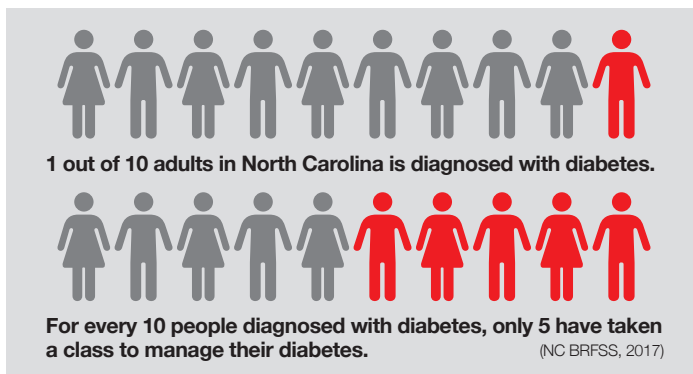


What is diabetes?

- Diabetes is marked by high levels of blood glucose (sugar) resulting from defects in the production or action of insulin, a hormone that regulates blood glucose levels.
- People with diabetes, working together with their support network and health care team, can take steps to control the disease and lower their risk of serious complications and premature death.
- Type 2 diabetes accounts for about 90% to 95% of all diagnosed cases of diabetes.¹

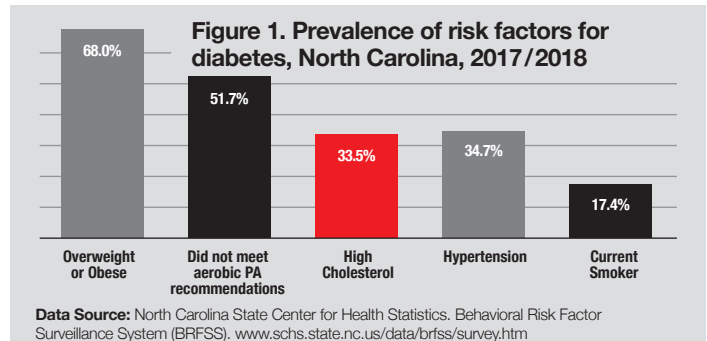
How many people have diabetes?

- Diabetes is the seventh leading cause of death in both the United States and North Carolina.^{1,2} In 2018, diabetes was the primary cause for 3,021 deaths (3.2% of all deaths) and a contributing cause to many more deaths in North Carolina.²
- An estimated 30.3 million people in the United States have diabetes, and of these, about a quarter (7.2 million people) are unaware.¹ In North Carolina, about 1 million (12.5%) adults report having been diagnosed with diabetes.³
- In 2018, diabetes was listed as the primary diagnosis for 23,713 hospital discharges in North Carolina.⁴
- The North Carolina Medicaid program spent over \$655 million on 164,757 beneficiaries who have diabetes in 2018.⁵ That's about \$3,978 per beneficiary with diabetes.
- Over 50,000 adults are newly diagnosed in North Carolina with diabetes each year.⁶



What are the risk factors for type 2 diabetes?

- The risk factors include: older age (45 years and older), a family history of type 2 diabetes (parent, brother or sister) and race/ethnicity (African-Americans, Hispanics and other minority groups), overweight/obesity, physical inactivity, high cholesterol, high blood pressure and smoking.
- Additional risk factors specific to women include: gestational diabetes (abnormal blood sugar during pregnancy), giving birth to a baby who weighed more than 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 diabetes diagnosed?

- Fasting blood glucose, oral glucose tolerance test and HbA1c are blood tests used to diagnose diabetes as shown in Table 1.
- In North Carolina, only three out of five adults (60.5%) without a known diagnosis of diabetes have had a blood sugar test within the past three years.⁷

What are the complications of type 2 diabetes?

- Diabetes affects multiple areas of the body and can lead to serious complications including: heart disease and stroke, hypertension, hearing loss, blindness and other eye problems, kidney disease, nerve damage (e.g., impaired sensation or pain in the feet or hands, slow digestion of food in the stomach, erectile dysfunction), amputations (mainly of the lower limbs), dental disease (especially of the gums), excessively large babies, diabetic coma, increased susceptibility to pneumonia and influenza, and depression.

How is type 2 diabetes managed?

- Many people with type 2 diabetes can control their blood glucose by following a healthy meal plan and exercise program, losing excess weight, taking oral medication and/or, in some cases, insulin.
- Preventing complications, especially heart disease, is a key component of diabetes management. The **ABCs** of diabetes management include optimal blood glucose, blood pressure and cholesterol targets.
 - A. A1c less than 7.0%
 - B. Blood pressure less than 140/90 mmHg
 - C. Cholesterol-LDL less than 100 mg/dl
- Many people with diabetes also need to take medications to control their cholesterol and blood pressure.

Table 1: Diagnostic criteria for diabetes

Test	Normal	Prediabetes	Diabetes
Fasting Blood Glucose (FBG)	less than 100 mg/dl	100 to 125 mg/dl	126 mg/dl or higher
Oral Glucose Tolerance Test (OGTT)	less than 140 mg/dl	140 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. diabetes.org/diabetes-basics/diagnosis

- The American Diabetes Association recommends that all people with diabetes participate in Diabetes Self-Management Education and Support (DSMES)—training that focuses on self-care behaviors such as healthy eating, being active and monitoring blood sugar. DSMES is a key step in improving health outcomes and quality of life for people with diabetes.
 - People with diabetes should receive DSMES when their diabetes is diagnosed and as needed thereafter.
 - To obtain information about DSMES programs in North Carolina, visit DiabetesManagementNC.com.

How can complications of type 2 diabetes be prevented?

- Adherence to the ABCs of diabetes control — optimal control of blood glucose, blood pressure and blood cholesterol.
- Detection and treatment of diabetes related eye disease.
- Comprehensive foot care including risk assessment, education, preventive therapy, treatment of foot problems and referral to specialists.
- Detection and treatment of early diabetes related kidney disease.
- Vaccination against the flu and pneumonia.

How can type 2 diabetes be prevented?

For individuals who do not have a diagnosis of diabetes, prevention can be achieved by addressing modifiable risk factors:

- Losing a modest amount of weight (5% to 7% of total body weight) through healthy eating and moderate physical activity, with the help of a lifestyle change program, such as the CDC-recognized National Diabetes Prevention Program, has been proven to be the most effective way of delaying or preventing progression from prediabetes to type 2 diabetes.⁸
 - For more information, visit DiabetesFreeNC.com or call the North Carolina Diabetes Prevention Program Navigator at 844-328-0021.

- Metformin, a drug used to control blood sugar, has also been shown to be somewhat effective in delaying or preventing progression from prediabetes to type 2 diabetes, but it is not as effective as lifestyle change.⁹
- Preventing and/or controlling high 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 quitlinenc.com or call 1-800-QUIT-NOW.

What are the disparities, inequalities and inequities in the burden of diabetes?

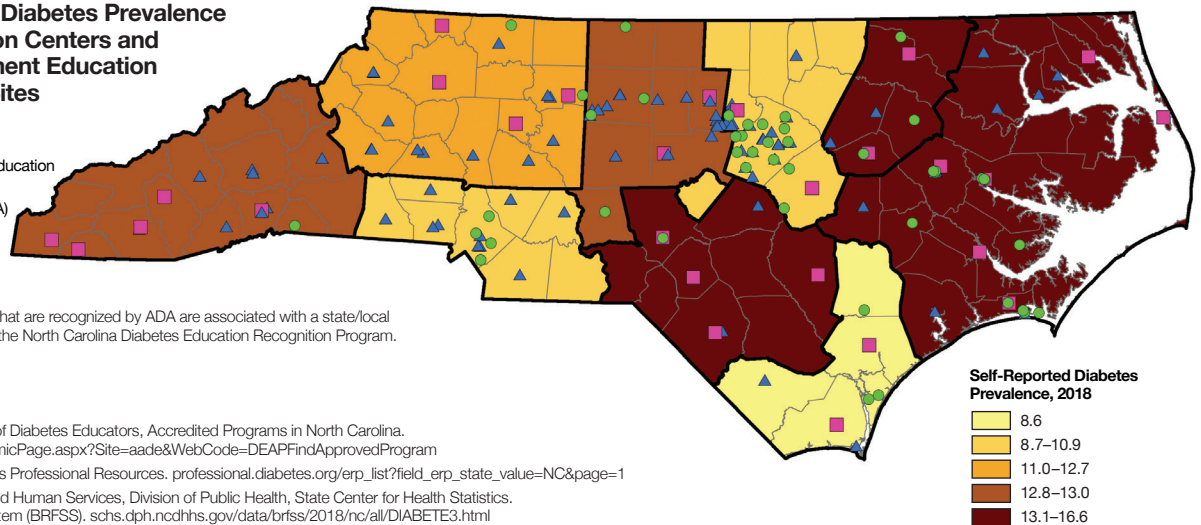
- Non-Hispanic African-Americans (prevalence = 15.9%) are more likely to have been diagnosed with diabetes compared to Non-Hispanic Whites (prevalence = 12.2%) in North Carolina.³
- Diabetes is the seventh leading cause of death among Whites, the fifth leading cause of death for American Indians and the fourth leading cause of death for African-Americans in North Carolina.⁹
- African-Americans (age-adjusted death rate = 43.2 per 100,000) as well as American Indians and Alaska Natives (age-adjusted death rate = 30.9 per 100,000) are more likely to die from diabetes compared to Whites (age-adjusted death rate = 19.4 per 100,000) in North Carolina.¹⁰
- Type 2 diabetes in children and adolescents is being diagnosed more frequently among U.S. minority populations than in non-Hispanic Whites.¹
- There is geographic variation in the burden of diabetes (prevalence, mortality rates and hospitalization rates). Figure 2 shows the prevalence of diabetes throughout North Carolina.

Figure 2. Self-Reported Diabetes Prevalence by Area Health Education Centers and Diabetes Self-Management Education and Support (DSMES) Sites

DSMES Sites

- American Association of Diabetes Education (AADE) (n=47)
- ▲ American Diabetes Association (ADA) (n=87)
- DiabetesSmart* (n=27)

*In North Carolina, some DSMES sites that are recognized by ADA are associated with a state/local partnership known as DiabetesSmart, the North Carolina Diabetes Education Recognition Program.



Data Sources: American Association of Diabetes Educators, Accredited Programs in North Carolina. nf01.diabeteseducator.org/eweb/DynamicPage.aspx?Site=aade&WebCode=DEAPFindApprovedProgram
 American Diabetes Association Diabetes Professional Resources. professional.diabetes.org/erp_list?field_erp_state_value=NC&page=1
 North Carolina Department of Health and Human Services, Division of Public Health, State Center for Health Statistics. Behavioral Risk Factor Surveillance System (BRFSS). schs.dph.ncdhhs.gov/data/brfss/2018/nc/all/DIABETE3.html

REFERENCES

- Centers for Disease Control and Prevention. National Diabetes Statistics Report, 2017. Estimates of Diabetes and Its Burden in the United States. Accessed at cdc.gov/diabetes/pdfs/data/statistics/national-diabetes-statistics-report.pdf on March 27, 2018.
- North Carolina Department of Health and Human Services, Division of Public Health, State Center for Health Statistics. Leading Causes of Death in North Carolina. Health Data Query System. Accessed at schs.dph.ncdhhs.gov/interactive/query/ncd/cd.cfm on January 07, 2020.
- North Carolina Department of Health and Human Services, Division of Public Health, State Center for Health Statistics. Behavioral Risk Factor Surveillance System (BRFSS). Accessed at schs.dph.ncdhhs.gov/data/brfss/2018/nc/all/DIABETE3.html on January 07, 2020.
- North Carolina Department of Health and Human Services, Division of Public Health, State Center for Health Statistics. Data produced upon request on June 12, 2019.
- North Carolina Department of Health and Human Services, Division of Medical Assistance. Data produced upon request on April 23, 2019.
- Centers for Disease Control and Prevention. National Center for Chronic Disease Prevention and Health Promotion, Division of Diabetes Translation. Diabetes Interactive Atlas available at cdc.gov/diabetes/atlas. Accessed on January 07, 2020.
- North Carolina Department of Health and Human Services, Division of Public Health, State Center for Health Statistics. Behavioral Risk Factor Surveillance System (BRFSS). Accessed at schs.dph.ncdhhs.gov/data/brfss/2018/nc/all/PDIABTST.html on January 07, 2020.
- Knowler WC, Barrett-Connor E, Fowler SE, et al. Reduction in the incidence of type 2 diabetes with lifestyle intervention or metformin. *N Engl J Med*. 2002;346(6):393-403.
- North Carolina Department of Health and Human Services, Division of Public Health, State Center for Health Statistics. North Carolina Vital Statistics 2016 – Volume 2. Leading Causes of Death. Accessed at schs.dph.ncdhhs.gov/data/vital/lcd/2017/pdf/TblsA-F.pdf on March 27, 2018.
- Centers for Disease Control and Prevention, National Center for Health Statistics. Underlying Cause of Death 1999-2017 on CDC WONDER Online Database, released December 2018. Data are from the Multiple Cause of Death Files, 1999-2017, as compiled from data provided by the 57 vital statistics jurisdictions through the Vital Statistics Cooperative Program. Accessed at wonder.cdc.gov/ucd-icd10.html on Jan 7, 2020