



MICHIGAN BRFSS SURVEILLANCE BRIEF

A NEWSLETTER FROM THE CHRONIC DISEASE EPIDEMIOLOGY UNIT, MDCH

Diabetes Testing and Prediabetes Among Michigan Adults

Background. Prediabetes is a condition in which blood glucose or hemoglobin A1c (A1c) levels are higher than normal, but not high enough to be diagnosed as diabetes. People with prediabetes have an increased risk of developing type 2 diabetes, and are at higher risk of heart disease and stroke.¹ Based on fasting blood glucose or A1c levels, 35.0% of the U.S. adult population 20 years and older have prediabetes. When applying this percentage to the 2008 Michigan adult population (over 18 years of age), an estimated 2,602,500 have prediabetes, with 1,650,900 of these individuals being 45 years of age and above.² Evidence has shown that prediabetes risk can be reduced by 58% when those at high risk make modest lifestyle changes, specifically losing 5-7% of their body weight and being physically active on five or more days a week for at least 30 minutes each day.³

The American Diabetes Association recommends diabetes testing for all adults with a body mass index (BMI) of 25.0 or above who also have additional risk factors such as physical inactivity, family history of diabetes, history of gestational diabetes, high-risk race/ethnicity, and hypertension. In the absence of these risk factors, diabetes testing should begin at 45 years of age. Individuals with normal diabetes testing results should be retested every three years.⁴

Methods. Two questions related to diabetes testing and prediabetes were included as state-added questions within the 2010 Michigan Behavioral Risk Factor Survey (MiBRFS). These questions, asked of adults who have never been told by a doctor or other health professional that they have diabetes, were used to determine the prevalence of diabetes testing and prediabetes among the Michigan adult population (Figure 1). Prevalence estimates by population demographics were also calculated in order to examine differences between demographic subpopulations.

Figure 1. State-added Questions Focusing on Diabetes Testing and Prediabetes, 2010 MiBRFS

1. Have you had a test for high blood sugar or diabetes in the past three years?
2. Have you ever been told by a doctor or other health professional that you have prediabetes or borderline diabetes?

Results. In 2010, 58.4% of Michigan adults without diabetes reported having been tested for diabetes in the past three years (Table 1). The prevalence of diabetes testing was low in 18-24 years olds (29.6%), but increased dramatically among the older age groups. Diabetes testing also increased with education and household income level, but was similar among males (57.1%) and females (59.7%).

When examining diabetes testing by race, Blacks (70.8%) reported a significantly higher prevalence of diabetes testing compared to Whites (57.8%). In addition, adults with some type of health care coverage (61.5%) reported a higher prevalence of diabetes testing compared to adults with no health care coverage (41.0%). Furthermore, overweight (61.1%) and obese (67.1%) adults

Table 1. Diabetes Testing in the Past Three Years¹, 2010 MiBRFS

	%	95% CI
Total	58.4	(55.6-61.3)
Age		
18 - 24	29.6	(20.8-40.2)
25 - 34	52.2	(42.7-61.5)
35 - 44	54.9	(48.6-61.1)
45 - 54	69.1	(64.1-73.7)
55 - 64	70.9	(66.6-74.9)
65 - 74	72.5	(67.6-77.0)
75 +	64.7	(59.3-69.8)
Gender		
Male	57.1	(52.4-61.6)
Female	59.7	(56.3-63.0)
Race		
White	57.8	(54.7-60.8)
Black	70.8	(62.7-77.8)
Other	56.0	(40.5-70.4)
Education		
< High school	43.7	(32.1-56.1)
High school grad	57.9	(52.6-63.0)
Some college	57.5	(52.1-62.8)
College graduate	62.5	(58.0-66.9)
Household Income		
< \$20,000	49.3	(41.8-57.0)
\$20,000 - \$34,999	57.0	(49.8-63.9)
\$35,000 - \$49,999	57.8	(50.2-65.0)
\$50,000 - \$74,999	58.1	(50.7-65.1)
\$75,000 +	64.5	(59.2-69.5)
Health Insurance		
Has insurance	61.5	(58.4-64.4)
No insurance	41.0	(33.0-49.4)
Weight Status		
Healthy weight	49.6	(44.7-54.5)
Overweight	61.1	(56.5-65.5)
Obese	67.1	(61.6-72.1)

¹ Among adults without diabetes, the proportion who have had a test for high blood sugar or diabetes within the past three years. (N = 2,467)

MiBRFSS News

- The 2010 Michigan BRFS Annual Report has been completed and is now available on the Michigan BRFSS website (www.michigan.gov/brfs).
- The Michigan BRFS questionnaires from 2003-2011 are now available on the Michigan BRFSS website.
- Did you miss an issue of *Michigan BRFSS Surveillance Brief*? Back issues are also available on our website.

Table 2. Prevalence of Prediabetes among Michigan Adults, 2010 MiBRFS

	%	95% CI
Total	6.4	(5.3-7.6)
Age		
18 - 24	1.0	(0.2-4.9)
25 - 34	3.6	(1.4-8.9)
35 - 44	5.9	(3.6-9.5)
45 - 54	7.0	(4.9-9.9)
55 - 64	8.9	(6.7-11.6)
65 - 74	11.4	(8.4-15.2)
75 +	10.1	(7.3-13.9)
Gender		
Male	4.8	(3.6-6.4)
Female	7.8	(6.3-9.7)
Race		
White	6.5	(5.4-7.8)
Black	7.4	(4.2-12.8)
Other	3.4	(1.0-10.9)
Education		
< High school	5.6	(3.2-9.8)
High school grad	6.7	(4.8-9.3)
Some college	7.9	(5.9-10.7)
College graduate	4.6	(3.4-6.2)
Household Income		
< \$20,000	8.9	(6.0-13.1)
\$20,000 - \$34,999	9.2	(6.6-12.7)
\$35,000 - \$49,999	6.9	(4.1-11.3)
\$50,000 - \$74,999	4.4	(2.7-6.9)
\$75,000 +	4.9	(3.2-7.4)
Weight Status		
Healthy weight	2.7	(1.7-4.3)
Overweight	5.3	(4.0-7.2)
Obese	12.6	(9.9-15.9)

¹ Among adults without diabetes, the proportion who have ever been told by a doctor or other health professional that they have prediabetes. (N = 2,523)

were more likely to have had diabetes testing compared to healthy weight adults (49.6%).

Table 2 examines the prevalence of prediabetes among the Michigan adult population. In 2010, 6.4% of adults without diabetes reported ever being told by a doctor or other health professional they had prediabetes or borderline diabetes. The prevalence was low within the 18-24 year old age group (1.0%), but increased to 11.4% within the 65-74 year old age group. Females (7.8%) were more likely than males (4.8%) to have been diagnosed with prediabetes.

The prevalence of prediabetes was similar for all racial groups. In addition, the prevalence of prediabetes decreased significantly with increasing education and household income level.

The prevalence of prediabetes also varied significantly by weight status. 2.7% of Michigan adults with a healthy weight reported ever being diagnosed with prediabetes, while 5.3% of overweight adults and 12.6% of obese adults reported ever being diagnosed with prediabetes.

Conclusions. Based on 2010 MiBRFS data, 58.4% of Michigan adults without diabetes have been tested for this disease within the past three years. These data also indicate diabetes testing is higher within certain high risk populations (e.g., adults 45 years of age and older, black, non-Hispanic adults, and adults who are overweight or obese). These results suggest the clinical guidelines for diabetes testing are being followed and providers are indeed performing more testing within high risk groups. However, the reported MiBRFS prevalence of prediabetes (6.4%) is substantially lower than the national estimate (35.0%). This discrepancy could be due to several issues including the large percentage of Michigan adults within the high risk populations (30-40%) not receiving timely diabetes testing or providers are not properly delivering diabetes testing results to their patients. Further investigations into this discrepancy are warranted.

References

- ¹ Centers for Disease Control and Prevention (CDC). National Diabetes Fact Sheet: National Estimates and General Information on Diabetes and Prediabetes in the United States, 2011. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, 2011.
- ² Prediabetes in Michigan 2011 - The Facts. Michigan Department of Community Health, Diabetes and Kidney Disease Unit, Chronic Disease and Injury Prevention Division. 2011.
- ³ The Diabetes Prevention Program Research Group. Reduction in the Incidence of Type 2 Diabetes with Lifestyle Intervention and Metformin. *N Engl J Med.* 2002 Feb 7;346(6):393-403.
- ⁴ American Diabetes Association: Clinical Practice Recommendations 2011. *Diabetes Care.* 2011 Jan;34(1).

The Michigan Behavioral Risk Factor Surveillance System (MiBRFSS)

The MiBRFSS comprises annual, statewide telephone surveys of Michigan adults aged 18 years and older and is part of the national BRFSS coordinated by the CDC. The annual Michigan Behavioral Risk Factor Surveys (MiBRFS) follow the CDC BRFSS protocol and use the standardized English core questionnaire that focuses on various health behaviors, medical conditions, and preventive health care practices related to the leading causes of mortality, morbidity, and disability. Interviews are conducted across each calendar year. Data are weighted to adjust for the probabilities of selection and a poststratification weighting factor that adjusts for the sex, age, and race distribution of the adult Michigan population. All analyses are performed using SAS-callable SUDAAN® to account for the complex sampling design.

Suggested citation: Fussman C, Pier K. Diabetes Testing and Prediabetes Among Michigan Adults. *Michigan BRFSS Surveillance Brief.* Vol. 5, No. 5. Lansing, MI: Michigan Department of Community Health, Division of Genomics, Perinatal Health, and Chronic Disease Epidemiology, Surveillance and Program Evaluation Section, Chronic Disease Epidemiology Unit, November 2011.

