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# Report from the National Diabetes Surveillance System:

Diabetes in Canada, 2008



Canada 

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— Public Health Agency of Canada

Report from the National Diabetes Surveillance System: Diabetes in Canada, 2008  
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*Aussi disponible en français sous le titre :  
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To obtain additional copies, please contact:

Chronic Disease Surveillance Division  
Centre for Chronic Disease Prevention and Control  
785 Carling Avenue, AL: 6806B  
Ottawa, Ontario K1A 0K9  
Canada  
E-mail: [infobase@phac-aspc.gc.ca](mailto:infobase@phac-aspc.gc.ca)

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# Report from the National Diabetes Surveillance System: Diabetes in Canada, 2008

# Executive Summary

## Diabetes

- Diabetes is a chronic condition that stems from the body's inability to produce and/or properly use insulin. The body needs insulin to use sugar as an energy source. Diabetes can lead to serious complications and premature death. However, if someone has diabetes, steps can be taken to control the disease and lower the risk of complications.

## National Diabetes Surveillance System (NDSS)

- The National Diabetes Surveillance System (NDSS) is a network of provincial and territorial diabetes surveillance systems. It was created to improve the breadth of information about the burden of diabetes in Canada so that policymakers, researchers, health practitioners, and the general public could make better public and personal health decisions. The NDSS includes federal, and all provincial and territorial governments, non-governmental organizations, national Aboriginal groups, and researchers.

## NDSS Highlights

- In 2005-2006, approximately 1.9 million Canadians, or about one in 17 people had been diagnosed with diabetes - 5.9% overall – 5.5% of girls and women and 6.2 % of boys and men.
- In 2005-2006, the prevalence<sup>1</sup> of diagnosed diabetes was lower among children and adolescents than adults. The rates increased with age from about 2% in individuals in their 30's to about 22%, or 1 in 5, in adults aged 75 to 79 years old.
- After adjusting<sup>2</sup> for differences in age distributions among provinces and territories, the prevalence<sup>1</sup> of diagnosed diabetes was generally found to be highest in the Atlantic provinces (New Brunswick, Nova Scotia, Newfoundland and Labrador) and was lowest in the west (Saskatchewan, Alberta, and British Columbia). The prevalence<sup>1</sup> for Ontario was higher than the national average, and for Quebec, prevalence was lower than the national average. Provincial and territorial obesity prevalence, followed a similar pattern; higher in the Atlantic provinces and lower in the western provinces.
- The age-standardized prevalence<sup>1</sup> of diagnosed diabetes has increased by about 22% between 2001-2002 and 2005-2006.
- By 2011, the number of Canadians with diagnosed diabetes is expected to be about 2.6 million - an average annual percent increase of almost 7% and an increase of about 33% from 2006.
- In 2005-2006, 199,471 individuals were newly diagnosed with diabetes – a rate of 6.4 per 1,000 population aged 1 and older, overall, and 5.9 per 1,000 among girls and women and 6.8 per 1,000 among boys and men.

- There is an increased risk of developing diabetes over age 40. The entrance of the baby boom generation into the older age groups, and the rise in the prevalence<sup>1</sup> of obesity, are associated with the rise in the diagnosed diabetes prevalence and incidence rates<sup>8</sup>. In addition, age-standardized prevalence<sup>1</sup> is climbing at 3 times the rate of age-standardized incidence rates<sup>8</sup>, indicating that the increase in prevalence<sup>1</sup> is due, also in part, to improved survival among individuals with diabetes.
- In 2005-2006, among adults aged 20 years and older, death rates of individuals with diabetes were twice as high as those in individuals without diabetes.
- Diagnosed diabetes shortens life expectancy for all ages. For example, both men and women in the 25 to 39 year age groups with diagnosed diabetes had about a 9 year reduction in life expectancy in 2005-2006.
- In 2005-2006, younger adults (aged 20 to 49) with diagnosed diabetes had about twice as many visits to family physicians and 2 to 3 times more visits to specialists than individuals without diabetes. Even in the oldest age groups, individuals with diagnosed diabetes visited physicians about 1.5 times more often than individuals without diabetes.
- In 2005-2006, compared to adults without diabetes, adults with diagnosed diabetes were hospitalized:
  - 23 times more often with lower limb amputations;
  - 7 times more often with chronic kidney disease;
  - 3 times more often with overall cardiovascular disease including, hypertensive disease, heart failure, heart attack, ischaemic heart disease, and stroke.

# Diabetes

- Diabetes is a chronic condition that stems from the body's inability to produce and/or properly use insulin. The body needs insulin to use sugar as an energy source. Diabetes can lead to serious complications and premature death. However, controlling the disease can lower the risk of complications.

## Type 1 Diabetes

- Type 1 diabetes occurs when the beta cells of the pancreas are destroyed by the immune system and no longer produce insulin. An adequate supply of insulin is needed to help the body function. It usually develops in childhood or adolescence and there is no known way to prevent type 1 diabetes.

## Type 2 Diabetes

- Type 2 diabetes occurs when the body does not make enough insulin and/or does not respond well to the insulin it makes. People are usually diagnosed with type 2 diabetes after the age of 40, although it is now also being seen in children and adolescents.

## Gestational Diabetes

- Gestational diabetes is a form of diabetes that develops in women during pregnancy and disappears after delivery. Gestational diabetes occurs in about 4% of all pregnancies and increases the risk of developing type 2 diabetes.

## Reducing the Risk of Diabetes

- The risk of developing diabetes can be reduced by making healthy lifestyle choices, such as having a healthy diet, losing excess weight and exercising regularly. Weight loss of 5% to 10% has been shown to significantly reduce risk—about 4.5 to 9 kg (10 to 20 lbs.) for a 90-kg (200-lb.) person.

## Living with Diabetes

- Treatment depends on the type of diabetes and can include lifestyle modification and/or medications, including insulin. Regular physical activity and healthy weight are important factors for effective management of diabetes. Controlling blood glucose, blood pressure and blood lipids are necessary to reduce the complications associated with diabetes. Self-management of diabetes is an essential part of overall care. Regular screening for complications and early treatment can also reduce complications.

# National Diabetes Surveillance System (NDSS)

- The National Diabetes Surveillance System (NDSS) is a network of provincial and territorial diabetes surveillance systems. It was created to improve the breadth of information about the burden of diabetes in Canada so that policymakers, researchers, health practitioners, and the general public could make better public and personal health decisions. The NDSS includes federal and all provincial and territorial governments, non-governmental organizations, national Aboriginal groups, and researchers.
- In each province and territory, the health insurance registry database is linked to the physician billing and hospitalization databases, in which health data are primarily stored and reported by fiscal year. This report includes the most recent data available from the provinces and territories<sup>3</sup>, fiscal year, 2005-2006.
- The linked database is used to designate individuals who have diabetes<sup>4</sup>, based on the NDSS validated case criteria, which use the International Classification of Disease (ICD) standard diabetes codes.
- Currently, the NDSS case criteria do not include women with gestational diabetes. In addition, the criteria do not distinguish between diabetes types in any of the reported rates due to limitations of the physician billing data and the hospital discharge abstract data in identifying type 1 and type 2 diabetes.
- In the latest version of the ICD system (ICD-10-CA) used by hospitals to record the details of discrete hospitalizations, separate codes for type 1 and type 2 diabetes are provided. It is anticipated that as additional ICD-10-CA coded hospital data are accumulated and validated, that it will be possible to analyze and report rates associated with hospitalization stratified by diabetes type. For example, the rate of amputations among those with type 1 diabetes versus those with type 2.
- Using administrative data for surveillance, as in the NDSS, often requires a compromise when trying to identify cases of a disease. It is necessary to balance the possibility of misclassifying people who actually have been diagnosed with diabetes but who have not been captured by the NDSS as a diabetes case (false-negatives) with the reverse where people do not have diabetes but have been captured by the NDSS using the case criteria (false-positives). Validation studies have indicated that the NDSS case criteria minimize both false-negatives and false-positives in order to depict a relatively accurate picture of diagnosed diabetes in Canada. Additionally, there are some people who have not been diagnosed with diabetes, but in fact have the disease. Estimates for the number of people in this category are outside the scope of the NDSS.

## People With Diagnosed Diabetes (Prevalence<sup>5</sup>)

### For People Aged 1 and Older:

- In 2005-2006, approximately 1.9 million Canadians aged 1 and older, or about 1 in 17, had diagnosed diabetes (1,939,247 overall, 925,523 among girls and women and 1,013,724 among boys and men). The prevalence among Canadians was 5.9% overall (5.5% of girls and women and 6.2% of boys and men). (Tables 1 and 2)

Table 1. Prevalence Percentages, Number of Cases, and Incidence Rates per 1,000 of Diagnosed Diabetes by Age Group, Year, and Sex, Canada\*, 2001-2002 to 2005-2006

		2001-2002			2002-2003			2003-2004			2004-2005			2005-2006		
		Women	Men	Total*	Women	Men	Total*	Women	Men	Total*	Women	Men	Total*	Women	Men	Total*
%		5.6	6.4	6.0	6.8	6.3	6.6	6.8	6.7	6.8	6.8	6.7	7.2	7.1	7.1	7.6
cases		679,816	742,727	1,422,543	807,984	793,993	1,601,977	869,128	853,346	1,722,474	933,963	914,006	1,847,969	914,006	1,001,105	1,915,111
pop		12,173,768	11,627,576	23,801,344	11,813,939	12,548,093	24,362,032	11,999,980	12,738,242	24,738,222	12,186,941	12,938,339	25,125,280	12,938,339	12,385,139	25,323,478
1,000 cases pop		6.8	8.3	7.6	8.5	6.9	7.8	8.2	7.5	7.3	8.6	7.9	7.9	7.7	9.0	8.3
		79,207	90,969	170,176	93,978	82,000	175,978	91,541	87,655	179,196	97,196	92,812	190,008	92,812	103,401	196,213
		11,573,159	10,975,818	22,548,977	11,706,799	11,836,200	23,542,999	11,222,393	11,972,551	23,194,944	11,350,174	12,117,145	23,467,319	12,117,145	11,487,435	23,604,580
<b>Diagnosed Diabetes among Children, Aged 1 Year to 19</b>																
		2001-2002			2002-2003			2003-2004			2004-2005			2005-2006		
		Boys	Girls	Total*	Boys	Girls	Total*	Boys	Girls	Total*	Boys	Girls	Total*	Boys	Girls	Total*
%		0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
cases		9,722	10,543	20,265	11,226	10,228	21,454	11,766	22,531	24,307	11,192	12,192	23,384	11,517	12,619	24,136
pop		3,805,331	4,003,789	7,809,120	3,994,556	3,795,557	7,790,113	3,979,336	3,770,282	7,749,618	3,995,098	3,763,695	7,758,793	3,957,862	3,957,862	7,915,724
1,000 cases pop		0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
		1,561	1,596	3,157	1,673	1,574	3,247	1,693	3,314	3,507	1,542	1,647	3,189	1,539	1,719	3,258
		3,797,170	3,994,842	7,792,012	3,985,003	3,773,802	7,758,805	3,969,263	3,760,718	7,730,001	3,954,553	3,753,717	7,707,770	3,946,962	3,946,962	7,894,932
<b>Diagnosed Diabetes among People Aged 1 Year and Older</b>																
		2001-2002			2002-2003			2003-2004			2004-2005			2005-2006		
		Males	Females	Canada*	Males	Females	Canada*	Males	Females	Canada*	Males	Females	Canada*	Males	Females	Canada*
%		4.3	4.8	4.6	5.2	4.9	5.1	5.5	5.2	5.2	5.2	5.9	5.5	5.5	6.2	5.9
cases		689,538	753,270	1,442,808	819,210	1,567,869	2,387,079	880,894	864,538	1,745,432	864,538	946,155	1,810,693	925,523	1,013,724	1,939,247
pop		15,979,099	15,631,365	31,610,464	15,808,495	16,331,039	32,139,534	15,979,316	16,508,610	32,487,926	16,508,610	16,152,039	32,660,649	16,702,034	16,343,001	33,045,035
1,000 cases pop		5.3	6.2	5.7	6.3	6.3	6.1	6.1	5.7	5.7	6.5	6.1	6.1	5.9	6.8	6.4
		80,768	92,565	173,333	95,651	180,498	276,149	93,234	176,855	373,000	89,197	98,843	188,040	94,351	105,120	199,471
		15,370,329	14,970,660	30,340,989	15,493,702	15,084,936	30,578,638	15,191,656	15,801,668	30,993,324	15,733,269	15,304,727	31,037,996	15,870,862	15,434,397	31,305,259

Source: Public Health Agency of Canada, using NDSS data files contributed by provinces and territories, as of August, 2008  
\*Data for Nunavut were unavailable.

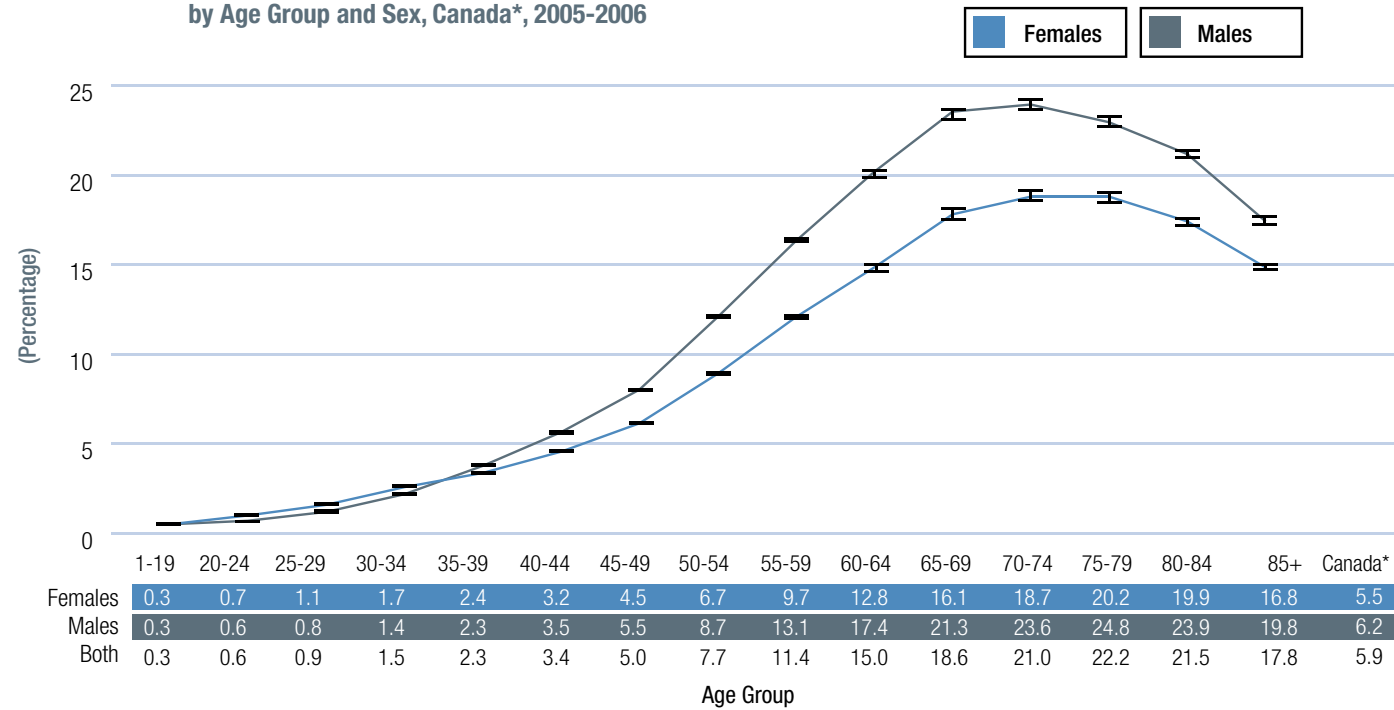
Table 2. Prevalence Percentages, Incidence Rates, and Number of Cases of Diagnosed Diabetes, by Sex and Age Group, Canada\*, 2005-2006

Age Group		Prevalence			Incidence		
		Females	Males	Canada*	Females	Males	Canada*
1-19	Rates	0.3%	0.3%	0.3%	0.4 per 1,000	0.4 per 1,000	0.4 per 1,000
	Cases	11,517	12,619	24,136	1,539	1,719	3,258
	Population	3,763,695	3,957,862	7,721,557	3,753,717	3,946,962	7,700,679
20-24	Rates	0.7%	0.6%	0.7%	0.9 per 1,000	0.6 per 1,000	0.7 per 1,000
	Cases	7,598	7,002	14,600	947	702	1,649
	Population	1,109,116	1,141,060	2,250,176	1,102,465	1,134,760	2,237,225
25-29	Rates	1.1%	0.8%	0.9%	1.5 per 1,000	1.1 per 1,000	1.3 per 1,000
	Cases	11,852	9,134	20,986	1,705	1,202	2,907
	Population	1,112,207	1,110,782	2,222,989	1,102,060	1,102,850	2,204,910
30-34	Rates	1.7%	1.4%	1.5%	2.5 per 1,000	2.1 per 1,000	2.3 per 1,000
	Cases	19,309	15,660	34,969	2,854	2,436	5,290
	Population	1,148,564	1,146,417	2,294,981	1,132,109	1,133,193	2,265,302
35-39	Rates	2.4%	2.3%	2.3%	3.3 per 1,000	3.7 per 1,000	3.5 per 1,000
	Cases	29,332	28,452	57,784	4,021	4,475	8,496
	Population	1,232,181	1,238,665	2,470,846	1,206,870	1,214,688	2,421,558
40-44	Rates	3.2%	3.5%	3.4%	4.5 per 1,000	5.6 per 1,000	5.0 per 1,000
	Cases	45,648	50,677	96,325	6,178	7,765	13,943
	Population	1,424,866	1,438,552	2,863,418	1,385,396	1,395,640	2,781,036
45-49	Rates	4.5%	5.5%	5.0%	6.1 per 1,000	8.0 per 1,000	7.0 per 1,000
	Cases	61,948	76,030	137,978	7,972	10,528	18,500
	Population	1,371,505	1,374,094	2,745,599	1,317,529	1,308,592	2,626,121
50-54	Rates	6.7%	8.7%	7.7%	8.9 per 1,000	12.1 per 1,000	10.5 per 1,000
	Cases	80,817	104,145	184,962	10,160	13,332	23,492
	Population	1,206,207	1,194,864	2,401,071	1,135,550	1,104,051	2,239,601
55-59	Rates	9.8%	13.1%	11.4%	12.1 per 1,000	16.4 per 1,000	14.2 per 1,000
	Cases	102,897	136,277	239,174	11,713	15,099	26,812
	Population	1,055,657	1,043,827	2,099,484	964,473	922,649	1,887,122
60-64	Rates	12.8%	17.4%	15.0%	14.9 per 1,000	20.3 per 1,000	17.5 per 1,000
	Cases	101,272	134,699	235,971	10,509	13,238	23,747
	Population	794,194	775,120	1,569,314	703,431	653,659	1,357,090
65-69	Rates	16.1%	21.3%	18.6%	17.9 per 1,000	23.7 per 1,000	20.6 per 1,000
	Cases	102,877	127,548	230,425	9,751	11,438	21,189
	Population	638,283	597,836	1,236,119	545,157	481,726	1,026,883
70-74	Rates	18.7%	23.7%	21.0%	18.9 per 1,000	24.1 per 1,000	21.3 per 1,000
	Cases	106,303	119,143	225,446	8,874	9,509	18,383
	Population	567,927	503,867	1,071,794	470,498	394,233	864,731
75-79	Rates	20.2%	24.8%	22.0%	18.9 per 1,000	23.1 per 1,000	22.2 per 1,000
	Cases	100,892	97,325	198,217	7,677	6,990	14,667
	Population	499,898	392,536	892,434	406,683	302,201	708,884
80-84	Rates	20.0%	23.9%	21.5%	17.5 per 1,000	21.3 per 1,000	18.9 per 1,000
	Cases	79,695	60,641	140,336	5,680	4,202	9,882
	Population	399,484	254,013	653,497	325,469	197,574	523,043
85+	Rates	16.8%	19.8%	17.8%	14.9 per 1,000	17.5 per 1,000	15.7 per 1,000
	Cases	63,566	34,372	97,938	4,771	2,485	7,256
	Population	378,250	173,506	551,756	319,455	141,619	461,074
Canada	Rates	5.5%	6.2%	5.9%	5.9 per 1,000	6.8 per 1,000	6.4 per 1,000
	Cases	925,523	1,013,724	1,939,247	94,351	105,120	199,471
	Population	16,702,034	16,343,001	33,045,035	15,870,862	15,434,397	31,305,259

Source: Public Health Agency of Canada, using NDSS data files contributed by provinces and territories, as of August, 2008  
\*Data for Nunavut were unavailable.

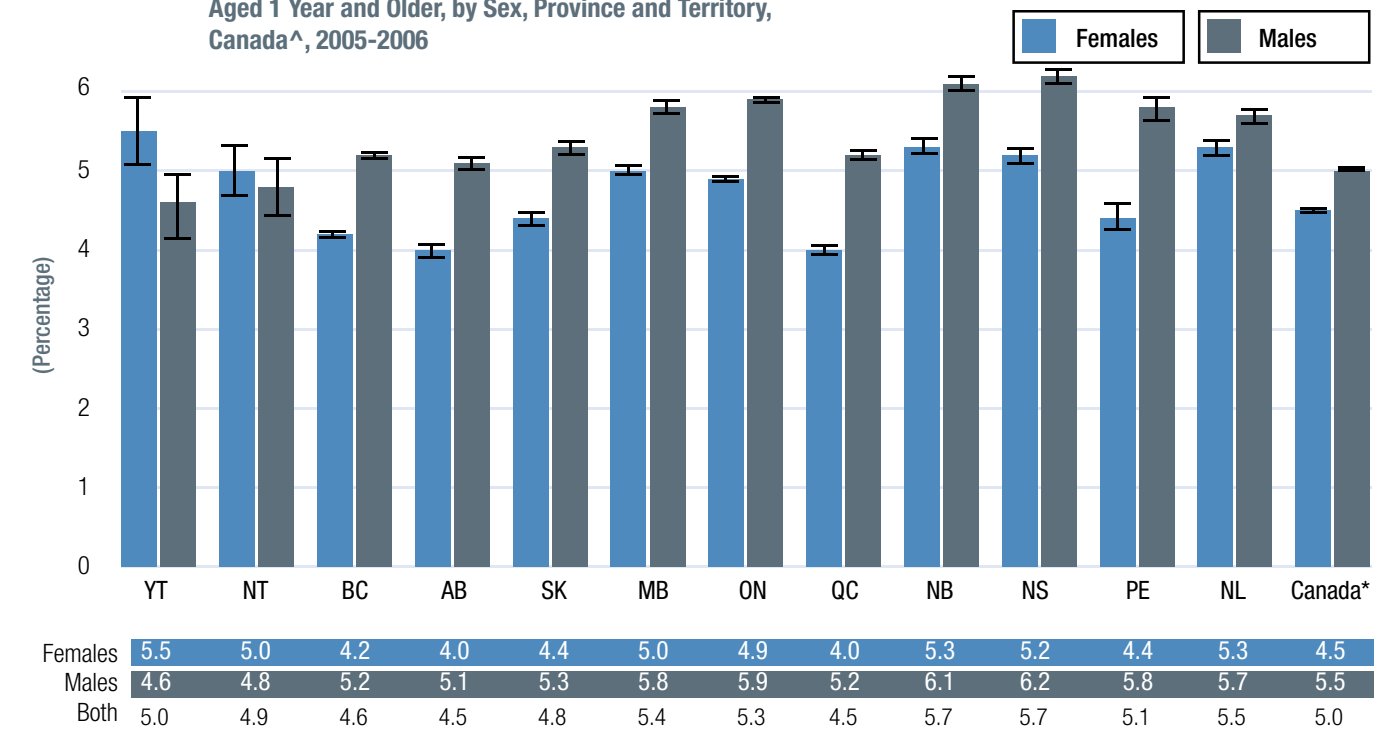
- As anticipated, in 2005-2006, as in prior years, the prevalence<sup>5</sup> of diagnosed diabetes was significantly lower among children and adolescents than adults. The prevalence increased with age from about 2% among individuals in their 30's to about 22%, or 1 in 5, adults aged 75 to 79 years old. (Figure 1 and Table 2)
- After adjusting<sup>6</sup> for differences in age distributions among provinces and territories, the prevalence<sup>5</sup> of diagnosed diabetes was generally found to be highest in the Atlantic provinces (New Brunswick, Nova Scotia, Newfoundland and Labrador) and was lowest in the west (Saskatchewan, Alberta, and British Columbia). The prevalence for Ontario was higher than the national average, and for Quebec, prevalence was lower than the national average. (Figure 2) Provincial and territorial obesity prevalence, followed a similar pattern; higher in the Atlantic provinces and lower in the western provinces.
- After adjusting<sup>6</sup> to account for changes in the age distributions over time, the prevalence<sup>5</sup> of diagnosed diabetes has increased by about 22% between 2001-2002 and 2005-2006. (Figure 3)

Figure 1. Prevalence Percentages of Diagnosed Diabetes among People Aged 1 Year and Older by Age Group and Sex, Canada\*, 2005-2006



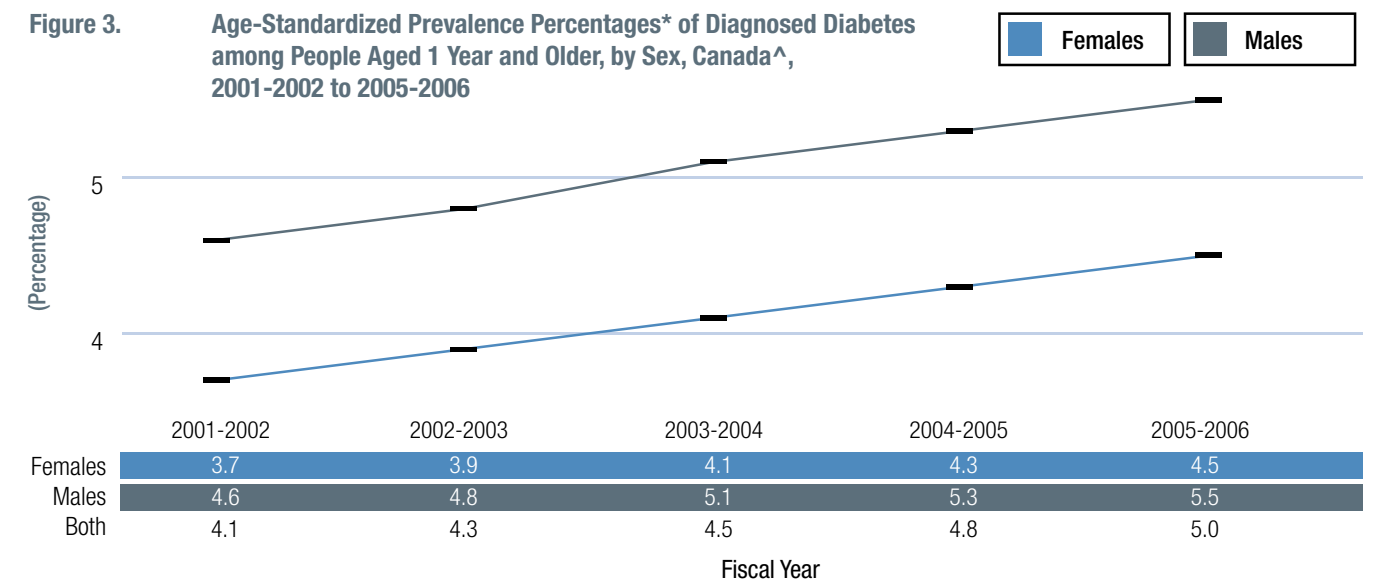
Source: Public Health Agency of Canada, using NDSS data files contributed by provinces and territories, as of August, 2008  
\*Data for Nunavut were unavailable.  
‡The 95% Confidence Interval shows an estimated range of values which is likely to include the true prevalence rate 19 times out of 20.

Figure 2. Age-Standardized Prevalence Percentages\* of Diagnosed Diabetes among People Aged 1 Year and Older, by Sex, Province and Territory, Canada^, 2005-2006



Source: Public Health Agency of Canada, using NDSS data files contributed by provinces and territories, as of August, 2008  
\*Age-standardized to 1991 Canadian population  
^Data for Nunavut were unavailable.  
‡The 95% Confidence Interval shows an estimated range of values which is likely to include the true prevalence rate 19 times out of 20.  
YT: Yukon, NT: Northwest Territories, BC: British Columbia, AB: Alberta, SK: Saskatchewan, MB: Manitoba, ON: Ontario, QC: Quebec, NB: New Brunswick, NS: Nova Scotia, PE: Prince Edward Island, NL: Newfoundland

Figure 3. Age-Standardized Prevalence Percentages\* of Diagnosed Diabetes among People Aged 1 Year and Older, by Sex, Canada^, 2001-2002 to 2005-2006



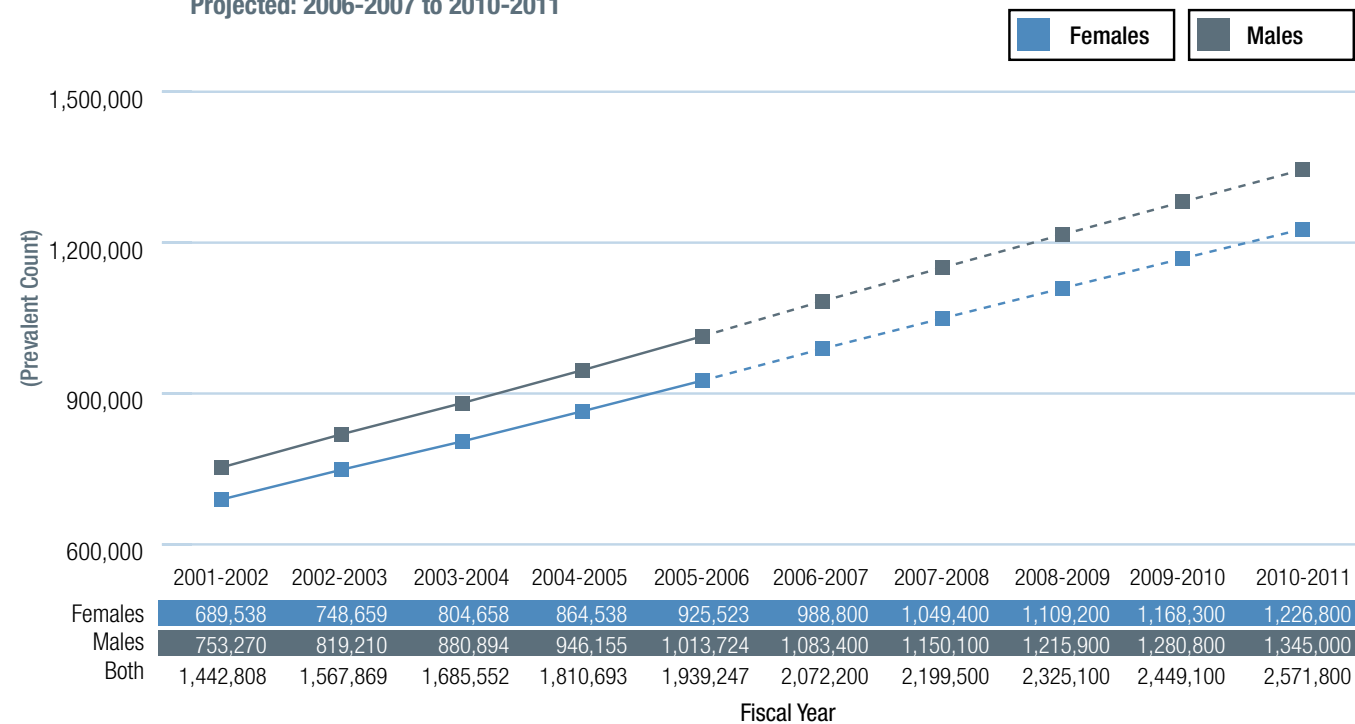
Source: Public Health Agency of Canada, using NDSS data files contributed by provinces and territories, as of August, 2008  
\*Age-standardized to 1991 Canadian population  
^Data for Nunavut were unavailable.  
‡The 95% Confidence Interval shows an estimated range of values which is likely to include the true prevalence rate 19 times out of 20.

## Forecasted Prevalence<sup>5,7</sup>

### For People Aged 1 and Older:

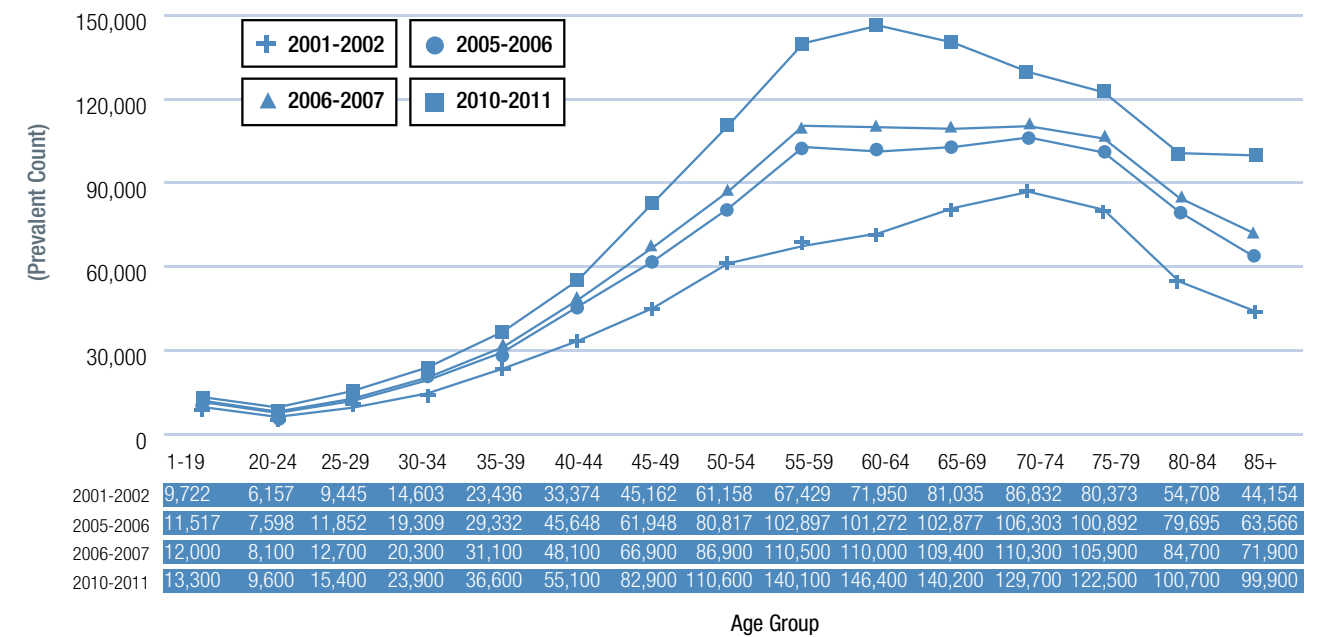
- By 2011, the number of Canadians with diagnosed diabetes is expected to be about 2.6 million - an average annual percent increase of almost 7% and an increase by about 33% since 2006. (Figure 4)
- By 2010-2011, one in three (35%) of people with diabetes will be in the 50 to 64 year old age range, due to the increased risk of developing diabetes over age 40, the entrance of the baby boom generation into the older age groups, and the rise in the prevalence<sup>5</sup> of obesity. (Figures 5 and 6)

Figure 4. Observed and Projected Prevalent Number of Cases\* of Diagnosed Diabetes among People Aged 1 Year and Older, by Sex, Canada<sup>^</sup>, Observed: 2001-2002 to 2005-2006 and Projected: 2006-2007 to 2010-2011



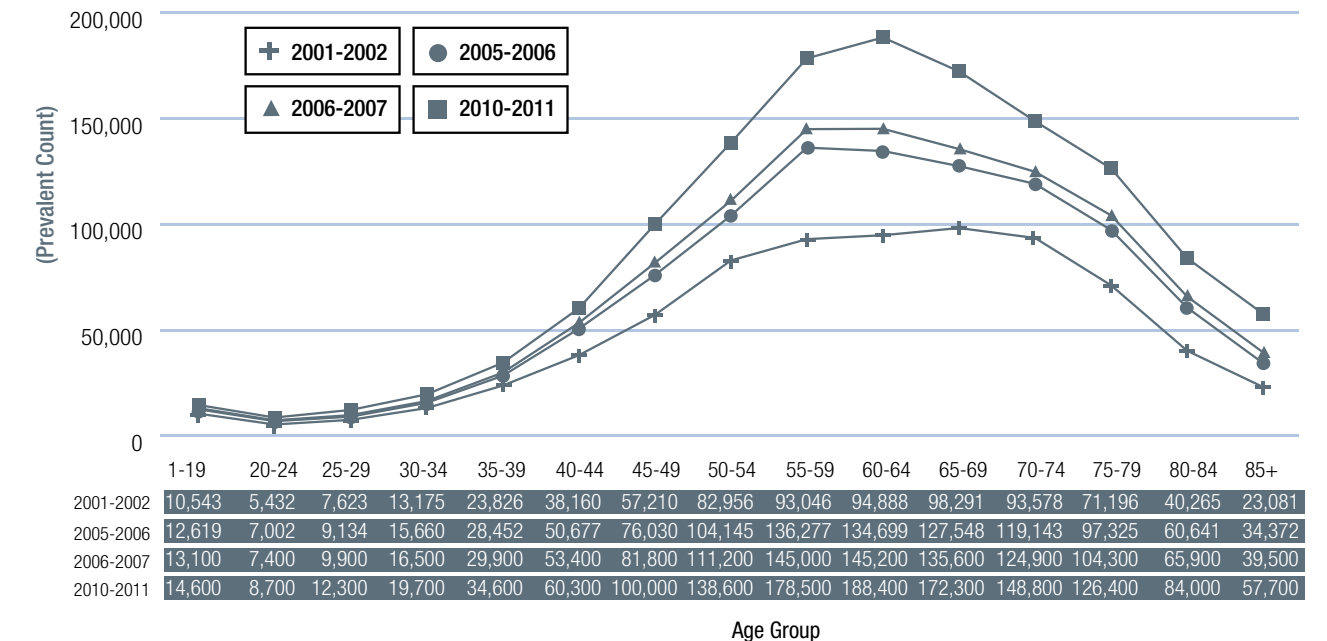
Source: Public Health Agency of Canada, using NDSS data files contributed by provinces and territories, as of August, 2008  
\*Counts were rounded to the nearest 100.  
^Data for Nunavut were unavailable for the observed prevalent counts.

Figure 5. Observed and Projected Prevalent Number of Cases\* of Diagnosed Diabetes among Girls and Women Aged 1 Year and Older, by Age Group, Canada<sup>^</sup>, Observed: 2001-2002, 2005-2006 Projected: 2006-2007 and 2010-2011



Source: Public Health Agency of Canada, using NDSS data files contributed by provinces and territories, as of August, 2008  
\*Counts were rounded to the nearest 100.  
^Data for Nunavut were unavailable for the observed prevalent counts.

Figure 6. Observed and Projected Prevalent Number of Cases\* of Diagnosed Diabetes among Boys and Men Aged 1 Year and Older, by Age Group, Canada<sup>^</sup>, Observed: 2001-2002, 2005-2006 Projected: 2006-2007 and 2010-2011



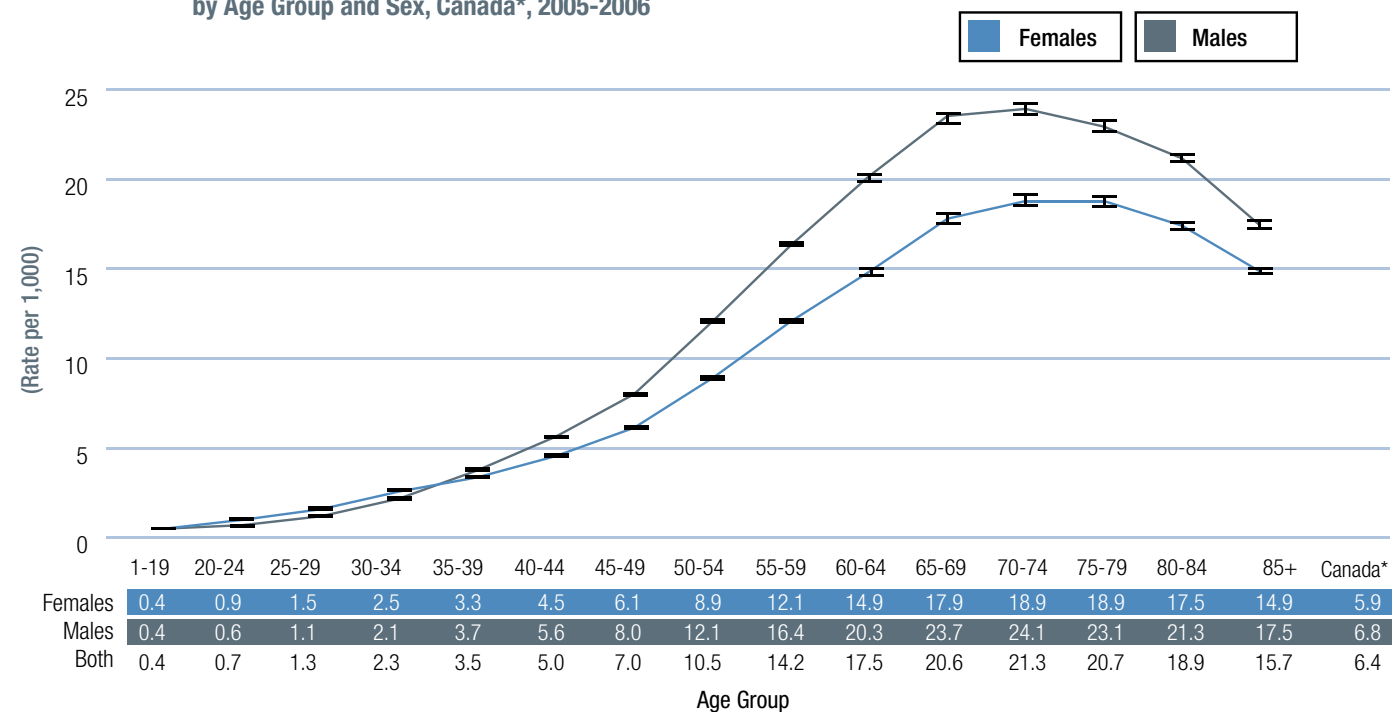
Source: Public Health Agency of Canada, using NDSS data files contributed by provinces and territories, as of August, 2008  
\*Counts were rounded to the nearest 100.  
^Data for Nunavut were unavailable for the observed prevalent counts.

## People With Newly Diagnosed Diabetes (Incidence<sup>8</sup>)

### For People Aged 1 Year and Older:

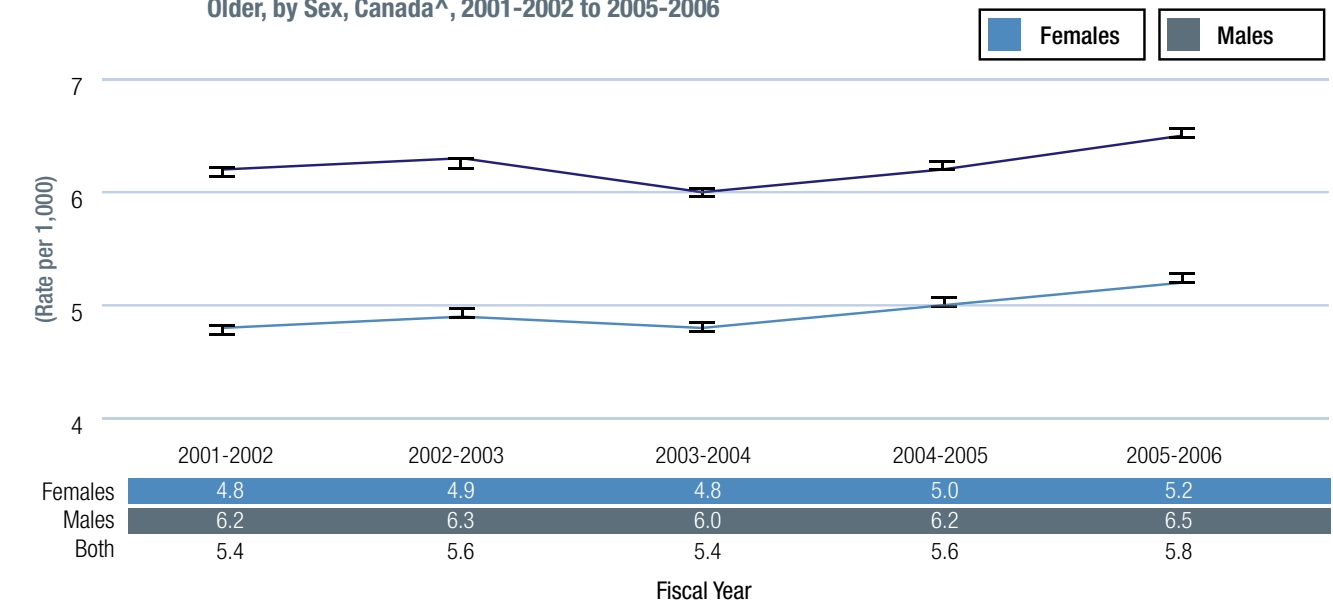
- In 2005-2006, 199,471 individuals were newly diagnosed with diabetes – a rate<sup>8</sup> of 6.4 per 1,000 population aged 1 and older, overall, and 5.9 per 1,000 among girls and women and 6.8 per 1,000 among boys and men. (Tables 1, 2, and Figure 7)
- In 2005-2006, incidence rates<sup>8</sup> of diagnosed diabetes were lower for children and adolescents than for adults. The rates rose steeply after age 45 and peaked among both men and women in the 70-74 age group. The rates were significantly higher among men than women over age 40. (Table 2 and Figure 7)
- After adjusting<sup>6</sup> to account for changes in the age distributions across time, the incidence rates<sup>8</sup> of diagnosed diabetes have increased by about 7% between 2001-2002 and 2005-2006. (Figure 8) Rising age-standardized incidence rates<sup>8</sup> are likely a reflection of the rising prevalence<sup>5</sup> of obesity. In addition, age-standardized prevalence is climbing at 3 times the rate of age-standardized incidence rates, indicating that the increase in prevalence is also due, in part, to improved survival among individuals with diabetes.

Figure 7. Incidence Rates of Diagnosed Diabetes among People Aged 1 Year and Older, by Age Group and Sex, Canada\*, 2005-2006



Source: Public Health Agency of Canada, using NDSS data files contributed by provinces and territories, as of August, 2008  
\*Data for Nunavut were unavailable.  
‡The 95% Confidence Interval shows an estimated range of values which is likely to include the true incidence rate 19 times out of 20.

Figure 8. Age-Standardized Incidence Rates\* of Diagnosed Diabetes among People Aged 1 Year and Older, by Sex, Canada^, 2001-2002 to 2005-2006



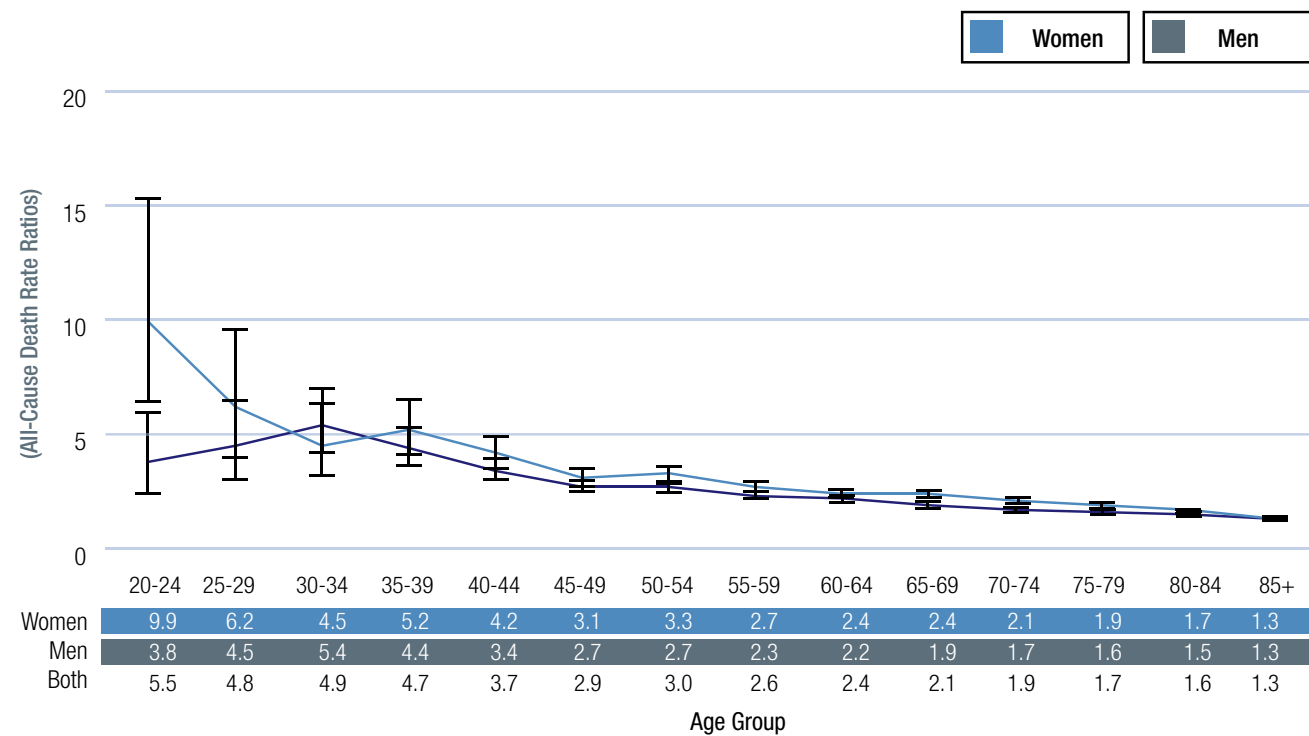
Source: Public Health Agency of Canada, using NDSS data files contributed by provinces and territories, as of August, 2008  
\*Age-standardized to 1991 Canadian population  
^Data for Nunavut were unavailable.  
‡The 95% Confidence Interval shows an estimated range of values which is likely to include the true incidence rate 19 times out of 20.

## Deaths Among People With Diagnosed Diabetes (Mortality<sup>9</sup>)

### For Adults Aged 20 Years and Older:

- In 2005-2006, among adults aged 20 years and older, overall death rates were twice as high in individuals with diabetes compared to individuals without diabetes.
- The differences in mortality rates for people with and without diabetes are higher among the younger age groups. Younger adults, those aged 20 to 44, with diabetes die at rates that are 4 to 6 times higher than those without diabetes. While for adults aged 45 to 79, the rates are 2 to 3 times higher in individuals with diabetes. (Figure 9)

Figure 9. All-Cause Death Rate Ratios among Women and Men Aged 20 Years and Older with Diagnosed Diabetes Compared to Those without Diagnosed Diabetes, Canada<sup>†</sup>, 2005-2006



Source: Public Health Agency of Canada, using NDSS data files contributed by provinces and territories, as of August, 2008

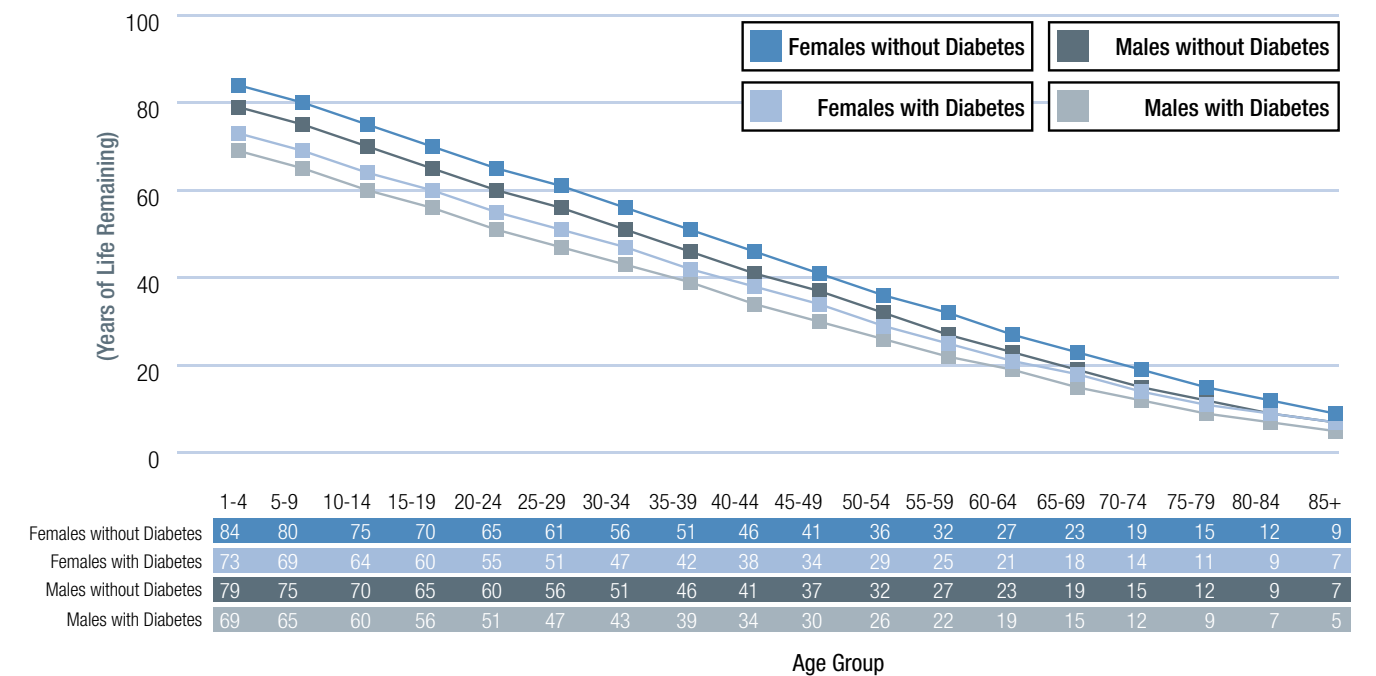
\*Data for Nunavut were unavailable.

†The 95% Confidence Interval shows an estimated range of values which is likely to include the true death rate 19 times out of 20.

## Years of Life Remaining for People With Diagnosed Diabetes

- Diabetes shortens life expectancy for all ages. For example, in 2005-2006, both men and women with diagnosed diabetes, in the 25 to 39 year age groups, had about an 8-year reduction in life expectancy in 2005-2006. (Figure 10)
- Both girls and boys with diagnosed diabetes in the 1 to 19 year age group had about a 10- to 11-year reduction in life expectancy in 2005-2006. (Figure 10)

Figure 10. Years of Life Remaining for People with Diagnosed Diabetes Compared to Those without Diagnosed Diabetes, by Age Group and Sex, Canada\*, 2003-2004 to 2005-2006



Source: Public Health Agency of Canada, using NDSS data files contributed by provinces and territories, August, 2008

\*Data for Nunavut were unavailable.

## Health Services Utilization

Two measures of health services utilization are the number of visits to physicians (family physicians and specialists) and the length (days) of hospital stays.

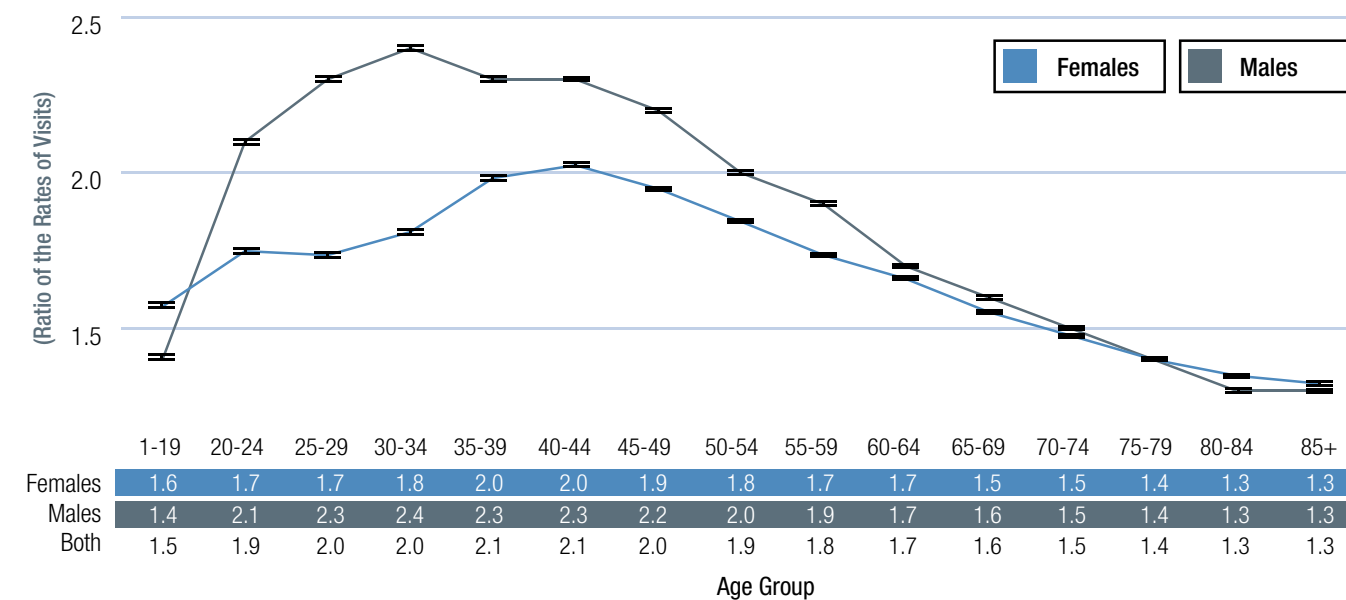
### For Adults Aged 20 Years and Older:

- In 2005-2006, younger adults (aged 20 to 49) with diagnosed diabetes had about 2 times as many visits to family physicians (Figure 11) and 2 to 3 times as many visits to specialists (Figure 12) than individuals without diabetes. Even in the oldest age groups, individuals with diagnosed diabetes visited physicians about 1.5 times more than individuals without diabetes.
- During the 2005-2006 fiscal year, adults with diagnosed diabetes stayed more days in hospital than individuals without diabetes. For hospitalized adults with diagnosed diabetes, aged 20 to 29 and 35 to 54 years old, the number of days stayed in hospital was about 4 to 6 times the number of days stayed by individuals without diabetes. Among those older than 54 years, the ratio of days stay between those with diabetes and those without ranged from 2 to 3. (Figure 13)

### For Children and Adolescents Aged 1 to 19 Years Old:

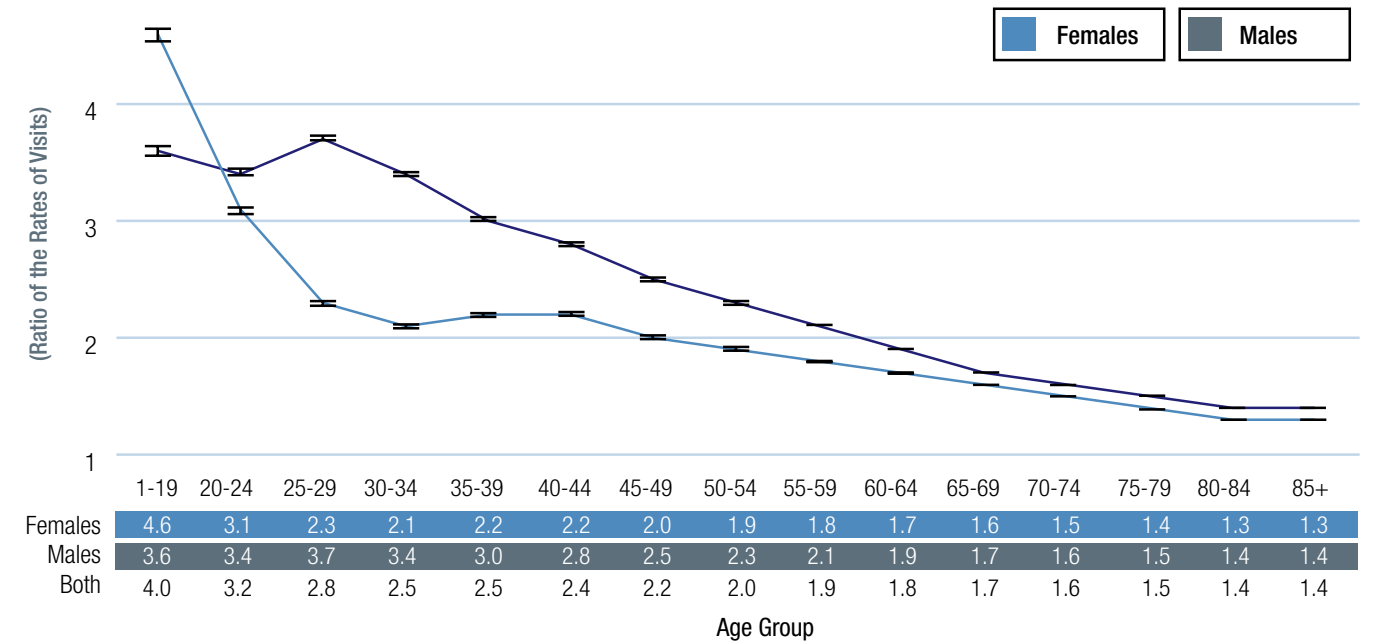
- Children and adolescents with diagnosed diabetes had about 1.5 times more visits to family physicians (Figure 11) and 4 times as many visits to specialists (Figure 12) as children and adolescents without diabetes, in 2005-2006.
- During 2005-2006, hospitalized children and adolescents with diagnosed diabetes, aged 1 to 19, stayed about 8 to 11 times the number of days in hospital than hospitalized individuals without diabetes. (Figure 13)

Figure 11. Ratio of the Rates of Visits to Family Physicians among People Aged 1 Year and Older with Diagnosed Diabetes Compared to Those without Diagnosed Diabetes, by Age Group and Sex, Canada<sup>^</sup>, 2005-2006



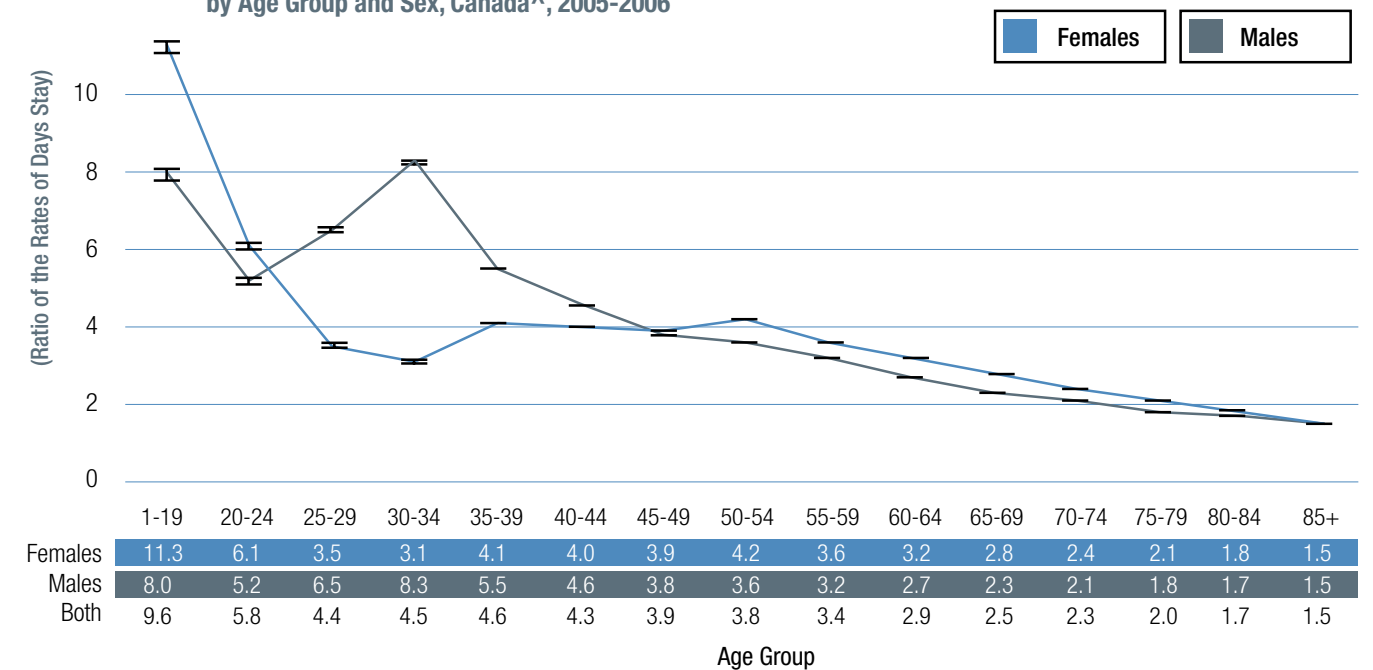
Source: Public Health Agency of Canada, using NDSS data files contributed by provinces and territories, as of August, 2008  
<sup>^</sup>Quebec data were excluded from analysis and data from Nunavut were unavailable.  
‡The 95% Confidence Interval shows an estimated range of values which is likely to include the true rate ratio 19 times out of 20.

Figure 12. Ratio of the Rates of Visits to Specialists among People Aged 1 Year and Older with Diagnosed Diabetes Compared to Those without Diagnosed Diabetes, by Age Group and Sex, Canada<sup>^</sup>, 2005-2006



Source: Public Health Agency of Canada, using NDSS data files contributed by provinces and territories, as of August, 2008  
<sup>^</sup>Quebec data were excluded from analysis and data from Nunavut were unavailable.  
‡The 95% Confidence Interval shows an estimated range of values which is likely to include the true rate ratio 19 times out of 20.

Figure 13. Ratio of the Rates of Days Stayed in Hospital among People Aged 1 Year and Older with Diagnosed Diabetes Compared to Those without Diagnosed Diabetes, by Age Group and Sex, Canada<sup>^</sup>, 2005-2006



Source: Public Health Agency of Canada, using NDSS data files contributed by provinces and territories, as of August, 2008  
<sup>^</sup>Quebec data were excluded from analysis and data from Nunavut were unavailable.  
‡The 95% Confidence Interval shows an estimated range of values which is likely to include the true rate ratio 19 times out of 20.

## Other Health Problems<sup>10</sup>

Eight health problems, for which hospitalizations are common among individuals with diagnosed diabetes, are currently tracked by the NDSS. They are chronic kidney disease, lower limb amputations, and cardiovascular disease – which include but are not limited to: hypertensive disease, heart failure, heart attack, ischaemic heart disease, and stroke.

### For Adults Aged 20 Years and Older:

- In 2005-2006, the most common health problem seen in hospitalizations among individuals with diagnosed diabetes was for cardiovascular disease (about 9%). (Table 3)
- During 2005-2006, adults, aged 20 years and older, with diagnosed diabetes were hospitalized more often than their counterparts without diagnosed diabetes<sup>11</sup> (Table 3):
  - 23 times more often with lower limb amputations;
  - 7 times more often with chronic kidney disease;
  - 3 times more often with all cardiovascular diseases;
    - 4 times more often with hypertensive disease and heart failure and,
    - 3 times more often with heart attack, ischaemic heart disease, and stroke.

Table 3. Numbers and Percentages of Individuals with Diagnosed Diabetes Hospitalized with Select Comorbid Hospitalizations\* and Rate Ratios\*\* for Individuals with Diagnosed Diabetes Compared to Those without Diagnosed Diabetes, Women and Men Aged 20 Years and Older, Canada<sup>^</sup>, 2005-2006

Select Comorbid Hospitalizations*	Individuals with Diagnosed Diabetes Hospitalized for Select Comorbid Hospitalizations*		Individuals with Diagnosed Diabetes Compared to Those without Diagnosed Diabetes
	Individuals	Percentages	Rate Ratios**
Cardiovascular Disease***	131,102	8.8%	3.1
Hypertensive Disease	72,845	4.9%	3.9
Ischaemic Heart Disease	57,726	3.9%	3.3
Heart Attack (Acute Myocardial Infarction)	19,847	1.3%	3.2
Heart Failure	35,343	2.4%	3.7
Stroke (Cerebrovascular Disease)	16,553	1.1%	2.7
Chronic Kidney Disease	26,120	1.7%	7.1
Lower Limb Amputations****	2,657	0.2%	23.0
<b>Individuals with Diagnosed Diabetes</b>	<b>1,495,676</b>		

Source: Public Health Agency of Canada, using NDSS data files contributed by provinces and territories, as of September, 2008

\*Select comorbid conditions were for the following: cardiovascular disease, hypertensive disease, ischaemic heart disease, acute myocardial infarction, heart failure, cerebrovascular disease, chronic kidney disease, and lower limb amputations. An individual may have more than one comorbid hospitalization, and is only counted once in each category.

\*\*Data are rate ratios of age-standardized rates. Rates are age-standardized to the 1991 Canadian population.

<sup>^</sup>Quebec data were excluded from analysis and data from Nunavut were unavailable.

\*\*\*When more than one hospitalization is recorded in one of the highlighted cardiovascular disease categories: hypertensive disease, ischaemic heart disease, acute myocardial infarction, heart failure, or cerebrovascular disease, an individual with diagnosed diabetes is counted only once under this broader cardiovascular disease category.

\*\*\*\*Lower limb amputations exclude those caused by trauma or cancer.

## NDSS Future Plans

The NDSS provides a valuable source of information about diabetes in Canada. Future work will include:

- Continuing work with First Nations, Métis, and Inuit organizations to produce NDSS data for analysis, interpretation, and up-to-date reporting, to gain a better understanding of diabetes among these populations;
- Expanding the breadth of data reporting on diabetes and other related conditions among adults, children, and adolescents;
- Exploring the use of ICD-10-CA diagnosis coding in hospitals and pharmaceutical data to differentiate between types of diabetes; and,
- Developing a collaborative standard approach to improving and documenting data quality.

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Newfoundland and Labrador Centre for Health Information  
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Saskatchewan Health  
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Kayla Collins, Newfoundland and Labrador Centre for Health Information  
Hasan Hutchinson/Paul Belanger, Institute of Nutrition Metabolism and Diabetes, Canadian Institutes of Health Research  
Jeffrey Johnson, School of Public Health, University of Alberta  
Isabelle Larocque, Institut national de santé publique du Québec  
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Ellen Toth, Department of Medicine, University of Alberta  
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Connie Cheverie, Prince Edward Island Department of Health  
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Janice Hawkey, Saskatchewan Health  
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A newly formed Diabetes Surveillance Advisory Committee, chaired by the Canadian Diabetes Association, advises PHAC on diabetes surveillance in Canada.

## Footnotes

- 1 The proportion of individuals that are affected by diagnosed diabetes at a given point in time.
- 2 For a more detailed explanation of the age-standardization technique, refer to the methods for this report on the NDSS website: [www.ndss.gc.ca](http://www.ndss.gc.ca).
- 3 Nunavut was unable to provide the 2008 data submission for this report.
- 4 From this point forward, diabetes refers to the NDSS case definition for diagnosed diabetes.
- 5 The proportion of individuals that are affected by diagnosed diabetes at a given point in time.
- 6 For a more detailed explanation of the age-standardization technique, refer to the methods for this report on the NDSS website: [www.ndss.gc.ca](http://www.ndss.gc.ca).
- 7 These statistics were calculated using estimates for future populations from Statistics Canada and the assumption that both future NDSS incidence and mortality rates remain constant.
- 8 The rate of individuals newly diagnosed with diabetes during the year.
- 9 Data are ratios of age-standardized rates.
- 10 These select health problems are diagnosed in hospital. Refer to the NDSS methods for more information on the NDSS website: [www.ndss.gc.ca](http://www.ndss.gc.ca). Data are ratios of age-standardized rates.
- 11 Data are ratios of age-specific rates.

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