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Diabetes: Prevalence and care practices

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Diabetes–prevalence and care practices

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Abstract

In 2005, an estimated 1.3 million Canadians aged 12 or older (4.9% of the population of these ages) reported to the Canadian Community Health Survey (CCHS) that they had been diagnosed with diabetes. The Canadian Diabetes Association has published Clinical Practice Guidelines for the Prevention and Management of Diabetes in Canada, which recommend the type of care that should be provided to individuals with diabetes. According to the CCHS, and based on data from six of the provinces/territories (Newfoundland and Labrador, Prince Edward Island, New Brunswick, Ontario, Manitoba and Yukon Territory), almost three-quarters of diabetic respondents aged 18 or older reported having had their hemoglobin A1C checked by a health care professional at least once in the year before the survey, and those who had had the test were close to meeting the recommended frequency of every three months. The majority of diabetic respondents were also meeting the recommendation for eye examinations, but only half had the recommended annual foot examinations. Half the diabetic population reported that they or a family member had checked their glucose level every day.

Keywords

Diabetes mellitus, diabetic foot, diabetic retinopathy

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Diabetes is a serious chronic disease that affects the body's ability to produce or properly use insulin.[1] It can lead to various disabling and life-threatening complications such as heart disease and stroke, high blood pressure, and premature death.[2] In Canada, diabetes is the single largest cause of blindness, and a leading cause of kidney failure and lower limb amputations.[3] Diabetes is the seventh leading cause of death and accounts for 25,000 person-years of life lost before age 75.[2]

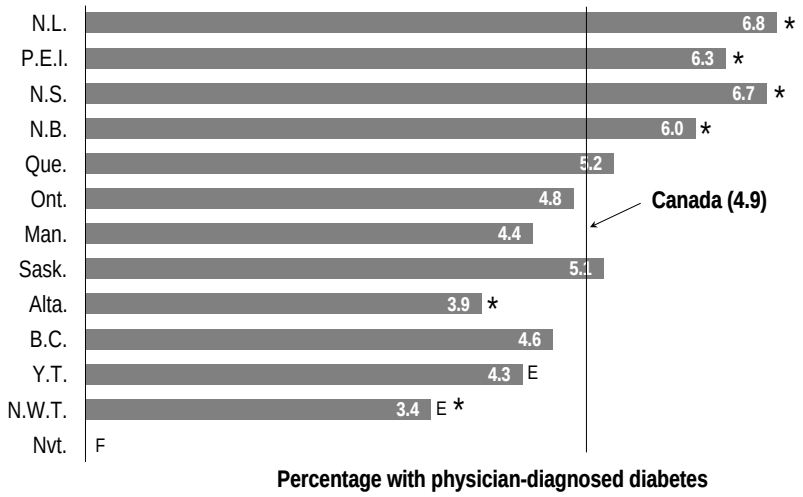
In 2005, 1.3 million Canadians aged 12 or older, or 4.9% of the population in this age group, reported that they were living with diabetes (Chart 1). This estimate, which reflects self-reports of physician-diagnosed diabetes, is based on recent national data from the Canadian Community Health Survey (CCHS) (see *Data source*). Prevalence was higher than the national average in all four Atlantic provinces: 6.0% in New Brunswick, 6.3% in Prince Edward Island, 6.7% in Nova Scotia, and 6.8% in Newfoundland and Labrador. In Alberta and the Northwest Territories, rates were significantly lower than the national average, at 3.9% and 3.4%, respectively.

Males aged 12 or older were slightly more likely (5.4%) than females (4.4%) to report having diabetes (Table 1). People younger than 45 were much less likely to have diabetes than were those aged 45 or older. Overall, in 2005, about one in five (19.9%) individuals with diabetes reported using insulin (data not shown).

Diabetes care in selected regions

Appropriate care is critical to managing diabetes and to preventing serious complications. In 2003, the Canadian Diabetes Association published the Clinical Practice Guidelines for the Prevention and Management of Diabetes in Canada.[4] These guidelines

Figure 1
Percentage of Canadians with physician-diagnosed diabetes, by province/ territory, household population aged 12 or older, Canada, 2005



* signficantly different from estimate for Canada ($p < 0.05$)
E use with caution (coefficient of variation 16.6% to 33.3%)
F too unreliable to be published (coefficient of variation greater than 33.3%, suppressed because of extreme sampling variability)
Source: 2005 Canadian Community Health Survey.

Table 1
Percentage of Canadians with physician-diagnosed diabetes, by sex and age group, household population aged 12 or older, Canada, 2005

	%
Total	**4.9**
Males	**5.4**†
Females	**4.4**†
Age group	
12 to 17	0.3E
18 to 34	0.9*
35 to 44	2.0*
45 to 64	6.9*
65 or older	14.6*

† significantly different from estimate for total and other sex ($p < 0.05$)
* significantly different from estimate for total and all other age groups ($p < 0.05$)
E use with caution (coefficient of variation 16.6% to 33.3%)
Source: 2005 Canadian Community Health Survey.

recommend the type of care that should be provided to individuals with diabetes.

While some information about the quality of care for diabetes in Canada is available,[1,5] it has been based on small studies that do not always represent the overall Canadian population. The 2005 CCHS included a set of questions on diabetes care. Developed by Statistics Canada in collaboration with the Public Health Agency of Canada, these questions were designed to collect information about the care practices of people with diabetes, including glucose testing and foot and eye examinations (see *The data*).

The following information on hemoglobin A1C testing, foot care and eye exams is based on the "diabetes care module" of the 2005 CCHS and reflects results from the following provinces and territories: Newfoundland and Labrador, Prince Edward Island, New Brunswick, Ontario, Manitoba and Yukon Territory.

Hemoglobin testing

Management of glycemic levels is a critical part of diabetes care. Glycemic control, as measured by hemoglobin A1C, is associated with a reduced risk of developing long-term complications. The Clinical Practice Guidelines recommend that a physician measure this indicator every three months to ensure that glycemic goals are being met or maintained.

In 2005, almost three-quarters (74%) of diabetic respondents aged 18 or older reported having had their hemoglobin A1C checked by a health care professional at least once in the year before the survey (Table 2). Diabetic respondents who had been tested were tested an average of 3.4 times during the 12-month period, or about once every three and a half months (data not shown). Rates were similar for men and women aged 18 or older, as well as across age groups. Diabetics who used insulin were more likely to have been tested (83%) than those not using insulin (74%).

Among the diabetic population, half (49.8%) reported that they, or a family member had checked their glucose level every day (Table 3).

Foot care

Individuals with diabetes often experience foot problems such as ulcers, lesions and infections. Without appropriate care, these may lead to more serious health conditions such as gangrene and the need for amputation. To reduce the risk of serious complications and to improve quality of life, the Clinical Practice Guidelines recommend annual foot examinations for all people with diabetes, and more frequent exams for those at high risk. The Guidelines also recommend that high-risk individuals receive instruction for appropriate self-care.

In 2005, almost half (48%) of the diabetic population aged 18 or older (in Newfoundland and Labrador, Prince Edward Island, New Brunswick, Ontario, Manitoba and Yukon Territory) reported having had their feet checked

Table 2
Percentage of Canadians with physician-diagnosed diabetes reporting tests performed by a health care professional, by selected characteristics, household population aged 18 or older, selected provinces/territories,† 2005

	Hemoglobin A1C test, past 12 months		Foot examination, past 12 months		Eye exam (pupils dilated), ever	
	%	95% confidence interval	%	95% confidence interval	%	95% confidence interval
Total, aged 18 or older	**74.4**	**72.2 to 76.6**	**48.4**	**45.9 to 51.0**	**68.2**	**65.8 to 70.5**
Sex						
Male‡	75.6	72.5 to 78.8	49.1	45.3 to 52.8	67.2	64.0 to 70.5
Female	72.7	69.7 to 75.8	47.5	44.0 to 51.0	69.4	66.3 to 72.6
Age						
18 to 24‡	71.9	65.1 to 78.8	45.9	38.1 to 53.7	58.6	50.5 to 66.7
45 to 64	76.2	72.6 to 79.8	48.5	44.7 to 52.4	70.3*	66.7 to 73.9
65 or older	73.3	70.3 to 76.3	49.0	45.3 to 52.8	68.8*	65.8 to 70.5
Uses insulin						
Yes‡	82.9	78.6 to 87.1	67.8	62.8 to 72.8	81.8	77.5 to 86.0
No	74.1*	71.5 to 76.6	44.7*	41.7 to 47.6	66.3*	63.6 to 69.0
Has a regular medical doctor						
Yes	74.8*	72.5 to 77.1	48.7	46.1 to 51.3	68.5	66.2 to 70.9
No‡	61.5	52.1 to 71.0	39.8	29.6 to 49.9	56.5	45.9 to 67.0
Household income						
Less than $20,000	70.8	66.2 to 75.3	46.1	40.6 to 51.5	65.5	60.8 to 70.3
$20,000 to $39,999	72.7	68.3 to 77.1	52.0	47.3 to 56.6	69.8	65.4 to 74.3
$40,000 to $59,999	76.5	71.1 to 81.9	42.7	36.3 to 49.1	67.8	61.6 to 74.0
$60,000 or more‡	77.8	73.0 to 82.6	52.4	47.0 to 57.8	69.1	63.8 to 74.4
Missing	72.5	67.1 to 77.9	44.4	38.0 to 50.7	66.7	60.6 to 72.8
Highest level of education						
Less than secondary	73.2	69.9 to 76.5	46.0	41.8 to 50.2	65.4	61.6 to 69.1
Secondary graduation‡	75.9	70.0 to 81.7	53.5	46.3 to 60.6	67.3	60.7 to 73.9
Some postsecondary	73.6	65.3 to 81.9	39.0	27.7 to 50.3	72.6	63.7 to 81.5
Postsecondary graduation	76.7	73.1 to 80.3	50.8	47.0 to 54.5	70.8	66.9 to 74.6

† Newfoundland and Labrador, Prince Edward Island, New Brunswick, Ontario, Manitoba and Yukon Territory
‡ reference category
* significantly different from estimate for reference category ($p < 0.05$)
Source: 2005 Canadian Community Health Survey, diabetes care module.

Table 3
Diabetes care provided by self, family member or friend, diabetic household population aged 18 or older, selected provinces/territories,† 2005

	Glucose checked (frequency)		Feet checked (frequency)	
	%	95% confidence interval	%	95% confidence interval
Daily	49.8	47.1 to 52.4	37.4	34.9 to 39.9
Weekly	27.9	25.6 to 30.2	17.3	15.3 to 20.9
Monthly	7.2	5.9 to 8.6	6.1	5.0 to 7.2
Yearly	2.9	2.1 to 3.6	3.7	2.9 to 4.5
Never	9.7	8.2 to 11.2	31.3	28.8 to 33.8

† Newfoundland and Labrador, Prince Edward Island, New Brunswick, Ontario, Manitoba and Yukon Territory.
Source: 2005 Canadian Community Health Survey, diabetes care module.

by a health care professional at least once during the previous 12 months (Table 3). On average, these individuals had had their feet checked 3.7 times over a 12-month period. The participation rates were similar for males and females, and across age groups and socio-economic status. Individuals using insulin were more likely to have had their feet checked (68%), compared with those who were not using insulin (45%). After adjusting for other factors, diabetic respondents using insulin were 2.7 times more likely to have had their feet examined by a health care professional in the previous year, compared with those not using insulin.

Respondents were also asked about foot care provided by themselves or

The data

Estimates in this article are based on data from the 2005 Canadian Community Health Survey (CCHS), conducted by Statistics Canada. The CCHS covers the population aged 12 or older living in private households. It does not include residents of Indian reserves, institutions, and some remote areas, full-time members of the Canadian Forces, and civilian residents of military bases. The data were collected by personal and telephone interviews between January and December 2005. The estimated prevalence of diabetes is based on these national data for the population aged 12 or older (n=132,947).

In 2005, participation in the "diabetes care module" of the CCHS was optional, and all health regions in Newfoundland and Labrador, Prince Edward Island, New Brunswick, Ontario, Manitoba and Yukon Territory chose to participate. Data on individuals aged 18 or older in these provinces were selected for analysis (n=3,924).

Following the collection and processing of the data, the respondents' records were weighted to reflect the sampling and non-response that occurred in the CCHS. Weights were adjusted to demographic projections by age group and province.

Weighted distributions and frequencies were produced. Partial or item non-response accounted for less than 5% of the totals in most analyses; records with item non-responses were excluded from the calculations. The bootstrap technique, which fully adjusts for the design effects of the survey, was used to estimate the variance and confidence intervals; a significance level of $p = 0.05$ was established.

All 2005 Canadian Community Health Survey (CCHS) respondents aged 12 or older were asked a series of questions about "long-term conditions" that were expected to last, or had already lasted, six months or more and that had "been diagnosed by a health care professional." Individuals who reported having received a diagnosis of diabetes were asked several follow-up questions, including their age at diagnosis and whether they were using insulin.

In 2005, all health regions in Newfoundland and Labrador, Prince Edward Island, New Brunswick, Ontario, Manitoba and Yukon Territory chose to participate in the diabetes care module of the CCHS. Respondents aged 18 or older were asked:

- "In the past 12 months, has a health care professional tested you for hemoglobin A-one-C? (An A-one-C hemoglobin test measures the average level of blood sugar over a three-month period.)" Those who said "yes" were asked how many times they had had the test.
- "In the past 12 months, has a health care professional checked your feet for any sores or irritations?" People who said "yes" were asked how often they had had such checks.
- "Have you ever had an eye exam where the pupils of your eyes were dilated?" Response categories were: less than one month ago; one month to less than one year ago; one year to less than two years ago; and two or more years ago.

These questions were derived in part from the 2003 Behavioral Risk Factor Surveillance System (BRFSS) in the United States, which has been used for reporting diabetes care indicators since 1984.[6]

The information respondents provided about their diabetic status and health care (professional and self-care) is based on self-reported data, and has not been clinically validated. The CCHS did not ask respondents specifics about their diagnosis (i.e., whether they had Type I (insulin-dependent) or Type II (non-insulin-dependent) diabetes).

a family member or friend. The majority of respondents (65%) indicated that they, or a family member or friend, had checked their feet for sores or irritations at least once in the previous 12 months; 37% checked daily and 17% checked weekly (Table 3). Almost one third of respondents indicated that they had never checked their feet.

Eye exams

People with diabetes are at risk of developing diabetic retinopathy—a disease of the blood vessels of the eye. High blood sugar levels cause the blood vessels in the eye to weaken and leak tiny amounts of blood or fluid, causing swelling of the retina. Vision may become blurred and, in some cases, blindness will result. The Clinical Practice Guidelines recommend that all people with diabetes be screened and examined for retinopathy when diabetes is first diagnosed.

Most of those responding to the questions on diabetes care (68%) indicated that, at least once, they had had an eye test where their pupils were dilated. Diabetics aged 18 to 44 were less likely to have had a dilation eye exam in the past 12 months, compared with older diabetic respondents (Table 2). As with other types of care, those using insulin were more likely to have had an eye exam (82%), compared with those not using insulin (66%). After adjusting for other factors, diabetic respondents taking insulin were 2.7 times more likely to have received an eye dilation examination compared with those not taking insulin.

Among all those who reported having had an eye examination, 14% reported having had it within the last month, 58% between one month and one year ago; and 17%, one to two years ago (Table 4).

Table 4
Most recent eye exam (pupils-dilated), diabetic population aged 18 or older who have ever had a dilation eye exam, selected provinces/territories,† 2005

	%	95% confidence interval
Less than month ago	13.5	11.4 to 15.5
1 month to less than 1 year ago	57.8	54.8 to 60.9
1 year to less than 2 years ago	17.1	14.6 to 19.6
2 or more years ago	11.3	9.3 to 13.4

† Newfoundland and Labrador, Prince Edward Island, New Brunswick, Ontario, Manitoba and Yukon Territory
Source: 2005 Canadian Community Health Survey, diabetes care module.

Meeting the CPG requirements?

Information from the 2005 CCHS diabetes care module provides insight into care practices for and of diabetic patients in the participating regions of Canada. Overall, the proportion of diabetic respondents meeting the Clinical Practice Guidelines varied by the type of care. Most diabetic patients (74%) had had their hemoglobin A1C checked by a health care professional at least once in the year before the survey, and, on average, those who had received the test were close to meeting the recommended frequency of every three months. The majority of diabetic respondents were also meeting the recommendation for eye examinations (dilation of pupils), but only half had the recommended annual foot examinations. The Canadian rates for eye examinations were slightly higher than those reported in the United States; in 2001, only 66% of the US respondents indicated that they had had an eye examination.[7] For foot examinations, though, the Canadian rates were lower than those in the United States, where approximately 60% of diabetics received annual foot examinations.

The results indicate that diabetics who were using insulin were more likely to receive diabetes care, compared with those not using insulin. In some cases, insulin use may be a marker for a more progressed or advanced disease or may reflect poor glycemic control.

Based on data from six of the provinces/territories, this article presents a first look at the health care practices for diabetics—information needed to better understand this aspect of the disease and the factors that affect the receipt of appropriate care. ■

An electronic version of this article entitled "Diabetes care" was released on June 13, 2006 in the online publication Smoking and Diabetes Care: Results from the CCHS Cycle 3.1, 2005, part of the Your Community, Your Health: Findings from the Canadian Community Health Survey (CCHS) series. *The free publication (Catalogue no. 82-621-XWE2006002) is available at http://www.statcan.ca/bsolc/english/bsolc?catno=82-621-X20060029226.*

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