



# PEI DIABETES TRENDS REPORT 2018

## **OBJECTIVE**

The objective of this report is to provide information on the current state of diabetes in Prince Edward Island (PEI), with hopes of informing decision-making, planning, and delivery of health services.

## **DATA SOURCES**

The report used data from the PEI Chronic Disease Surveillance System [in collaboration with the Canadian Chronic Disease Surveillance System (CCDSS)<sup>1</sup>], the Canadian Community Health Survey (CCHS), Vital Statistics, and the INSPQ Deprivation Index.

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## BACKGROUND

Diabetes is a chronic disease caused by defects in insulin production or insulin use.<sup>2</sup> Insulin is a hormone that allows glucose (sugar) to enter the body's cells to be used for energy. Diabetes leads to high blood sugar levels, which can damage organs, blood vessels, and nerves.<sup>3</sup> Diabetes is a major public health challenge because of its large effect on health, but it can be prevented and controlled.<sup>4</sup>

## INCIDENCE OF DIABETES

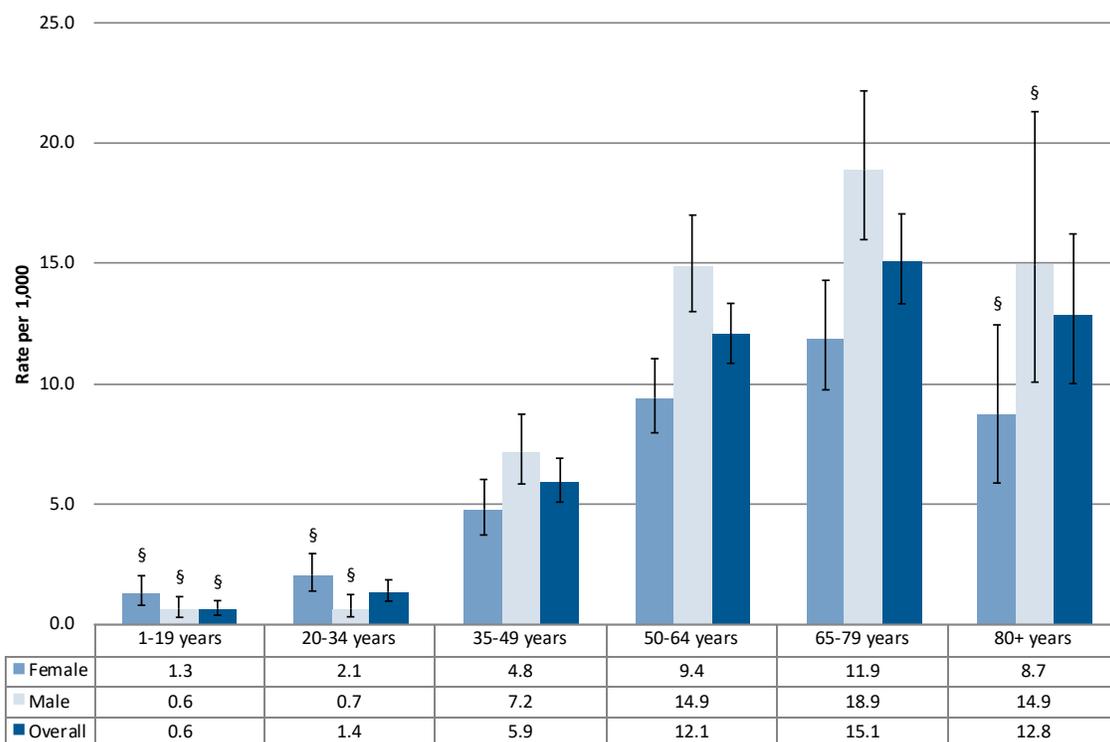
During 2016/17 there were 944 new cases of diabetes (incidence) in PEI. The rates of diabetes incidence were 6.6 per 1,000 Islanders (crude rate) and 6.4 per 1,000 Islanders (age-standardized rate).

### Age-Specific Diabetes Incidence

Diabetes incidence increased with age in both sexes and peaked in Islanders of the ages 65-79. In Islanders aged 35 and older, the incidence of diabetes was significantly higher in males than in females.

The graphic below shows the age-specific incidence of diabetes in PEI overall and by sex in 2016/17. Rates were estimated using the methodology of the CCDSS.

**Age-Specific Diabetes Incidence by Sex, PEI, Ages 1+, 2016/17**



§ Interpret incidence estimate with caution (CV>16.5)

## PREVALENCE OF DIABETES

In 2016/17 there were 13,946 Islanders living with diabetes (prevalence). The estimates for diabetes prevalence were 9.0% (crude) and 7.8% (age-standardized).

### Age-Specific Diabetes Prevalence

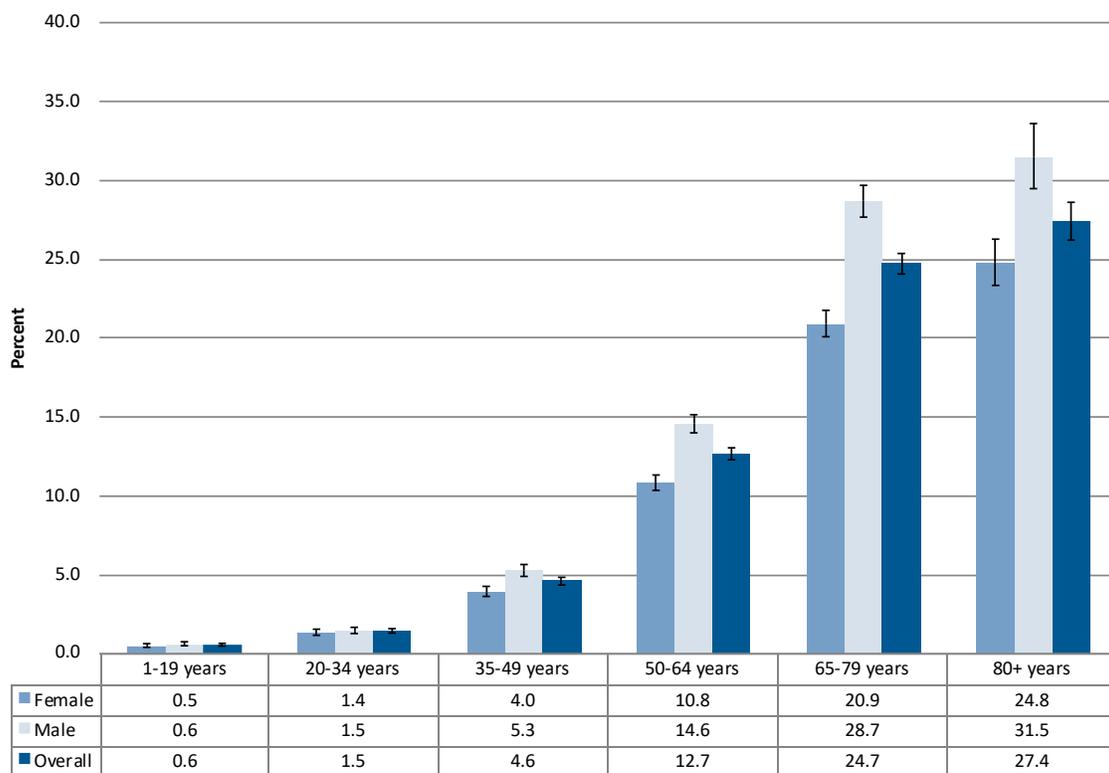
Diabetes prevalence increased with age in both sexes and peaked in Islanders of the ages 80 and older.

The prevalence of diabetes was significantly higher in males than in females for Islanders aged 35 and older.

The graphic below shows the age-specific prevalence of diabetes in PEI overall and by sex in 2016/17.

Rates were estimated using the methodology of the CCDSS.

**Age-Specific Diabetes Prevalence by Sex, PEI, Ages 1+, 2016/17**

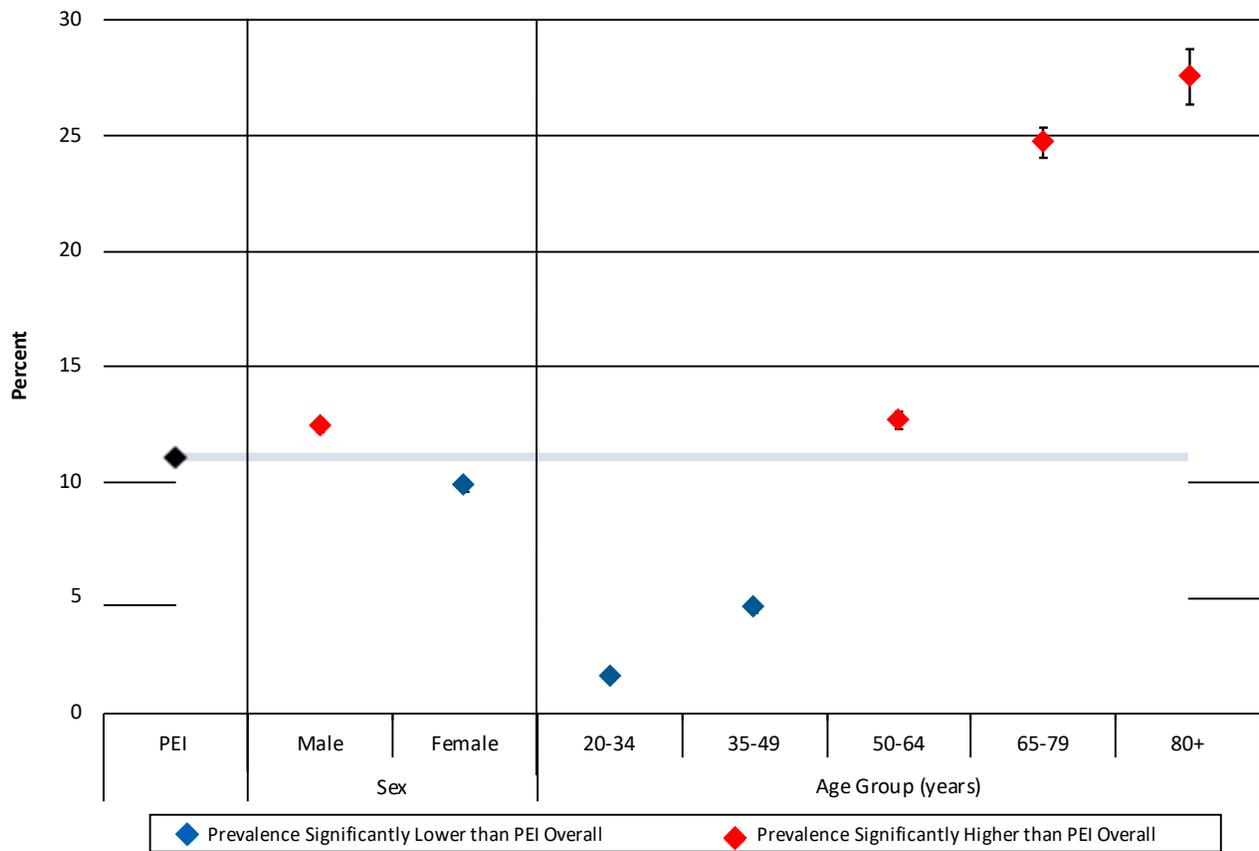


### Prevalence of Diabetes in Adults

The percentage of Island adults (ages 20+) who were living with diabetes in 2016/17 was 11.1% (crude prevalence). Compared to the PEI average, significantly higher diabetes prevalence estimates were seen in men and in people 50 years of age and older.

The graphic below shows the crude prevalence of diabetes for ages 20+ in 2016/17 in PEI, stratified by age and sex. Rates were estimated using the methodology of the CCDSS.

### Diabetes Prevalence, Crude Rates, PEI, Ages 20+, 2016/17

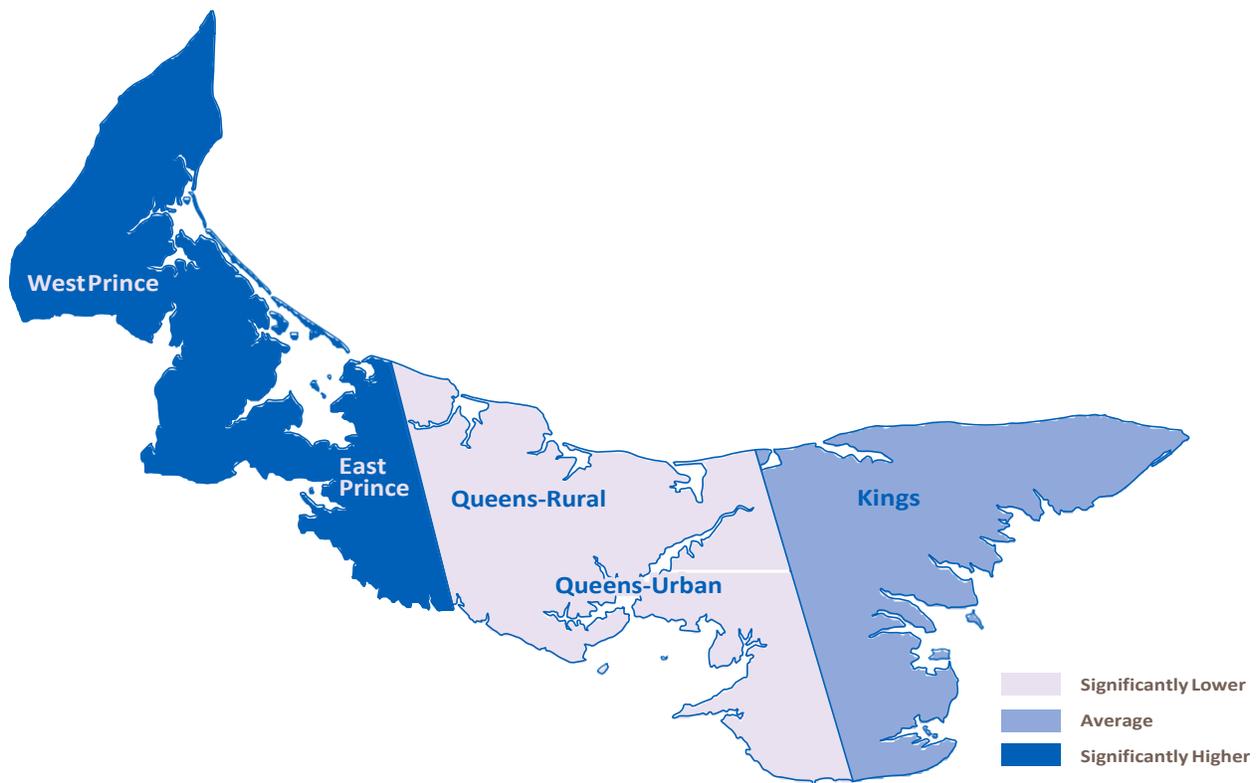


### Prevalence of Diabetes by Zone

There was a significant difference in the prevalence of diabetes in adult Islanders based upon the geographic area where they lived. When divided into five zones, the crude prevalence per zone in 2016/17 ranged from 10.1% in Queens Urban to 13.4% in East Prince. Island adults who resided in West Prince or East Prince had significantly higher prevalence of diabetes than Islanders overall. Island adults who resided in Queens Rural or Queens Urban had significantly lower prevalence of diabetes than Islanders overall. Differences in prevalence were not detected between Islanders who resided in Kings compared to all Island adults.

A map depicting the prevalence of adult diabetes per zone compared to the prevalence for PEI overall is shown below. Rates were estimated using the methodology of the CCDSS.

### Diabetes Prevalence by Zone, PEI, Ages 20+, 2016/17

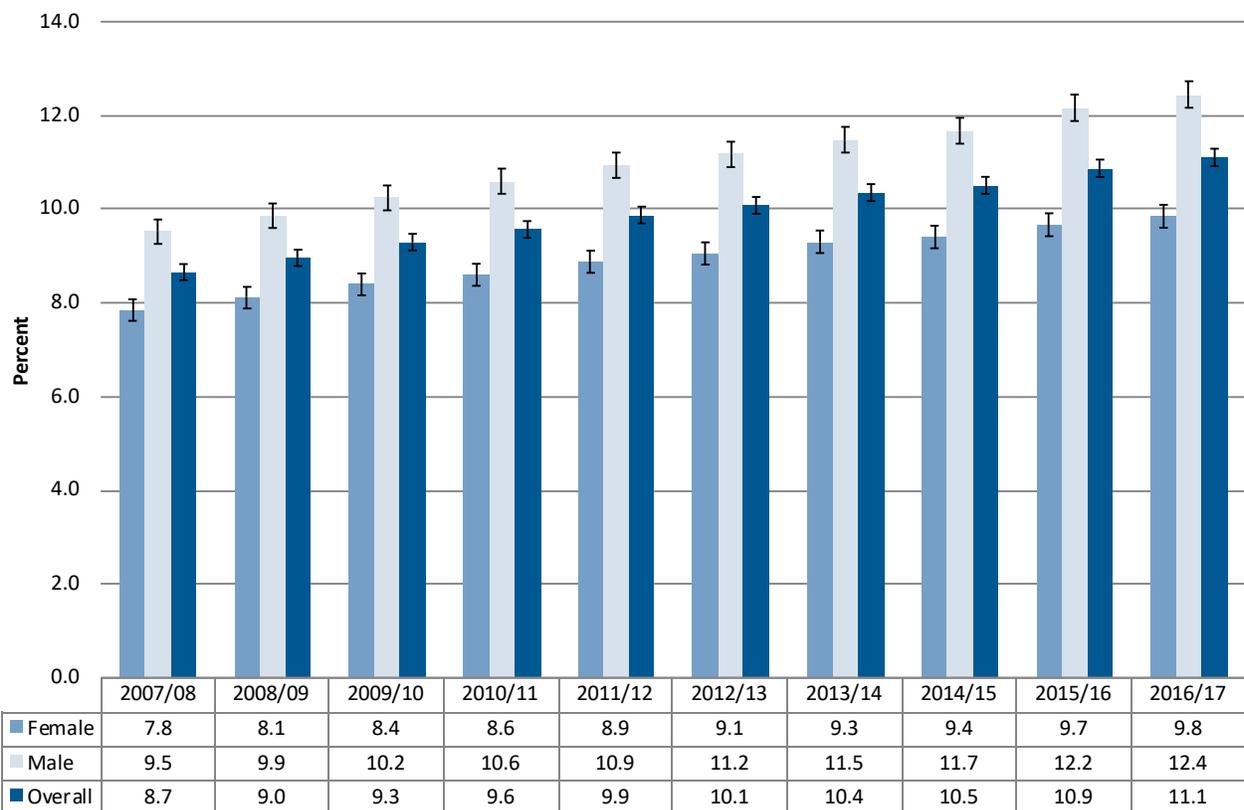


### Diabetes Prevalence Trends over Time

The burden of diabetes in Island adults has been increasing over time. During the ten-year time period from 2007/08 to 2016/17, the crude prevalence of diabetes increased by almost 28%. The same trend was seen for both men and women; the crude prevalence of diabetes increased by almost 26% in women and by almost 31% in men.

The graphic below shows the crude prevalence of diabetes in PEI overall and by sex for ages 20+ from 2007/08 to 2016/17. Rates were estimated using the methodology of the CCDSS.

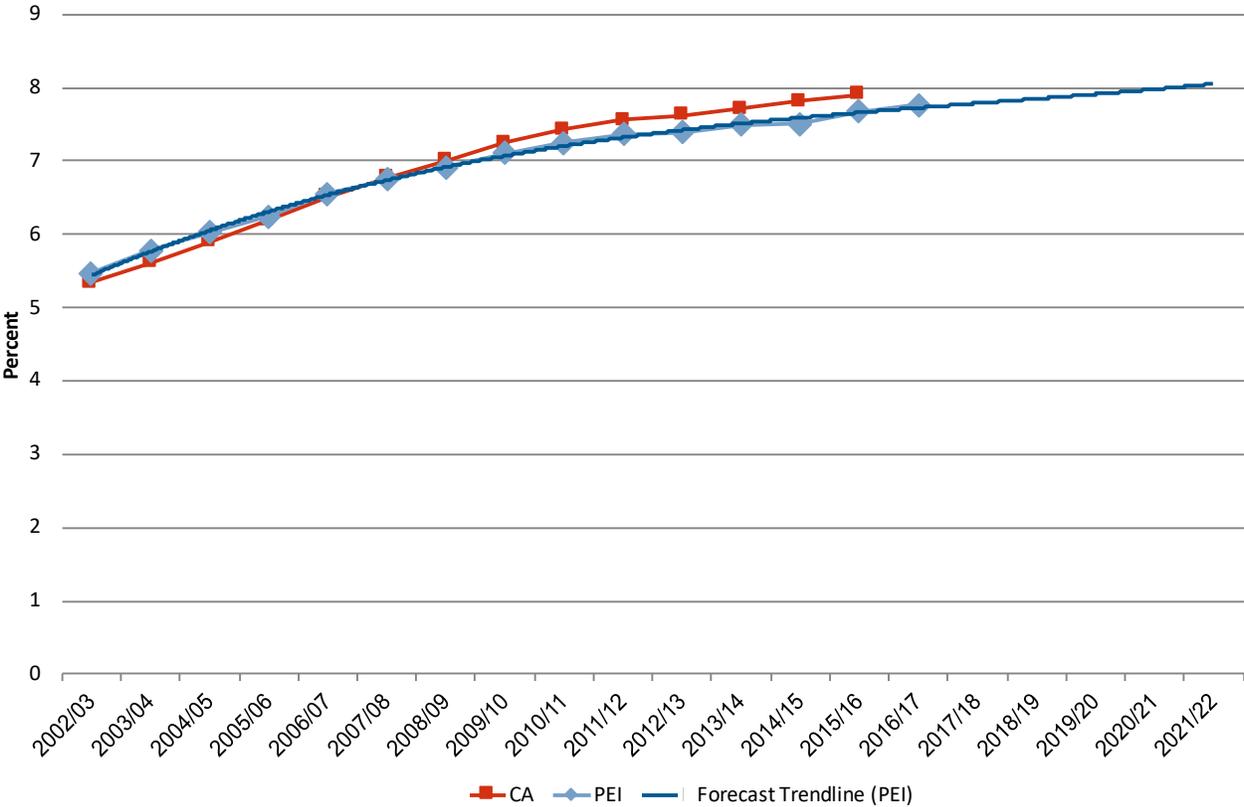
### Diabetes Prevalence by Sex and Year, Crude Rates, PEI, Ages 20+, 2007/08 - 2016/17



The percentage of people living with diabetes has been increasing over time for both PEI and Canada.<sup>5</sup> Compared to Canada, the percentage of people living with diabetes was significantly lower in PEI from 2010/11 to 2015/16. Nevertheless, the burden of diabetes in Islanders is expected to continue increasing over the next five years. It is projected that in 2021/22, the age-standardized prevalence of diabetes in PEI will be just over 8%.

The graphic below shows the age-standardized prevalence of diabetes from 2002/03 to 2015/16 for Canada, 2002/03 to 2016/17 for PEI, and prevalence projections to 2021/22 for PEI. Rates for PEI were estimated using the methodology of the CCDSS and rates for Canada were obtained from the CCDSS.<sup>5</sup>

**Diabetes Prevalence, Age-Standardized Rates & Polynomial Forecast  
Trendline, PEI & Canada, Ages 1+, 2002/03 - 2021/22**

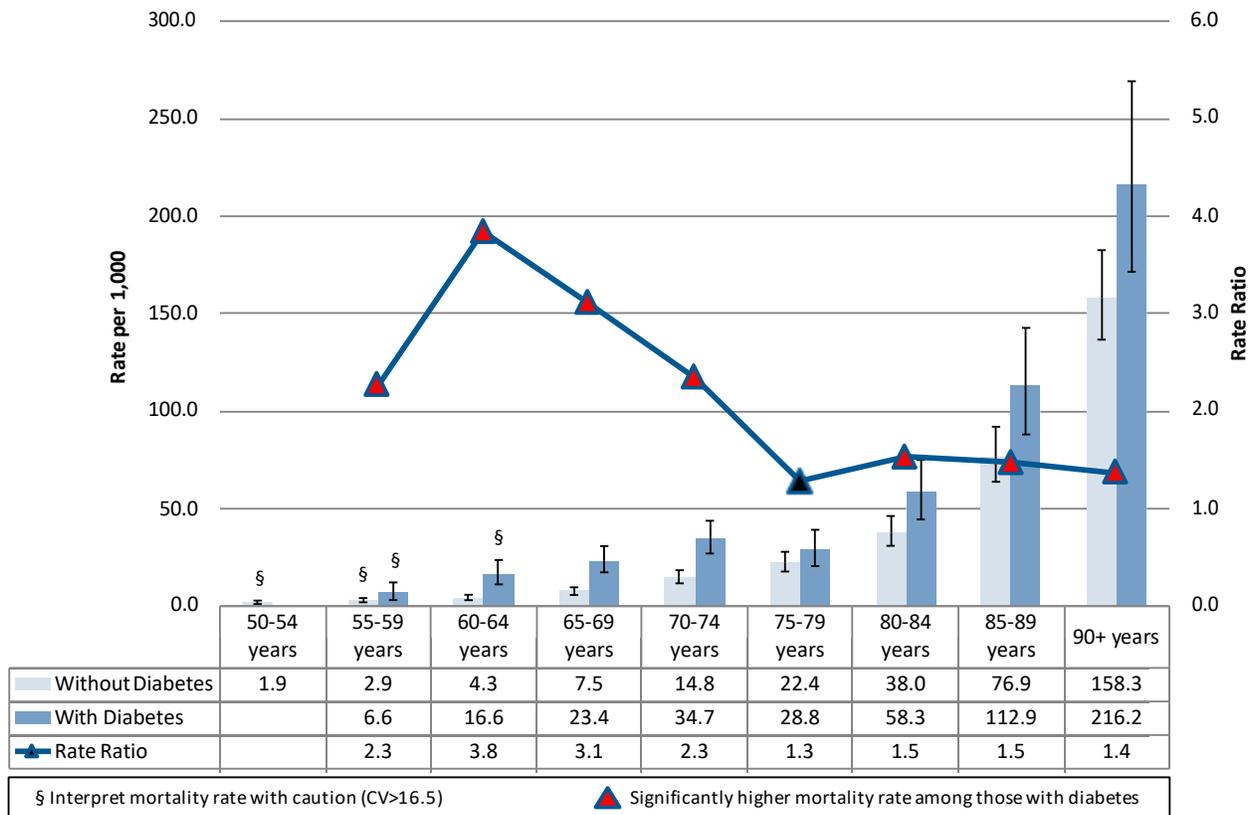


## MORTALITY

Diabetes reduces life expectancy by 5 to 15 years.<sup>6</sup> In 2016/17, the mortality rate for Islanders with diabetes was almost twice that of Islanders without diabetes. For Island seniors (65+), the mortality rate for those with diabetes was significantly higher than for those without diabetes for all age groups except 75-79 year olds. The mortality rates for senior age groups ranged from 1.3 to 3.1 times as high for those with diabetes as for those without. The mortality rate ratio between Islanders with and without diabetes was similar to the ratio for all Canadians in 2015/16.<sup>5</sup>

The graphic below presents all-cause mortality among Islanders with and without diabetes by age group for 2016/17. Rates were estimated using the methodology of the CCDSS and data from vital statistics.

### Age-Specific All-Cause Mortality Among People with and without Diabetes, PEI, Ages 50+, 2016/17



## ECONOMIC COSTS

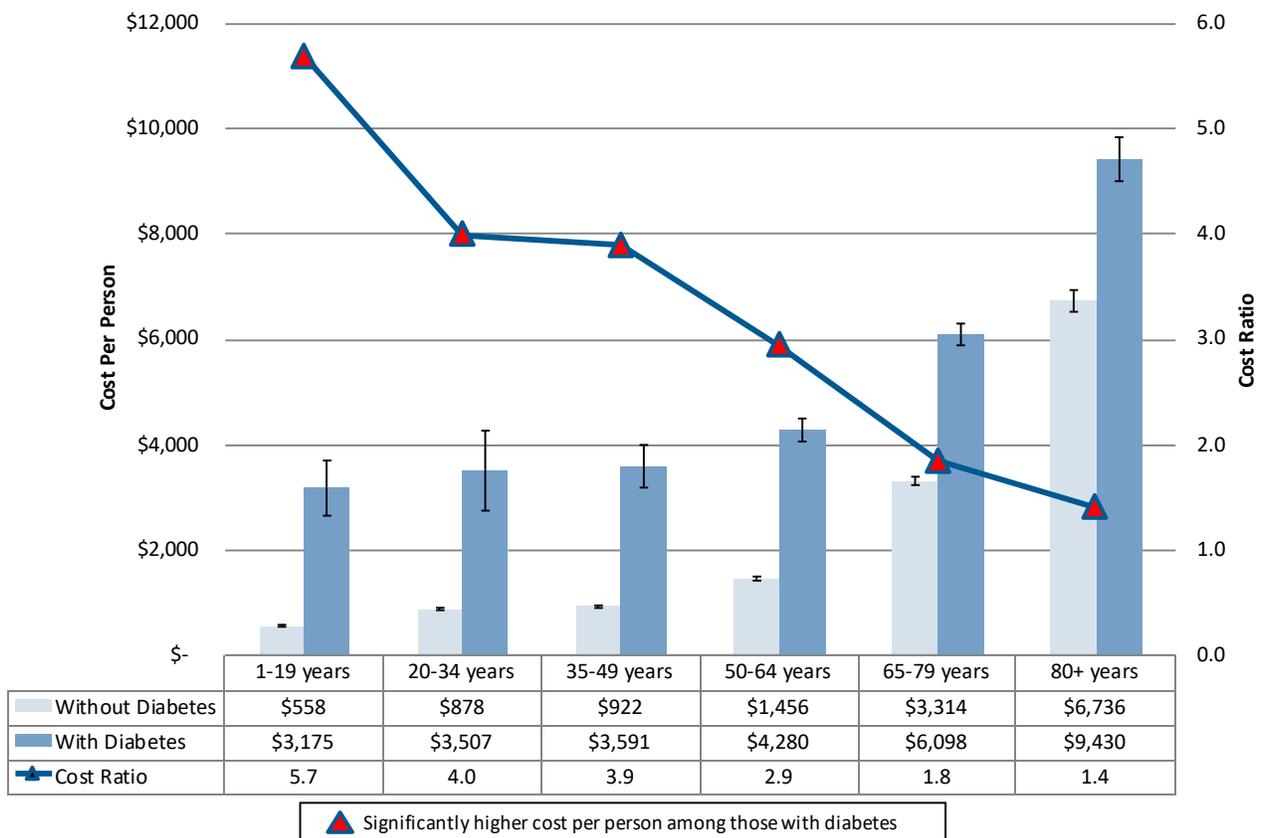
Diabetes affects not only the health of people living with the disease, but also imposes significant direct and indirect economic costs on them and society as a whole.<sup>7</sup> In PEI from 2012/13 to 2016/17, the average annual cost of hospital care, physician care, and drugs (for people 65 years of age and older) for Islanders with diabetes was estimated to be \$74 million; resulting in an average annual cost of \$5,633 per person. This per-person health care cost was almost four times higher than the per-person cost for Islanders without diabetes.

### Age-Specific Health Care Costs Per Person

The average annual health care costs per person tended to increase with age for all Islanders; however, the differences between the per-person costs for Islanders with diabetes and those without diabetes decreased with age. For Islanders of the ages 1-19 years, health care costs per person were almost six times higher for those with diabetes than for those without diabetes. For Islanders 80 years of age and older, the health care costs per person for those with diabetes was less than 1 ½ times the costs for those without diabetes.

The graphic below presents the average age-specific health care costs per person (ages 1+) for those living with diabetes compared to those living without diabetes for 2012/13 to 2016/17. Costs were estimated using the methodology of the CCDSS.

**Average Age-Specific Health Care Costs per Person Among Those with and without Diabetes, PEI, Ages 1+, 2012/13-2016/17**

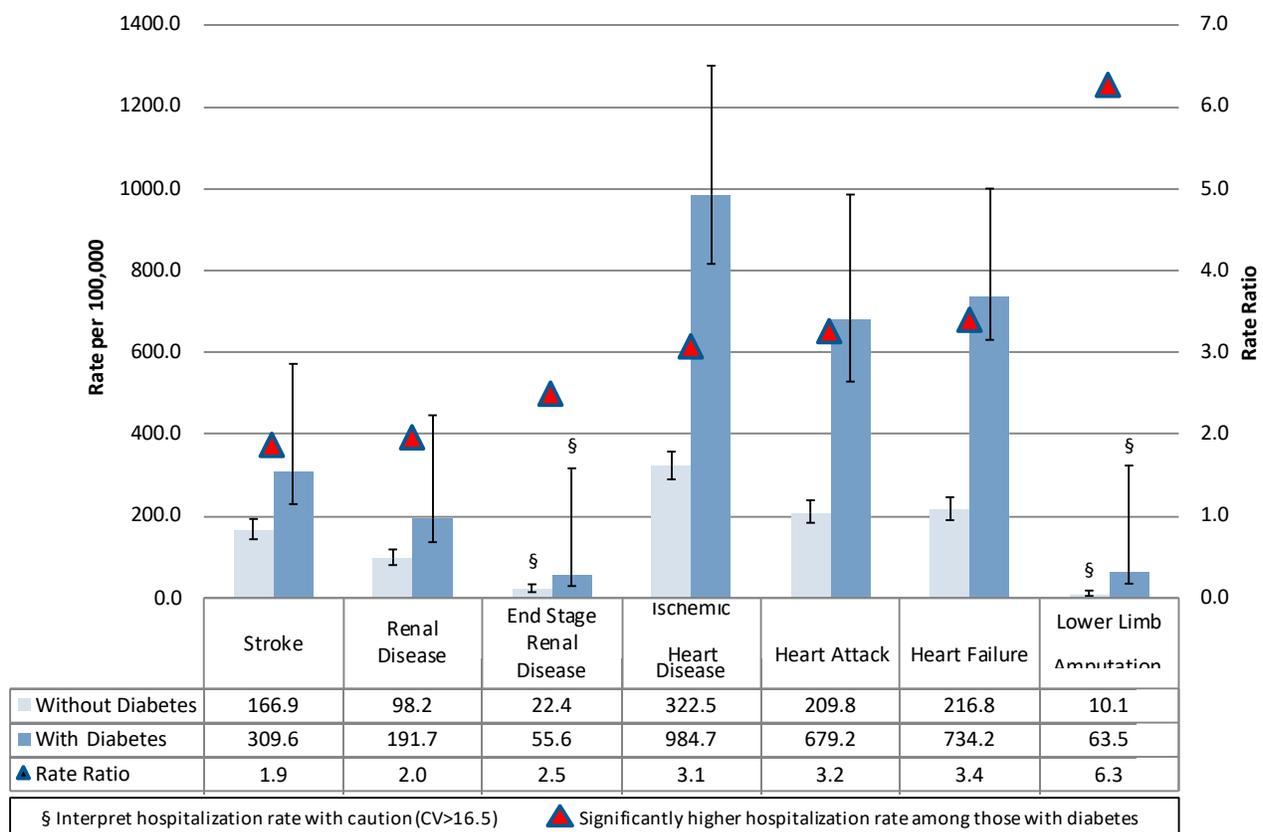


## HEALTH COMPLICATIONS OF DIABETES

Diabetes increases people’s risk for many serious health problems.<sup>6</sup> In 2016/17, adult Islanders with diabetes were almost twice as likely as those without diabetes to be hospitalized. Adults with diabetes were twice as likely to be hospitalized for stroke or renal disease and about three times as likely to be hospitalized for ischemic heart disease (narrowing of arteries that supply blood to the heart), heart attack, and heart failure. Hospitalization rates for lower limb amputation and end-stage renal disease are also higher for adult Islanders with diabetes; however, these rates and ratios should be considered with caution due to the effect of small numbers on the accuracy of the estimations.

The graphic below presents the rates of hospitalization due to complications for those living with diabetes compared to those living without diabetes for ages 20+ for 2016/17. Rates were estimated using the methodology of the CCDSS.

### Hospitalization due to Complications Among People with and without Diabetes, Age-Standardized Rates, PEI, Ages 20+, 2016/17



**Note:** A person was included in a category if they had at least one hospitalization with a diagnosis code for that complication during 2016/17. People hospitalized with more than one complication were counted once in each category.

## RISK FACTORS FOR DIABETES

Diabetes is caused by a number of genetic, environmental, and biological risk factors. Definite risk factors for type 1 diabetes are currently not known, but there are controllable and modifiable risk factors for type 2 diabetes. A person's risk of developing type 2 diabetes can increase with certain socio-demographic and economic characteristics, health behaviours, and health conditions. For this report, diabetes type was not identified. However, an examination of socio-economic characteristics and modifiable risk factors was conducted for adults living with diabetes compared to adults living without diabetes. Attention to social determinants of health and modifiable risk factors can be of benefit to decrease the risk of developing type 2 diabetes and can help with disease management for people who already have diabetes.<sup>6,9</sup>

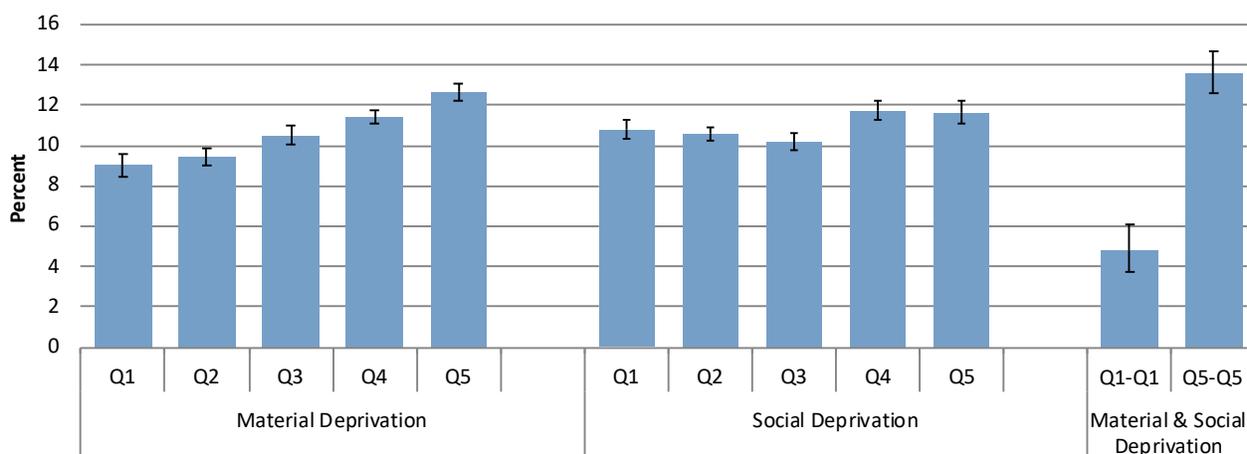
### Material and Social Deprivation

To measure and monitor social inequalities in health and wellness, an area-based deprivation index was developed for Québec and Canada (INSPQ).<sup>10</sup> Since its development, this deprivation index has been validated and used extensively in the field of public health throughout Canada.<sup>11</sup> It is made up of six socio-economic indicators selected from the Canadian Census that are divided into a material deprivation component and a social deprivation component. The material component reflects education, employment, and income, and the social component reflects marital status (being widowed, separated, or divorced), living alone, and being in a single-parent family.<sup>12</sup> The deprivation index is structured so that the fifth quintile (Q5) indicates most deprived, while the first quintile (Q1) indicates most privileged. The material and social components can be examined separately or jointly.

In 2016/17, the prevalence of diabetes in Island adults was significantly associated with the amount of deprivation in the community where they lived. With increasing material deprivation, significantly higher percentages of adults were living with diabetes. Adults who lived in areas with high social deprivation (Q4 and Q5) were also significantly more likely to be living with diabetes than were adults who lived in areas with higher social privilege (Q1, Q2 and Q3). When considered in combination, the burden of diabetes was significantly higher for people living in areas that had the highest levels of material and social deprivation (Q5-Q5, crude prevalence of 13.6%) compared to those living in areas that had the highest levels of material and social privilege (Q1-Q1, crude prevalence of 4.8%).

The graphic below shows the crude prevalence of diabetes for ages 20+ in 2016/17, stratified by material and social deprivation quintiles. Rates were estimated using the INSPQ deprivation index (2011) and the methodology of the CCDSS.

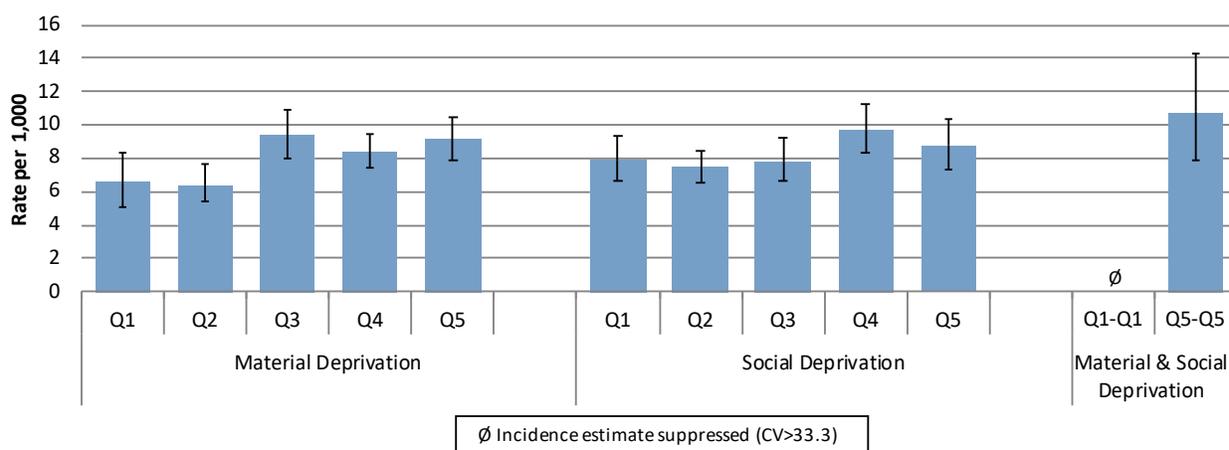
## Diabetes Prevalence by Material and Social Deprivation, Crude Rates, PEI, Ages 20+, 2016/17



In 2016/17, there was also a significant association between the incidence of diabetes in Island adults and the amount of material deprivation in the community where they lived. Non-diabetic adults who lived in areas with the highest material deprivation (Q5) were significantly more likely to become diabetic than those who lived in areas with high material privilege (Q1 and Q2). A significant association was not detected between diabetes incidence in adults and the social deprivation of the community in which they lived. The diabetes incidence for people living in areas that had the highest levels of material and social privilege had to be suppressed due to the effect of small numbers on the accuracy of the estimation.

The graphic below shows the incidence of diabetes for ages 20+ in 2016/17, stratified by material and social deprivation quintiles. Rates were estimated using the INSPQ deprivation index (2011) and the methodology of the CCDSS.

## Diabetes Incidence by Material and Social Deprivation, Crude Rates, PEI, Ages 20+, 2016/17

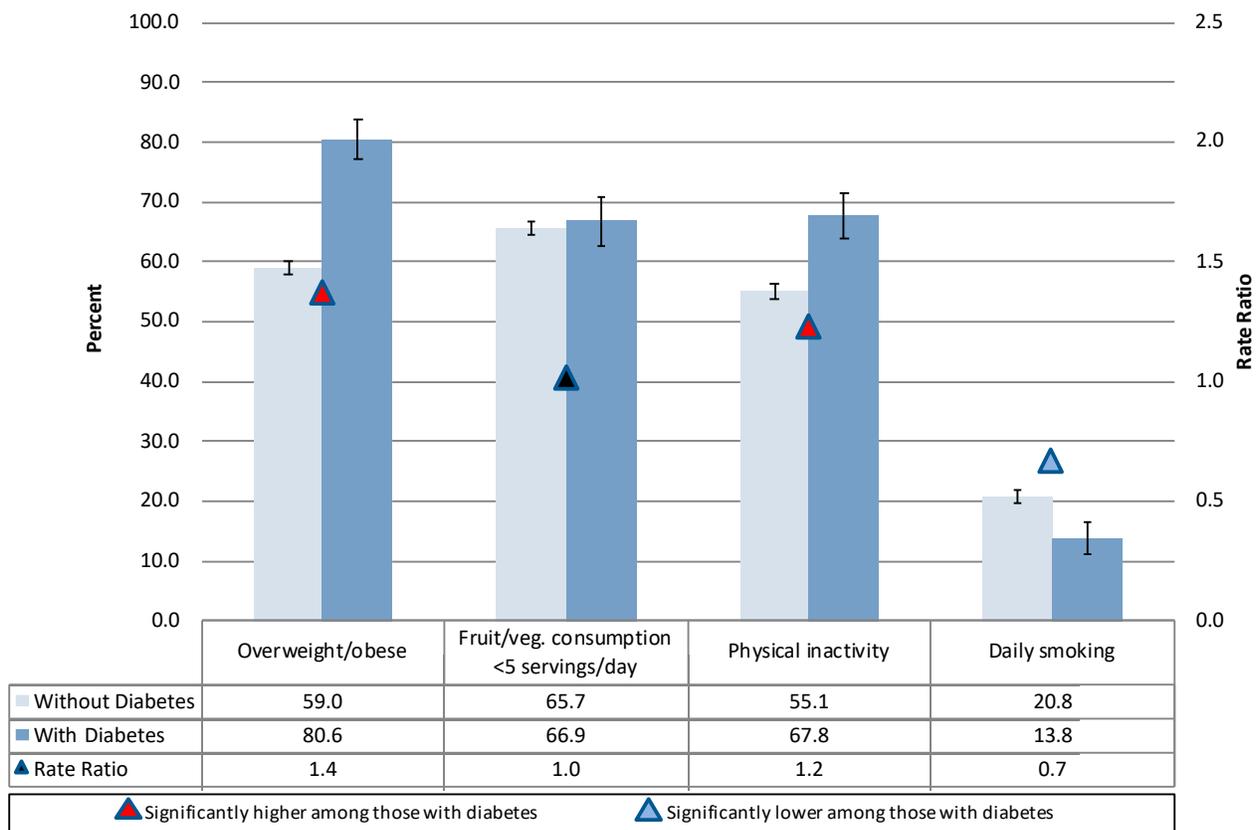


## Modifiable Risk Factors

Modifiable risk factors for type 2 diabetes include overweight and obesity, unhealthy diet, physical inactivity, and tobacco use.<sup>6</sup> From CCHS survey responses in 2001 to 2013/14, adult Islanders with diabetes were significantly more likely to be overweight or obese and to be physically inactive than were Islanders without diabetes. Specifically, being overweight or obese was 40% more likely and physical inactivity was 20% more likely among those with diabetes than those without diabetes. No significant association was found between diabetes status and the proportion of adult Islanders who consumed less than 5 servings of fruit or vegetables daily. In contrast, adult Islanders with diabetes were significantly less likely to smoke cigarettes on a daily basis than were those without diabetes (30% less likely).

The graphic below shows the prevalence of modifiable risk factors among people with and without diabetes in PEI for ages 20+ from 2001 to 2013/14. Rates were estimated using data from the CCHS.

### Modifiable Risk Factors Among People with and without Diabetes, PEI, Ages 20+, 2001 to 2013/14



## CONCLUSION

Diabetes is a complex chronic disease that puts substantial burden on individuals, families, communities, and society. While there is currently no way to prevent type 1 diabetes, diabetes control efforts (i.e., promotion of physical activity, healthy eating, obesity prevention, early diabetes detection, and diabetes self-management) could have a profound effect on diabetes incidence and the quality and length of life of those diagnosed.<sup>4</sup> Attention to control efforts will also yield preventive benefits for other conditions and diseases, such as cardiovascular and renal conditions. Diabetes control efforts will result in cost savings in diabetes management and diabetes-related care in the health system. Consideration of social determinants of health in the design, implementation, and evaluation of diabetes control efforts will also reduce the health inequities of those diagnosed with diabetes.

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