate of 316 separations per 1,000 population (see bar graph in Figure 27). On average, New Brunswickers with diagnosed diabetes were hospitalized 3.3 times more often than those without the disease.

Figure 27. Age-standardized hospital separation rates† (per 1,000 population) in individuals ≥1 year old, by diabetes status and health region, and rate ratios, New Brunswick, 2003-04 to 2007-08



†Age-standardized to the 1991 Canadian population
*Regional rate ratio statistically different from provincial rate ratio at 95% confidence level

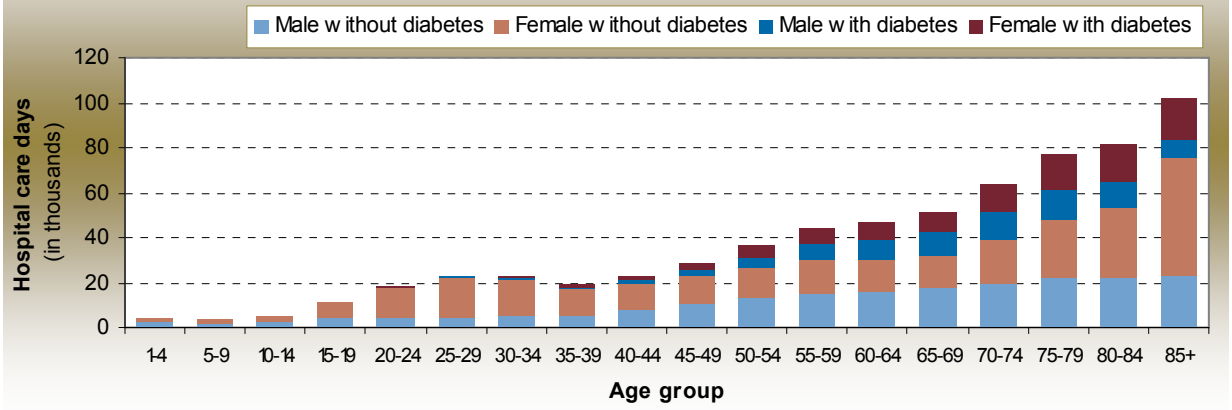
3.4 Hospital Care Days

Hospital care days is the total number of patient days accumulated by an inpatient when released from hospital.

3.4.1 Average annual number of hospital care days by diabetes status, age group and sex, 2003-04 to 2007-08

During the period 2003-04 to 2007-08, the average annual number of hospital care days consumed by New Brunswickers ≥1 year old increased with age. Individuals in the 50-54 to 65-69 year age groups accounted for about 27% of total hospital care days and those in the 70-74 to 85+ age groups accounted for another 49%; about 1/3 of care days in these age groups were consumed by individuals with diagnosed diabetes (Figure 28). In the 75-79 to 85+ age groups, females with diagnosed diabetes accounted for more hospital care days than males with the disease.

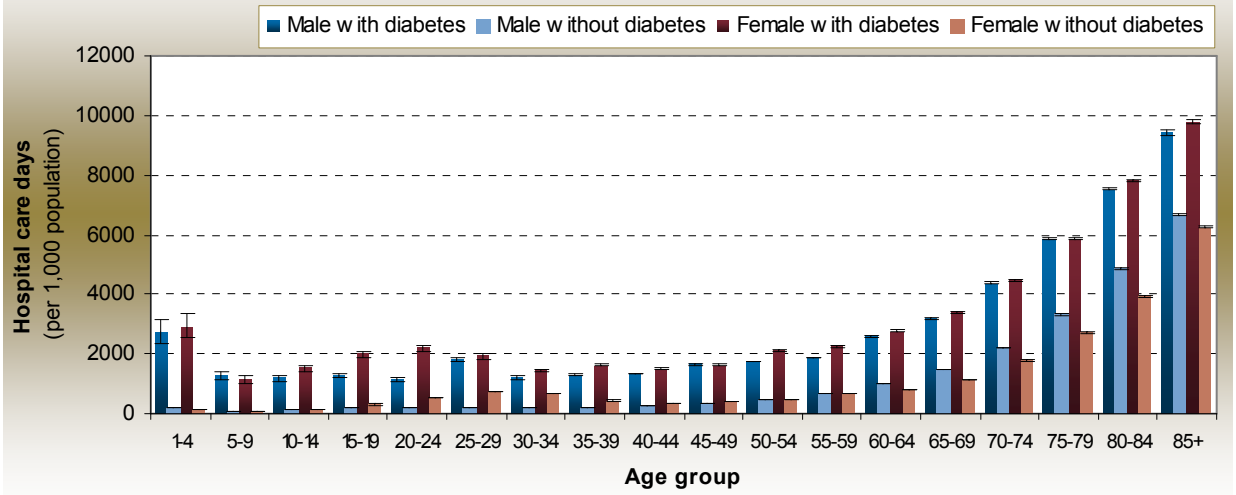
Figure 28. Average annual number of hospital care days consumed by individuals ≥1 year old, by diabetes status, age group and sex, New Brunswick, 2003-04 to 2007-08



3.4.2 Age-specific rates of hospital care days by diabetes status and sex, 2003-04 to 2007-08

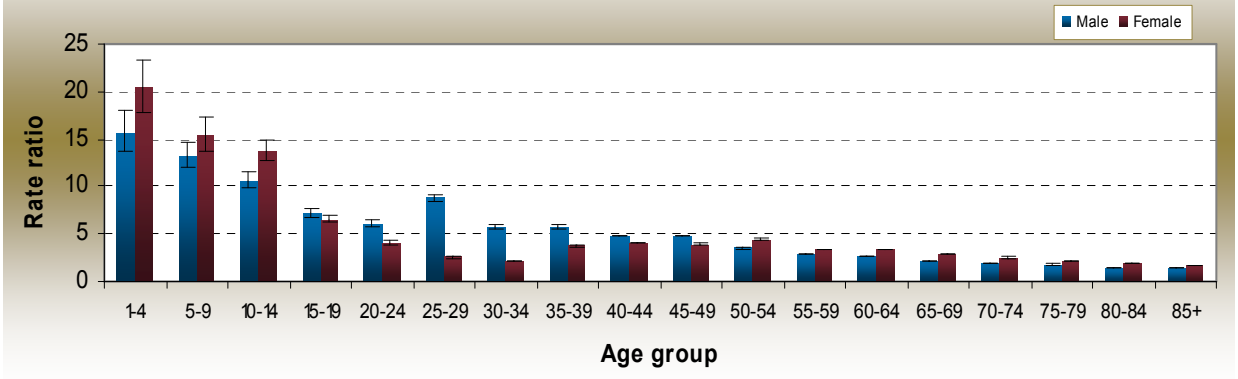
During the same five-year period, age-specific rates of hospital care days increased with age in the 40-44 to 85+ year age groups. Rates for individuals with diagnosed diabetes were statistically higher in females than males in all age groups, except for the 1-4, 5-9, 25-29, 45-49 and 75-79 year age groups where differences in age-specific rates were statistically insignificant (Figure 29).

Figure 29. Age-specific rates (per 1,000 population) of hospital care days in individuals ≥1 year old, by diabetes status and sex, New Brunswick, 2003-04 to 2007-08



Individuals with diagnosed diabetes were hospitalized significantly longer than those without the disease. During the period 2003-04 to 2007-08, age-specific rates of hospital care days were 1.4 to 15.7 times higher in males with diagnosed diabetes than those without the disease. Similarly, age-specific rates were 1.6 to 20.4 times higher in females with diagnosed diabetes compared to those without the disease. Rate ratios were statistically higher in females than males in the 10-14 as well as the 50-54 to 85+ year age groups and statistically lower in females than males in the 20-24 to 45-49 age groups (Figure 30).

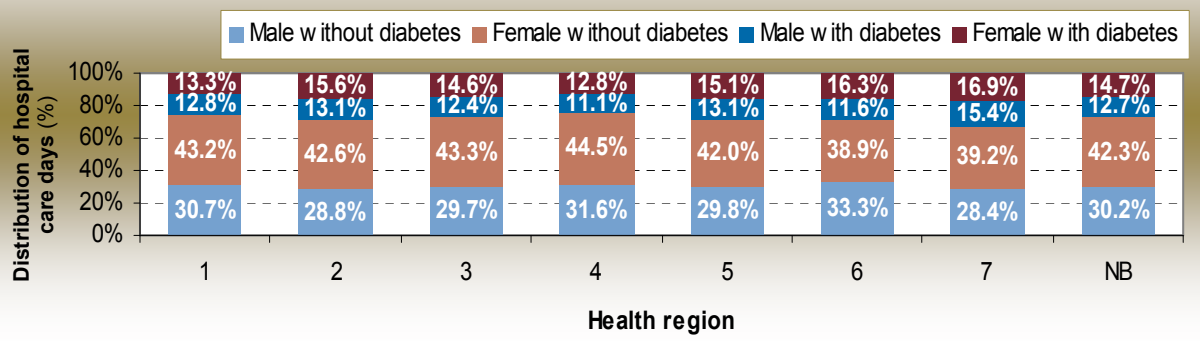
Figure 30. Ratio of age-specific rates of hospital care days comparing individuals ≥1 year old with diagnosed diabetes to those without diabetes, by sex, New Brunswick, 2003-04 to 2007-08



3.4.3 Distribution of hospital care days by diabetes status, sex and health region, 2003-04 to 2007-08

During the period 2003-04 to 2007-08, an average of 27.4% of total hospital care days were consumed by New Brunswickers with diagnosed diabetes (12.7% males and 14.7% females) (Figure 31).

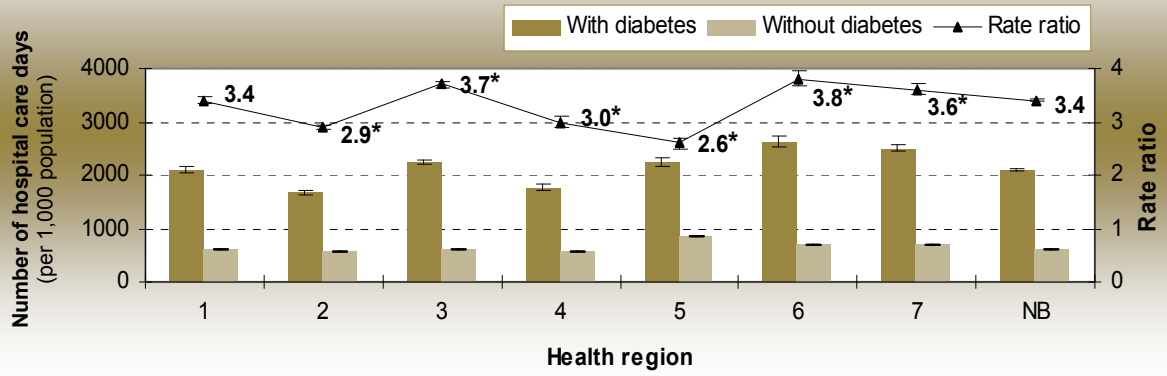
Figure 31. Distribution of hospital care days consumed by individuals ≥1 year old, by diabetes status, sex and health region, New Brunswick, 2003-04 to 2007-08



3.4.4 Age-standardized rates of hospital care days by diabetes status and health region, 2003-04 to 2007-08

The age-standardized rates of hospital care days in individuals with diagnosed diabetes were statistically higher in health regions 3, 5, 6 and 7 and statistically lower in health regions 2 and 4 compared to the provincial rate of 2,095 hospital care days per 1,000 population (see bar graph in Figure 32). On average, New Brunswickers with diagnosed diabetes stayed in hospital about 3.4 times longer than those without the disease.

Figure 32. Age-standardized rates† (per 1,000 population) of hospital care days in individuals ≥1 year old, by diabetes status and health region, and rate ratios, New Brunswick, 2003-04 to 2007-08



†Age-standardized to the 1991 Canadian population
*Regional rate ratio statistically different from provincial rate ratio at 95% confidence level

SECTION 4. CO-MORBIDITIES OF DIABETES

KEY FINDINGS

Percentage of hospitalizations with selected co-morbidities of diabetes that involved someone with diagnosed diabetes:

- Cardiovascular disease - 33.8%
- Chronic kidney disease - 52.2%
- Lower limb amputation - 64.2%

Compared to the general population, after age standardization, individuals with diagnosed diabetes were about:

- 3 times more likely to be hospitalized with cardiovascular disease.
- 7 times more likely to be hospitalized with chronic kidney disease.
- 15 times more likely to be hospitalized with lower limb amputations.

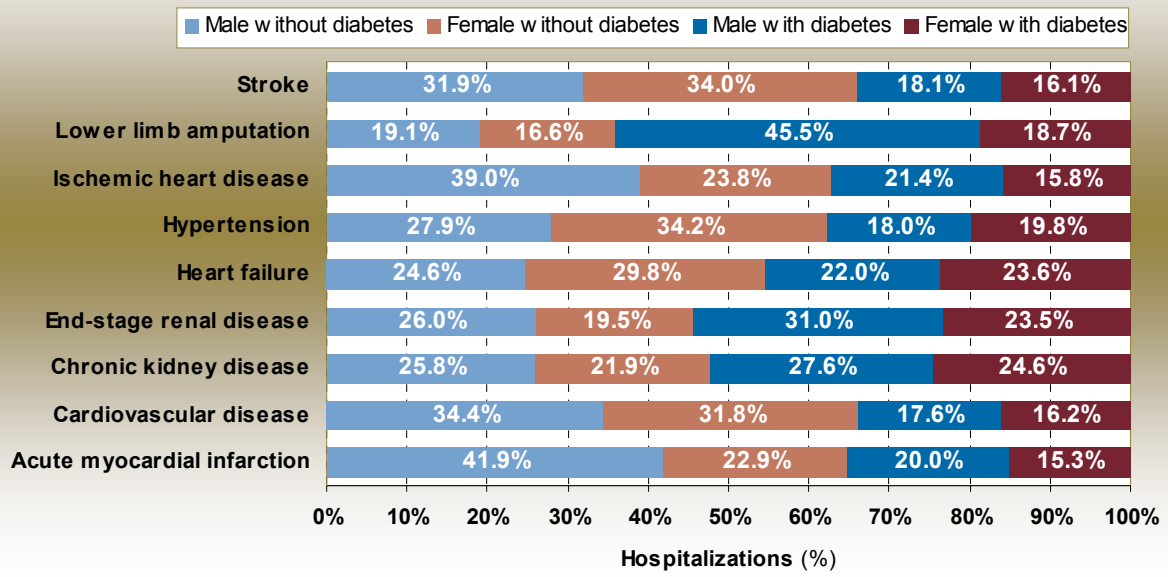
BACKGROUND

People with diabetes are at increased risk of developing cardiovascular disease and chronic kidney disease. Complications arising from these co-morbidities of diabetes include heart attack, stroke, heart failure and renal failure. Individuals with diabetes are also at increased risk of lower limb amputation and blindness. These complications are now found in the diabetes population at a much younger age than in the past.[17] This section of the report provides information about New Brunswickers admitted to hospital for selected co-morbidities of diabetes.

4.1 Distribution of hospitalizations with selected co-morbidities of diabetes by diabetes status and sex, 2003-04 to 2007-08

As mentioned in Section 3, individuals with diabetes are more likely to be hospitalized. During the period 2003-04 to 2007-08, at least 1 in 3 hospitalizations of New Brunswickers with cardiovascular disease, chronic kidney disease or lower limb amputation involved someone with diagnosed diabetes. The largest proportion was for lower limb amputation where 2 in 3 (64.2%) hospitalizations implicated someone with diagnosed diabetes (Figure 33).

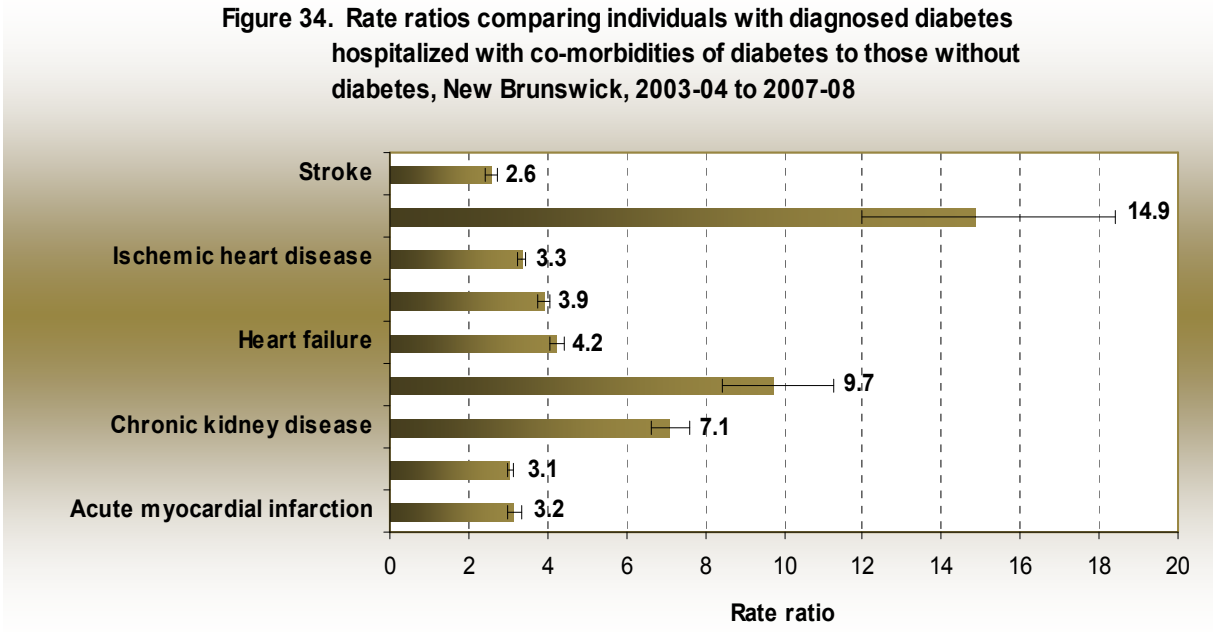
Figure 33. Distribution of hospitalizations with selected co-morbidities of diabetes among individuals ≥20 years old, by diabetes status and sex, New Brunswick, 2003-04 to 2007-08



4.2 Rate ratios comparing individuals with diagnosed diabetes hospitalized with co-morbidities of diabetes to those without diabetes, 2003-04 to 2007-08

During the period 2003-04 to 2007-08, the proportion of New Brunswickers hospitalized with selected co-morbidities of diabetes was statistically higher among individuals with diagnosed diabetes than those without the disease (Figure 34). The highest rate ratio was for lower limb amputation (14.9). This means that the proportion of New Brunswickers hospitalized with lower limb amputations was about 15 times higher in individuals with diagnosed diabetes than those without the disease.

Figure 34. Rate ratios comparing individuals with diagnosed diabetes hospitalized with co-morbidities of diabetes to those without diabetes, New Brunswick, 2003-04 to 2007-08



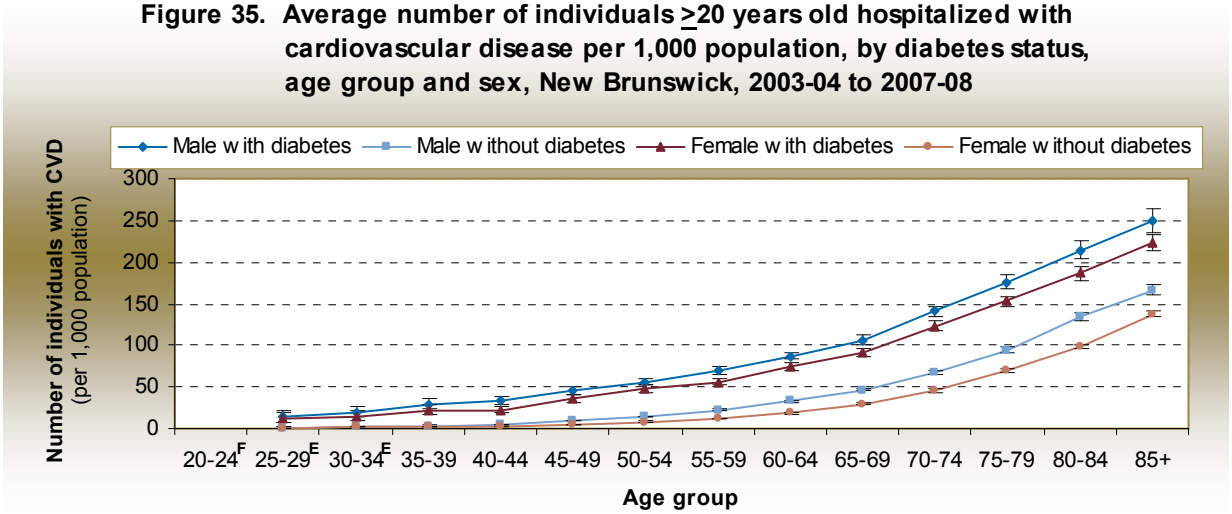
4.3 Cardiovascular disease

Cardiovascular disease (CVD) refers to the class of diseases that involve the heart or blood vessels. The selected CVD co-morbidities of diabetes in this report include heart failure, ischemic heart disease, acute myocardial infarction, hypertension and stroke.

4.3.1 Proportion of individuals hospitalized with cardiovascular disease by diabetes status, age group and sex, 2003-04 to 2007-08

During the period 2003-04 to 2007-08, the average number of individuals hospitalized with CVD per 1,000 population increased with age in both males and females and was statistically higher in individuals with diagnosed diabetes than those without diabetes. The proportion of males hospitalized with both diagnosed diabetes and CVD was statistically higher than females in the 40-44 to 85+ year age groups (Figure 35).

Figure 35. Average number of individuals ≥20 years old hospitalized with cardiovascular disease per 1,000 population, by diabetes status, age group and sex, New Brunswick, 2003-04 to 2007-08



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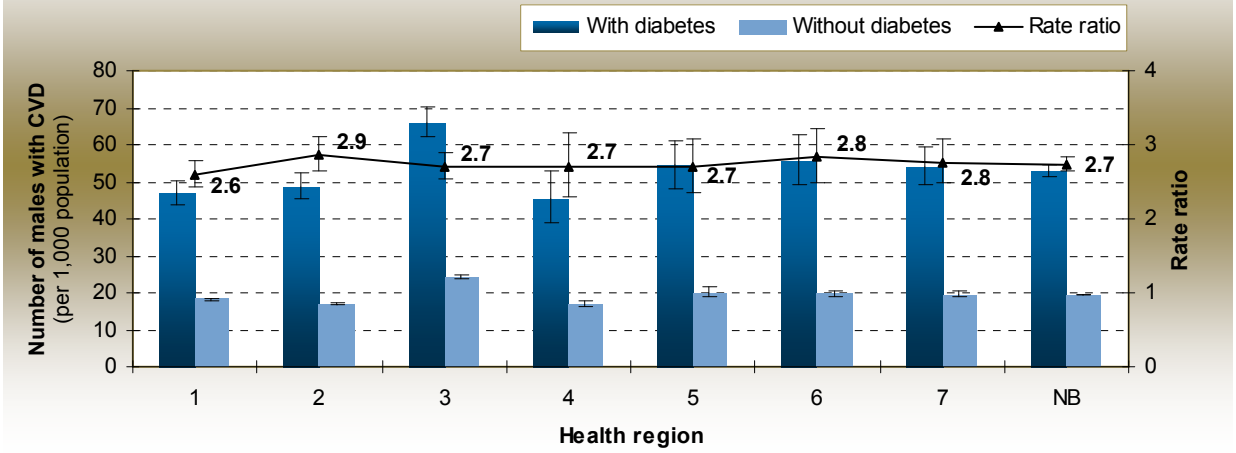
4.3.2 Proportion of individuals hospitalized with cardiovascular disease by diabetes status and health region, 2003-04 to 2007-08

During the same five-year period, after age standardization, the number of individuals hospitalized with both diagnosed diabetes and CVD per 1,000 population was statistically higher in Health Region 3 for both males and females compared to the provincial figures of 53.0 males and 44.5 females per 1,000 population. The proportion of individuals hospitalized with both diagnosed diabetes and CVD was statistically lower than the provincial figures in Health Region 1 for males and in health regions 1, 2 and 4 for females (see bar graphs in Figures 36 and 37).

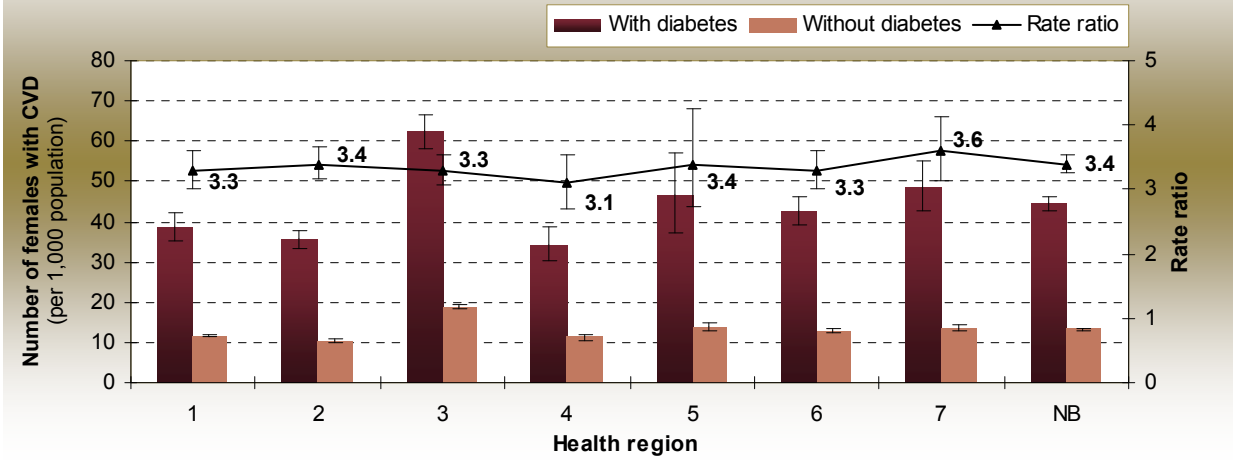
Male New Brunswickers with diagnosed diabetes were 2.7 times more likely to be hospitalized with CVD than males without diabetes. Females with diagnosed diabetes were also (3.4 times) more likely to be hospitalized with CVD than those without the disease. In both sexes, rate ratios in the seven health regions were not statistically different than the provincial average.

Figure 36. Average number of males ≥20 years old hospitalized with cardiovascular disease per 1,000 population†, by diabetes status, and rate ratios, by health region, New Brunswick, 2003-04 to 2007-08



†Age-standardized to the 1991 Canadian population

Figure 37. Average number of females ≥20 years old hospitalized with cardiovascular disease per 1,000 population†, by diabetes status, and rate ratios, by health region, New Brunswick, 2003-04 to 2007-08



†Age-standardized to the 1991 Canadian population

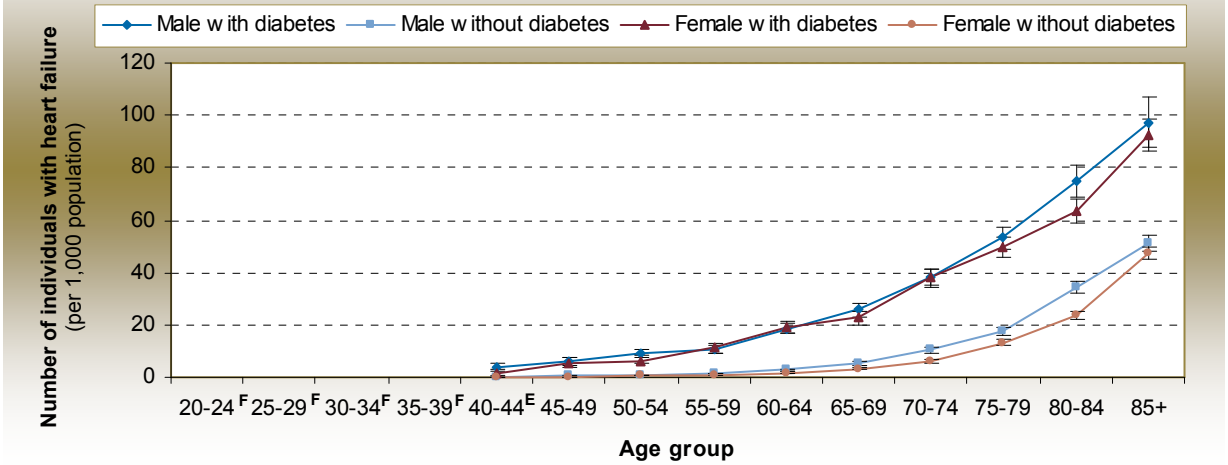
4.4 Heart failure

Heart failure is the condition in which a problem with the structure or function of the heart impairs its ability to supply sufficient blood flow to meet the body's needs. Common causes of heart failure include myocardial infarction and other forms of ischemic heart disease, hypertension, valvular heart disease and cardiomyopathy. It is a common, costly, disabling and deadly condition.

4.4.1 Proportion of individuals hospitalized with heart failure by diabetes status, age group and sex, 2003-04 to 2007-08

During the period 2003-04 to 2007-08, the average number of individuals hospitalized with heart failure per 1,000 population increased with age in both males and females and was statistically higher in individuals with diagnosed diabetes than those without diabetes. The proportion of males hospitalized with both diagnosed diabetes and heart failure was statistically higher than females in the 80-84 year age group and similar in the other age groups (Figure 38).

Figure 38. Average number of individuals ≥20 years old hospitalized with heart failure per 1,000 population, by diabetes status, age group and sex, New Brunswick, 2003-04 to 2007-08



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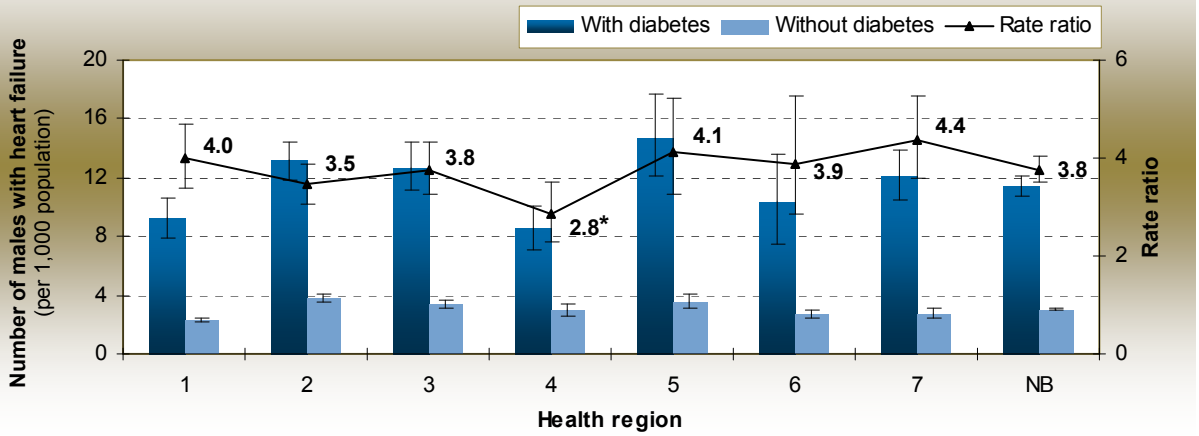
4.4.2 Proportion of individuals hospitalized with heart failure by diabetes status and health region, 2003-04 to 2007-08

During the same five-year period, after age standardization, the number of females hospitalized with both diagnosed diabetes and heart failure per 1,000 population was statistically higher in Health Region 2 and statistically lower in Health Region 4 compared to the provincial figure of 10.4 females

per 1,000 population. The proportion of males hospitalized with both diagnosed diabetes and heart failure was statistically lower in health regions 1 and 4 compared to the provincial average of 11.5 males per 1,000 population (see bar graphs in Figures 39 and 40).

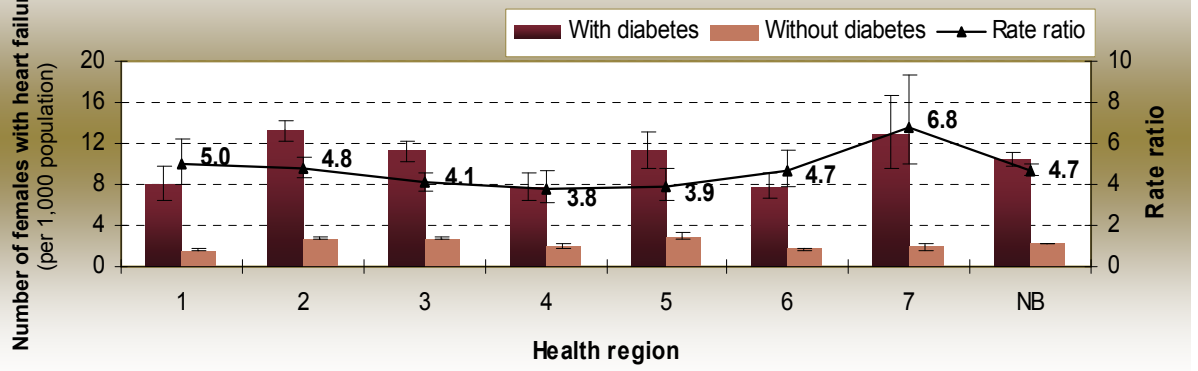
Male New Brunswickers with diagnosed diabetes were 3.8 times more likely to be hospitalized with heart failure than males without diabetes. Females with diagnosed diabetes were also (4.7 times) more likely to be hospitalized with heart failure than those without the disease. The rate ratio for males living in Health Region 4 was statistically lower than the provincial average.

Figure 39. Average number of males ≥20 years old hospitalized with heart failure per 1,000 population†, by diabetes status, and rate ratios, by health region, New Brunswick, 2003-04 to 2007-08



†Age-standardized to the 1991 Canadian population
*Regional rate ratio statistically different from provincial rate ratio at 95% confidence level

Figure 40. Average number of females ≥20 years old hospitalized with heart failure per 1,000 population†, by diabetes status, and rate ratios, by health region, New Brunswick, 2003-04 to 2007-08



†Age-standardized to the 1991 Canadian population

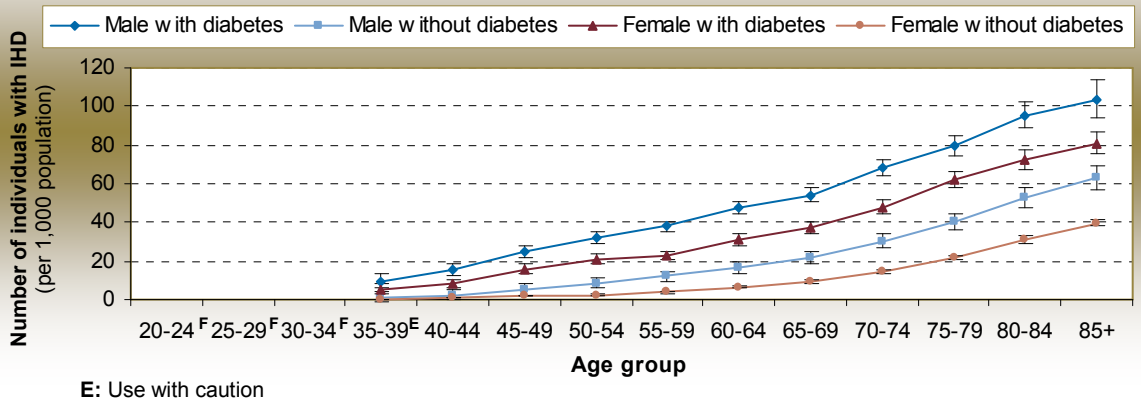
4.5 Ischemic heart disease

Diabetes is a major risk factor in the development of ischemic heart disease (IHD), a disease characterized by reduced blood supply to the heart muscle; it includes acute myocardial infarction.

4.5.1 Proportion of individuals hospitalized with ischemic heart disease by diabetes status, age group and sex, 2003-04 to 2007-08

During the period 2003-04 to 2007-08, the average number of New Brunswickers hospitalized with IHD per 1,000 population increased with age in both males and females and was statistically higher in individuals with diagnosed diabetes than those without diabetes in the 35-39 to 85+ year age groups. The proportion of males hospitalized with both diagnosed diabetes and IHD was statistically higher than females in the 40-44 to 85+ year age groups (Figure 41).

Figure 41. Average number of individuals ≥20 years old hospitalized with ischemic heart disease per 1,000 population, by diabetes status, age group and sex, New Brunswick, 2003-04 to 2007-08



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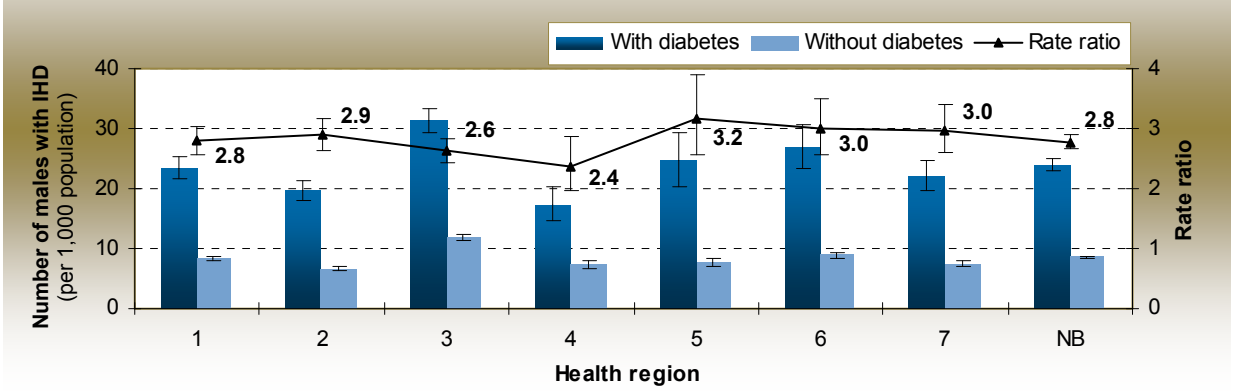
4.5.2 Proportion of individuals hospitalized with ischemic heart disease by diabetes status and health region, 2003-04 to 2007-08

During the same five-year period, after age standardization, the number of individuals hospitalized with both diagnosed diabetes and IHD per 1,000 population was statistically higher in Health Region 3 for both males and females compared to the provincial averages of 24.0 males and 16.2 females per 1,000 population. In both males and females, the proportion of individuals hospitalized with both diagnosed diabetes and IHD was statistically lower than the provincial average in health regions 2 and 4 (see bar graphs in Figures 42 and 43).

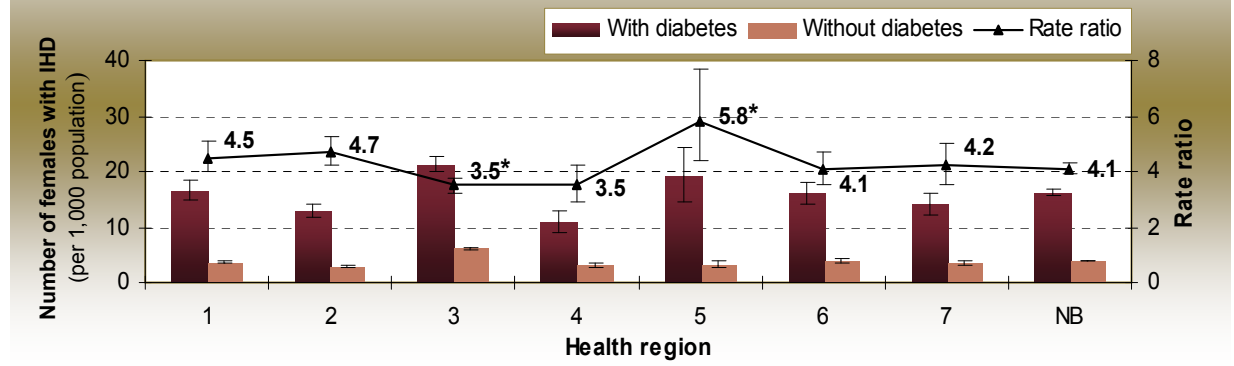
Male New Brunswickers with diagnosed diabetes were 2.8 times more likely to be hospitalized with IHD than males without diabetes. Females with diagnosed diabetes were also (4.1 times) more likely to be hospitalized with IHD than those without the disease. The rate ratio was statistically higher in females living in Heath Region 5 and statistically lower in females living in Health Region 3 compared to the provincial average.

Figure 42. Average number of males ≥20 years old hospitalized with ischemic heart disease per 1,000 population†, by diabetes status, and rate ratios, by health region, New Brunswick, 2003-04 to 2007-08



†Age-standardized to the 1991 Canadian population

Figure 43. Average number of females ≥20 years old hospitalized with ischemic heart disease per 1,000 population†, by diabetes status, and rate ratios, by health region, New Brunswick, 2003-04 to 2007-08



†Age-standardized to the 1991 Canadian population
*Regional rate ratio statistically different from provincial rate ratio at 95% confidence level

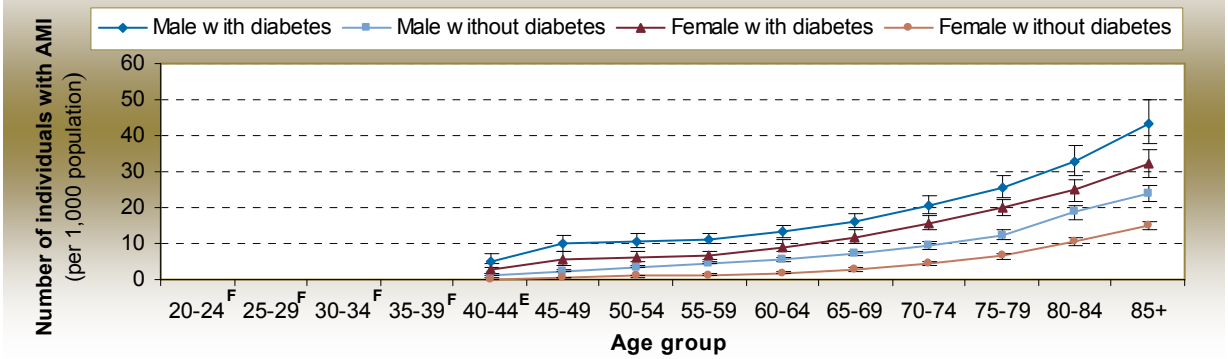
4.6 Acute myocardial infarction

Acute myocardial infarction (AMI), commonly known as heart attack, is the interruption of blood supply to part of the heart, causing some heart cells to die. Individuals with diabetes are at increased risk of having an AMI because of the high prevalence of coronary heart disease associated with diabetes.

4.6.1 Proportion of individuals hospitalized with acute myocardial infarction by diabetes status, age group and sex, 2003-04 to 2007-08

During the period 2003-04 to 2007-08, the average number of New Brunswickers hospitalized with AMI per 1,000 population increased with age in both males and females and was statistically higher in individuals with diagnosed diabetes than those without diabetes in the 40-44 to 85+ year age groups. The proportion of males hospitalized with both diagnosed diabetes and AMI was statistically higher than females in the 45-49 to 85+ year age groups (Figure 44).

Figure 44. Average number of individuals ≥20 years old hospitalized with acute myocardial infarction per 1,000 population, by diabetes status, age group and sex, New Brunswick, 2003-04 to 2007-08



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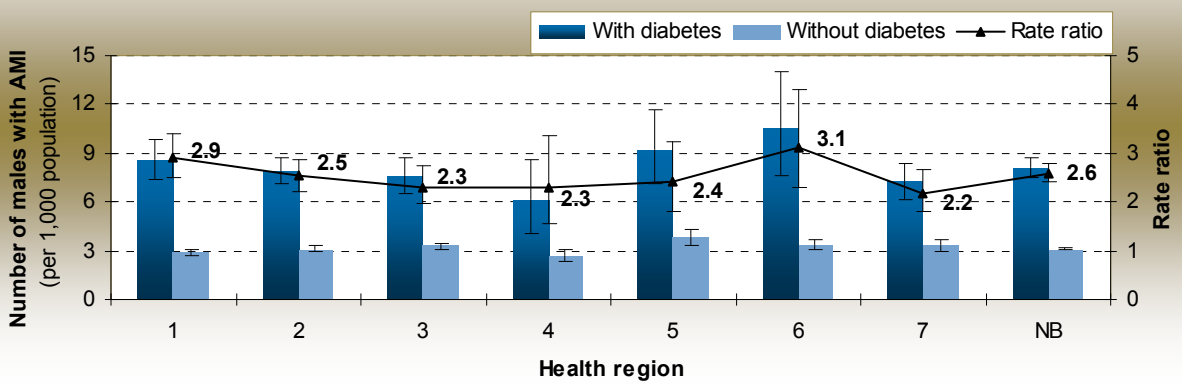
4.6.2 Proportion of individuals hospitalized with acute myocardial infarction by diabetes status and health region, 2003-04 to 2007-08

During the same five-year period, after age standardization, the number of females hospitalized with both diagnosed diabetes and AMI per 1,000 population was statistically lower in Health Region 4 than the provincial average of 5.3 females per 1,000 population. The proportion of males hospitalized with both diagnosed diabetes and AMI was not statistically different from the provincial average of 8.1 per 1,000 population in the seven health regions (see bar graphs in Figures 45 and 46).

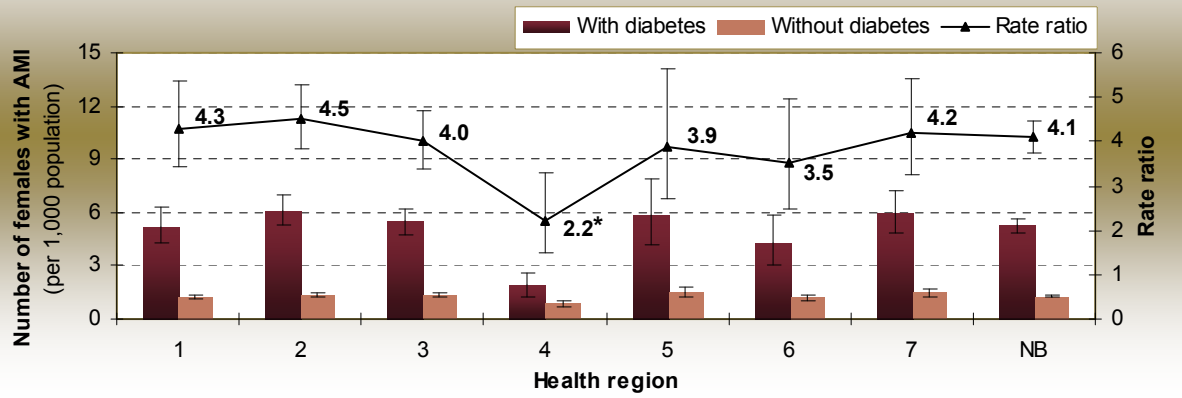
Male New Brunswickers with diagnosed diabetes were 2.6 times more likely to be hospitalized with AMI than males without diabetes. Females with diagnosed diabetes were also (4.1 times) more likely to be hospitalized with AMI than those without the disease. The rate ratio for females living in Heath Region 4 was statistically lower than the provincial average.

Figure 45. Average number of males ≥20 years old hospitalized with acute myocardial infarction per 1,000 population†, by diabetes status, and rate ratios, by health region, New Brunswick, 2003-04 to 2007-08



†Age-standardized to the 1991 Canadian population

Figure 46. Average number of females ≥20 years old hospitalized with acute myocardial infarction per 1,000 population†, by diabetes status, and rate ratios, by health region, New Brunswick, 2003-04 to 2007-08



†Age-standardized to the 1991 Canadian population
*Regional rate ratio statistically different from provincial rate ratio at 95% confidence level

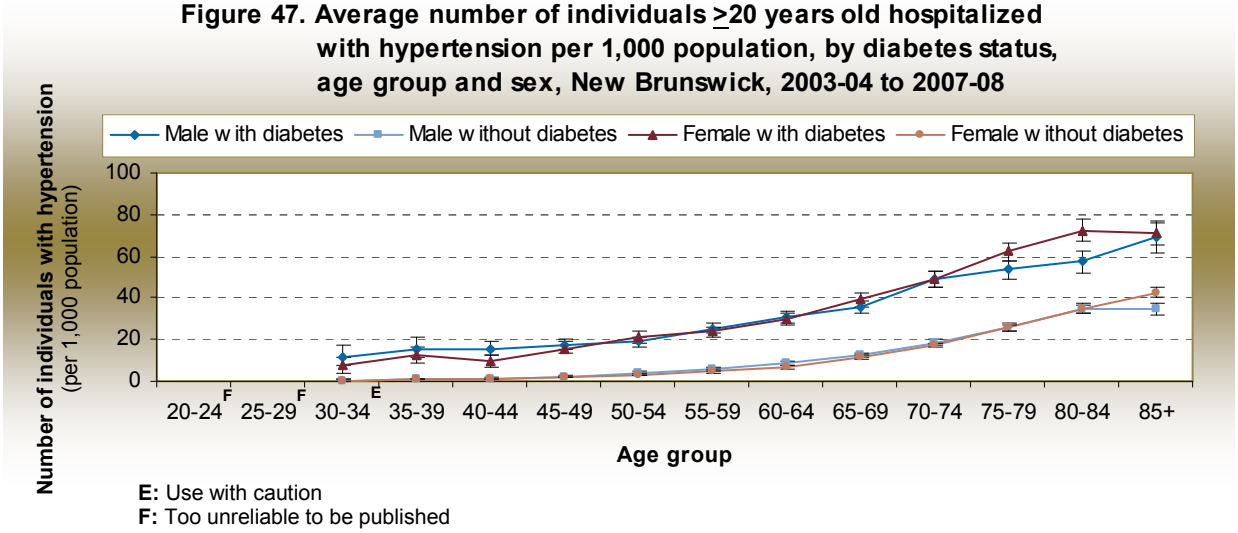
4.7 Hypertension

Hypertension is a chronic medical condition in which the blood pressure is elevated. It is also referred to as high blood pressure. Hypertension is an important risk factor for the development and worsening of many complications of diabetes, including diabetic eye disease and kidney disease. Having diabetes increases a person's risk of developing high blood pressure and other cardiovascular problems because diabetes adversely affects the arteries, predisposing them to atherosclerosis (hardening of the arteries). Atherosclerosis can cause hypertension which, if not treated, can lead to blood vessel damage, stroke, heart failure, heart attack or kidney failure.

4.7.1 Proportion of individuals hospitalized with hypertension by diabetes status, age group and sex, 2003-04 to 2007-08

During the period 2003-04 to 2007-08, the average number of New Brunswickers hospitalized with hypertension per 1,000 population increased with age and was statistically higher in individuals with diagnosed diabetes than those without diabetes. The proportion of individuals hospitalized with both diagnosed diabetes and hypertension was statistically higher in females than males in the 75-79 and 80-84 year age groups and statistically lower in females than males in the 40-44 age group (Figure 47).

Figure 47. Average number of individuals ≥20 years old hospitalized with hypertension per 1,000 population, by diabetes status, age group and sex, New Brunswick, 2003-04 to 2007-08



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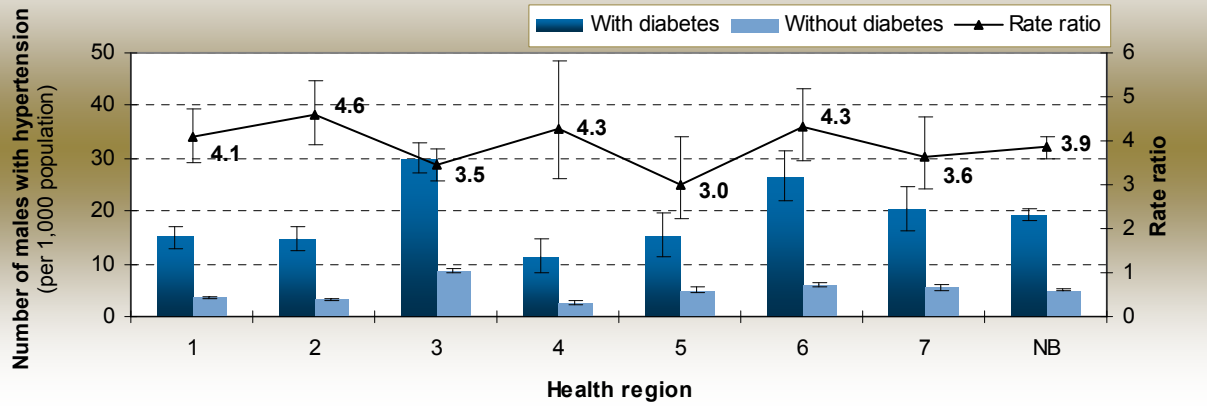
4.7.2 Proportion of individuals hospitalized with hypertension by diabetes status and health region, 2003-04 to 2007-08

During the same five-year period, after age standardization, the number of individuals hospitalized with both diagnosed diabetes and hypertension per 1,000 population was statistically higher in health regions 3 and 6 for both

males and females compared to the provincial averages of 19.5 males and 18.2 females per 1,000 population. The proportion of individuals hospitalized with both diagnosed diabetes and hypertension was statistically lower than the provincial average in health regions 1, 2 and 4 for males and in health regions 1, 2, 4 and 5 for females (see bar graphs in Figures 48 and 49).

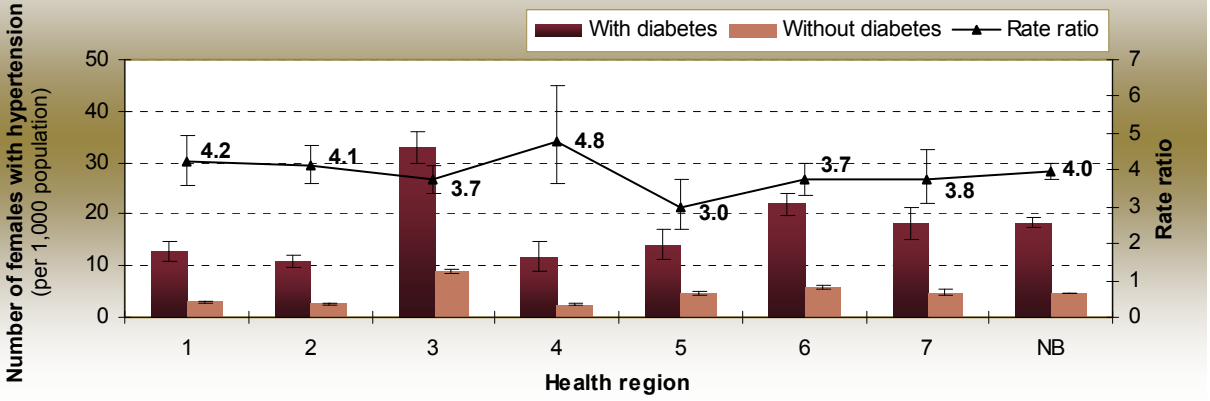
Male New Brunswickers with diagnosed diabetes were 3.9 times more likely to be hospitalized with hypertension than males without diabetes. Females with diagnosed diabetes were also (4.0 times) more likely to be hospitalized with hypertension than those without the disease. In both sexes, rate ratios in the seven health regions were not statistically different than the provincial average.

Figure 48. Average number of males ≥20 years old hospitalized with hypertension per 1,000 population†, by diabetes status, and rate ratios, by health region, New Brunswick, 2003-04 to 2007-08



†Age-standardized to the 1991 Canadian population

Figure 49. Average number of females ≥20 years old hospitalized with hypertension per 1,000 population†, by diabetes status, and rate ratios, by health region, New Brunswick, 2003-04 to 2007-08



†Age-standardized to the 1991 Canadian population

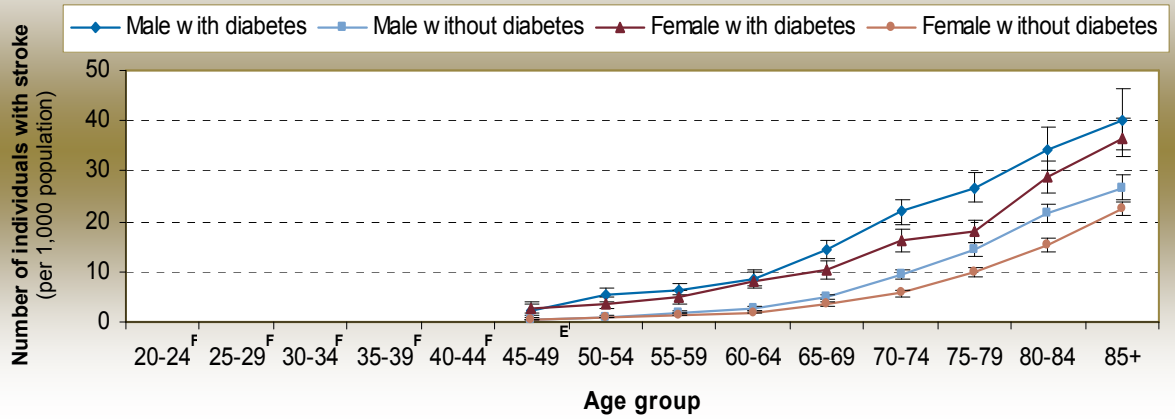
4.8 Stroke

A stroke, also known as cerebrovascular accident, is the rapidly developing loss of brain functions due to disturbance in the blood supply to the brain. This can be due to ischemia (lack of blood flow) caused by thrombosis or arterial embolism or due to a hemorrhage. As a result, the affected area of the brain is unable to function, leading to inability to move one or more limbs on one side of the body, inability to understand or formulate speech, or inability to see one side of the visual field.

4.8.1 Proportion of individuals hospitalized with stroke by diabetes status, age group and sex, 2003-04 to 2007-08

During the period 2003-04 to 2007-08, the average number of New Brunswickers hospitalized with a stroke per 1,000 population increased with age in both males and females and was statistically higher in individuals with diagnosed diabetes than those without diabetes in the 45-49 to 85+ year age groups. The proportion of males hospitalized with both diagnosed diabetes and stroke was statistically higher than females in the 65-69 to 75-79 year age groups (Figure 50).

Figure 50. Average number of individuals ≥20 years old hospitalized with stroke per 1,000 population, by diabetes status, age group and sex, New Brunswick, 2003-04 to 2007-08



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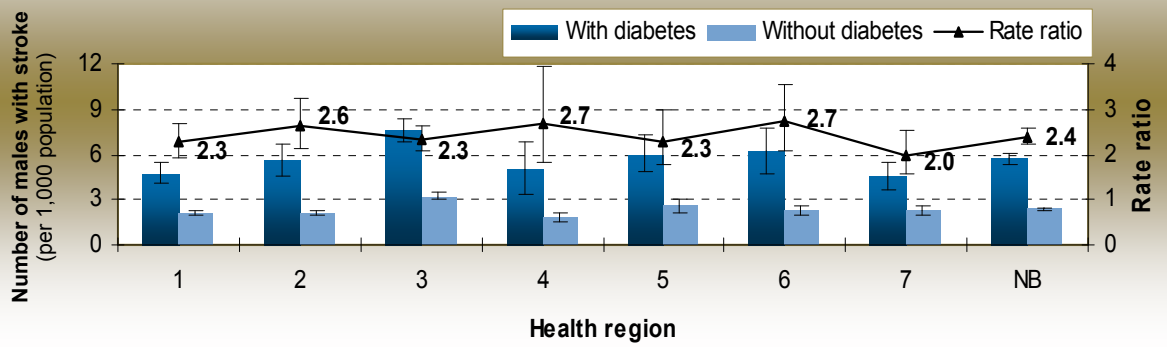
4.8.2 Proportion of individuals hospitalized with stroke by diabetes status and health region, 2003-04 to 2007-08

During the same five-year period, after age standardization, the number of individuals hospitalized with both diagnosed diabetes and stroke per 1,000 population was statistically higher for males and females in Health Region 3 compared to the provincial averages of 5.7 males and 4.6 females per 1,000 population (see bar graphs in Figures 51 and 52).

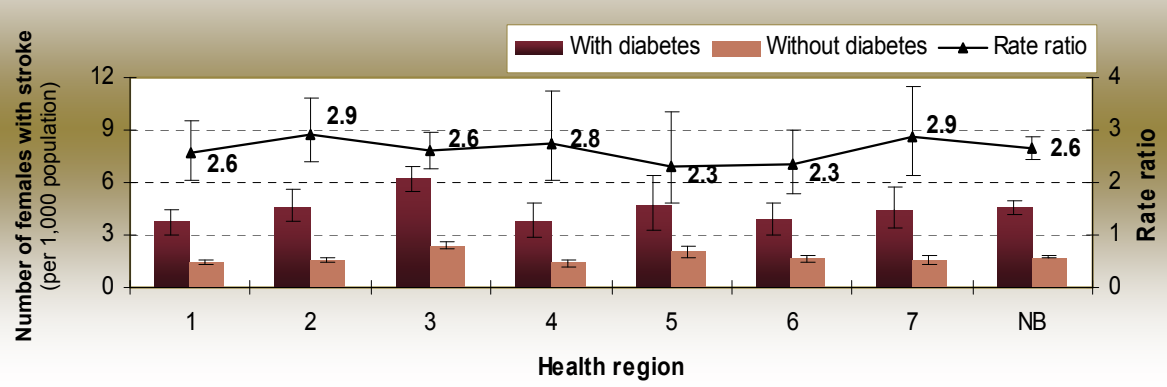
Male New Brunswickers with diagnosed diabetes were 2.4 times more likely to be hospitalized with a stroke than males without diabetes. Females with diagnosed diabetes were also (2.6 times) more likely to be hospitalized with a stroke than those without the disease. In both sexes, rate ratios in the seven health regions were not statistically different than the provincial average.

Figure 51. Average number of males ≥20 years old hospitalized with stroke per 1,000 population†, by diabetes status, and rate ratios, by health region, New Brunswick, 2003-04 to 2007-08



†Age-standardized to the 1991 Canadian population

Figure 52. Average number of females ≥20 years old hospitalized with stroke per 1,000 population†, by diabetes status, and rate ratios, by health region, New Brunswick, 2003-04 to 2007-08



†Age-standardized to the 1991 Canadian population

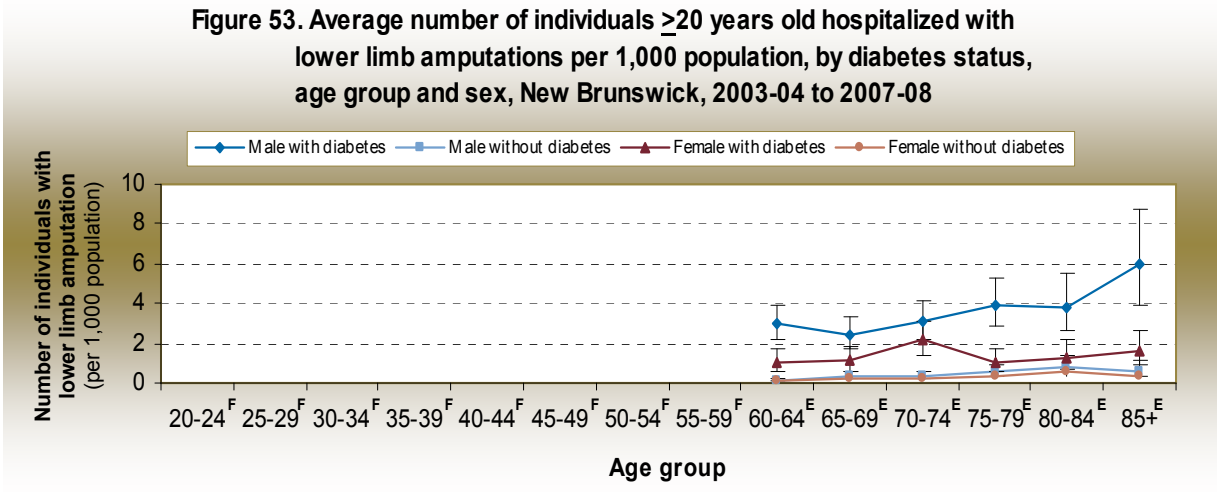
4.9 Lower limb amputation

Amputation is one of the most devastating consequences of poorly controlled diabetes. Foot or leg amputation caused by diabetes often begins with a seemingly minor injury. For example, a person with diabetes often has nerve damage that reduces sensation. This impairment makes it harder to notice and treat minor injuries such as blisters and skin cracks. Infection can enter these wounds and spread. Poor circulation from peripheral arterial disease and high blood glucose limit the body's ability to fight the infection. Infection can worsen and kill skin, muscle and even bone tissues (gangrene). By that point, amputation may be the only way to stop the infection and keep gangrene from spreading.

4.9.1 Proportion of individuals hospitalized with lower limb amputations by diabetes status, age group and sex, 2003-04 to 2007-08

During the period 2003-04 to 2007-08, the average number of New Brunswickers hospitalized with lower limb amputations per 1,000 population was statistically higher in individuals with diagnosed diabetes than those without diabetes in the 60-64 to 85+ year age groups. The proportion of males with diagnosed diabetes hospitalized with lower limb amputations was statistically higher than females in the 60-64 and 75-79 to 85+ year age groups (Figure 53).

Figure 53. Average number of individuals ≥20 years old hospitalized with lower limb amputations per 1,000 population, by diabetes status, age group and sex, New Brunswick, 2003-04 to 2007-08



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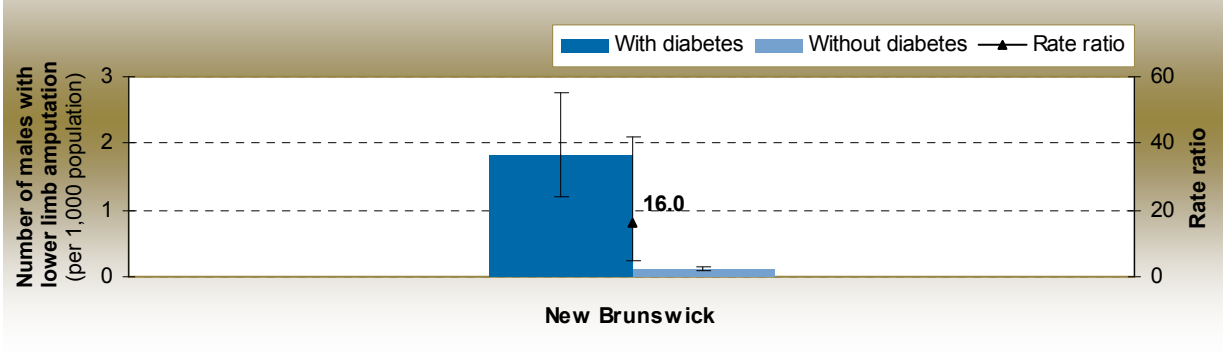
4.9.2 Proportion of individuals hospitalized with lower limb amputations by diabetes status, 2003-04 to 2007-08

During the same five-year period, after age standardization, the number of New Brunswickers with diagnosed diabetes hospitalized with lower limb amputations was 1.8 per 1,000 population for males and 0.9 per 1,000 population for females (see bar graphs in Figures 54 and 55).

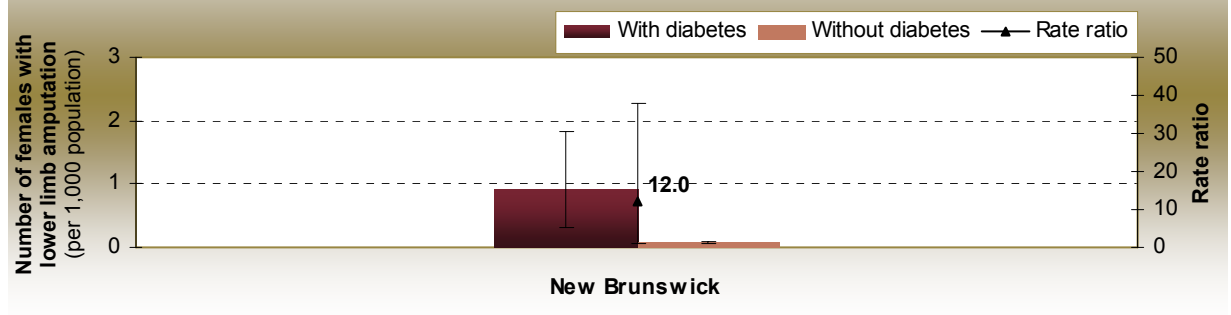
Male New Brunswickers with diagnosed diabetes were 16.0 times more likely to be hospitalized with lower limb amputations than males without diabetes. Females with diagnosed diabetes were also (12.0 times) more likely to be hospitalized with lower limb amputations than those without the disease.

Figure 54. Average number of males ≥20 years old hospitalized with lower limb amputations per 1,000 population†, by diabetes status, and rate ratio, New Brunswick*, 2003-04 to 2007-08



†Age-standardized to the 1991 Canadian population
* Regional level information too unreliable to be published

Figure 55. Average number of females ≥20 years old hospitalized with lower limb amputations per 1,000 population†, by diabetes status, and rate ratio, New Brunswick*, 2003-04 to 2007-08



†Age-standardized to the 1991 Canadian population
* Regional level information too unreliable to be published

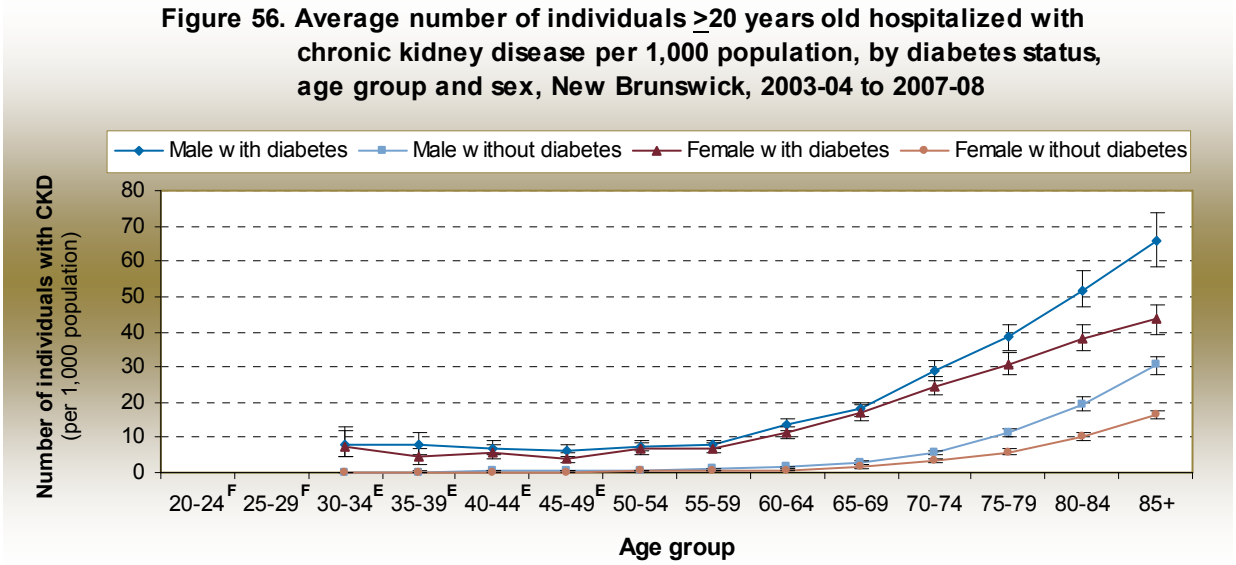
4.10 Chronic kidney disease

Chronic kidney disease (CKD), also known as chronic renal disease, is a progressive loss of renal function over a period of months or years. CKD in individuals with diabetes takes many years to develop. Over several years, people developing CKD will have small amounts of the blood protein albumin begin to leak into their urine. The kidney's filtration function usually remains normal during this period. As the disease progresses, more albumin leaks into the urine. As the amount of albumin in the urine increases, the kidneys' filtering function usually begins to drop. The body retains various wastes as filtration falls. As kidney damage develops, blood pressure often rises as well.

4.10.1 Proportion of individuals hospitalized with chronic kidney disease by diabetes status, age group and sex, 2003-04 to 2007-08

During the period 2003-04 to 2007-08, the number of individuals hospitalized with CKD per 1,000 population was relatively stable in the 30-34 to 55-59 year age groups and increased with age thereafter, especially in the older age groups. In both males and females, the proportion of New Brunswickers hospitalized with CKD was statistically higher in individuals with diagnosed diabetes than those without diabetes in the 30-34 to 85+ year age groups. The proportion of males hospitalized with both diagnosed diabetes and CKD was statistically higher than females in the 75-79 to 85+ year age groups (Figure 56).

Figure 56. Average number of individuals ≥20 years old hospitalized with chronic kidney disease per 1,000 population, by diabetes status, age group and sex, New Brunswick, 2003-04 to 2007-08



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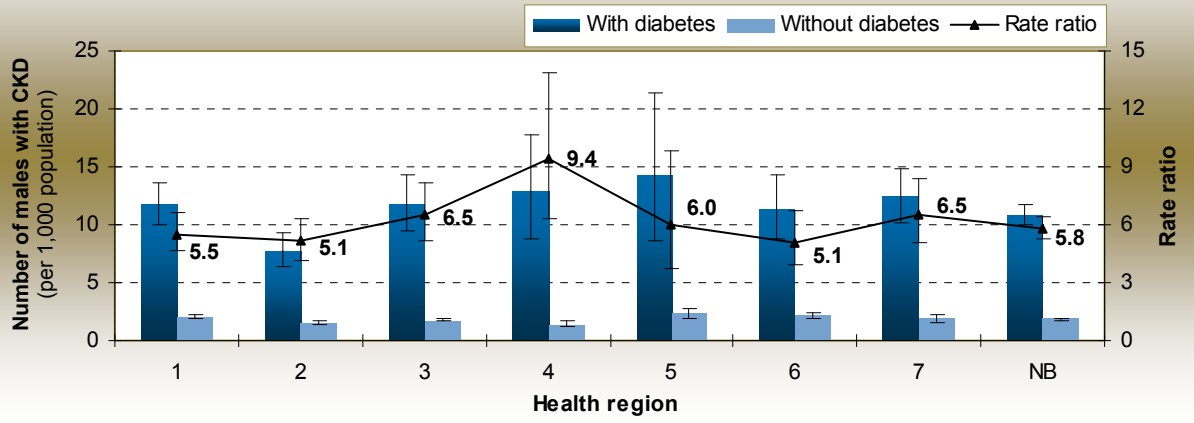
4.10.2 Proportion of individuals hospitalized with chronic kidney disease by diabetes status and health region, 2003-04 to 2007-08

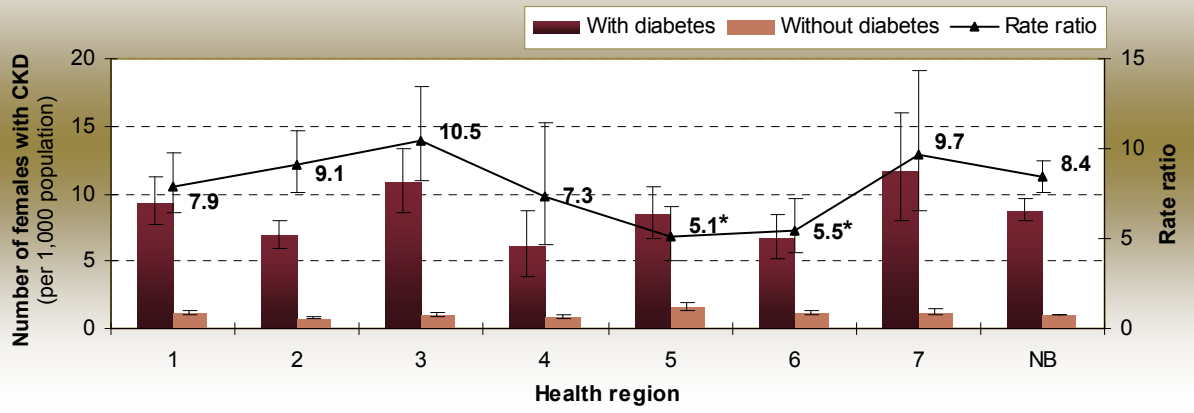
During the same five-year period, after age standardization, the number of individuals hospitalized with both diagnosed diabetes and CKD per 1,000 population was statistically lower for males in Health Region 2 compared to the provincial average of 10.9 males per 1,000 population. The proportion of females hospitalized with both diagnosed diabetes and CKD was not statistically different in the seven health regions compared to the provincial average of 8.8 females per 1,000 population (see bar graphs in Figures 57 and 58).

Figure 57. Average number of males ≥20 years old hospitalized with chronic kidney disease per 1,000 population†, by diabetes status, and rate ratios, by health region, New Brunswick, 2003-04 to 2007-08



†Age-standardized to the 1991 Canadian population

Figure 58. Average number of females ≥20 years old hospitalized with chronic kidney disease per 1,000 population†, by diabetes status, and rate ratios, by health region, New Brunswick, 2003-04 to 2007-08



†Age-standardized to the 1991 Canadian population
*Regional rate ratio statistically different from provincial rate ratio at 95% confidence level

Male New Brunswickers with diagnosed diabetes were 5.8 times more likely to be hospitalized with CKD than males without diabetes. Females with diagnosed diabetes were also (8.4 times) more likely to be hospitalized with CKD than those without the disease. Rate ratios for females in health regions 5 and 6 were statistically lower than the provincial average.

Please note that differences in proportions and rate ratios between health regions should be interpreted with caution because of the small numbers involved.

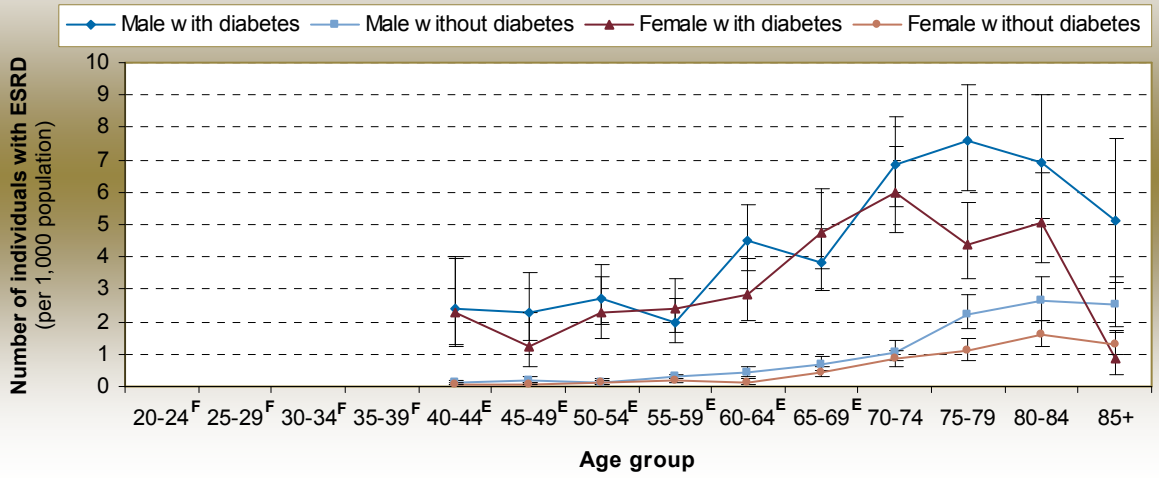
4.10.3 End-stage renal disease

End-stage renal disease (ESRD) is the last stage (Stage 5) of CKD. This means kidneys are only functioning at 10% to 15% of their normal capacity. When kidney function is this low, they cannot effectively remove waste or excess fluid from blood. Kidneys are also responsible for other functions that support the body, such as balancing electrolytes and producing certain hormones. When CKD develops into ESRD, dialysis or a kidney transplant is necessary to stay alive. The predominant cause of ESRD in Canada is diabetes.[18]

4.10.3.1 Proportion of individuals hospitalized with end-stage renal disease by diabetes status, age group and sex, 2003-04 to 2007-08

During the period 2003-04 to 2007-08, the number of New Brunswickers hospitalized with ESRD per 1,000 population was statistically higher in individuals with diagnosed diabetes than those without diabetes in the 40-44 to 80-84 year age groups. The proportion of males hospitalized with both diagnosed diabetes and ESRD was statistically higher than females in the 75-79 and 85+ year age groups (Figure 59).

Figure 59. Average number of individuals ≥20 years old hospitalized with end-stage renal disease per 1,000 population, by diabetes status, age group and sex, New Brunswick, 2003-04 to 2007-08



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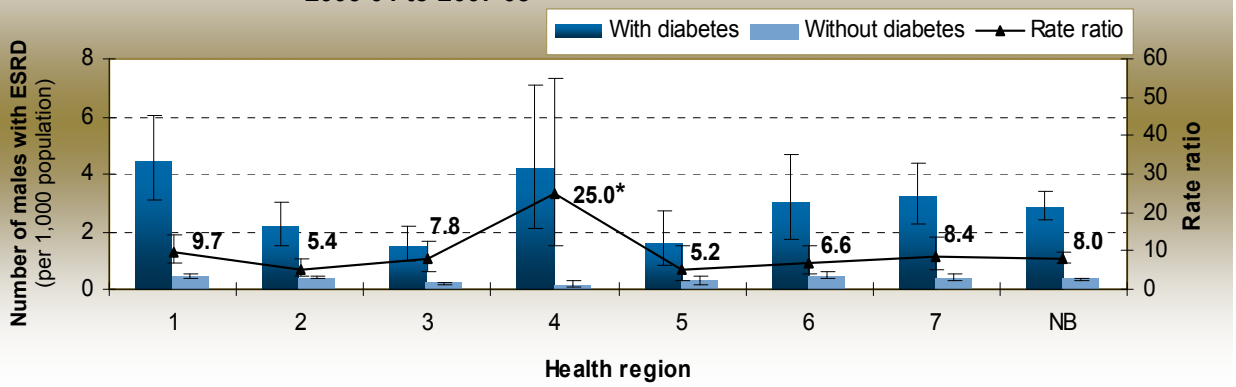
4.10.3.2 Proportion of individuals hospitalized with end-stage renal disease by diabetes status and health region, 2003-04 to 2007-08

During the period 2003-04 to 2007-08, after age standardization, the number of individuals hospitalized with both diagnosed diabetes and ESRD per 1,000 population was statistically lower for males in Health Region 3 and statistically insignificant for females in the seven health regions compared to the provincial averages of 2.9 males and 2.4 females per 1,000 population (see bar graphs in Figures 60 and 61).

Male New Brunswickers with diagnosed diabetes were 8.0 times more likely to be hospitalized with ESRD than males without diabetes. Females with diagnosed diabetes were also (11.9 times) more likely to be hospitalized with ESRD than those without the disease. The rate ratio for males in Health Region 4 was statistically higher than the provincial average.

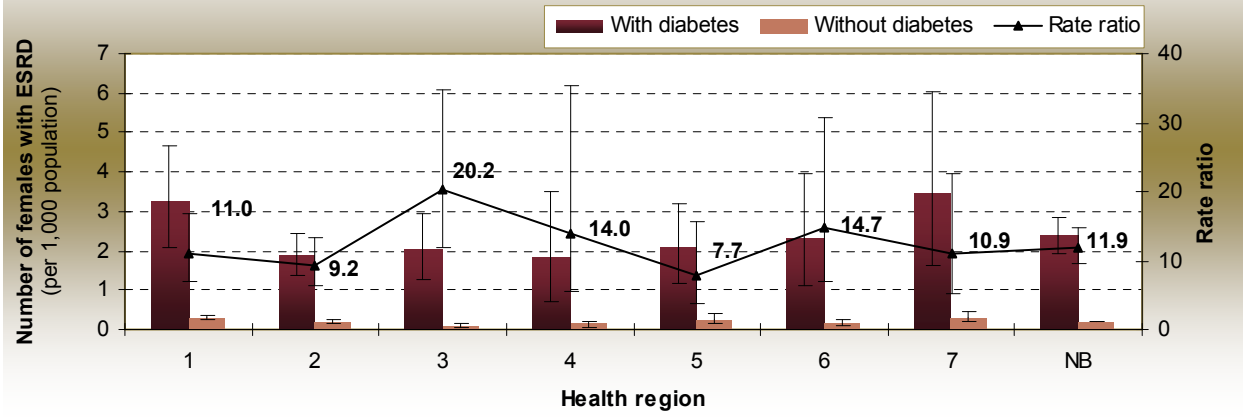
Please note that differences in proportions and rate ratios between health regions should be interpreted with caution because of the small numbers involved.

Figure 60. Average number of males ≥20 years old hospitalized with end-stage renal disease per 1,000 population†, by diabetes status, and rate ratios, by health region, New Brunswick, 2003-04 to 2007-08



†Age-standardized to the 1991 Canadian population
*Regional rate ratio statistically different from provincial rate ratio at 95% confidence level

Figure 61. Average number of females ≥20 years old hospitalized with end-stage renal disease per 1,000 population†, by diabetes status, and rate ratios, by health region, New Brunswick, 2003-04 to 2007-08



†Age-standardized to the 1991 Canadian population

SECTION 5. GESTATIONAL DIABETES

KEY FINDINGS

- Gestational diabetes occurred in 3.6% to 4.2% of pregnancies.
- The age-standardized incidence rate of type 2 diabetes in females who were previously diagnosed with gestational diabetes (12.4 cases per 1,000 population) was statistically higher than in females in the general population (5.4 cases per 1,000 population).
- About 1 in 9 females between 20 and 39 years old when first diagnosed with gestational diabetes developed type 2 diabetes within five years and 1 in 5 developed diabetes within nine years.

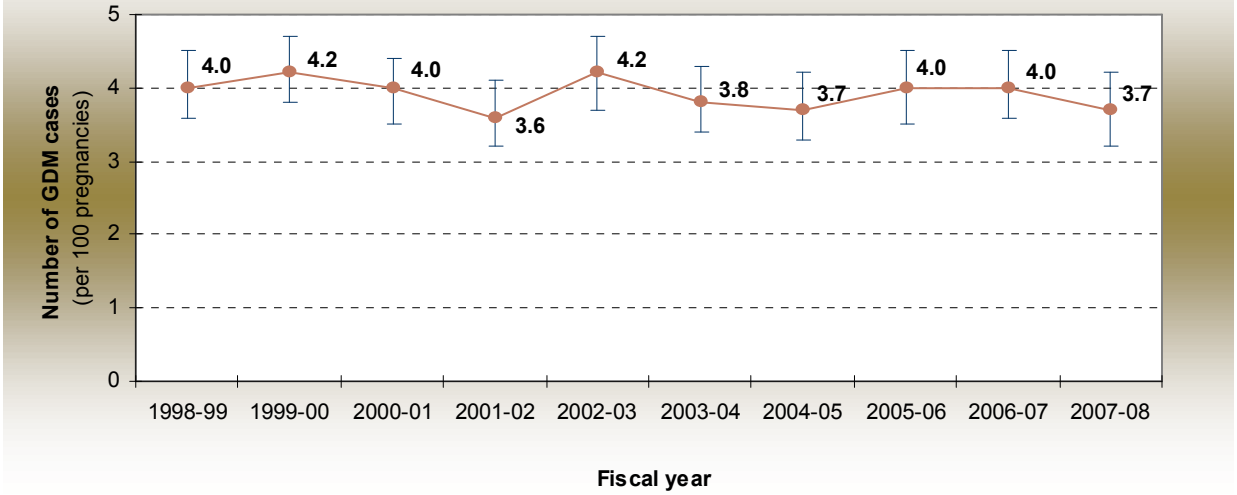
BACKGROUND

Gestational diabetes mellitus (GDM) is the most common medical complication and metabolic disorder in pregnancy.[19] It is a condition in which women without previously diagnosed diabetes exhibit high blood glucose levels during pregnancy. In Canada, 3.5% to 3.8% of pregnancies with birth outcomes are complicated by GDM which generally resolves once the baby is born.[19] GDM is characterized by a relative insufficient level of insulin to meet the increased insulin demands of pregnancy, as well as a reduction in insulin sensitivity (by approximately 50% to 70%).[20] GDM usually presents in the third trimester as the placenta matures. The placenta is a rich source of steroids, lipid-derived molecules, peptides and hormones, which contribute to insulin resistance. This insulin resistance usually recedes after the placenta is delivered. Women with GDM are at increased risk of developing type 2 diabetes after pregnancy[19], while their offspring are prone to developing childhood obesity, with type 2 diabetes later in life.[21,22] This section describes the incidence of GDM in New Brunswick and the likelihood of developing type 2 diabetes later in life among those previously diagnosed with GDM.

5.1 Gestational diabetes rates by fiscal year, 1998-99 to 2007-08

During the period 1998-99 to 2007-08, GDM rates varied between 3.6 and 4.2 cases per 100 pregnancies (Figure 62).

Figure 62. Gestational diabetes rates per 100 pregnancies, by fiscal year, New Brunswick, 1998-99 to 2007-08

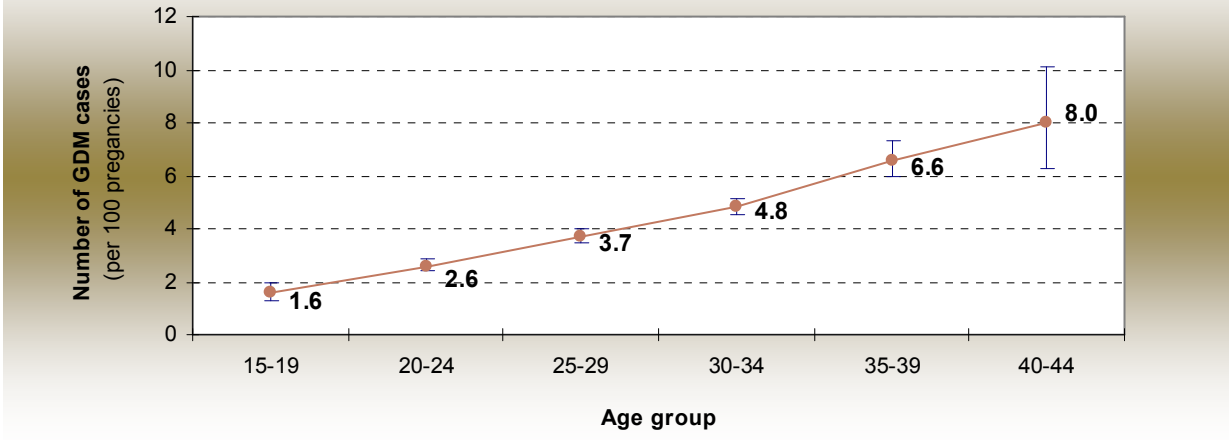


Note: *Calculation of pregnancies involved the compilation of registered live births and stillbirths (with at least 20 weeks gestation) that occurred inside the province among NB female residents.*

5.2 Age-specific rates of gestational diabetes, 1998-99 to 2007-08

During the period 1998-99 to 2007-08, the GDM rate increased with age at an average of about one percentage point per age group from the 15-19 to 30-34 year age groups, and then at an average of about two percentage points from the 30-34 to 35-39 year age groups (Figure 63). In the 40-44 year age group, the number of pregnancies was small compared to the other age groups so the difference in rates between this age group and the 35-39 year age group was statistically insignificant. The number of GDM cases in females younger than 15 and those older than 44 was too small to be reported during the 10-year period.

Figure 63. Age-specific rates of gestational diabetes per 100 pregnancies, New Brunswick, 1998-99 to 2007-08



5.3 Age-standardized incidence rates of diabetes in females previously diagnosed with gestational diabetes, 2003-04 to 2007-08

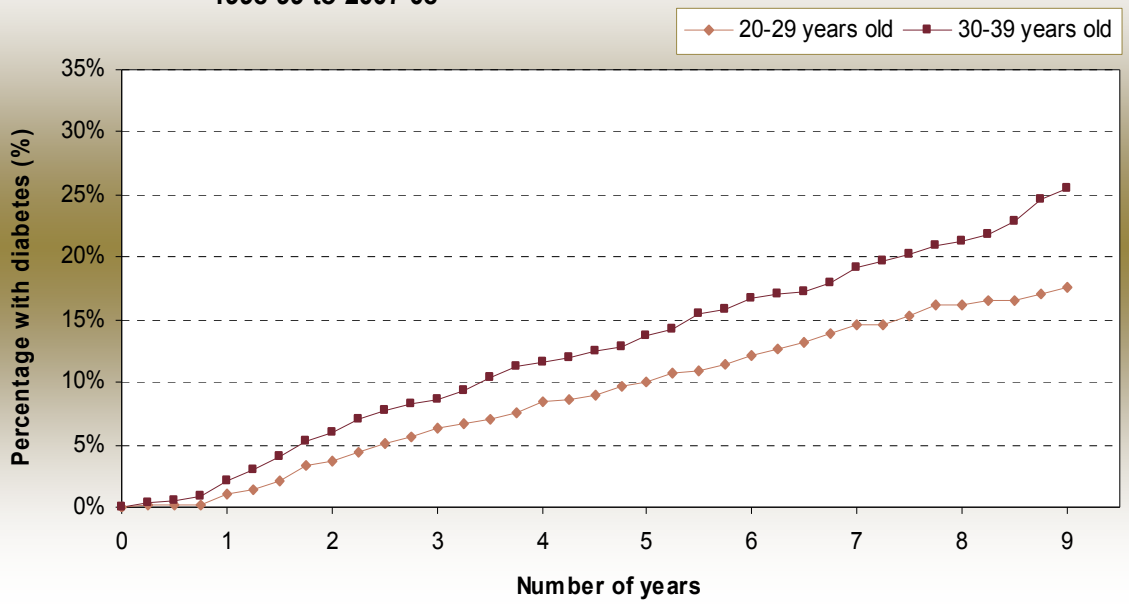
During the period 2003-04 to 2007-08, the age-standardized incidence rate of type 2 diabetes in females who were previously diagnosed with GDM (12.4 cases per 1,000 population, 95% CI: 8.2-17.6) was statistically higher than in females in the general population (5.4 cases per 1,000 population, 95% CI: 5.3-5.5).

5.4 Percentage of females with gestational diabetes who developed diabetes within nine years, by age group, 1998-99 to 2007-08

During the period 1998-99 to 2007-08, 10% of females in the 20-29 year age group and 14% of females in the 30-39 year age group when first diagnosed with GDM developed type 2 diabetes within five years. Nine years after being diagnosed with GDM, a total of 21% (18% in the 20-29 year age group and 25% in the 30-39 year age group) had developed diabetes (Figure 64).

Females in the 20-29 and 30-39 year age groups who were diagnosed with GDM had a different probability of developing type 2 diabetes within the nine-year period and this difference became more apparent over time (p-value of log-rank test: <0.01). Females younger than 20 years and those older than 39 were excluded in the analysis because of the small number of GDM cases involved.

Figure 64. Percentage of females with gestational diabetes who developed type 2 diabetes within nine years, by age group, New Brunswick, 1998-99 to 2007-08



SECTION 6. DIABETES IN CHILDREN AND ADOLESCENTS

KEY FINDINGS

- In 2007-08, about 620 New Brunswick children and adolescents were living with diagnosed diabetes, a 12% increase from 2002-03.
- The prevalence of diagnosed diabetes in New Brunswick's children and adolescents is on the rise.
- On average, 78 new cases of diabetes were diagnosed each year among New Brunswickers aged 1 to 19 years.

BACKGROUND

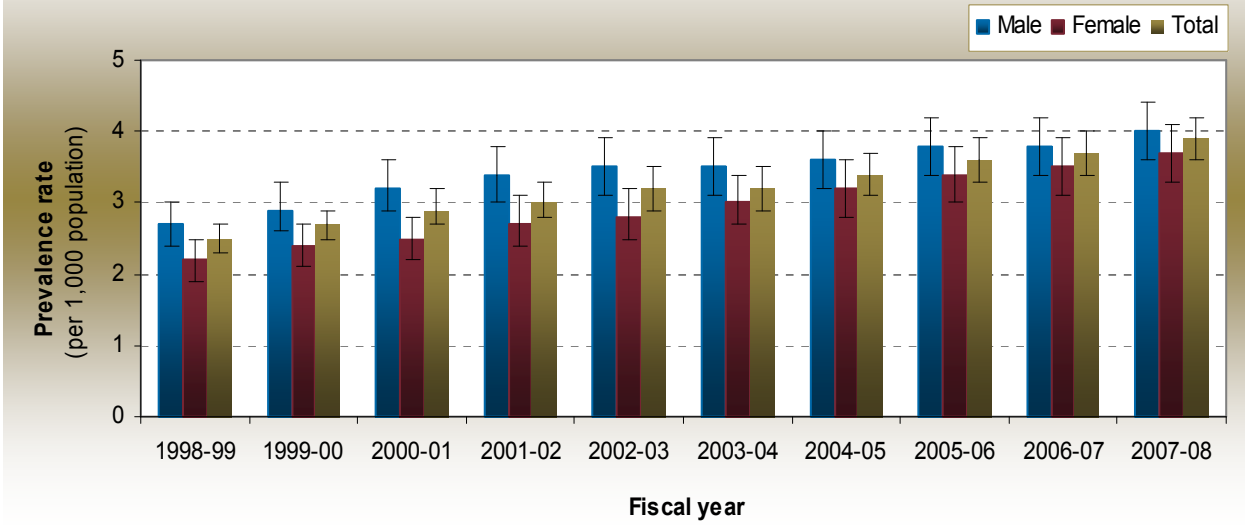
Diabetes is the most common endocrine disease and one of the most common chronic conditions in children. Worldwide, the prevalence and incidence of diabetes in children and adolescents are on the rise, and this is partly due to the increase in prevalence of childhood overweight and obesity.[23] As shown in Section 2.3.3, children diagnosed with diabetes at an early age have a reduced life expectancy. This section focuses on the prevalence and incidence of diabetes in New Brunswick's children and adolescents aged 1 to 19 years. It does not differentiate between type 1 and type 2 diabetes because the data source - health insurance claims database - does not make distinction between different types of diabetes.

6.1 Prevalence

6.1.1 Prevalence rates of diagnosed diabetes by sex and fiscal year, 1998-99 to 2007-08

In 2007-08, about 620 New Brunswickers aged 1 to 19 years were living with diagnosed diabetes, a 12% increase from 2002-03 (see Appendix 6). During the period 1998-99 to 2007-08, the prevalence rate of diagnosed diabetes increased over time. Rates increased from 2.7 to 4.0 cases per 1,000 population and from 2.2 to 3.7 cases per 1,000 population in males and females, respectively (Figure 65). During the 10-year period, prevalence rates in males were consistently higher than in females. However, rate differences were not statistically significant.

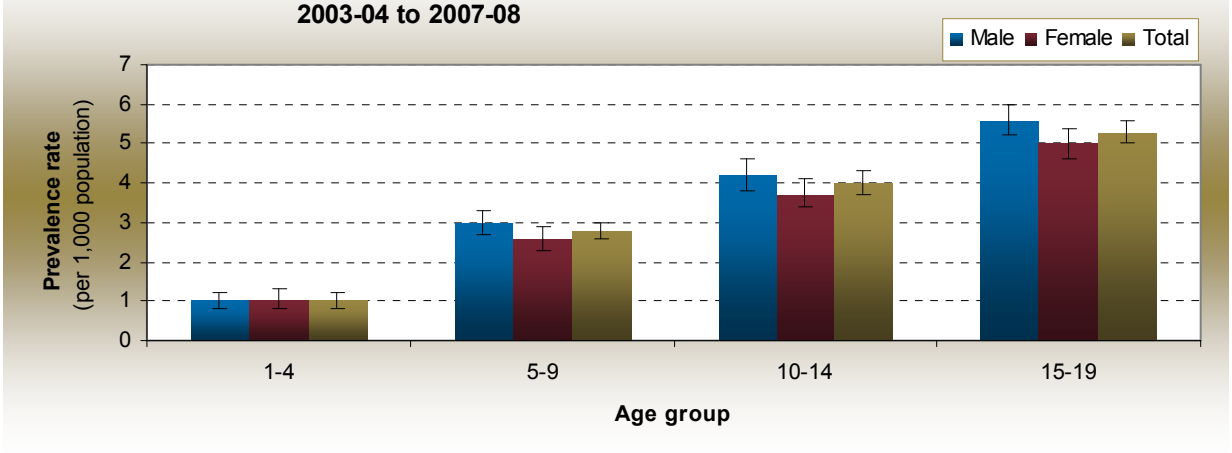
Figure 65. Prevalence rates (per 1,000 population) of diagnosed diabetes in individuals 1-19 years old, by sex and fiscal year, New Brunswick, 1998-99 to 2007-08



6.1.2 Age-specific prevalence rates of diagnosed diabetes by sex, 2003-04 to 2007-08

During the period 2003-04 to 2007-08, prevalence rates of diagnosed diabetes increased with age (Figure 66). In both males and females, the highest age-specific prevalence rate was in the 15-19 year age group. Prevalence rates in each age group were not statistically different between sexes.

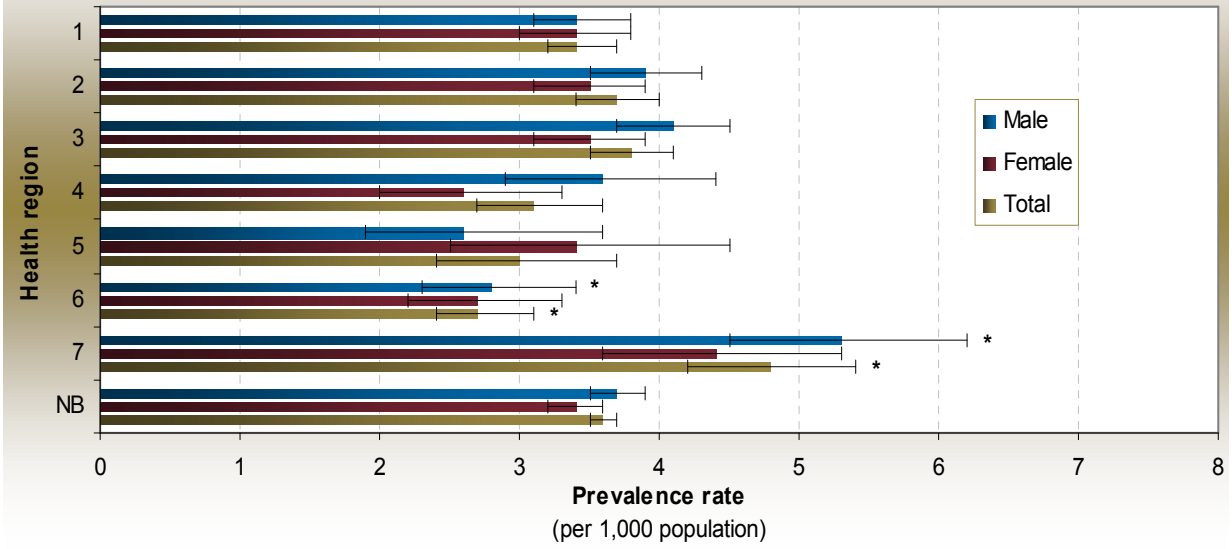
Figure 66. Age-specific prevalence rates (per 1,000 population) of diagnosed diabetes in individuals 1-19 years old, by sex, New Brunswick, 2003-04 to 2007-08



6.1.3 Prevalence rates of diagnosed diabetes by sex and health region, 2003-04 to 2007-08

During the same five-year period, the prevalence rate of diagnosed diabetes in New Brunswickers aged 1 to 19 years was 3.7 per 1,000 population for males and 3.4 per 1,000 population for females. Prevalence rates were statistically higher for males living in Health Region 7 and statistically lower for males living in Health Region 6 compared to the province (Figure 67).

Figure 67. Prevalence rates (per 1,000 population) of diagnosed diabetes in individuals 1-19 years old, by sex and health region, New Brunswick, 2003-04 to 2007-08



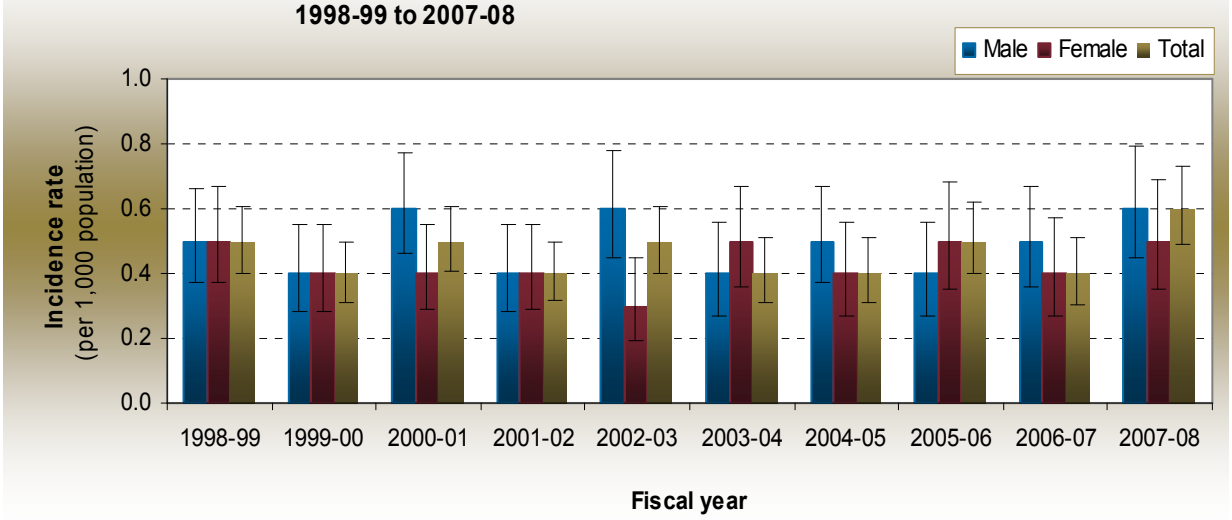
*Regional rate statistically different from provincial rate at 95% confidence level

6.2 Incidence

6.2.1 Incidence rates of diagnosed diabetes by sex and fiscal year, 1998-99 to 2007-08

During the period 1998-99 to 2007-08, an average of 78 New Brunswickers aged 1 to 19 years were diagnosed with diabetes each year (see Appendix 6). Incidence rates of diagnosed diabetes ranged from 0.4 to 0.6 cases per 1,000 population for males and 0.3 to 0.5 cases per 1,000 population for females (Figure 68).

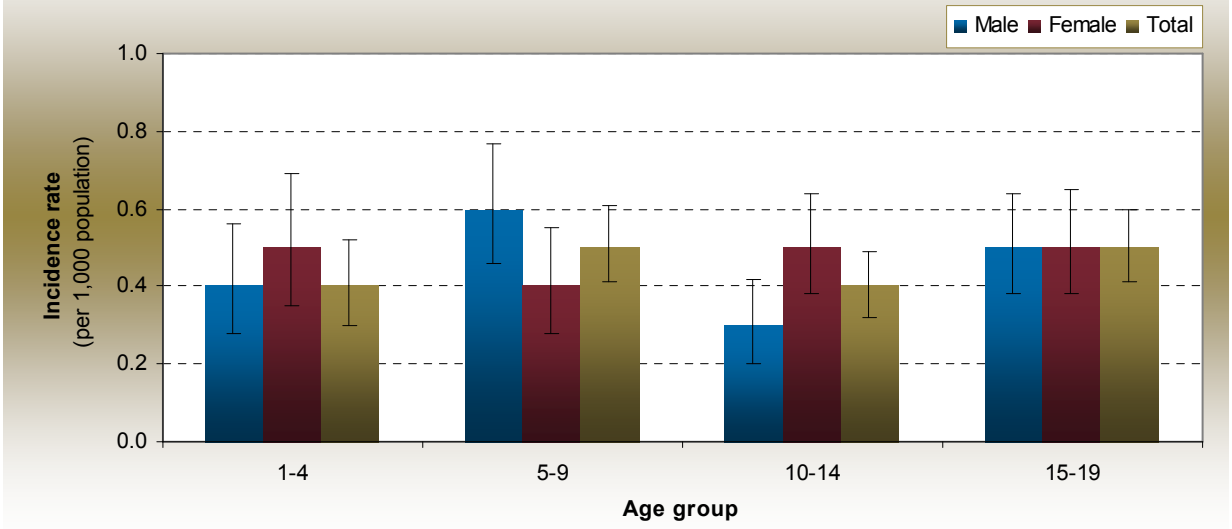
Figure 68. Incidence rates (per 1,000 population) of diagnosed diabetes in individuals 1-19 years old, by sex and fiscal year, New Brunswick, 1998-99 to 2007-08



6.2.2 Age-specific incidence rates of diagnosed diabetes by sex, 2003-04 to 2007-08

During the period 2003-04 to 2007-08, the age-specific incidence rates of diagnosed diabetes in New Brunswickers aged 1 to 19 years ranged from 0.4 to 0.5 new cases per 1,000 population. Incidence rates in each age group were not statistically different between sexes (Figure 69).

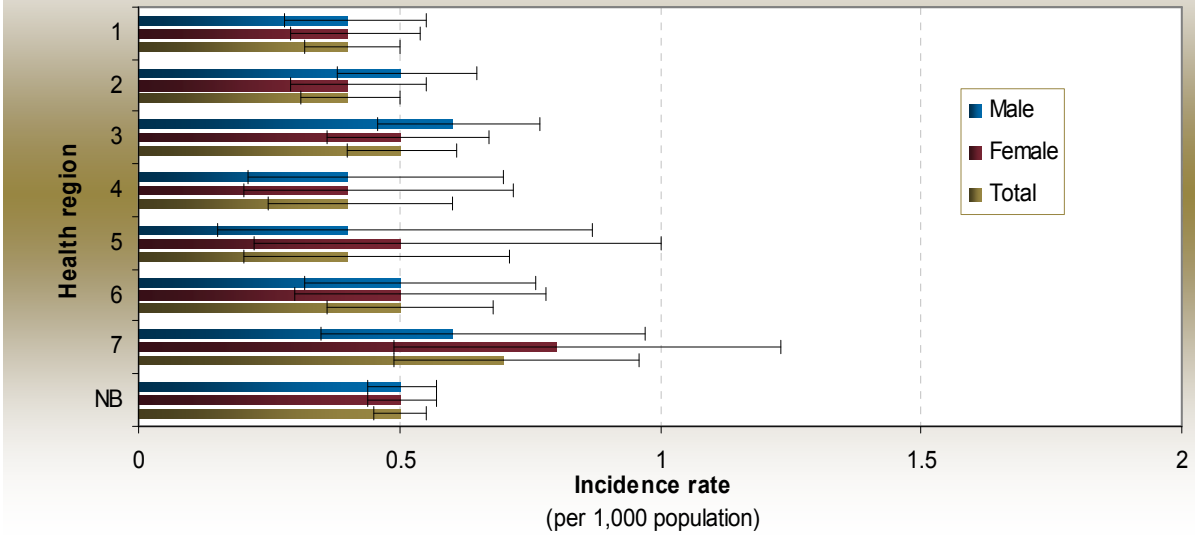
Figure 69. Age-specific incidence rates (per 1,000 population) of diagnosed diabetes in individuals 1-19 years old, by sex, New Brunswick, 2003-04 to 2007-08



6.2.3 Incidence rates of diagnosed diabetes by sex and health region, 2003-04 to 2007-08

During the same five-year period, the incidence rate of diagnosed diabetes in New Brunswickers aged 1 to 19 years was 0.5 per 1,000 population for both males and females. In the seven health regions, rates were not statistically different than the provincial rate (Figure 70).

Figure 70. Incidence rates (per 1,000 population) of diagnosed diabetes in individuals 1-19 years old, by sex and health region, New Brunswick, 2003-04 to 2007-08



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Appendix 1a - 1b. Prevalent cases and age-specific prevalence rates (per 1,000 population) of diagnosed diabetes in individuals ≥1 year old, by sex and fiscal year, New Brunswick, 2002-03 to 2007-08

1a. Male:

Age group	Prevalence	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08
1-19	Cases	314	308	315	321	320	326
	Crude rate	3.5	3.5	3.6	3.8	3.8	4.0
	95% CI	(3.1-3.9)	(3.1-3.9)	(3.3-4.1)	(3.4-4.2)	(3.4-4.3)	(3.5-4.4)
20-24	Cases	169	186	193	203	195	204
	Crude rate	6.7	7.3	7.7	8.2	7.9	8.4
	95% CI	(5.7-7.8)	(6.3-8.4)	(6.6-8.8)	(7.1-9.4)	(6.9-9.1)	(7.3-9.7)
25-29	Cases	206	212	226	221	222	242
	Crude rate	8.5	8.8	9.5	9.4	9.6	10.6
	95% CI	(7.4-9.7)	(7.7-10.1)	(8.3-10.8)	(8.2-10.7)	(8.3-10.9)	(9.3-12.0)
30-34	Cases	343	385	394	403	411	405
	Crude rate	13.4	15.0	15.7	16.2	16.8	16.9
	95% CI	(12.0-14.9)	(13.6-16.6)	(14.2-17.3)	(14.6-17.8)	(15.2-18.5)	(15.3-18.7)
35-39	Cases	605	585	616	650	691	740
	Crude rate	20.5	20.8	22.7	24.9	26.6	28.5
	95% CI	(18.9-22.2)	(19.2-22.6)	(20.9-24.6)	(23.0-26.8)	(24.7-28.7)	(26.4-30.6)
40-44	Cases	976	1,062	1,133	1,211	1,249	1,237
	Crude rate	30.9	33.4	35.8	38.3	40.6	41.4
	95% CI	(29.0-32.9)	(31.4-35.4)	(33.7-37.9)	(36.2-40.6)	(38.4-42.9)	(39.2-43.8)
45-49	Cases	1,570	1,678	1,736	1,816	1,925	1,993
	Crude rate	51.0	53.8	55.5	57.8	61.0	63.4
	95% CI	(48.5-53.6)	(51.3-56.5)	(52.9-58.1)	(55.2-60.5)	(58.3-63.8)	(60.6-66.2)
50-54	Cases	2,429	2,512	2,589	2,706	2,816	2,975
	Crude rate	86.5	88.7	90.4	92.8	94.6	97.7
	95% CI	(83.1-90.0)	(85.3-92.2)	(86.9-93.9)	(89.4-96.4)	(91.1-98.1)	(94.2-101.2)
55-59	Cases	2,843	3,121	3,442	3,740	3,968	4,080
	Crude rate	122.2	127.0	132.7	138.0	143.7	147.9
	95% CI	(117.8-126.8)	(122.6-131.6)	(128.3-137.2)	(133.6-142.5)	(139.2-148.2)	(143.4-152.5)
60-64	Cases	2,743	2,972	3,187	3,452	3,823	4,291
	Crude rate	157.8	163.2	167.6	174.2	184.2	190.8
	95% CI	(151.9-163.8)	(157.4-169.2)	(161.8-173.5)	(168.4-180.1)	(178.4-190.2)	(185.1-196.6)
65-69	Cases	2,597	2,762	3,013	3,316	3,559	3,782
	Crude rate	191.2	198.5	207.7	220.4	228.0	230.2
	95% CI	(183.9-198.7)	(191.2-206.1)	(200.3-215.2)	(212.9-228.0)	(220.6-235.6)	(222.9-237.6)
70-74	Cases	2,408	2,558	2,675	2,815	3,087	3,280
	Crude rate	209.5	219.5	229.0	239.2	258.1	271.2
	95% CI	(201.3-218.1)	(211.1-228.2)	(220.4-237.8)	(230.4-248.2)	(249.1-267.4)	(262.0-280.6)
75-79	Cases	1,963	2,110	2,108	2,236	2,418	2,628
	Crude rate	223.0	235.8	238.0	250.5	265.8	278.9
	95% CI	(213.2-233.1)	(225.8-246.0)	(228.0-248.4)	(240.3-261.1)	(255.3-276.6)	(268.4-289.8)
80-84	Cases	1,240	1,307	1,464	1,588	1,674	1,788
	Crude rate	210.6	221.4	237.7	253.1	262.5	282.4
	95% CI	(199.1-222.7)	(209.6-233.8)	(225.6-250.2)	(240.8-265.8)	(250.1-275.4)	(269.5-295.8)
85+	Cases	744	799	800	859	956	1,076
	Crude rate	183.4	191.1	190.7	196.2	210.2	221.6
	95% CI	(170.4-197.1)	(178.0-204.8)	(177.7-204.4)	(183.3-209.8)	(197.1-224.0)	(208.5-235.2)

Appendix 1a - 1b (cont.) Prevalent cases and age-specific prevalence rates (per 1,000 population) of diagnosed diabetes in individuals ≥1 year old, by sex and fiscal year, New Brunswick, 2002-03 to 2007-08

1b. Female:

Age group	Prevalence	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08
1-19	Cases	238	248	260	279	278	292
	Crude rate	2.8	3.0	3.2	3.4	3.5	3.7
	95% CI	(2.5-3.2)	(2.6-3.4)	(2.8-3.6)	(3.1-3.9)	(3.1-4.0)	(3.3-4.2)
20-24	Cases	140	153	159	162	166	166
	Crude rate	5.6	6.2	6.4	6.6	6.8	7.0
	95% CI	(4.7-6.7)	(5.3-7.3)	(5.5-7.5)	(5.6-7.7)	(5.8-8.0)	(6.0-8.2)
25-29	Cases	239	246	229	238	261	262
	Crude rate	9.6	10.0	9.4	9.9	11.1	11.3
	95% CI	(8.4-10.9)	(8.8-11.4)	(8.2-10.7)	(8.7-11.3)	(9.8-12.5)	(10.0-12.7)
30-34	Cases	399	411	446	476	481	486
	Crude rate	15.3	15.8	17.2	18.6	19.2	19.6
	95% CI	(13.9-16.9)	(14.3-17.4)	(15.7-18.9)	(16.9-20.3)	(17.5-21.0)	(17.9-21.4)
35-39	Cases	591	638	679	722	714	761
	Crude rate	19.5	22.0	24.5	27.0	27.1	29.1
	95% CI	(17.9-21.1)	(20.3-23.7)	(22.7-26.4)	(25.1-29.1)	(25.1-29.1)	(27.1-31.2)
40-44	Cases	976	1,053	1,094	1,132	1,202	1,172
	Crude rate	30.2	32.5	33.8	35.2	38.4	38.7
	95% CI	(28.4-32.2)	(30.6-34.6)	(31.8-35.9)	(33.1-37.3)	(36.2-40.6)	(36.5-41.0)
45-49	Cases	1,348	1,411	1,490	1,632	1,724	1,822
	Crude rate	43.3	45.0	47.1	51.3	53.7	56.8
	95% CI	(41.0-45.6)	(42.7-47.4)	(44.7-49.5)	(48.8-53.8)	(51.2-56.3)	(54.2-59.4)
50-54	Cases	1,882	2,038	2,168	2,264	2,399	2,456
	Crude rate	66.8	71.1	74.4	75.9	79.0	79.3
	95% CI	(63.8-69.9)	(68.1-74.3)	(71.3-77.6)	(72.8-79.1)	(75.9-82.2)	(76.2-82.5)
55-59	Cases	2,088	2,398	2,637	2,918	3,144	3,185
	Crude rate	91.4	98.3	102.8	108.3	114.5	114.6
	95% CI	(87.5-95.4)	(94.4-102.3)	(98.9-106.8)	(104.4-112.3)	(110.5-118.6)	(110.6-118.6)
60-64	Cases	2,129	2,236	2,478	2,646	2,923	3,323
	Crude rate	122.3	123.9	131.6	135.3	141.8	148.5
	95% CI	(117.2-127.6)	(118.8-129.1)	(126.5-136.9)	(130.2-140.6)	(136.7-147.0)	(143.5-153.7)
65-69	Cases	2,205	2,265	2,396	2,662	2,849	3,055
	Crude rate	151.8	152.9	158.2	171.8	177.9	182.6
	95% CI	(145.5-158.3)	(146.7-159.3)	(151.9-164.6)	(165.3-178.4)	(171.4-184.6)	(176.2-189.2)
70-74	Cases	2,464	2,547	2,592	2,713	2,843	2,906
	Crude rate	181.3	188.2	191.8	199.1	208.8	214.8
	95% CI	(174.2-188.6)	(180.9-195.6)	(184.5-199.4)	(191.7-206.8)	(201.2-216.6)	(207.0-222.7)
75-79	Cases	2,325	2,448	2,564	2,629	2,744	2,884
	Crude rate	190.8	201.8	211.8	221.2	231.1	239.8
	95% CI	(183.1-198.7)	(193.9-210.0)	(203.7-220.1)	(212.8-229.8)	(222.5-239.9)	(231.2-248.7)
80-84	Cases	1,841	1,967	2,034	2,168	2,298	2,391
	Crude rate	189.0	198.1	202.0	215.0	229.7	242.3
	95% CI	(180.4-197.8)	(189.4-207.1)	(193.3-210.9)	(206.0-224.2)	(220.4-239.3)	(232.7-252.3)
85+	Cases	1,466	1,564	1,648	1,805	2,002	2,235
	Crude rate	157.2	163.6	170.4	179.2	190.3	204.2
	95% CI	(149.3-165.5)	(155.6-171.9)	(162.2-178.8)	(171.0-187.6)	(182.1-198.9)	(195.8-212.8)

Appendix 2a - 2f. Prevalent cases, crude and age-standardized prevalence rates (per 1,000 population) of diagnosed diabetes in individuals ≥1 year old, by sex, health region and fiscal year, New Brunswick, 2002-03 to 2007-08

2a. 2002-03:

Health region	Male			Female		
	Prevalent cases	Crude rate (95% CI)	ASPR (95% CI)	Prevalent cases	Crude rate (95% CI)	ASPR (95% CI)
1	5,100	55.5 (54.0-57.0)	48.4 (47.0-49.7)	4,701	49.2 (47.8-50.7)	38.3 (37.2-39.5)
2	5,433	63.1 (61.5-64.8)	56.9 (55.4-58.5)	5,005	55.6 (54.0-57.1)	45.0 (43.7-46.3)
3	4,449	56.2 (54.5-57.8)	50.7 (49.2-52.2)	4,281	51.2 (49.7-52.8)	42.6 (41.3-43.9)
4	1,181	45.1 (42.5-47.7)	40.3 (38.0-42.7)	1,203	44.7 (42.2-47.3)	35.7 (33.7-37.9)
5	1,030	68.5 (64.4-72.9)	55.0 (51.6-58.5)	1,067	68.5 (64.5-72.8)	49.5 (46.5-52.7)
6	2,081	49.0 (46.9-51.1)	41.2 (39.4-43.0)	2,257	53.0 (50.9-55.3)	41.4 (39.6-43.1)
7	1,793	74.0 (70.6-77.5)	63.9 (60.9-66.9)	1,750	72.1 (68.8-75.6)	56.8 (54.1-59.5)
NB	21,150	57.3 (56.5-58.1)	50.6 (49.9-51.3)	20,331	53.2 (52.4-53.9)	42.5 (41.9-43.1)

2b. 2003-04:

Health region	Male			Female		
	Prevalent cases	Crude rate (95% CI)	ASPR (95% CI)	Prevalent cases	Crude rate (95% CI)	ASPR (95% CI)
1	5,544	59.8 (58.3-61.4)	51.3 (49.9-52.6)	5,023	52.2 (50.8-53.7)	40.3 (39.1-41.4)
2	5,641	65.9 (64.2-67.7)	58.7 (57.1-60.3)	5,231	58.4 (56.9-60.0)	46.6 (45.3-48.0)
3	4,805	60.1 (58.4-61.8)	53.1 (51.6-54.7)	4,570	54.3 (52.7-55.9)	44.4 (43.0-45.7)
4	1,235	47.6 (44.9-50.3)	41.5 (39.1-43.9)	1,265	47.4 (44.8-50.1)	37.1 (35.0-39.2)
5	1,098	74.0 (69.7-78.5)	57.7 (54.3-61.3)	1,140	74.0 (69.8-78.4)	52.3 (49.2-55.6)
6	2,244	53.5 (51.3-55.8)	43.5 (41.7-45.4)	2,436	57.8 (55.5-60.2)	43.6 (41.9-45.4)
7	1,879	78.1 (74.6-81.7)	65.9 (62.9-68.9)	1,868	77.5 (74.1-81.1)	60.0 (57.2-62.8)
NB	22,557	61.0 (60.2-61.8)	52.9 (52.2-53.6)	21,623	56.5 (55.8-57.3)	44.5 (43.9-45.1)

2c. 2004-05:

Health region	Male			Female		
	Prevalent cases	Crude rate (95% CI)	ASPR (95% CI)	Prevalent cases	Crude rate (95% CI)	ASPR (95% CI)
1	5,953	63.6 (62.0-65.2)	53.7 (52.3-55.1)	5,344	54.9 (53.4-56.4)	42.0 (40.8-43.2)
2	5,911	69.1 (67.3-70.9)	60.6 (59.0-62.1)	5,447	60.6 (59.0-62.3)	47.8 (46.5-49.2)
3	5,098	63.2 (61.5-65.0)	55.1 (53.6-56.7)	4,870	57.4 (55.8-59.0)	46.6 (45.3-48.0)
4	1,312	50.8 (48.1-53.6)	43.0 (40.7-45.5)	1,354	51.0 (48.3-53.7)	39.4 (37.2-41.6)
5	1,177	80.2 (75.7-84.9)	61.1 (57.6-64.8)	1,217	79.4 (75.0-84.0)	55.4 (52.1-58.7)
6	2,428	58.3 (56.0-60.6)	46.3 (44.4-48.2)	2,658	63.4 (61.0-65.9)	46.9 (45.0-48.7)
7	1,930	80.3 (76.8-84.0)	66.4 (63.4-69.5)	1,913	79.5 (75.9-83.1)	60.6 (57.8-63.5)
NB	23,891	64.7 (63.8-65.5)	55.0 (54.3-55.7)	22,874	59.7 (59.0-60.5)	46.4 (45.8-47.0)

Appendix 2a - 2f (cont.) Prevalent cases, crude and age-standardized prevalence rates (per 1,000 population) of diagnosed diabetes in individuals ≥1 year old, by sex, health region and fiscal year, New Brunswick, 2002-03 to 2007-08

2d. 2005-06:

Health region	Male			Female		
	Prevalent cases	Crude rate (95% CI)	ASPR (95% CI)	Prevalent cases	Crude rate (95% CI)	ASPR (95% CI)
1	6,428	68.2 (66.6-69.9)	56.6 (55.2-58.0)	5,779	59.0 (57.5-60.5)	44.6 (43.4-45.8)
2	6,216	72.9 (71.1-74.7)	62.7 (61.1-64.3)	5,781	64.7 (63.0-66.3)	50.4 (49.0-51.7)
3	5,429	67.2 (65.5-69.1)	57.7 (56.1-59.3)	5,170	61.0 (59.3-62.7)	49.0 (47.6-50.4)
4	1,434	55.8 (53.0-58.8)	45.9 (43.4-48.4)	1,454	55.3 (52.5-58.2)	42.0 (39.7-44.3)
5	1,263	87.2 (82.5-92.1)	64.5 (60.8-68.2)	1,265	83.9 (79.3-88.6)	57.5 (54.1-60.9)
6	2,644	64.3 (61.9-66.8)	49.4 (47.5-51.4)	2,880	69.5 (67.0-72.1)	50.1 (48.2-52.0)
7	2,004	84.2 (80.5-88.0)	68.2 (65.2-71.3)	2,006	84.3 (80.7-88.1)	62.7 (59.9-65.6)
NB	25,537	69.0 (68.2-69.9)	57.6 (56.9-58.3)	24,446	63.8 (63.0-64.6)	48.9 (48.3-49.6)

2e. 2006-07:

Health region	Male			Female		
	Prevalent cases	Crude rate (95% CI)	ASPR (95% CI)	Prevalent cases	Crude rate (95% CI)	ASPR (95% CI)
1	6,960	73.5 (71.8-75.2)	60.0 (58.6-61.5)	6,205	63.1 (61.5-64.7)	46.9 (45.7-48.1)
2	6,589	77.4 (75.5-79.3)	65.4 (63.8-67.0)	6,134	68.7 (67.0-70.4)	52.7 (51.3-54.1)
3	5,742	71.2 (69.3-73.0)	59.9 (58.3-61.5)	5,459	64.6 (62.9-66.3)	51.0 (49.6-52.4)
4	1,571	61.9 (58.9-65.0)	49.6 (47.1-52.2)	1,582	60.9 (58.0-64.0)	44.8 (42.5-47.1)
5	1,330	93.1 (88.2-98.3)	66.7 (63.1-70.5)	1,351	91.0 (86.2-96.0)	61.0 (57.5-64.6)
6	2,893	71.3 (68.7-73.9)	53.2 (51.2-55.2)	3,123	76.3 (73.6-79.0)	53.7 (51.7-55.7)
7	2,103	89.1 (85.4-93.0)	70.4 (67.3-73.5)	2,051	87.0 (83.2-90.8)	63.6 (60.7-66.5)
NB	27,314	73.9 (73.0-74.8)	60.4 (59.7-61.2)	26,028	68.1 (67.3-68.9)	51.3 (50.7-52.0)

2f. 2007-08:

Health region	Male			Female		
	Prevalent cases	Crude rate (95% CI)	ASPR (95% CI)	Prevalent cases	Crude rate (95% CI)	ASPR (95% CI)
1	7,457	78.0 (76.3-79.8)	62.6 (61.1-64.0)	6,564	66.2 (64.6-67.8)	48.4 (47.2-49.6)
2	6,923	81.1 (79.2-83.0)	67.2 (65.6-68.8)	6,427	71.8 (70.1-73.6)	54.4 (53.0-55.8)
3	6,112	75.4 (73.5-77.3)	62.3 (60.7-63.9)	5,724	67.5 (65.7-69.2)	52.5 (51.1-53.9)
4	1,686	67.0 (63.8-70.3)	52.0 (49.4-54.6)	1,693	65.9 (62.8-69.1)	47.4 (45.0-49.8)
5	1,414	100.4 (95.2-105.7)	69.4 (65.7-73.2)	1,390	95.1 (90.2-100.3)	61.8 (58.3-65.4)
6	3,123	77.1 (74.4-79.9)	55.6 (53.6-57.6)	3,337	82.0 (79.2-84.8)	56.2 (54.2-58.2)
7	2,182	93.4 (89.5-97.4)	71.7 (68.6-74.8)	2,155	92.0 (88.1-95.9)	65.9 (63.0-68.9)
NB	29,047	78.4 (77.5-79.3)	62.8 (62.0-63.5)	27,396	71.6 (70.8-72.5)	53.0 (52.3-53.7)

Appendix 3a - 3b. Incident cases and age-specific incidence rates (per 1,000 population) of diagnosed diabetes in individuals ≥1 year old, by sex and fiscal year, New Brunswick, 2002-03 to 2007-08

3a. Male:

Age group	Incidence	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08
1-19	Cases	52	37	41	35	39	47
	Crude rate	0.6	0.4	0.5	0.4	0.5	0.6
	95% CI	(0.4-0.8)	(0.3-0.6)	(0.3-0.6)	(0.3-0.6)	(0.3-0.6)	(0.1-0.2)
20-24	Cases	15	12	15	24	13	23
	Crude rate	0.6	0.5	0.6	1.0	0.5	1.0
	95% CI	(0.3-1.0)	(0.2-0.8)	(0.3-1.0)	(0.6-1.4)	(0.3-0.9)	(0.6-1.4)
25-29	Cases	24	29	33	21	21	31
	Crude rate	1.0	1.2	1.4	0.9	0.9	1.4
	95% CI	(0.6-1.5)	(0.8-1.8)	1.0-2.0)	(0.6-1.4)	(0.6-1.4)	(0.9-1.9)
30-34	Cases	59	67	54	59	60	56
	Crude rate	2.3	2.6	2.2	2.4	2.5	2.4
	95% CI	(1.8-3.0)	(2.1-3.4)	(1.6-2.8)	(1.8-3.1)	(1.9-3.2)	(1.8-3.1)
35-39	Cases	90	88	94	87	112	102
	Crude rate	3.1	3.2	3.5	3.4	4.4	4.0
	95% CI	(2.5-3.8)	(2.6-3.9)	(2.9-4.3)	(2.7-4.2)	(3.6-5.3)	(3.3-4.9)
40-44	Cases	147	156	187	210	169	167
	Crude rate	4.8	5.0	6.1	6.9	5.7	5.8
	95% CI	(4.0-5.6)	(4.3-5.9)	(5.2-7.0)	(6.0-7.9)	(4.9-6.6)	(5.0-6.8)
45-49	Cases	245	258	220	230	291	257
	Crude rate	8.3	8.7	7.4	7.7	9.7	8.6
	95% CI	(7.3-9.4)	(7.6-9.8)	(6.4-8.4)	(6.7-8.8)	(8.6-10.9)	(7.6-9.8)
50-54	Cases	310	319	316	336	343	358
	Crude rate	11.9	12.2	12.0	12.5	12.6	12.9
	95% CI	(10.6-13.3)	(10.9-13.6)	(10.7-13.4)	(11.2-14.0)	(11.3-14.0)	(11.6-14.3)
55-59	Cases	320	333	347	391	416	440
	Crude rate	15.4	15.3	15.2	16.5	17.3	18.4
	95% CI	(13.8-17.2)	(13.7-17.0)	(13.6-16.9)	(14.9-18.2)	(15.7-19.0)	(16.7-20.2)
60-64	Cases	287	252	279	343	400	379
	Crude rate	19.2	16.3	17.3	20.5	23.1	20.4
	95% CI	(17.1-21.6)	(14.3-18.4)	(15.3-19.5)	(18.4-22.8)	(20.9-25.5)	(18.4-22.6)
65-69	Cases	274	262	257	302	326	294
	Crude rate	24.3	23.0	21.9	25.1	26.3	22.7
	95% CI	(21.5-27.4)	(20.3-25.9)	(19.3-24.7)	(22.3-28.1)	(23.6-29.4)	(20.2-25.5)
70-74	Cases	217	189	196	228	281	224
	Crude rate	23.3	20.4	21.3	24.8	30.7	24.8
	95% CI	(20.3-26.7)	(17.6-23.5)	(18.4-24.5)	(21.7-28.3)	(27.2-34.5)	(21.6-28.2)
75-79	Cases	165	153	133	144	187	183
	Crude rate	23.6	21.9	19.3	21.1	27.2	26.2
	95% CI	(20.1-27.4)	(18.5-25.6)	(16.2-22.9)	(17.8-24.8)	(23.5-31.4)	(22.6-30.3)
80-84	Cases	93	86	85	95	105	120
	Crude rate	19.6	18.4	17.8	19.9	21.8	25.7
	95% CI	(15.8-24.0)	(14.7-22.7)	(14.2-22.0)	(16.1-24.3)	(17.9-26.4)	(21.3-30.8)
85+	Cases	67	52	49	49	77	72
	Crude rate	19.8	15.1	14.2	13.7	21.0	18.7
	95% CI	(15.4-25.2)	(11.3-19.9)	(10.5-18.8)	(10.2-18.2)	(16.6-26.2)	(14.6-23.5)

Appendix 3a - 3b (cont.) Incident cases and age-specific incidence rates (per 1,000 population) of diagnosed diabetes in individuals ≥1 year old, by sex and fiscal year, New Brunswick, 2002-03 to 2007-08

3b. Female:

Age group	Incidence	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08
1-19	Cases	29	39	33	42	32	41
	Crude rate	0.3	0.5	0.4	0.5	0.4	0.5
	95% CI	(0.2-0.5)	(0.3-0.6)	(0.3-0.6)	(0.4-0.7)	(0.3-0.6)	(0.1-0.2)
20-24	Cases	22	23	18	21	18	23
	Crude rate	0.9	0.9	0.7	0.9	0.7	1.0
	95% CI	(0.6-1.3)	(0.6-1.4)	(0.4-1.2)	(0.5-1.3)	(0.4-1.2)	(0.6-1.5)
25-29	Cases	31	34	33	35	38	31
	Crude rate	1.3	1.4	1.4	1.5	1.6	1.3
	95% CI	(0.9-1.8)	(1.0-2.0)	(0.9-1.9)	(1.0-2.1)	(1.2-2.2)	(0.9-1.9)
30-34	Cases	56	56	60	74	73	77
	Crude rate	2.2	2.2	2.4	2.9	3.0	3.2
	95% CI	(1.6-2.8)	(1.7-2.8)	(1.8-3.0)	(2.3-3.7)	(2.3-3.7)	(2.5-3.9)
35-39	Cases	86	106	93	99	84	100
	Crude rate	2.9	3.7	3.4	3.8	3.3	3.9
	95% CI	(2.3-3.6)	(3.0-4.5)	(2.8-4.2)	(3.1-4.6)	(2.6-4.0)	(3.2-4.8)
40-44	Cases	139	156	142	169	173	126
	Crude rate	4.4	5.0	4.5	5.4	5.7	4.3
	95% CI	(3.7-5.2)	(4.2-5.8)	(3.8-5.3)	(4.6-6.3)	(4.9-6.6)	(3.6-5.1)
45-49	Cases	192	188	186	214	220	186
	Crude rate	6.4	6.2	6.1	7.0	7.2	6.1
	95% CI	(5.5-7.4)	(5.4-7.2)	(5.3-7.1)	(6.1-8.0)	(6.3-8.2)	(5.3-7.0)
50-54	Cases	230	283	272	274	278	264
	Crude rate	8.7	10.5	10.0	9.8	9.8	9.2
	95% CI	(7.6-9.9)	(9.3-11.8)	(8.8-11.2)	(8.7-11.1)	(8.7-11.1)	(8.1-10.3)
55-59	Cases	238	287	292	312	341	281
	Crude rate	11.3	12.9	12.5	12.8	13.8	11.3
	95% CI	(9.9-12.9)	(11.4-14.5)	(11.1-14.0)	(11.4-14.3)	(12.4-15.4)	(10.0-12.7)
60-64	Cases	199	219	272	280	276	282
	Crude rate	12.9	13.7	16.4	16.3	15.4	14.6
	95% CI	(11.1-14.8)	(11.9-15.6)	(14.5-18.4)	(14.4-18.3)	(13.6-17.3)	(12.9-16.4)
65-69	Cases	200	170	221	269	255	227
	Crude rate	16.0	13.4	17.0	20.5	19.0	16.3
	95% CI	(13.8-18.3)	(11.4-15.5)	(14.9-19.4)	(18.1-23.1)	(16.7-21.5)	(14.3-18.6)
70-74	Cases	224	181	185	235	241	211
	Crude rate	19.7	16.2	16.7	21.1	21.9	19.5
	95% CI	(17.2-22.5)	(13.9-18.7)	(14.3-19.2)	(18.5-24.0)	(19.2-24.8)	(16.9-22.3)
75-79	Cases	186	176	165	188	210	201
	Crude rate	18.5	17.9	17.0	19.9	22.5	21.5
	95% CI	(15.9-21.4)	(15.3-20.7)	(14.5-19.8)	(17.2-23.0)	(19.5-25.7)	(18.6-24.7)
80-84	Cases	136	135	125	135	171	167
	Crude rate	16.9	16.7	15.3	16.8	21.7	21.9
	95% CI	(14.2-20.0)	(14.0-19.7)	(12.7-18.2)	(14.1-19.8)	(18.6-25.2)	(18.7-25.4)
85+	Cases	116	91	75	112	144	148
	Crude rate	14.5	11.3	9.3	13.4	16.6	16.7
	95% CI	(12.0-17.5)	(9.1-13.8)	(7.3-11.6)	(11.0-16.1)	(14.0-19.6)	(14.1-19.6)

Appendix 4a - 4f. Incident cases, crude and age-standardized incidence rates (per 1,000 population) of diagnosed diabetes in individuals ≥1 year old, by sex, health region and fiscal year, New Brunswick, 2002-03 to 2007-08

4a. 2002-03:

Health region	Male			Female		
	Incident cases	Crude rate (95% CI)	ASIR (95% CI)	Incident cases	Crude rate (95% CI)	ASIR (95% CI)
1	628	7.2 (6.6-7.8)	6.7 (6.2-7.2)	517	5.7 (5.2-6.2)	4.8 (4.4-5.2)
2	604	7.4 (6.9-8.1)	7.3 (6.7-7.9)	487	5.7 (5.2-6.2)	5.0 (4.5-5.5)
3	462	6.1 (5.6-6.7)	5.9 (5.4-6.5)	452	5.7 (5.2-6.2)	5.0 (4.6-5.5)
4	139	5.5 (4.6-6.5)	5.2 (4.3-6.1)	121	4.7 (3.9-5.6)	4.0 (3.3-4.7)
5	96	6.8 (5.5-8.3)	5.9 (4.7-7.2)	98	6.7 (5.4-8.2)	5.5 (4.4-6.7)
6	213	5.2 (4.6-6.0)	4.5 (3.9-5.2)	220	5.4 (4.7-6.2)	4.5 (3.9-5.2)
7	213	9.4 (8.2-10.7)	8.8 (7.7-10.1)	192	8.5 (7.3-9.7)	7.5 (6.5-8.6)
NB	2,365	6.7 (6.5-7.0)	6.4 (6.1-6.7)	2,084	5.7 (5.5-6.0)	4.9 (4.7-5.2)

4b. 2003-04:

Health region	Male			Female		
	Incident cases	Crude rate (95% CI)	ASIR (95% CI)	Incident cases	Crude rate (95% CI)	ASIR (95% CI)
1	620	7.1 (6.5-7.6)	6.4 (5.9-7.0)	519	5.7 (5.2-6.2)	4.7 (4.3-5.1)
2	493	6.1 (5.6-6.7)	5.9 (5.4-6.5)	466	5.5 (5.0-6.0)	4.8 (4.4-5.3)
3	507	6.7 (6.1-7.3)	6.3 (5.8-6.9)	465	5.8 (5.3-6.4)	5.1 (4.6-5.6)
4	109	4.4 (3.6-5.3)	3.9 (3.2-4.7)	110	4.3 (3.5-5.2)	3.6 (2.9-4.3)
5	129	9.3 (7.8-11.1)	7.9 (6.6-9.4)	123	8.5 (7.1-10.2)	6.8 (5.6-8.1)
6	254	6.4 (5.6-7.2)	5.4 (4.8-6.1)	260	6.5 (5.7-7.3)	5.3 (4.6-5.9)
7	172	7.7 (6.6-8.9)	7.0 (6.0-8.2)	199	8.9 (7.7-10.2)	7.6 (6.5-8.7)
NB	2,293	6.6 (6.3-6.8)	6.1 (5.8-6.3)	2,144	5.9 (5.7-6.2)	5.0 (4.8-5.3)

4c. 2004-05:

Health region	Male			Female		
	Incident cases	Crude rate (95% CI)	ASIR (95% CI)	Incident cases	Crude rate (95% CI)	ASIR (95% CI)
1	592	6.7 (6.2-7.3)	6.0 (5.5-6.5)	517	5.6 (5.1-6.1)	4.7 (4.3-5.1)
2	519	6.5 (5.9-7.1)	6.3 (5.7-6.9)	438	5.2 (4.7-5.7)	4.5 (4.0-4.9)
3	505	6.6 (6.1-7.2)	6.2 (5.7-6.8)	502	6.2 (5.7-6.8)	5.5 (5.0-6.0)
4	125	5.1 (4.2-6.0)	4.4 (3.6-5.2)	142	5.6 (4.7-6.6)	4.5 (3.8-5.3)
5	130	9.5 (8.0-11.3)	8.0 (6.6-9.5)	119	8.4 (6.9-10.0)	6.8 (5.6-8.2)
6	284	7.2 (6.4-8.1)	6.1 (5.4-6.8)	321	8.1 (7.2-9.1)	6.7 (5.9-7.4)
7	148	6.7 (5.6-7.8)	6.0 (5.1-7.1)	133	6.0 (5.0-7.1)	5.1 (4.2-6.0)
NB	2,306	6.6 (6.4-6.9)	6.0 (5.8-6.3)	2,172	6.0 (5.7-6.3)	5.1 (4.9-5.3)

Appendix 4a - 4f (cont.) Incident cases, crude and age-standardized incidence rates (per 1,000 population) of diagnosed diabetes in individuals ≥1 year old, by sex, health region and fiscal year, New Brunswick, 2002-03 to 2007-08

4d. 2005-06:

Health region	Male			Female		
	Incident cases	Crude rate (95% CI)	ASIR (95% CI)	Incident cases	Crude rate (95% CI)	ASIR (95% CI)
1	690	7.8 (7.2-8.4)	7.0 (6.5-7.6)	618	6.7 (6.1-7.2)	5.6 (5.2-6.1)
2	560	7.0 (6.5-7.6)	6.6 (6.0-7.1)	573	6.8 (6.3-7.4)	5.8 (5.3-6.3)
3	519	6.8 (6.3-7.5)	6.3 (5.8-6.9)	502	6.3 (5.7-6.8)	5.6 (5.1-6.1)
4	164	6.7 (5.7-7.8)	5.7 (4.8-6.7)	166	6.6 (5.7-7.7)	5.6 (4.7-6.5)
5	124	9.3 (7.7-11.1)	7.3 (6.1-8.7)	111	8.0 (6.6-9.6)	6.3 (5.1-7.6)
6	305	7.9 (7.0-8.8)	6.5 (5.7-7.2)	330	8.5 (7.6-9.5)	6.8 (6.0-7.6)
7	193	8.8 (7.6-10.1)	7.6 (6.5-8.7)	159	7.2 (6.2-8.5)	6.0 (5.1-7.0)
NB	2,554	7.4 (7.1-7.6)	6.6 (6.4-6.9)	2,459	6.8 (6.5-7.1)	5.8 (5.5-6.0)

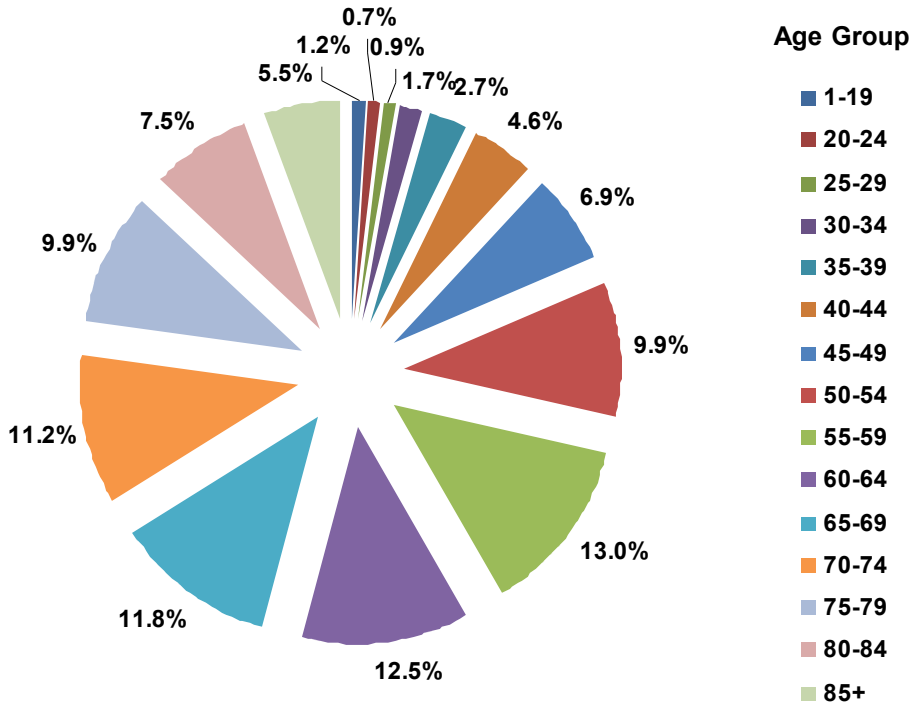
4e. 2006-07:

Health region	Male			Female		
	Incident cases	Crude rate (95% CI)	ASIR (95% CI)	Incident cases	Crude rate (95% CI)	ASIR (95% CI)
1	795	9.0 (8.4-9.6)	8.0 (7.5-8.6)	625	6.7 (6.2-7.3)	5.5 (5.1-6.0)
2	661	8.3 (7.7-9.0)	7.8 (7.2-8.4)	595	7.1 (6.5-7.7)	5.9 (5.4-6.4)
3	564	7.5 (6.9-8.1)	6.8 (6.2-7.3)	507	6.4 (5.8-6.9)	5.5 (5.0-6.0)
4	182	7.6 (6.5-8.8)	6.5 (5.6-7.5)	179	7.3 (6.3-8.4)	5.6 (4.8-6.5)
5	122	9.3 (7.7-11.1)	7.3 (6.1-8.7)	128	9.4 (7.8-11.2)	7.1 (5.9-8.5)
6	334	8.8 (7.9-9.8)	7.1 (6.3-7.9)	362	9.5 (8.5-10.5)	7.5 (6.7-8.3)
7	180	8.3 (7.1-9.6)	7.2 (6.2-8.4)	155	7.1 (6.1-8.4)	5.8 (4.9-6.8)
NB	2,840	8.2 (7.9-8.5)	7.3 (7.1-7.6)	2,554	7.1 (6.8-7.4)	5.9 (5.6-6.1)

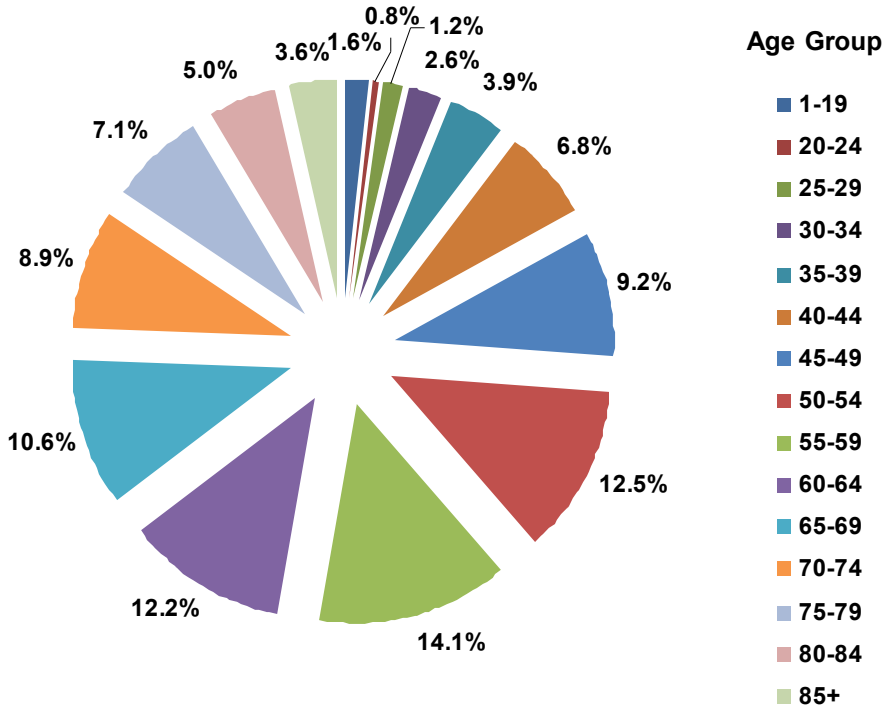
4f. 2007-08:

Health region	Male			Female		
	Incident cases	Crude rate (95% CI)	ASIR (95% CI)	Incident cases	Crude rate (95% CI)	ASIR (95% CI)
1	718	8.1 (7.5-8.7)	7.2 (6.6-7.7)	581	6.2 (5.7-6.8)	5.0 (4.6-5.5)
2	610	7.7 (7.1-8.3)	7.0 (6.4-7.5)	555	6.6 (6.1-7.2)	5.5 (5.1-6.0)
3	590	7.8 (7.2-8.5)	7.1 (6.5-7.7)	473	5.9 (5.4-6.5)	5.1 (4.6-5.5)
4	177	7.5 (6.4-8.7)	6.1 (5.2-7.1)	159	6.6 (5.6-7.7)	5.2 (4.4-6.1)
5	124	9.7 (8.1-11.6)	7.4 (6.1-8.8)	86	6.5 (5.2-8.0)	4.6 (3.6-5.7)
6	337	8.9 (8.0-9.9)	6.7 (6.0-7.5)	322	8.5 (7.6-9.5)	6.6 (5.9-7.4)
7	189	8.8 (7.6-10.2)	7.4 (6.3-8.5)	181	8.4 (7.3-9.8)	7.0 (6.0-8.1)
NB	2,753	8.0 (7.7-8.3)	7.0 (6.7-7.2)	2,365	6.6 (6.3-6.9)	5.4 (5.2-5.7)

Appendix 5a. Percentage distribution of prevalent cases of diagnosed diabetes, by age group, New Brunswick, 2003-04 to 2007-08



Appendix 5b. Percentage distribution of incident cases of diagnosed diabetes, by age group, New Brunswick, 2003-04 to 2007-08



Appendix 6. Incidence and prevalence rates (per 1,000 population) of diagnosed diabetes in individuals 1 to 19 years old, by sex and fiscal year, New Brunswick, 1998-99 to 2007-08

Male:

Fiscal year	Incidence		Prevalence	
	Cases	Crude rate (95% CI)	Cases	Crude rate (95% CI)
1998-99	46	0.5 (0.4-0.6)	260	2.7 (2.4-3.1)
1999-00	39	0.4 (0.3-0.6)	274	2.9 (2.6-3.3)
2000-01	52	0.6 (0.4-0.7)	300	3.2 (2.9-3.6)
2001-02	35	0.4 (0.3-0.5)	307	3.4 (3.0-3.8)
2002-03	52	0.6 (0.4-0.8)	314	3.5 (3.1-3.9)
2003-04	37	0.4 (0.3-0.6)	308	3.5 (3.1-3.9)
2004-05	41	0.5 (0.3-0.6)	315	3.6 (3.3-4.1)
2005-06	35	0.4 (0.3-0.6)	321	3.8 (3.4-4.2)
2006-07	39	0.5 (0.3-0.6)	320	3.8 (3.4-4.3)
2007-08	47	0.6 (0.4-0.8)	326	4.0 (3.5-4.4)

Female:

Fiscal year	Incidence		Prevalence	
	Cases	Crude rate (95% CI)	Cases	Crude rate (95% CI)
1998-99	45	0.5 (0.4-0.7)	204	2.2 (1.9-2.6)
1999-00	33	0.4 (0.3-0.5)	215	2.4 (2.1-2.7)
2000-01	31	0.4 (0.2-0.5)	218	2.5 (2.2-2.8)
2001-02	31	0.4 (0.2-0.5)	231	2.7 (2.3-3.0)
2002-03	29	0.3 (0.2-0.5)	238	2.8 (2.5-3.2)
2003-04	39	0.5 (0.3-0.6)	248	3.0 (2.6-3.4)
2004-05	33	0.4 (0.3-0.6)	260	3.2 (2.8-3.6)
2005-06	42	0.5 (0.4-0.7)	279	3.4 (3.1-3.9)
2006-07	32	0.4 (0.3-0.6)	278	3.5 (3.1-4.0)
2007-08	41	0.5 (0.4-0.7)	292	3.7 (3.3-4.2)

Appendix 7. Incidence and prevalence rates (per 1,000 population) of diagnosed diabetes in individuals 1 to 19 years old, by age group and sex, New Brunswick, 2003-04 to 2007-08

Male:

Fiscal year	Incidence		Prevalence	
	Cases	Crude rate (95% CI)	Cases	Crude rate (95% CI)
1-4	28	0.4 (0.2-0.5)	73	1.0 (0.8-1.2)
5-9	64	0.6 (0.5-0.8)	310	3.0 (2.6-3.3)
10-14	40	0.3 (0.2-0.5)	502	4.2 (3.9-4.6)
15-19	67	0.5 (0.4-0.7)	705	5.6 (5.2-6.0)

Female:

Fiscal year	Incidence		Prevalence	
	Cases	Crude rate (95% CI)	Cases	Crude rate (95% CI)
1-4	35	0.5 (0.3-0.7)	75	1.0 (0.8-1.3)
5-9	40	0.4 (0.3-0.6)	262	2.6 (2.3-3.0)
10-14	51	0.5 (0.3-0.6)	423	3.7 (3.4-4.1)
15-19	61	0.5 (0.4-0.7)	597	5.0 (4.6-5.4)

Appendix 8. Age-specific mortality rates (per 1,000 population) in individuals ≥20 years old, by diabetes status, and rate ratios, by sex, New Brunswick, 2003-04 to 2007-08

Male:

Age group	With diagnosed diabetes		Without diagnosed diabetes		Rate ratio	95% CI
	Mortality rate	95% CI	Mortality rate	95% CI		
20-24	3.1	(0.6-9.2)	1.0	(0.8-1.2)	3.3	(1.0-10.3)
25-29	5.4	(2.0-11.9)	0.9	(0.7-1.0)	6.3	(2.8-14.5)
30-34	3.6	(1.4-7.3)	1.0	(0.8-1.2)	3.7	(1.7-7.9)
35-39	6.2	(3.8-9.5)	1.1	(0.9-1.3)	5.5	(3.4-8.8)
40-44	2.7	(1.6-4.5)	1.5	(1.3-1.7)	1.8	(1.1-3.0)
45-49	6.0	(4.5-7.9)	2.3	(2.0-2.5)	2.7	(2.0-3.5)
50-54	9.2	(7.6-10.9)	3.4	(3.1-3.8)	2.7	(2.2-3.2)
55-59	12.4	(10.8-14.1)	5.7	(5.3-6.2)	2.2	(1.9-2.5)
60-64	20.3	(18.3-22.5)	9.2	(8.6-9.9)	2.2	(1.9-2.5)
65-69	28.2	(25.6-30.8)	15.1	(14.1-16.1)	1.9	(1.7-2.1)
70-74	42.0	(38.8-45.5)	27.1	(25.6-28.7)	1.6	(1.4-1.7)
75-79	67.1	(62.4-72.0)	45.0	(42.7-47.3)	1.5	(1.4-1.6)
80-84	101.7	(94.8-109.1)	71.8	(68.4-75.3)	1.4	(1.3-1.5)
85+	205.6	(192.5-219.3)	146.4	(140.8-152.2)	1.4	(1.3-1.5)

Female:

Age group	With diagnosed diabetes		Without diagnosed diabetes		Rate ratio	95% CI
	Mortality rate	95% CI	Mortality rate	95% CI		
20-24	2.5	(0.3-9.1)	0.3	(0.2-0.4)	8.0	(1.9-33.3)
25-29	0.8	(0.0-4.6)	0.3	(0.2-0.4)	2.6	(0.4-19.2)
30-34	2.6	(1.0-5.8)	0.4	(0.3-0.6)	5.9	(2.5-13.8)
35-39	2.3	(1.0-4.5)	0.5	(0.4-0.7)	4.3	(2.1-8.9)
40-44	4.1	(2.6-6.1)	1.0	(0.8-1.1)	4.3	(2.8-6.7)
45-49	4.5	(3.1-6.2)	1.2	(1.0-1.4)	3.7	(2.6-5.3)
50-54	6.8	(5.4-8.5)	2.2	(2.0-2.5)	3.1	(2.4-3.9)
55-59	10.1	(8.5-11.9)	3.4	(3.0-3.7)	3.0	(2.5-3.6)
60-64	15.9	(13.9-18.2)	5.6	(5.1-6.1)	2.8	(2.4-3.3)
65-69	22.7	(20.2-25.5)	8.7	(8.0-9.4)	2.6	(2.3-3.0)
70-74	30.4	(27.6-33.5)	14.9	(13.9-16.0)	2.0	(1.8-2.3)
75-79	48.8	(45.1-52.7)	26.6	(25.1-28.1)	1.8	(1.7-2.0)
80-84	76.9	(71.8-82.3)	45.6	(43.5-47.8)	1.7	(1.6-1.8)
85+	154.0	(146.1-162.2)	118.1	(114.8-121.4)	1.3	(1.2-1.4)

Appendix 9a - 9f. Crude and age-standardized mortality rates (per 1,000 population) in individuals ≥20 years old, by sex, diabetes status, health region and fiscal year, New Brunswick, 2002-03 to 2007-08

9a. 2002-03:

Health region	Male						Female					
	With diagnosed diabetes			Without diagnosed diabetes			With diagnosed diabetes			Without diagnosed diabetes		
	Total deaths	Crude rate (95% CI)	ASMR (95% CI)	Total deaths	Crude rate (95% CI)	ASMR (95% CI)	Total deaths	Crude rate (95% CI)	ASMR (95% CI)	Total deaths	Crude rate (95% CI)	ASMR (95% CI)
1	164	32.6 (27.8-38.0)	14.9 (11.9-18.2)	548	8.3 (7.6-9.0)	8.5 (7.8-9.2)	190	41.0 (35.4-47.3)	12.4 (10.3-14.7)	564	8.0 (7.3-8.7)	5.2 (4.8-5.7)
2	196	36.6 (31.6-42.1)	13.9 (12.0-16.0)	564	9.7 (8.9-10.5)	10.4 (9.6-11.3)	159	32.2 (27.4-37.6)	12.2 (9.6-15.2)	576	9.0 (8.3-9.7)	5.9 (5.4-6.4)
3	171	39.1 (33.5-45.4)	18.1 (13.9-22.7)	482	8.9 (8.1-9.7)	9.4 (8.6-10.3)	170	40.2 (34.4-46.8)	14.1 (11.2-17.3)	432	7.2 (6.6-7.9)	5.4 (4.9-6.0)
4	42	36.1 (26.0-48.9)	15.3 (10.8-20.5)	180	9.5 (8.2-11.0)	10.7 (9.2-12.4)	40	33.6 (24.0-45.7)	10.5 (7.1-14.5)	179	9.1 (7.8-10.5)	6.7 (5.8-7.8)
5	45	44.1 (32.2-59.0)	24.6 (10.4-44.7)	99	9.3 (7.6-11.4)	9.6 (7.8-11.6)	39	36.8 (26.2-50.3)	18.6 (6.6-36.7)	100	8.9 (7.3-10.9)	5.6 (4.5-6.9)
6	79	38.4 (30.4-47.8)	21.4 (11.7-34.1)	282	9.1 (8.0-10.2)	9.5 (8.4-10.6)	70	31.2 (24.3-39.4)	9.9 (7.1-13.1)	214	6.8 (5.9-7.8)	5.5 (4.7-6.2)
7	67	38.1 (29.5-48.4)	15.1 (11.6-19.0)	119	7.1 (5.9-8.5)	7.5 (6.2-9.0)	69	39.8 (31.0-50.4)	12.5 (9.4-16.2)	126	7.4 (6.2-8.8)	5.4 (4.5-6.4)
NB	768	36.9 (34.3-39.6)	16.3 (14.5-18.1)	2,285	8.8 (8.5-9.2)	9.4 (9.0-9.8)	737	36.7 (34.1-39.4)	12.5 (11.2-13.9)	2,198	7.9 (7.6-8.3)	5.6 (5.3-5.8)

9b. 2003-04:

Health region	Male						Female					
	With diagnosed diabetes			Without diagnosed diabetes			With diagnosed diabetes			Without diagnosed diabetes		
	Total deaths	Crude rate (95% CI)	ASMR (95% CI)	Total deaths	Crude rate (95% CI)	ASMR (95% CI)	Total deaths	Crude rate (95% CI)	ASMR (95% CI)	Total deaths	Crude rate (95% CI)	ASMR (95% CI)
1	187	34.2 (29.4-39.4)	12.5 (10.7-14.5)	542	8.2 (7.5-8.9)	8.4 (7.7-9.2)	181	36.5 (31.4-42.2)	10.0 (8.3-12.0)	574	8.0 (7.4-8.7)	5.4 (4.9-5.9)
2	223	40.1 (35.0-45.7)	20.9 (14.7-28.0)	535	9.2 (8.4-10.0)	10.0 (9.1-10.8)	193	37.4 (32.3-43.1)	13.3 (10.7-16.1)	588	9.2 (8.5-10.0)	6.1 (5.5-6.6)
3	201	42.5 (36.9-48.8)	17.7 (14.8-20.7)	489	8.9 (8.1-9.8)	9.6 (8.7-10.5)	204	45.2 (39.2-51.9)	13.8 (11.6-16.1)	515	8.5 (7.8-9.3)	6.2 (5.7-6.8)
4	41	33.8 (24.2-45.8)	13.6 (9.7-18.2)	166	8.8 (7.5-10.2)	9.8 (8.3-11.4)	46	36.7 (26.9-49.0)	10.3 (7.4-13.7)	188	9.6 (8.2-11.0)	7.1 (6.1-8.2)
5	52	47.8 (35.7-62.6)	16.9 (12.6-21.8)	107	10.2 (8.4-12.3)	10.4 (8.5-12.5)	33	29.2 (20.1-41.0)	10.2 (5.9-15.6)	97	8.8 (7.1-10.7)	5.4 (4.3-6.5)
6	79	35.5 (28.1-44.3)	19.5 (12.8-27.7)	251	8.1 (7.2-9.2)	8.4 (7.4-9.5)	83	34.3 (27.3-42.5)	10.9 (7.0-15.7)	167	5.4 (4.6-6.2)	4.4 (3.7-5.1)
7	76	41.0 (32.3-51.3)	15.7 (12.3-19.6)	151	9.1 (7.7-10.7)	9.5 (8.1-11.1)	76	41.1 (32.3-51.4)	21.1 (8.3-39.8)	122	7.2 (6.0-8.6)	4.8 (4.0-5.8)
NB	867	39.0 (36.4-41.7)	17.1 (15.0-19.2)	2,253	8.7 (8.3-9.0)	9.3 (8.9-9.7)	817	38.2 (35.6-40.9)	12.6 (10.9-14.4)	2,254	8.1 (7.8-8.5)	5.7 (5.4-5.9)

Appendix 9a - 9f (cont.) Crude and age-standardized mortality rates (per 1,000 population) in individuals ≥20 years old, by sex, diabetes status, health region and fiscal year, New Brunswick, 2002-03 to 2007-08

9c. 2004-05:

	Male						Female					
	With diagnosed diabetes			Without diagnosed diabetes			With diagnosed diabetes			Without diagnosed diabetes		
Health region	Total deaths	Crude rate (95% CI)	ASMR (95% CI)	Total deaths	Crude rate (95% CI)	ASMR (95% CI)	Total deaths	Crude rate (95% CI)	ASMR (95% CI)	Total deaths	Crude rate (95% CI)	ASMR (95% CI)
1	178	30.3 (26.0-35.0)	12.8 (10.0-15.9)	542	8.1 (7.4-8.8)	8.3 (7.6-9.0)	173	32.8 (28.1-38.0)	12.1 (7.4-17.8)	536	7.4 (6.8-8.1)	4.9 (4.5-5.3)
2	229	39.3 (34.4-44.7)	18.5 (14.4-23.1)	529	9.1 (8.3-9.9)	9.6 (8.8-10.4)	196	36.5 (31.5-41.9)	12.7 (10.1-15.6)	632	9.9 (9.1-10.7)	6.4 (5.9-7.0)
3	171	34.1 (29.1-39.6)	18.8 (12.9-25.7)	453	8.2 (7.5-9.0)	8.6 (7.8-9.4)	175	36.4 (31.2-42.2)	12.5 (9.6-15.8)	480	7.9 (7.2-8.6)	5.8 (5.2-6.3)
4	32	24.8 (17.0-35.0)	10.2 (6.9-14.1)	167	8.9 (7.6-10.3)	10.1 (8.6-11.7)	48	35.8 (26.4-47.5)	14.4 (7.1-24.3)	137	7.0 (5.9-8.3)	5.2 (4.4-6.2)
5	38	32.5 (23.0-44.7)	13.0 (9.1-17.8)	103	9.9 (8.1-12.1)	9.9 (8.0-11.9)	44	36.5 (26.5-49.0)	10.8 (7.5-14.8)	98	8.9 (7.2-10.8)	5.9 (4.8-7.2)
6	67	27.8 (21.6-35.4)	17.6 (8.3-30.2)	254	8.3 (7.3-9.4)	8.5 (7.5-9.6)	82	31.1 (24.7-38.6)	8.5 (6.6-10.7)	195	6.3 (5.4-7.2)	4.6 (4.0-5.3)
7	94	49.5 (40.0-60.5)	20.5 (15.4-26.3)	152	9.1 (7.7-10.7)	9.3 (7.9-10.9)	58	30.6 (23.3-39.6)	11.2 (7.9-15.0)	136	8.0 (6.7-9.5)	5.8 (4.8-6.8)
NB	812	34.4 (32.1-36.9)	16.5 (14.3-18.8)	2,205	8.5 (8.1-8.9)	8.9 (8.6-9.3)	777	34.4 (32.0-36.9)	12.0 (10.3-13.9)	2,216	8.0 (7.6-8.3)	5.5 (5.3-5.8)

9d. 2005-06:

	Male						Female					
	With diagnosed diabetes			Without diagnosed diabetes			With diagnosed diabetes			Without diagnosed diabetes		
Health region	Total deaths	Crude rate (95% CI)	ASMR (95% CI)	Total deaths	Crude rate (95% CI)	ASMR (95% CI)	Total deaths	Crude rate (95% CI)	ASMR (95% CI)	Total deaths	Crude rate (95% CI)	ASMR (95% CI)
1	225	35.4 (30.9-40.3)	16.4 (11.2-22.5)	565	8.4 (7.7-9.1)	8.4 (7.7-9.1)	183	32.0 (27.6-37.0)	9.8 (7.7-12.3)	546	7.5 (6.9-8.2)	5.0 (4.5-5.4)
2	217	35.4 (30.8-40.4)	16.5 (12.3-21.3)	503	8.7 (7.9-9.5)	9.1 (8.3-9.9)	188	32.9 (28.4-38.0)	9.3 (7.9-10.8)	563	8.8 (8.1-9.6)	5.9 (5.3-6.4)
3	194	36.3 (31.4-41.8)	16.1 (13.3-19.0)	435	7.9 (7.1-8.6)	8.1 (7.3-8.9)	170	33.3 (28.5-38.7)	11.7 (9.6-13.9)	426	7.0 (6.4-7.7)	5.2 (4.7-5.7)
4	38	26.8 (19.0-36.8)	16.7 (7.9-28.7)	162	8.7 (7.4-10.1)	9.3 (7.9-10.8)	44	30.6 (22.2-41.0)	11.0 (6.8-16.2)	180	9.3 (7.9-10.7)	6.6 (5.6-7.6)
5	41	32.7 (23.4-44.3)	13.2 (9.4-17.6)	87	8.5 (6.8-10.5)	8.2 (6.5-10.0)	31	24.7 (16.8-35.0)	7.8 (4.9-11.3)	98	9.0 (7.3-11.0)	5.8 (4.7-7.1)
6	70	26.7 (20.8-33.8)	10.3 (8.0-12.9)	250	8.3 (7.3-9.4)	8.4 (7.3-9.4)	92	32.2 (25.9-39.5)	8.9 (7.0-11.1)	204	6.7 (5.8-7.6)	5.0 (4.3-5.8)
7	61	30.9 (23.6-39.7)	12.1 (9.2-15.3)	108	6.5 (5.4-7.9)	6.5 (5.3-7.8)	75	37.8 (29.8-47.4)	11.2 (8.4-14.3)	112	6.7 (5.5-8.0)	4.8 (3.9-5.7)
NB	846	33.6 (31.3-35.9)	15.0 (13.2-16.9)	2,115	8.1 (7.8-8.5)	8.4 (8.0-8.7)	783	32.4 (30.2-34.8)	9.9 (9.1-10.8)	2,132	7.7 (7.3-8.0)	5.3 (5.1-5.6)

Appendix 9a - 9f (cont.) Crude and age-standardized mortality rates (per 1,000 population) in individuals ≥20 years old, by sex, diabetes status, health region and fiscal year, New Brunswick, 2002-03 to 2007-08

9e. 2006-07:

	Male						Female					
	With diagnosed diabetes			Without diagnosed diabetes			With diagnosed diabetes			Without diagnosed diabetes		
Health region	Total deaths	Crude rate (95% CI)	ASMR (95% CI)	Total deaths	Crude rate (95% CI)	ASMR (95% CI)	Total deaths	Crude rate (95% CI)	ASMR (95% CI)	Total deaths	Crude rate (95% CI)	ASMR (95% CI)
1	197	28.6 (24.7-32.9)	11.8 (9.3-14.5)	488	7.2 (6.6-7.9)	7.2 (6.6-7.9)	192	31.3 (27.0-36.0)	13.3 (8.4-19.2)	580	8.0 (7.3-8.6)	5.4 (4.9-5.9)
2	220	33.8 (29.5-38.6)	13.2 (11.3-15.1)	472	8.2 (7.4-8.9)	8.6 (7.8-9.4)	210	34.6 (30.1-39.6)	11.6 (9.1-14.4)	560	8.8 (8.1-9.6)	5.8 (5.3-6.3)
3	198	35.0 (30.3-40.3)	20.9 (13.5-30.0)	472	8.5 (7.8-9.3)	8.9 (8.1-9.7)	188	34.9 (30.1-40.2)	11.9 (9.8-14.2)	510	8.4 (7.7-9.2)	6.1 (5.6-6.7)
4	56	36.1 (27.3-46.9)	17.3 (11.0-25.0)	160	8.7 (7.4-10.1)	9.0 (7.7-10.5)	46	29.3 (21.5-39.1)	11.6 (7.4-16.7)	157	8.2 (6.9-9.5)	5.6 (4.7-6.5)
5	36	27.2 (19.0-37.6)	12.5 (7.6-18.7)	110	10.9 (9.0-13.2)	10.2 (8.3-12.2)	44	32.8 (23.8-44.0)	9.4 (6.4-13.1)	97	9.1 (7.4-11.1)	5.6 (4.5-6.8)
6	72	25.1 (19.6-31.6)	11.6 (7.6-16.3)	226	7.6 (6.6-8.6)	7.5 (6.5-8.5)	103	33.2 (27.1-40.3)	10.3 (8.1-12.8)	184	6.1 (5.2-7.0)	4.2 (3.6-4.8)
7	87	41.9 (33.6-51.7)	21.1 (12.4-32.1)	143	8.8 (7.4-10.3)	8.7 (7.3-10.2)	67	33.1 (25.6-42.0)	14.2 (7.2-23.6)	126	7.6 (6.3-9.0)	5.2 (4.3-6.2)
NB	867	32.1 (30.0-34.3)	15.1 (13.0-17.4)	2,076	8.0 (7.7-8.4)	8.2 (7.9-8.6)	851	33.0 (30.9-35.3)	11.9 (10.3-13.6)	2,216	8.0 (7.7-8.3)	5.5 (5.3-5.7)

9f. 2007-08:

	Male						Female					
	With diagnosed diabetes			Without diagnosed diabetes			With diagnosed diabetes			Without diagnosed diabetes		
Health region	Total deaths	Crude rate (95% CI)	ASMR (95% CI)	Total deaths	Crude rate (95% CI)	ASMR (95% CI)	Total deaths	Crude rate (95% CI)	ASMR (95% CI)	Total deaths	Crude rate (95% CI)	ASMR (95% CI)
1	240	32.5 (28.5-36.9)	14.2 (11.4-17.4)	529	7.8 (7.1-8.5)	7.8 (7.1-8.5)	202	31.1 (27.0-35.7)	9.3 (7.4-11.4)	564	7.7 (7.1-8.3)	5.1 (4.6-5.5)
2	246	36.0 (31.6-40.8)	14.6 (12.2-17.2)	503	8.7 (7.9-9.5)	9.0 (8.2-9.8)	242	38.1 (33.4-43.2)	10.9 (9.3-12.6)	535	8.4 (7.7-9.1)	5.4 (5.0-6.0)
3	202	33.5 (29.0-38.5)	15.6 (10.5-21.7)	455	8.2 (7.5-9.0)	8.3 (7.5-9.1)	201	35.6 (30.8-40.9)	10.9 (9.3-12.6)	496	8.2 (7.5-8.9)	5.6 (5.1-6.2)
4	69	41.5 (32.3-52.5)	18.0 (13.0-23.8)	161	8.8 (7.5-10.2)	9.2 (7.8-10.7)	53	31.6 (23.7-41.4)	11.0 (7.9-14.7)	145	7.6 (6.4-9.0)	5.1 (4.3-6.0)
5	58	41.2 (31.3-53.3)	15.4 (11.6-19.7)	102	10.2 (8.4-12.4)	9.2 (7.5-11.1)	33	23.9 (16.5-33.6)	6.9 (4.3-10.1)	97	9.2 (7.5-11.2)	5.5 (4.4-6.7)
6	99	32.0 (26.0-38.9)	12.0 (9.7-14.5)	236	8.0 (7.0-9.1)	7.5 (6.5-8.5)	99	29.9 (24.3-36.4)	10.2 (7.1-14.0)	197	6.6 (5.7-7.5)	4.6 (4.0-5.3)
7	71	33.0 (25.8-41.6)	13.1 (10.1-16.4)	133	8.2 (6.9-9.8)	7.7 (6.5-9.1)	70	32.8 (25.6-41.5)	10.7 (7.7-14.2)	132	8.0 (6.7-9.5)	5.2 (4.3-6.2)
NB	986	34.3 (32.2-36.5)	14.5 (12.9-16.1)	2,120	8.2 (7.8-8.5)	8.2 (7.9-8.6)	901	33.2 (31.1-35.5)	10.1 (9.3-11.0)	2,168	7.8 (7.5-8.1)	5.2 (5.0-5.5)

Appendix 10. Crude and age-standardized hospital separation rates (per 1,000 population) in individuals ≥1 year old, by diabetes status, and rate ratios, by sex and fiscal year, New Brunswick, 2002-03 to 2007-08

Fiscal year	Sex	With diagnosed diabetes		Without diagnosed diabetes		Ratio of age-standardized rates (95% CI)
		Crude rate (95% CI)	Age-standardized rate (95% CI)	Crude rate (95% CI)	Age-standardized rate (95% CI)	
2002-03	Male	404.6 (396.1-413.3)	294.2 (271.5-317.8)	88.4 (87.4-89.4)	89.8 (88.8-90.9)	3.3 (3.0-3.5)
	Female	433.0 (424.0-442.1)	400.6 (364.3-438.6)	129.1 (128.0-130.3)	125.5 (124.4-126.7)	3.2 (2.9-3.5)
2003-04	Male	363.5 (355.7-371.4)	292.2 (265.7-320.0)	78.6 (77.7-79.6)	79.4 (78.4-80.3)	3.7 (3.4-4.0)
	Female	385.2 (377.0-393.6)	367.7 (333.9-403.2)	114.0 (112.9-115.2)	111.7 (110.6-112.8)	3.3 (3.0-3.6)
2004-05	Male	362.7 (355.1-370.4)	295.0 (266.9-324.6)	87.7 (86.7-88.6)	87.7 (86.7-88.7)	3.4 (3.1-3.7)
	Female	391.3 (383.2-399.5)	346.0 (316.0-377.3)	127.1 (125.9-128.3)	123.4 (122.2-124.6)	2.8 (2.6-3.1)
2005-06	Male	349.5 (342.2-356.8)	275.7 (249.5-303.1)	83.1 (82.1-84.1)	82.4 (81.4-83.4)	3.3 (3.0-3.7)
	Female	366.0 (358.4-373.7)	338.2 (304.7-373.5)	120.1 (118.9-121.2)	117.2 (116.0-118.3)	2.9 (2.6-3.2)
2006-07	Male	354.4 (347.4-361.5)	299.8 (267.2-334.2)	79.8 (78.8-80.7)	78.5 (77.6-79.5)	3.8 (3.4-4.3)
	Female	370.8 (363.4-378.2)	349.7 (315.4-385.7)	116.0 (114.9-117.1)	112.9 (111.8-114.0)	3.1 (2.8-3.4)
2007-08	Male	339.2 (332.6-346.0)	284.3 (258.5-311.3)	76.3 (75.4-77.3)	74.4 (73.4-75.3)	3.8 (3.5-4.2)
	Female	348.0 (341.1-355.1)	324.8 (295.1-356.0)	111.3 (110.3-112.4)	108.7 (107.6-109.9)	3.0 (2.7-3.3)

*Age-standardized to the 1991 Canadian population.

Appendix 11. Distribution of individuals ≥1 year old with multiple yearly hospital separations, by average yearly number of hospital separations, by diabetes status, sex and health region, New Brunswick, 2003-04 to 2007-08

Health region	Number of separations	Male				Female			
		With diagnosed diabetes		Without diagnosed diabetes		With diagnosed diabetes		Without diagnosed diabetes	
		Number of individuals	%	Number of Individuals	%	Number of individuals	%	Number of individuals	%
1	1	792	61.3%	3,625	73.9%	776	62.8%	5,541	72.3%
	2	290	22.4%	850	17.3%	266	21.5%	1,538	20.1%
	3	114	8.8%	253	5.2%	106	8.6%	388	5.1%
	4+	97	7.5%	179	3.6%	87	7.0%	199	2.6%
	Total	1,293	100.0%	4,907	100.0%	1,235	100.0%	7,666	100.0%
2	1	765	66.5%	2891	77.9%	763	66.8%	4,457	73.6%
	2	235	20.4%	557	15.0%	233	20.4%	1,218	20.1%
	3	88	7.6%	160	4.3%	82	7.2%	255	4.2%
	4+	63	5.5%	104	2.8%	65	5.7%	122	2.0%
	Total	1,151	100.0%	3,712	100.0%	1,143	100.0%	6,052	100.0%
3	1	656	59.3%	2880	72.0%	684	61.3%	4,567	71.3%
	2	248	22.4%	710	17.8%	234	21.0%	1,292	20.2%
	3	112	10.1%	238	6.0%	105	9.4%	354	5.5%
	4+	90	8.1%	172	4.3%	92	8.3%	195	3.0%
	Total	1,106	100.0%	4,000	100.0%	1,115	100.0%	6,408	100.0%
4	1	162	58.9%	1,050	74.4%	172	61.6%	1,371	70.6%
	2	61	22.2%	229	16.2%	61	21.9%	386	19.9%
	3	28	10.2%	78	5.5%	24	8.6%	114	5.9%
	4+	24	8.7%	55	3.9%	22	7.9%	72	3.7%
	Total	275	100.0%	1,412	100.0%	279	100.0%	1,943	100.0%
5	1	178	59.3%	735	70.7%	198	59.1%	1,063	69.6%
	2	62	20.7%	187	18.0%	76	22.7%	279	18.3%
	3	31	10.3%	62	6.0%	34	10.1%	107	7.0%
	4+	29	9.7%	55	5.3%	27	8.1%	78	5.1%
	Total	300	100.0%	1,039	100.0%	335	100.0%	1,527	100.0%
6	1	324	56.7%	1,941	71.3%	384	55.5%	2,645	71.4%
	2	129	22.6%	478	17.6%	164	23.7%	714	19.3%
	3	55	9.6%	164	6.0%	72	10.4%	216	5.8%
	4+	63	11.0%	140	5.1%	72	10.4%	128	3.5%
	Total	571	100.0%	2,723	100.0%	692	100.0%	3,703	100.0%
7	1	280	56.2%	1,117	71.5%	293	57.2%	1,526	69.0%
	2	104	20.9%	270	17.3%	121	23.6%	437	19.8%
	3	54	10.8%	97	6.2%	51	10.0%	142	6.4%
	4+	60	12.0%	78	5.0%	47	9.2%	105	4.8%
	Total	498	100.0%	1,562	100.0%	512	100.0%	2,210	100.0%

Appendix 12. Distribution of individuals ≥20 years old with multiple yearly hospital separations for selected co-morbidities of diabetes, by average yearly number of hospital separations, by diabetes status and sex, New Brunswick, 2003-04 to 2007-08

With diagnosed diabetes:

Sex	Number of separations	Acute myocardial infarction	Cardiovascular disease	Heart failure	Hypertension	Ischemic heart disease	Stroke	Chronic kidney disease	End-stage renal disease	Lower limb amputation
Male	1	314	1,685	490	682	801	282	340	65	59
	2	77	557	115	121	306	44	95	23	9
	3	17	351	63	48	156	12	62	18	2
Female	1	249	1,601	519	744	626	261	304	46	25
	2	52	479	127	135	201	31	82	19	3
	3	11	302	70	56	111	9	57	16	1
Total	1	563	3,286	1,009	1,426	1,427	543	644	111	84
	2	129	1,036	242	256	507	75	177	42	12
	3	28	653	133	104	267	21	119	34	3

Without diagnosed diabetes:

Sex	Number of separations	Acute myocardial infarction	Cardiovascular disease	Heart failure	Hypertension	Ischemic heart disease	Stroke	Chronic kidney disease	End-stage renal disease	Lower limb amputation
Male	1	656	3,611	594	1,130	1,481	514	351	60	30
	2	172	1,043	111	147	608	65	76	19	2
	3	26	452	45	49	219	20	39	11	0
Female	1	382	3,597	743	1,383	1,029	561	307	40	25
	2	71	773	121	186	269	64	57	16	2
	3	14	334	40	53	109	14	33	11	0
Total	1	1,038	7,208	1,337	2,513	2,510	1,075	658	100	55
	2	243	1,816	232	333	877	129	133	35	4
	3	40	786	85	102	328	34	72	22	0

Appendix 13. 1991 Canadian standard population weights

Age group	Weight per 100,000 population
1-4	5,517.7
5-9	6,945.4
10-14	6,803.4
15-19	6,849.5
20-24	7,501.6
25-29	8,994.4
30-34	9,240.0
35-39	8,338.8
40-44	7,606.3
45-49	5,953.6
50-54	4,764.9
55-59	4,404.1
60-64	4,232.6
65-69	3,857.0
70-74	2,965.9
75-79	2,212.7
80-84	1,359.5
85+	1,023.7

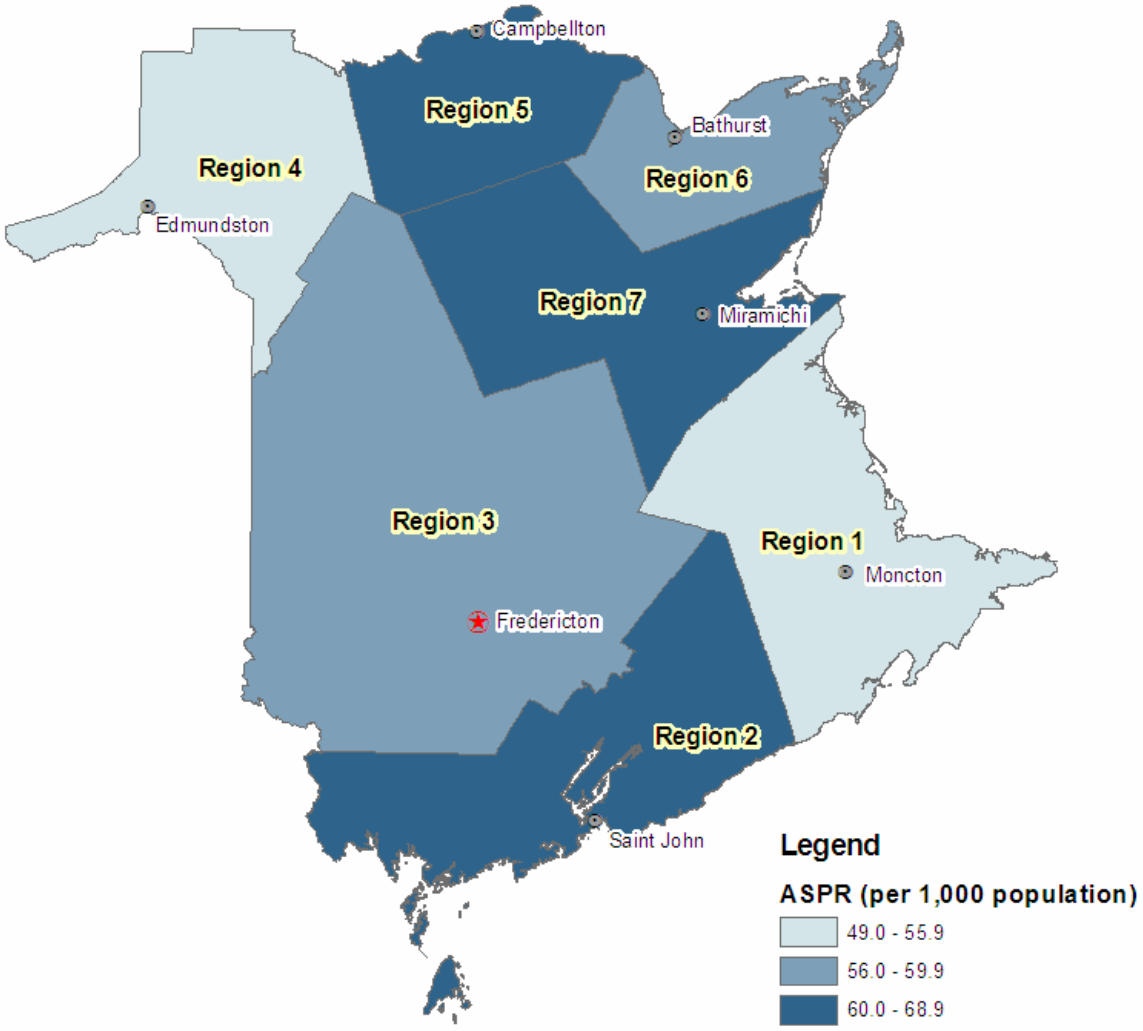
Appendix 14. Specifications for ascertainment of diseases

Diseases	ICD-9-CM	ICD-10-CA
Diabetes mellitus	250	E10, E11, E13, E14
Cardiovascular disease	390 - 448	I00 - I78
Ischemic heart disease	410 - 414	I20 - I25
Hypertensive disease	401 - 405	I10 - I15
Acute myocardial infarction	410	I21 - I22
Heart failure	428	I50
Stroke	430 - 438	I60 - I69
Chronic kidney disease	585 - 586	N18 - N19
Gestational diabetes mellitus	648.8	O24.4-O24.9 (Version 2003), O24.8 (Version 2006)

Appendix 15. Specifications for ascertainment of lower limb amputation

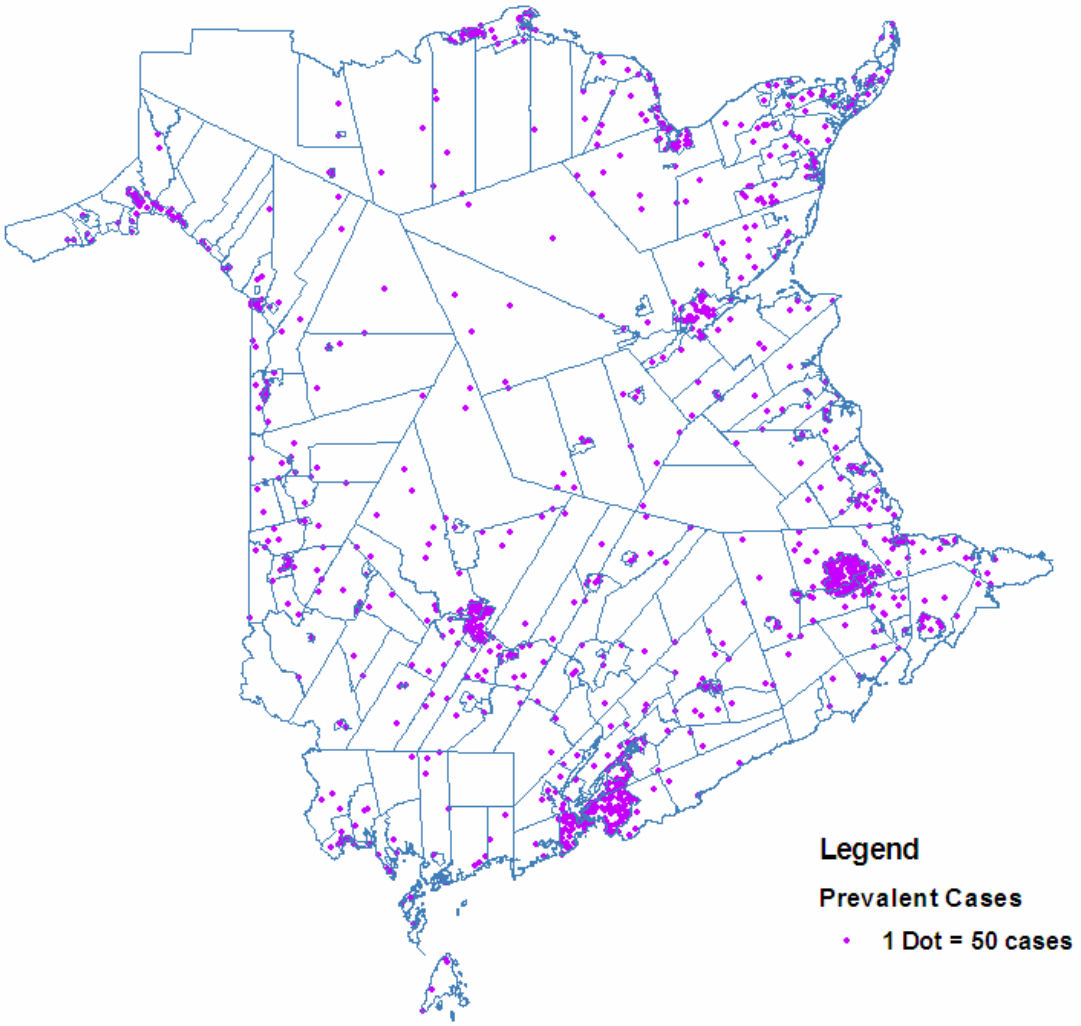
Coding system	Procedure / intervention code	Diagnosis codes excluded (amputations as a result of trauma or cancer)
ICD-9-CM	8411 - 8419	170, 171, 213, 740 - 759, 800 - 904, 940 - 950
ICD-10-CA and CCI	1SQ93, 1VA93, 1VC93, 1VG93, 1VQ93, 1WA93, 1WE93, 1WJ93, 1WL93, 1WM93	C40, C41, C46.1, C47, C49, C80, C96.2, D16.0, E83.0, G90.1, H47.3, L59.0, M43.1, M43.2, M89.8, N07.9, N81.8, P29.3, P96.0, Q00 - Q99, R294, S00 - S99, T00 - T98

Appendix 16. Age-standardized prevalence rates† of diagnosed diabetes, by health region, New Brunswick, 2007-08



†Age-standardized to 1991 Canadian population.

Appendix 17. Distribution of individuals with diagnosed diabetes, New Brunswick, 2007-08



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GLOSSARY

Acute care: an in-patient service where the patient is admitted to hospital for a short period for treatment that cannot be done on an out-patient basis.

Age-specific rate: calculated by dividing the number of cases occurring in each of the specified age groups by the corresponding population in each of these age groups.

Age-standardized rate: a procedure where rates are adjusted for age to facilitate comparisons between populations that have different age distributions. This report used the method of direct standardization in which age-specific rates were multiplied by the number of people in the corresponding age group in the reference population (Canada, 1991 population). Then, these "expected" counts were summed and divided by the total population size of the reference population to yield the directly standardized rate. It represents what the observed rate would have been if the population had the same age distribution as the 1991 Canadian standard population.

Canadian Classification of Health Interventions/Procedures (CCI/CCP): the Canadian Classification of Health Interventions (CCI) is the national standard for classifying health care procedures. The CCI is the companion classification system to ICD-10-CA. It replaces the Canadian Classification of Diagnostic, Therapeutic and Surgical Procedures (CCP) and the intervention portion of ICD-9-CM in Canada.

Coefficient of variation: the ratio of the standard deviation to the mean.

Co-morbid hospitalization: hospitalization for a health problem other than diabetes in an individual that had already met the CCDSS case criteria for diabetes.

Confidence interval: a confidence interval gives an estimated range of values that is likely to include a given population parameter, the estimated range being calculated from a given set of sample data. For example, the 95% confidence interval for a given population parameter is the estimated range of values that is likely to contain the true value of the parameter 19 times out of 20. The width of the confidence interval gives us some idea about how uncertain we are about the unknown parameter.

Data cleaning: the process of identifying, correcting or removing incomplete, incorrect or inaccurate records from a database.

Fee-for-service: this billing system refers to payment of claims submitted by physicians for individual services they provided to patients (for example, office visits and clinical procedures).

Fiscal year: a 12-month period for which an organization uses to plan, organize and report its financial results. The fiscal year used by the government of New Brunswick is the period beginning April 1 and ending March 31 the next year. For example, fiscal year 2007-08 includes the period April 1, 2007 to March 31, 2008.

Gestational diabetes mellitus: gestational diabetes is a condition in which women without previously diagnosed diabetes exhibit high blood glucose levels during pregnancy. Blood sugar levels typically return to normal soon after delivery.

Hospital care days: the total number of patient days accumulated by an inpatient when released from hospital as a result of being discharged, transferred to another facility or because the patient has died. It is computed by counting all days from (and including) the date of admission to (but not including) the date of being released from hospital.

Hospital separation: occurs when an inpatient leaves the hospital as a result of being discharged, transferred to another facility or because the patient died. Hospital separation is the most commonly used measure of health care utilization. Separations, rather than admissions, are used because hospital abstracts for in-patient care are based on information gathered at the time of discharge.

Incidence: the number of individuals newly diagnosed with diabetes during the selected year(s).

Incidence rate: the number of new cases of diabetes diagnosed during the selected year(s) per 1,000 population at risk.

Insured population: the total number of individuals with a valid New Brunswick Medicare number at any point during the selected fiscal year. Individuals with less than a year of coverage due to immigration, emigration, or death were also included in the insured population.

International Statistical Classification of Diseases (ICD): this international standard diagnostic classification of diseases and health conditions is used to classify diseases, injuries and other health problems. It is recorded on many types of health and vital records, including death certificates and health records. In addition to facilitating the storage and retrieval of diagnostic information for clinical, epidemiological and quality purposes, the resulting records form the basis for compiling national morbidity and mortality statistics.

GLOSSARY

Life expectancy: the remaining number of years that an individual is expected to live after a given age based on mortality rates in the insured population.

Mortality rate: the number of deaths per 1,000 individuals of the insured population during a specified period.

Prevalence: the total number of individuals living with diagnosed diabetes among the insured population during a specified period.

Prevalence rate: the total number of prevalent cases of diagnosed diabetes per 1,000 individuals at risk during a specified period.

Rate ratio: the rate for individuals with diagnosed diabetes divided by the rate for individuals without diabetes. It is an expression of the relationship between those with diabetes and those without diabetes.

Shadow billing: a process whereby physicians submit service provision information using provincial fee codes as if in a fee-for-service arrangement. Salary, however, is through an alternate payment plan, not directly linked to the service provision information they submit (see Fee-for-service).