



Data Brief: Prediabetes in New Hampshire

Associated Health Behaviors and Chronic Conditions

INTRODUCTION

This data brief summarizes findings from the New Hampshire Behavioral Risk Factor Surveillance Survey^a (NH BRFSS) and describes the prevalence of prediabetes and associated health behaviors and chronic conditions among New Hampshire (NH) adults.

Prediabetes may precede the development of diabetes and is diagnosed when fasting blood glucose (sugar) is higher than normal (greater than or equal to 100 mg/dL but less than 126 mg/dL) but not high enough for a diagnosis of diabetes. As data on the risk factors and co-morbidities associated with diagnosed diabetes (fasting blood glucose greater than or equal to 126 mg/dL) have been presented previously, this report focuses primarily on prediabetes.

The following categories are used throughout this brief: 1) diabetes, 2) prediabetes, and 3) no diabetes, no prediabetes. Adults reporting a history of gestational (during pregnancy) diabetes were included in the no diabetes, no prediabetes category.

BACKGROUND AND PREVALENCE - UNITED STATES

The risk factors^b for prediabetes are the same as for type 2 diabetes (formerly known as adult-onset or noninsulin-dependent diabetes) and associated with lifestyle factors such as obesity and physical inactivity. The same tests that are used to diagnose diabetes are used to diagnose prediabetes.

According to the Centers for Disease Control and Prevention, prediabetes affects 35%, or 79 million of American adults 20 years of age or older.¹ Nevertheless, only 4-7% of adults with prediabetes has been diagnosed and/or are aware of their condition.^{2, 3, 4}

It has been estimated that between 35% and 65% of adults with prediabetes will develop type 2 diabetes within six years of a prediabetes diagnosis.⁵ However, with lifestyle intervention, it is possible to prevent or delay the progression from prediabetes to type 2 diabetes. A weight loss of just 5-7% can make a difference.⁶

PREVALENCE - NEW HAMPSHIRE

In 2009, the prevalence of diabetes was 7.1% and another 5.7% of NH adults reported ever being diagnosed with prediabetes. Because so many adults are undiagnosed, up to 35%¹ of NH adults could have prediabetes based on national estimates from the National Health and Nutrition Examination Survey.^c

NH BRFSS data show that those with diabetes are older and have, on average, higher Body Mass Index^d (BMI) compared with those reporting diagnosed prediabetes. NH respondents without diabetes or prediabetes are the youngest and with the lowest average BMI (Table 1).

PREVALENCE OF CHRONIC CONDITIONS ASSOCIATED WITH PREDIABETES

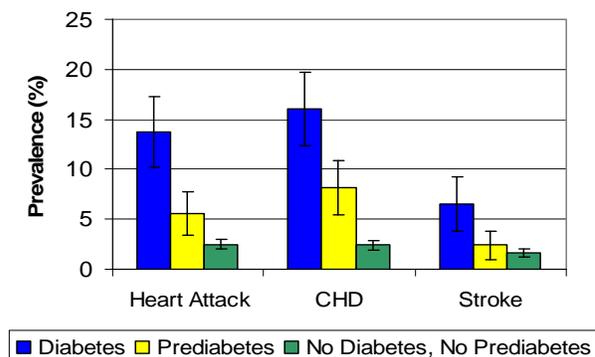
Table 1 - Mean age, BMI, and proportion of males among adults reporting diabetes and prediabetes

	Diabetes	Prediabetes	No Diabetes, No Prediabetes
Mean Age	60.1	54.7	45.9
Mean BMI	31.5	30.4	26.7
Proportion of Males	54.0%	44.2%	48.6%

Heart Disease and Stroke

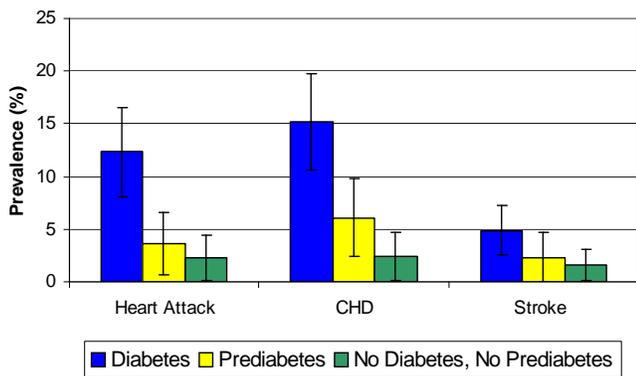
Both diabetes and prediabetes increase one's risk for heart disease and stroke; prediabetes also increases the risk for type 2 diabetes. Compared with adults with normal blood glucose, risk of heart disease and stroke is 2 to 4 times higher in people with diabetes and 1.5 times higher in people with prediabetes.⁷

Figure 1 - Prevalence of heart attack, coronary heart disease and stroke among NH adults, BRFSS, 2009



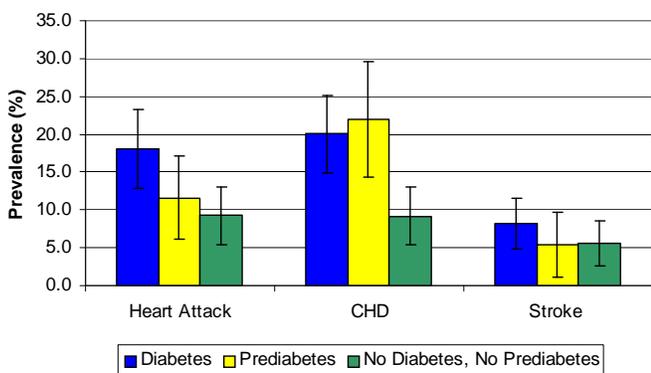
In 2009, a significantly higher proportion of adults with diabetes and prediabetes reported having had a heart attack or coronary heart disease (CHD) compared with adults without diabetes. The prevalence of stroke was 6.5%, 2.4%, and 1.7% across the three categories (Figure 1).

Figure 2 - Prevalence of heart attack, coronary heart disease, and stroke among obese NH adults, BRFSS 2009



Obesity and older age are recognized risk factors for both diabetes and heart disease. Nevertheless, increased risk for heart disease and stroke exists across the categories regardless of weight status or age. Figure 2 shows that among obese adults, the prevalence of heart disease and stroke was highest among adults with diabetes and lowest among adults with neither condition. Prevalence of heart attack, CHD, and stroke in adults 65 years of age and older is displayed in Figure 3.

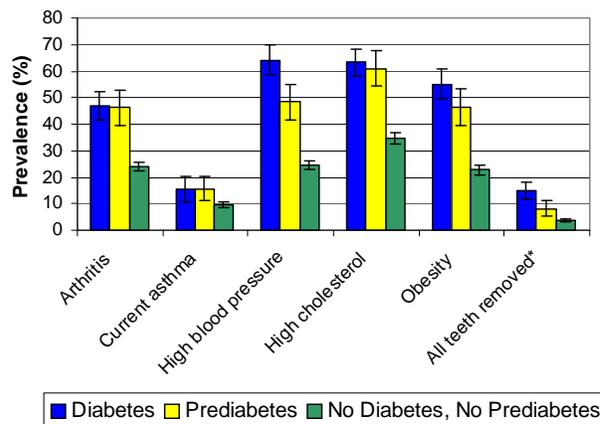
Figure 3 - Prevalence of heart attack, coronary heart disease, and stroke among NH adults 65 years of age and older , BRFSS, 2009



Other Chronic Conditions

Figure 4 - Prevalence of selected chronic conditions among NH adults, BRFSS, 2009

**All teeth removed asked only in 2008*



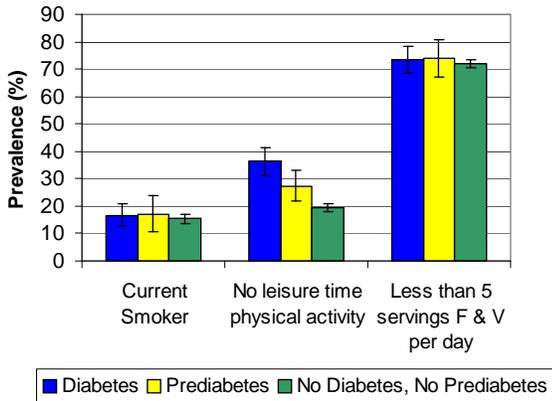
Overall, NH data show that the prevalence of various chronic conditions among those with prediabetes is significantly higher than in adults without diabetes. In some instances, adults with prediabetes experience a burden of chronic conditions similar to adults with diabetes (Figure 4).

In 2009, nearly 50% of adults with diabetes and prediabetes reported having arthritis (significantly higher than adults with neither condition). The prevalence of current asthma was also similar among NH adults with diabetes and prediabetes (15.4% and 15.6%, respectively) and significantly higher compared with adults with neither condition.

Prevalence of high blood pressure and loss of all teeth showed an increase across categories and was significantly higher in adults with diabetes and prediabetes when compared with adults with neither condition. Those with diabetes reported three times higher prevalence of complete tooth loss. Those with prediabetes were twice as likely to have all teeth removed.

Health Behaviors

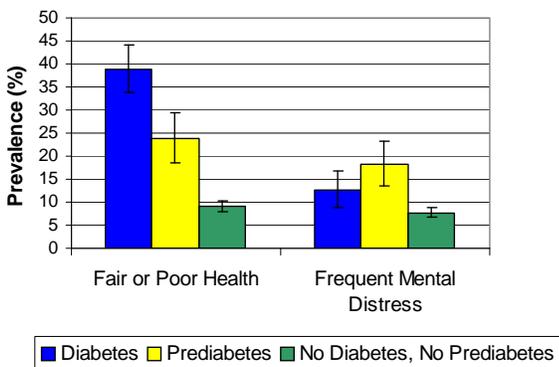
Figure 5 - Prevalence of smoking, physical inactivity, and fruit and vegetable consumption among NH adults, BRFSS, 2009



Physical inactivity and smoking are recognized risk factors for diabetes and prediabetes.^{8,9} Smoking can also worsen the late complications of diabetes.⁹ Poor diet contributes to obesity, a risk factor for type 2 diabetes. Data from the NH BRFSS illustrate the association of three health behaviors – smoking, physical inactivity, and fruit and vegetable consumption – with those having diabetes, prediabetes, and no diabetes or prediabetes. In 2009, NH adults with diabetes reported the highest prevalence of physical inactivity. There was no significant difference in smoking prevalence or recommended fruit and vegetable consumption (5 or more servings per day) by the three categories.

Health Related Quality of Life

Figure 6 - Fair or poor health and frequent mental distress among NH adults, BRFSS 2009



Significantly more adults with diabetes and prediabetes reported having fair or poor health compared with adults without diabetes or prediabetes. There was no significant difference between adults for self-reported frequent mental distress^e across the categories (18.4% of adults with prediabetes 12.7% of adults with diabetes, and 7.7% of adults without diabetes).

When asked about physical and mental health in the past 30 days, adults with diabetes reported 7 physically unhealthy and 4 mentally unhealthy days, adults with prediabetes reported 6 physically and 6 mentally unhealthy days, and adults without diabetes or prediabetes reported 3 physically and 3 mentally unhealthy days.

COST OF DIABETES AND PREDIABETES

Diabetes and prediabetes carry significant social and economic costs. The total annual cost of diabetes in the United States is \$174 billion¹⁰ and over \$800 million for NH.¹¹ The average annual health care cost for a person with diabetes is \$11,744, compared with \$2,935 for a person without diabetes.¹⁰ Each year, \$27 billion is spent on prediabetes in the United States.² It has been estimated that a fully implemented National Diabetes Prevention Program⁶ could save \$105 billion by 2020 by avoiding three million cases of diabetes.²

CONCLUSION

In addition to 7.1% of NH adults ever diagnosed with diabetes, 5.7% of adults reported having been diagnosed with prediabetes. Prediabetes is often undiagnosed and may affect close to 35% of NH adults. Adults with prediabetes have increased risk for type 2 diabetes and are at increased risk for various chronic conditions, including arthritis, heart disease, and stroke. It is important to raise awareness of prediabetes to support early recognition and promote effective management and better patient care.

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NOTES

- a. The BRFSS is a random digit dialed telephone survey of non-institutionalized adults who self-report their health status
- b. All adults 45 years of age and older should be tested for diabetes/prediabetes. Testing should be considered in patients under the age of 45 who are overweight and have at least one additional risk factor as follows: overweight/obesity, physical inactivity, family history of diabetes, race/ethnicity (African American, Latino, Native American, Asian American, Pacific Islander), delivering a baby weighing over nine pounds, hypertension, low HDL (good cholesterol) and/or high triglycerides, pre-diabetes, history of cardiovascular disease, and other conditions associated with insulin resistance such as acanthosis nigricans⁸
- c. The National Health and Nutrition Examination Survey (NHANES) is a program of the National Center for Health Statistics (NCHS) and part of the Centers for Disease Control and Prevention (CDC). It combines interviews and physical examinations to assess the health and nutritional status of children and adults in the United States (<http://www.cdc.gov/nchs/nhanes.htm>)
- d. BMI is defined as body weight in kilograms divided by height in meters squared (wt/ht²). For adults, a healthy BMI is 18.0-24.9, overweight is a BMI of 25-29.9, and obesity is a BMI equal to or greater than 30.0.
- e. Frequent mental distress is defined as 14 or more days in the past 30 when mental health was not good
<http://www.cdc.gov/hrqol/faqs.htm>

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