

# PREDIABETES IN MICHIGAN 2011 — The FACTS

## Prediabetes rates are increasing

In the United States, 79 million adults have prediabetes, up from 54 million just 2 years ago.<sup>1</sup> In Michigan, it is estimated over 2.5 million adults have prediabetes (Table 1).

- The cost is \$443 for each person with prediabetes each year.<sup>2</sup> The cost of prediabetes to Michigan is now over **\$1.1 billion annually**, a \$100 million increase in just 2 years.
- Over 34% of adults have prediabetes. This is 1 in 3 adults (Table 1).
- Almost 2 million adolescents in the United States have prediabetes.<sup>3</sup> Up to 230,700 Michigan adolescents could have prediabetes (Table 2).
- Men appear to be disproportionately affected by prediabetes (Table 2).
- It is estimated only 19% of people who have prediabetes have been diagnosed.<sup>4</sup>

**If current trends continue, 1 in 3 adults will have diabetes by 2050.<sup>5</sup>**

## What is prediabetes?

Prediabetes is a condition where people have higher than normal blood glucose levels, but not yet high enough to be diagnosed with diabetes.<sup>1</sup>

The long-term damage associated with diabetes, especially to the heart, may already be starting in prediabetes.<sup>6</sup> Most people with prediabetes will develop Type 2 diabetes within the next 10 years unless they make changes in their lifestyle.<sup>7</sup>

**Table 1. National prediabetes prevalence and estimated number of adults with prediabetes in Michigan in 2008.<sup>8</sup>**

|                                    | Adults 18+ | Adults 45+ |
|------------------------------------|------------|------------|
| Estimated National Prevalence (%)* | 34.2       | 41.0       |
| Estimated Number in Michigan       | 2,602,500  | 1,650,900  |

\* Since prediabetes prevalence cannot be estimated for Michigan specifically, the crude national prevalence rate is applied to Michigan's population to derive the estimated number of adults in Michigan affected by prediabetes.

**Table 2. National prediabetes prevalence and estimated number of people with prediabetes in Michigan by age group, gender and race/ethnicity, 2008.<sup>8</sup>**

|                          | Estimated National Prevalence |             | Estimated Number with Prediabetes in Michigan |
|--------------------------|-------------------------------|-------------|---|
|                          | %                             | 95% CI      |   |
| <b>Children 12-17</b>    | 21.9                          | 17.6 – 26.8 | 151,500 – 230,700                             |
| Male                     | 28.4                          | 22.3 – 35.4 | 98,400 – 156,200                              |
| Female                   | 14.9                          | 11.4 – 19.2 | 47,800 – 80,600                               |
| <b>Adults 18+</b>        | 34.2                          | 31.9 – 36.6 | 2,427,500 – 2,785,100                         |
| Male                     | 40.0                          | 36.7 – 43.5 | 1,356,000 – 1,607,200                         |
| Mexican Am. <sup>9</sup> | 41.5                          | 36.4 – 46.8 | 50,100 – 64,400                               |
| Black                    | 33.5                          | 29.5 – 37.7 | 137,300 – 175,400                             |
| White                    | 40.7                          | 36.7 – 44.8 | 1,092,800 – 1,334,000                         |
| Female                   | 28.7                          | 26.6 – 31.0 | 1,041,300 – 1,213,600                         |
| Mexican Am.              | 30.7                          | 25.5 – 36.6 | 30,900 – 44,400                               |
| Black                    | 28.2                          | 23.2 – 33.8 | 127,200 – 185,300                             |
| White                    | 29.4                          | 26.6 – 32.4 | 832,200 – 1,013,600                           |
| <b>Adults 45+</b>        | 41.0                          | 38.0 – 44.0 | 1,530,100 – 1,771,700                         |
| Male                     | 45.4                          | 41.4 – 49.5 | 782,300 – 935,400                             |
| Mexican Am.              | 39.0                          | 32.4 – 46.1 | 13,400 – 19,100                               |
| Black                    | 36.0                          | 28.8 – 43.8 | 56,600 – 86,100                               |
| White                    | 47.1                          | 42.3 – 51.8 | 680,900 – 833,900                             |
| Female                   | 37.0                          | 33.9 – 40.1 | 724,400 – 856,900                             |
| Mexican Am.              | 35.4                          | 30.4 – 40.6 | 12,300 – 16,400                               |
| Black                    | 30.4                          | 24.7 – 36.9 | 63,900 – 95,500                               |
| White                    | 38.5                          | 35.0 – 42.2 | 627,400 – 756,400                             |

## Prediabetes does not mean diabetes

Evidence shows people with prediabetes may delay the onset of Type 2 diabetes and possibly return their blood glucose levels to normal.

Modest lifestyle changes, including weight loss (7% of body weight) and moderate physical activity (150 minutes or more per week), can reduce the risk of developing type 2 diabetes by 58%. Prevention or delay of diabetes can persist for at least 10 years.<sup>10</sup>

Programs are located throughout Michigan to encourage healthy nutrition and regular physical activity.

### Who should be screened?

The American Diabetes Association (ADA) recommends diabetes testing starting at 45 years of age or for all adults who are overweight (BMI  $\geq$  25kg/m<sup>2</sup>) and have additional risk factors.<sup>11</sup>

- Physical inactivity
- Hypertension or history of CVD
- Low HDL cholesterol and high triglycerides
- First degree relative with diabetes
- History of previous IFG, A1C  $\geq$  5.7%, or IGT
- Women with polycystic ovarian syndrome (PCOS)
- History of gestational diabetes or giving birth to a baby weighing more than 9 lbs
- Member of an ethnic or minority group (African Americans, Latinos, Native Americans, Asian Americans and Pacific Islanders)

Roughly 78% of Michigan's adult population are either 45 and older or overweight/obese. Fortunately, over 63% of these adults are receiving the necessary screening once every 3 years.<sup>12</sup>

**Table 3. ADA diagnostic test criteria for prediabetes and diabetes.**

|                                      | Normal             | Prediabetes     | Diabetes               |
|--------------------------------------|--------------------|-----------------|------------------------|
| <b>HbA1c (A1c)</b>                   | Less than 5.7%     | 5.7% – 6.4%     | Greater than 6.4%      |
| <b>Fasting Blood Glucose (FBG)</b>   | Less than 100mg/dl | 100 – 125 mg/dl | Greater than 125 mg/dl |
| <b>Oral Glucose Tolerance (OGTT)</b> | Less than 140mg/dl | 140 – 199 mg/dl | Greater than 199 mg/dl |

## Referral resources in Michigan

Diabetes Self Management Education:  
[www.michigan.gov/diabetes](http://www.michigan.gov/diabetes)

Michigan Partners on the Path (PATH) chronic disease management program:  
[www.mihealthyprograms.org](http://www.mihealthyprograms.org)

YMCA:  
[www.ymca.net](http://www.ymca.net)

Michigan State University Extension Service (nutrition resources in every county):  
[www.msue.msu.edu](http://www.msue.msu.edu)

EnhanceFitness:  
[www.projectenhance.org](http://www.projectenhance.org)

### More information about prediabetes

Michigan Diabetes Program (MDCH):  
[www.michigan.gov/diabetes](http://www.michigan.gov/diabetes)

Michigan Diabetes Partners in Action Coalition:  
[www.dpacmi.org](http://www.dpacmi.org)

National Diabetes Education Program:  
[www.ndep.nih.gov](http://www.ndep.nih.gov)

National YMCA Diabetes Prevention Program  
[www.ymca.net/diabetes-prevention](http://www.ymca.net/diabetes-prevention)

National Kidney Foundation of Michigan:  
[www.nkfm.org](http://www.nkfm.org)

American Diabetes Association:  
[www.diabetes.org](http://www.diabetes.org)

American Heart Association Heart of Diabetes:  
[www.iknowdiabetes.org](http://www.iknowdiabetes.org)

1. Centers for Disease Control and Prevention. 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. Medical Cost Associated with Prediabetes. Zhang Y, Dall TM, Chen Y, Baldwin A, Yang W, Mann S, Moore V, Le Nestour E, and Quick WW. Pop Hlth Mgt 12(3): 157-163, 2009.
3. Prevalence of Impaired Fasting Glucose and Its Relationship With Cardiovascular Disease Risk Factors in US Adolescents, 1999-2000. D Williams, B Cadwell, Y Cheng, C Cowie, E Gregg, L Geiss, M Engelgau, K Narayan and G Imperatore. Pediatrics 116: 1122-1126, 2005.
4. Numerator: 2010 Michigan Behavioral Risk Factor Survey, Bureau of Epidemiology, Division of Genomics, Perinatal Health and Chronic Disease Epidemiology, MDCH. Denominator: Population estimate based on Michigan 2010 population data from the U.S. Census Bureau.
5. Centers for Disease Control and Prevention. Diabetes: Successes and opportunities for population-based prevention and control. At A Glance, 2011. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, 2011.
6. American Diabetes Association. [www.diabetes.org/prediabetes.jsp](http://www.diabetes.org/prediabetes.jsp)
7. National Institute of Health. NIH Publication No. 09-4893, October 2008. <http://diabetes.niddk.nih.gov/DM/pubs/insulinresistance/>
8. Prevalence based on the lab results (FBG or A1C) from the 2005-2008 National Health and Nutrition Examination Survey (NHANES) for the morning session and fasting  $\geq$  8 hours, National Center for Health Statistics. Population estimates based on Michigan 2008 population data from the National Center for Health Statistics (NCHS). Population estimate rounded to the nearest 100.
9. The 2005-2008 NHANES oversampled Mexican Americans, while the proportion of non-Mexican American Hispanics in the NHANES sample is much smaller than in the US population. NCHS generally considers this to be too small to produce reliable estimates to broad American Hispanic population. [www.cdc.gov/nchs/data/nhanes/analyticnote\\_2007-2010.pdf](http://www.cdc.gov/nchs/data/nhanes/analyticnote_2007-2010.pdf)
10. Diabetes Prevention Program Research Group. 10-year follow-up of diabetes incidence and weight loss in the Diabetes Prevention Program Outcomes Study. Lancet 374(9702): 1677-1686, 2009.
11. American Diabetes Association: Clinical Practice Recommendations, 2011. Diabetes Care, Vol 34, Supp 1, Jan 2011.
12. 2010 Michigan Behavioral Risk Factor Survey, Bureau of Epidemiology, Division of Genomics, Perinatal Health and Chronic Disease Epidemiology, MDCH.



Questions?  
PierK@Michigan.gov