

### What is prediabetes?

- Prediabetes is a condition whereby people have higher than normal blood glucose (sugar) levels, but not yet high enough to be diagnosed as diabetes.
- Prediabetes is a precursor of type 2 diabetes, as well as a risk factor for heart disease and stroke. Without lifestyle changes to improve their health, 15% to 30% of people with prediabetes will develop type 2 diabetes within five years.<sup>1</sup>
- Unlike diabetes, prediabetes often has no noticeable symptoms.
- Prediabetes can be developed at any age from childhood and adolescence through adulthood.

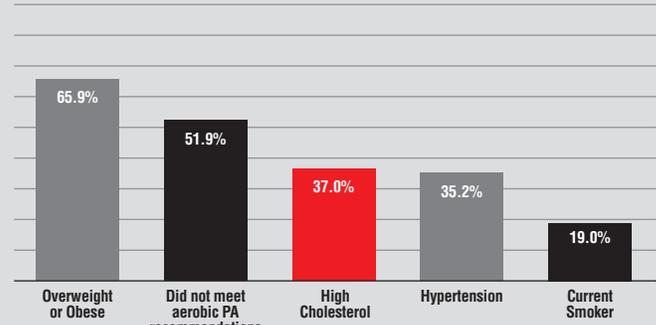
### How many people have prediabetes?

- Based on blood tests performed during the National Health and Nutrition Examination Survey (NHANES) from 2009-2012, about 37% of United States adults age 20 years and older (an estimated 86 million people) had prediabetes. The prevalence jumps to 51% among adults 65 years or older.<sup>1,2</sup>
- Nationwide, only about 1 out of every 10 individuals with prediabetes (about 10%) are aware of their condition.<sup>3</sup>
- If the measured national prevalence for prediabetes of 37% is applied to the North Carolina population age 20 years and above, then more than 2.7 million North Carolinians may have prediabetes. However, only about 780,000 North Carolinians (about 10.1% of the population) report having been diagnosed with prediabetes by a health professional.<sup>4</sup> This suggests that almost 2 million North Carolinians may have prediabetes but are unaware of their condition.
- According to data from the Centers for Disease Control and Prevention (CDC), about 166 adult North Carolinians develop diabetes every day;<sup>5</sup> without intervention people with prediabetes are more likely to develop diabetes.

### What are the risk factors for prediabetes?

- Non-modifiable risk factors include older age, a family history of type 2 diabetes (parent, brother or sister) and race/ethnicity (African-Americans, Hispanics and other minority groups).
- Modifiable risk factors (Figure 1) include overweight/obesity, physical inactivity, high blood cholesterol, high blood pressure and smoking.
- Additional risk factors for prediabetes specific to women include: gestational diabetes (abnormal blood sugar during

**Figure 1. Prevalence of modifiable risk factors for prediabetes, North Carolina, 2015**



**Data Source:** North Carolina State Center for Health Statistics. Behavioral Risk Factor Surveillance System (BRFSS) [schs.state.nc.us/data/brfss/survey.htm](http://schs.state.nc.us/data/brfss/survey.htm)

pregnancy), having a baby who weighs over 9 pounds and having a history of polycystic ovary syndrome (a common condition characterized by irregular menstrual periods, excess hair growth and obesity).

### How is prediabetes diagnosed?

- CDC has a simple paper screening tool that uses seven questions to assess an individual's risk of prediabetes.<sup>6</sup> A score of nine or above on the screening test indicates a high risk for prediabetes, and a confirmatory blood test for prediabetes (Table 1) is recommended.
- Fasting Blood Glucose (FBG), Oral Glucose Tolerance Test (OGTT) and Glycated Hemoglobin (HbA1c) are blood tests used to confirm both prediabetes and diabetes as shown in Table 1.
- In North Carolina, only three out of every five adults (61%) without a known diagnosis of diabetes have had a blood sugar test within the last three years.<sup>7</sup>

**Table 1: Diagnostic test criteria for prediabetes**

Test	Normal	Prediabetes	Diabetes
Fasting Blood Glucose (FBG)	less than 100 mg/dl	100 mg/dl to 125 mg/dl	126 mg/dl or higher
Oral Glucose Tolerance (OGTT)	less than 140 mg/dl	140 mg/dl to 199 mg/dl	200 mg/dl or higher
HbA1c	less than 5.7%	5.7% to 6.4%	6.5% or higher

**Source:** American Diabetes Association, Diagnosing Diabetes and Learning About Prediabetes. 2016. [diabetes.org/diabetes-basics/diagnosis](http://diabetes.org/diabetes-basics/diagnosis)

## How can prediabetes be treated?

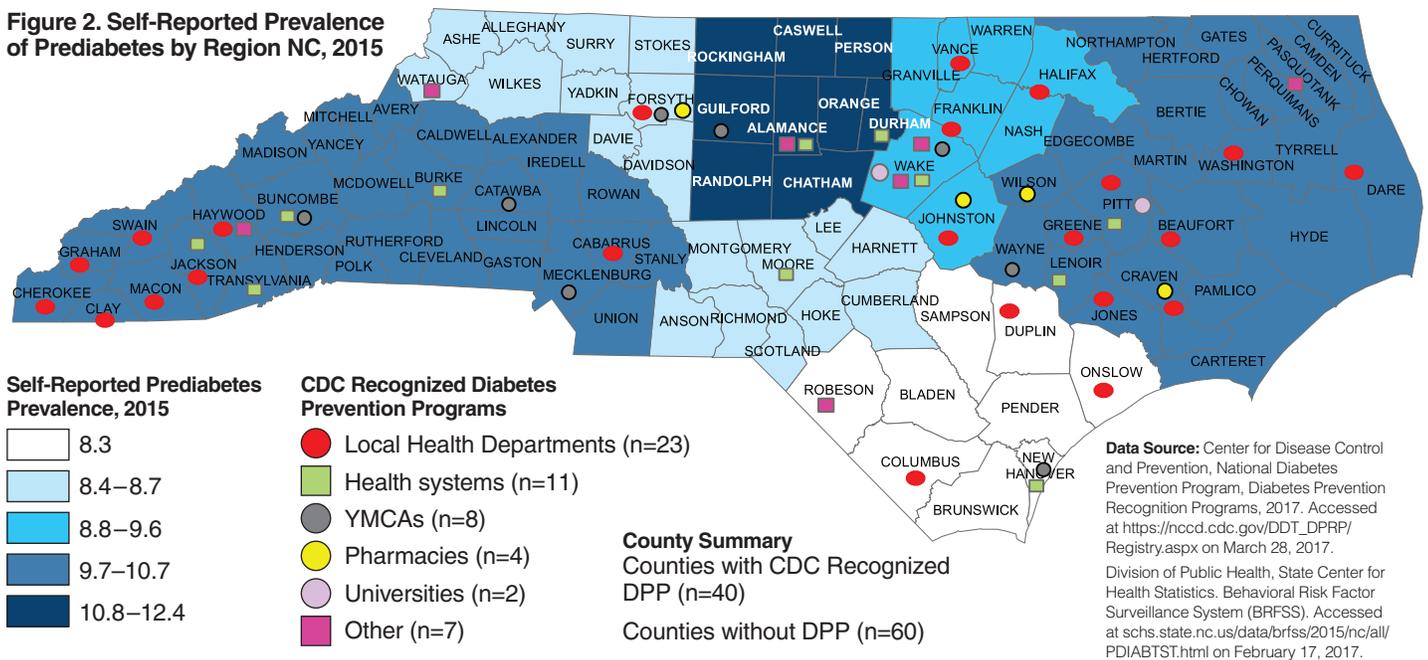
- Once an individual is diagnosed with prediabetes, the main goal of treatment is to delay or prevent progression to type 2 diabetes.
- Losing a modest amount of weight (5% to 7% of total body weight) through healthy diet and moderate physical activity (such as brisk walking 30 minutes a day, five days a week) within the context of an intensive lifestyle intervention program, like the CDC's Diabetes Prevention Program or similar programs, has been proven to be the most effective way of delaying or preventing progression from prediabetes to type 2 diabetes.<sup>8</sup>
- Metformin, a drug used for the treatment of diabetes, has also been shown to be effective in delaying or preventing progression from prediabetes to type 2 diabetes, but it is not as effective as lifestyle modification.<sup>8</sup>

## How can prediabetes be prevented?

For individuals who do not have prediabetes, prevention can be achieved by addressing the following modifiable risk factors:

- Preventing overweight/obesity through regular physical activity and healthy eating. For general information on physical activity and healthy eating please visit [esmmweighless.com](http://esmmweighless.com).
- Preventing and/or controlling high blood cholesterol and high blood pressure through lifestyle modification and medications if necessary.
- Avoiding tobacco products and secondhand smoke for non-smokers and quitting for current smokers. For general information about smoking and how to get help quitting please visit: [quitline.com](http://quitline.com) or call 1-800-QUIT-NOW.

**Figure 2. Self-Reported Prevalence of Prediabetes by Region NC, 2015**



## REFERENCES

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