

## Health Care System Cost of People With Diabetes

### Purpose

As of 2010, it is estimated that 5.5% of Albertans have diabetes ([http://www.ahw.gov.ab.ca/IHDA\\_Retrieval/](http://www.ahw.gov.ab.ca/IHDA_Retrieval/) -> 'Chronic Disease' -> 'Diabetes - Age-Sex Specific Prevalence') and that both diabetes incidence and prevalence are increasing in Alberta. Incidence and prevalence are two measures of the burden of disease but another important measure of disease burden is cost to the health care system.

The purpose of this public health surveillance bulletin is to estimate the health care system costs related to having diabetes.

### Key Findings

The health care system costs for individuals with diabetes in Alberta in 2008 was approximately \$1.2 billion, compared to an average of approximately \$318 million for five equally-sized random samples and an average of approximately \$612 million for five equally-sized age, sex and geography-matched random samples.

Assuming that the age, sex and geography-matched random samples represent the expected health care system costs based on age, sex and geography for individuals with diabetes, the \$600 million difference between the expected and actual health care system costs can, all else being equal, be said to be associated with diabetes.

**Table 1: Health Care System Costs**

Cost Source	Health Care System Cost (in millions)		
	Diabetes	Unmatched	Matched
Inpatient Hospitalizations	\$687	\$144	\$345
Ambulatory Care	\$245	\$78	\$114
Physician Services	\$253	\$95	\$148
<b>Total</b>	<b>\$1,184</b>	<b>\$318</b>	<b>\$612</b>

Individuals with diabetes cost the health care system approximately twice as much as an equally-sized group with the same age, sex and geographic distribution.

### Applications

Type 2 diabetes, which accounts for 90 to 95 per cent of all cases of diabetes is considered to be largely preventable. Addressing the major risk factors for developing diabetes, such as poor diet and sedentary lifestyle, can reduce the risk of developing diabetes and will also have positive impacts on other chronic health conditions.

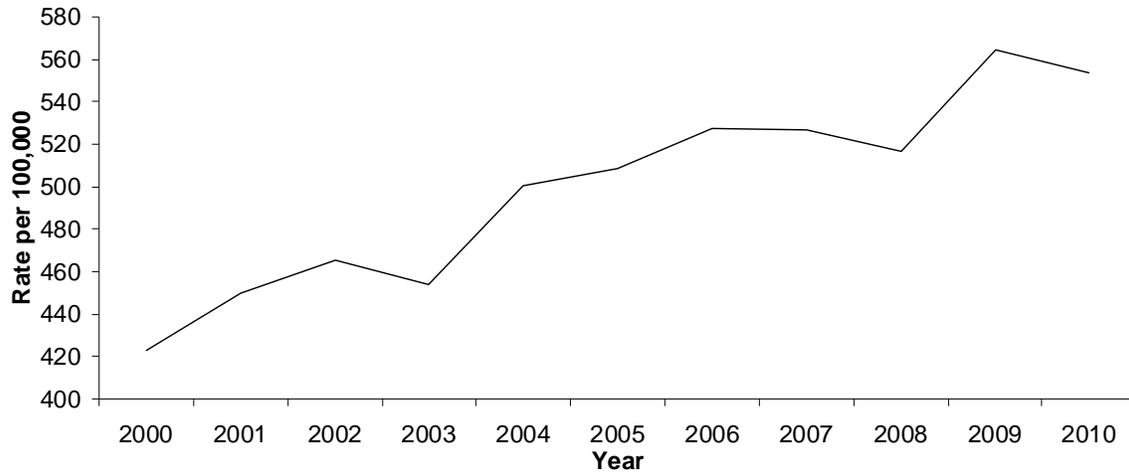
If the prevalence of diabetes continues to increase as it has recently, by 2020 the prevalence of diabetes in Alberta will be approximately 7.6 per cent. Allowing a four per cent annual inflation in costs, the direct health care system costs of people with diabetes in 2020 will be roughly \$3.6 billion. If the prevalence of diabetes between 2012 and 2020 could be made to remain at 2011 levels, roughly \$1.9 billion in total direct health care system costs could be avoided.

# Results

## Descriptive Epidemiology

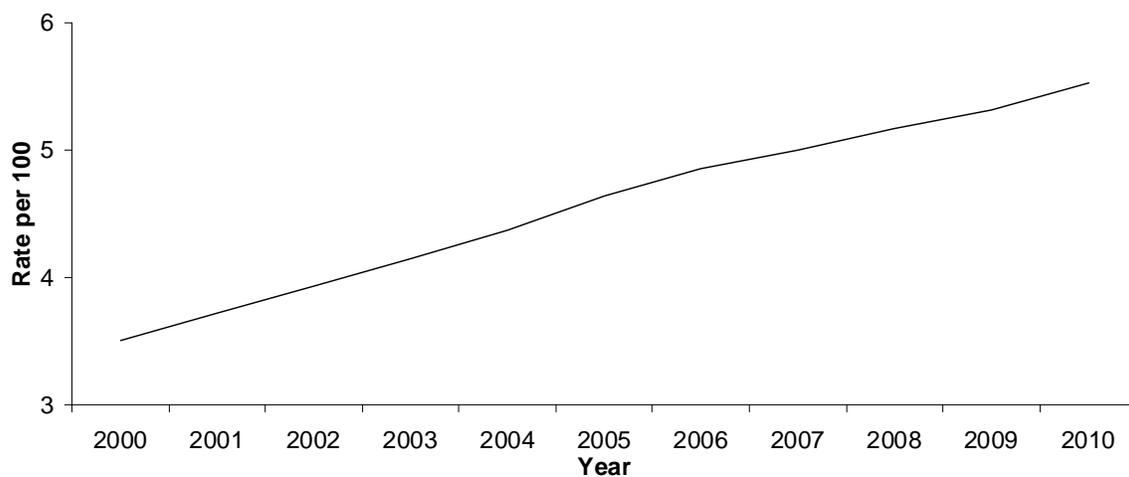
The incidence rate of diabetes in Alberta increased an additional 31 per cent between 2000 and 2010, and the number of new cases increased an additional 61 per cent. In 2010, there were 19,441 new cases of diabetes.

**Figure 1: Incidence Rate per 100,000 Population of Diabetes in Alberta, 2000 to 2010**



The prevalence of diabetes in Alberta has increased an additional 58 per cent between 2000 and 2010, and the number of prevalent cases increased an additional 97 per cent. In 2010, there were 205,368 individuals with diabetes (5.5 per cent of Albertans).

**Figure 2: Prevalence per 100 Population of Diabetes in Alberta, 2000 to 2010**



## Cost of Inpatient Hospitalizations

Individuals from the Alberta Health Care Insurance Plan (AHCIP) Registry were categorized as having diabetes if the following criteria was met:

A single hospital discharge in the Discharge Abstract Database (DAD) with a diagnosis of diabetes ('250\*' ICD-9, 'E10\*' to 'E14\*' ICD-10) in any diagnosis field.

or

Two physician claims within two years in the Supplemental Enhanced Service Event (SESE) database with a diagnosis of diabetes ('250\*' ICD-9) in any diagnosis field.

Note: Females aged 10 to 54 diagnosed with diabetes or gestational diabetes 120 days preceding or 180 days after any pregnancy-related visit were excluded.

This case definition is commonly used by the Surveillance and Assessment Branch of Alberta Health and the Alberta Diabetes Surveillance System. The cost of each inpatient hospitalization was estimated using the Case Mix Group (CMG) average cost, based on costing data provided by the Information and Analysis Branch of Alberta Health.

The cost of inpatient hospitalizations for individuals with diabetes in Alberta in 2008 was approximately \$687 million. The average cost (over five samples) of inpatient hospitalizations for an equally-sized random sample of individuals without diabetes in Alberta in 2008 was approximately \$144 million. The average cost (over five samples) of inpatient hospitalizations for an equally-sized random sample of age, sex and geography-matched individuals without diabetes in Alberta in 2008 was approximately \$349 million.

## Cost of Ambulatory Care

The cost of each inpatient hospitalization was estimated using the Ambulatory Care Classification System (ACCS) Grouper average cost, based on costing data provided by the Information and Analysis Branch of Alberta Health.

The cost of ambulatory care for individuals with diabetes in Alberta in 2008 was approximately \$245 million. The average cost (over five samples) of ambulatory care for an equally-sized random sample of individuals without diabetes in Alberta in 2008 was approximately \$78 million. The average cost (over five samples) of ambulatory care for an equally-sized random sample of age, sex and geography-matched individuals without diabetes in Alberta in 2008 was approximately \$114 million.

## Cost of Physician Services

The cost of physician services for individuals with diabetes in Alberta in 2008 was approximately \$253 million. The average cost (over five samples) of physician services for an equally-sized random sample of individuals without diabetes in Alberta in 2008 was approximately \$95 million. The average cost (over five samples) of physician services for an equally-sized random sample of age, sex and geography-matched individuals without diabetes in Alberta in 2008 was approximately \$148 million.

## Caveats

### Actual versus Estimated Costs

The actual cost for each inpatient hospitalization and ambulatory care service is not known directly. The costs for each inpatient hospitalization and ambulatory care service were inferred based upon average costs associated with the CMG or ACCS grouper code. The average costs were derived from a sample of all hospitalizations; for example, in the 2006-2007 fiscal year, 59 per cent of inpatient records and 32 per cent of ambulatory care events were costed. The suitability of the average cost to reflect the actual cost of each particular inpatient hospitalization and ambulatory care service will influence the accuracy of the estimated overall costs.

### Attributable Cost

The difference in cost between those with diabetes and those without diabetes seen above may not be entirely attributable to diabetes itself because the individuals with diabetes tended to have more chronic conditions than the unmatched and matched samples, particularly hypertension, end-stage renal disease and respiratory conditions.

**Table 2: Prevalence of Chronic Conditions in Costing Samples, 2008**

Sample	Diabetes	Hypertension	ESRD	COPD	MS	Osteoporosis	Epilepsy
Diabetes	196,992	127,129	1,680	20,324	491	17,383	4,495
Unmatched 1	0	25,375	101	3,380	350	7,741	2,585
Unmatched 2	0	25,327	105	3,434	308	7,743	2,576
Unmatched 3	0	25,072	93	3,346	320	7,844	2,506
Unmatched 4	0	25,464	104	3,257	360	7,899	2,517
Unmatched 5	0	25,319	126	3,376	348	7,668	2,566
Matched 1	0	75,801	198	12,551	0	19,925	1,350
Matched 2	0	83,598	335	17,765	791	25,230	3,938
Matched 3	0	74,745	87	13,111	86	25,967	2,154
Matched 4	0	79,274	0	15,218	351	21,382	6,708
Matched 5	0	80,460	119	11,770	426	21,126	4,173

ESRD: End Stage Renal Disease; COPD: Chronic Obstructive Pulmonary Disease; MS: Multiple Sclerosis

However, diabetes and associated chronic conditions tend to be influenced by similar risk factors such as diet and sedentary lifestyle, and gains in managing these risk factors ought to be seen in the associated chronic conditions as well.

**For further information or to suggest a topic for a Public Health Surveillance Bulletin:**

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Looking for Health Information? Check out the Interactive Health Data Application:

[www.health.alberta.ca/health-info/IHDA.html](http://www.health.alberta.ca/health-info/IHDA.html)

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