From the Beginning: Understanding Diabetes Using Dis-aggregated Data
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Introduction
This case study on diabetes was originally included in Prairie Women’s Health Centre of Excellence’s guide on gender and health planning to demonstrate how sex, age and belonging to a particular sub-population interact. It proved valuable for health planners in Manitoba – and elsewhere – because it provided step-by-step instructions for a simple sex- and gender-based analysis using data that were both familiar and readily available. While the figures reproduced here are accurate, they are by no means intended to give a complete picture of diabetes in Manitoba. Instead, the figures and statistics are used to take readers through the process of conducting a sex- and gender-based analysis using dis-aggregated data. This case study demonstrates how understanding populations “at risk” can change depending on how data are examined.

Considering Diabetes by Sex
Diabetes is a major health concern in Manitoba. According to Manitoba Health, in 1999, 57,391 Manitobans were living with diabetes, representing 5.0 percent of the total population or 7.4 percent of adults aged 25 years and over. Of those who had been diagnosed with diabetes, 29,850 were women and 27,541 were men. In Canada overall, 4.4 percent of males and 3.9 percent of females had diabetes, however, the reverse was true in Manitoba, where more women than men live with the disease. In 1999, the prevalence of diabetes (that is, the total number of cases) among female Manitobans (children and adults) was 515 per 10,000 (5.2 percent) and 487 per 10,000 (4.9 percent) for male Manitobans. Irrespective of sex, the number of cases of diabetes continues to rise in the province, with more and more women and men living with the disease every year (see Figure 1).

Not only has there been a consistent increase in the prevalence of the disease, but the incidence (the number of new cases diagnosed in a specified year) has also been on the rise for both Manitoba women and men. Until 1994, more women than men were being diagnosed with diabetes each year. However, starting in 1996, although the disease still increased for both sexes, more new cases were being reported annually among men. For example, Figure 2 shows that the annual incidence of diabetes for Manitoba men in 1990 was 33.2 per 10,000 and by 1999 the number rose to 51.9 per 10,000 – an increase of 56 percent. For women, the annual incidence of diabetes rose from 35.2 per 10,000 in 1990 to 49 per 10,000 in 1999 – an increase of 39 percent (see Figure 2). Given that the number of new cases among men was increasing faster than the rate for women, we expect that, over time, the prevalence of diabetes among men will also increase.

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Figure 1. Prevalence of Diabetes by Year and Sex, Manitoba, 1989 - 1999

Source: Diabetes and Chronic Disease Unit, Manitoba Health. 2002.

Figure 2. Annual Incidence of Diabetes by Year and Sex, Manitoba, 1989 - 1999

Source: Diabetes and Chronic Disease Unit, Manitoba Health. 2002.
Examining incidence and prevalence rates by sex can tell us a lot about diabetes among Manitoban women and men. However, if we fail to take other factors into account, we can miss out on important information.

**Sex and Age**

If we look at the same information, but take both sex and age into consideration, we see that in Manitoba, women are more likely than men to be diagnosed with diabetes from ages 15 to 39 (see Figure 3). However, the reverse is true when we look at the data for people 40 years and older, with more men than women being diagnosed with the disease in this age range. What this tells us is that diabetes prevention, detection and treatment programs will be more effective if they are both sex and age sensitive in their approach.

![Figure 3. Incidence of Diabetes by Age and Sex, Manitoba, 1999](source: Diabetes and Chronic Disease Unit, Manitoba Health. 2002.)

b Note that the data do not separate out gestational diabetes from other diabetes. Those women who develop gestational diabetes during pregnancy are more likely than other women to later develop overt diabetes. This is important because earlier onset of diabetes means an increased likelihood of developing complications later in life.
Sex, Age and First Nations: Prevalence and Incidence

If we look at a sub-population along with sex and age, we get an even more accurate picture of who in Manitoba is at a greater risk of developing diabetes. In general, Aboriginal women and men bear a greater burden of illness than other Canadians, suffering from higher rates of heart problems, hypertension, rheumatoid arthritis and diabetes.\(^3\)

In comparison to Canadians as a whole, there is a greater burden of diabetes borne by First Nations people living on-reserve in general, and among on-reserve First Nations women in particular (see Figure 4). In fact, when we look at every age group, we see that First Nations women have the highest rates of diabetes, compared to both First Nations men and other Canadian women and men.

Figure 4. Prevalence of Self-reported Diabetes by Age and First Nations on Reserve and Canada

(Reprinted from Health Canada, Diabetes Among Aboriginal People in Canada: The Evidence, 2000)

Similarly, when we examine diabetes at the provincial level we see that First Nations people living in Manitoba are at much greater risk of developing the disease than other Manitobans. For example, in 1999, the incidence of new cases of diabetes among First Nations people living in Manitoba was 74 cases per

Recent research about diabetes among on-reserve First Nations people living in Manitoba found that diabetes prevalence was significantly associated with both income and geography. Northern First Nations communities had lower rates of diabetes than southern First Nations communities. As well, the higher the income of the tribal council area, the lower the diabetes prevalence. Interestingly, access to specialists was not associated with diabetes prevalence.\(^4,p5-6\)

\(^c\) Aboriginal is an umbrella term that includes First Nations (Indian), Métis and Inuit peoples of Canada. Data sets vary in how Aboriginal people are included.
10,000 compared with 49 per 10,000 for other Manitobans. Among Manitoba First Nations people 50 years and older, 36 to 44 percent of the population in each age group had already been diagnosed with diabetes.

Therefore, in addition to being sensitive to age and sex, programs developed specifically to prevent, detect and/or treat diabetes will be more effective if they are responsive to the particular needs of First Nations and other Aboriginal women and men.

### Complications of Diabetes

Living with diabetes puts people at risk for long-term complications of the disease, including heart disease, stroke, permanent vision loss, lower limb amputation, and renal (kidney) failure. Figure 5 shows that both women and men are at-risk of developing renal failure, one of the most serious complications of diabetes. While the risks become greater for both sexes as they age, the risks for men increase sharply after age 65. In addition, Figure 6 illustrates higher rates of lower limb amputation among men than among women.

Since men are at much greater risk of developing complications of diabetes, a gender sensitive approach is needed to prevent complications.

*Figure 5. Rate of Renal Failure by Age and Sex, Manitoba, 1999*

Source: Diabetes and Chronic Disease Unit, Manitoba Health. 2002.

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d More data are available about diabetes among First Nations people living in Manitoba than for other Aboriginal people. First Nations people living in Manitoba in this data set are those identified to Manitoba Health as having treaty status.
Not only is it important to look at complication rates among women and men, but other factors, such as ancestry, need to be considered as well. When we look at differences among First Nations and non-First Nations women and men in Manitoba, we see that First Nations people living in Manitoba were much more likely to develop complications of this disease. But here too, gender differences are significant. Figure 7 shows that First Nations women were more likely to experience renal failure than either First Nations men or other Manitoba women or men. However, looking only at the data by age and sex obscured this important fact.

Source: Diabetes and Chronic Disease Unit, Manitoba Health. 2002.
Aboriginal people with diabetes have very high rates of complications of the disease. For example, in 1998 in the First Nations population of Manitoba, persons with diabetes account for:[6]

- 91 percent of limb amputations
- 60 percent of hospitalizations for heart disease
- 50 percent of hospitalizations for stroke
- 30 percent of hospitalizations

Data for lower limb amputations also show the greater risk faced by First Nations people living in Manitoba. However, in this case it was First Nations men, not women, who were at greatest risk of lower limb amputations (see Figure 8).
With diabetes, prevention is critical to reducing the number of new cases and to lessening the burden of complications on those who live with diabetes, and on the health care system. Knowing who is at greater risk helps to improve health planning. Taking sex, age and First Nations sub-populations into consideration will enable health planners to design more successful prevention programs.

**Incorporating Sex and Gender in Planning for Diabetes Prevention, Detection and Treatment**

In the past, planning for diabetes treatment, detection and prevention did not take sex and gender into consideration. Many documents did not include gender as a determinant of health, nor women and men as populations requiring special consideration. The trends are beginning to change. For example, Health Canada’s 1999 *Diabetes in Canada*[^7] recognized Aboriginal women as a population requiring special consideration because of their higher prevalence of diabetes, the risks of complications of pregnancy and the future risk for their children. In addition, in 2001, Manitoba Health and the Manitoba Women’s Directorate jointly published Manitoba’s *Women’s Health Strategy*.[^8] The strategy acknowledged the role of gender as a determinant of population health.

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Regional health planners can be leaders in developing diabetes programming which incorporates the broader knowledge gained by using a sex- and gender-based analysis. Here are some points for health planners to consider for diabetes programs for their regions.

**Primary Prevention of Type 2 Diabetes Focuses on Modifiable Risk Factors**

These are: obesity, physical inactivity and income adequacy.\(^{[9]}\)

- What do we know about obesity and physical inactivity in our region?
- What factors contribute to physical inactivity and obesity among women and men? How are they different?
- How can we promote physical activity and healthy body weight among women in a way that supports and encourages healthy body images for women of all ages and sizes?
- How can we design programs to promote healthy body weight and physical activity which are accessible to, and appropriate for, Aboriginal women and men? With which Aboriginal organizations, federal and provincial departments should we consult?
- In Canada and in Manitoba, women are more likely to be poor than men. Aboriginal women and senior women are among those most likely to be poor. What do we know about the income levels of the women and men in our region?

**Secondary Prevention of Diabetes Focuses on Early Detection Through Screening**

- How can we promote the appropriate use of screening for diabetes for women and men? Do we need different strategies to reach them? What would these be?
- What kinds of strategies are needed to reach Aboriginal women and men in our region? What Aboriginal organizations and resources could assist us?

**Tertiary Prevention of Diabetes Focuses on Preventing or Delaying the Complications of Diabetes**

Tight glycemic control (keeping blood glucose levels in the desired range) reduces the rate of complications from diabetes. This in turn requires that those living with diabetes have the information necessary to manage their own condition.

- Do women and men need different types of diabetes education in order to successfully control their blood glucose levels? What would these be? How can we find out?
- How can we make our diabetes education programs most useful to Aboriginal women and men? With which Aboriginal organizations and resources can we consult and work?

\(^{[9]}\) Health Canada considered income a modifiable risk factor. We understand this to mean that it is humanly constructed and can be changed at the societal level. Genetic endowment, for instance, is not modifiable.
References


