

### Background

- Healthy eating and physical activity play a positive role in the prevention and control of many chronic diseases and conditions which are among the leading causes of death and major contributors to health care costs in North Carolina.
- According to the 2017 North Carolina Behavioral Risk Factor Surveillance System (BRFSS) survey:<sup>1</sup>
  - About half (52%) of adults do not get the recommended 150 minutes per week of moderate-intensity aerobic physical activity and almost three out of four (71%) do not meet the weekly muscle-strengthening exercise recommendations. (See health.gov/paguidelines/guidelines for adult physical activity guidelines.)
  - About one out of six (16%) adults does not consume vegetables at least once a day.
  - Nearly three out of eight (37%) adults do not consume fruits at least once a day.
  - Almost four out of nine (43%) adults are not taking any steps to watch or reduce their sodium or salt intake. (See [medinsteadofmeds.com/intro](http://medinsteadofmeds.com/intro) for healthy eating guidelines.)

### What chronic conditions can be prevented or controlled through healthy eating and physical activity?

- Examples of chronic diseases and conditions for which healthy eating and physical activity play a role in prevention and control include overweight and obesity, high blood pressure, prediabetes, diabetes, heart disease, stroke and cancer.
- Cancer, heart disease, stroke and diabetes are among the top ten leading causes of death in North Carolina, and in 2017 they accounted for half of all deaths. (See Table 1.) These four conditions accounted for 194,706 hospital admissions (20% of all admissions) and over \$9.9 billion in hospital charges (27% of total hospital charges) in North Carolina in 2017.<sup>2</sup>

### How are healthy eating and physical activity associated with chronic diseases and conditions?

#### Overweight and Obesity

- Overweight and obesity are conditions that result from excess body fat and/or abnormal body fat distribution.
- The basic cause of overweight and obesity is calorie (energy) imbalance whereby calorie intake is greater than calorie use. Reducing calorie intake through healthy eating and increasing calorie use through physical activity helps prevent overweight and obesity in those at a healthy weight and helps those who are overweight or obese lose weight.
- There is strong evidence that shows that physical activity leads to weight loss, especially when combined with reduced calorie intake. Physical activity is also beneficial in the prevention of weight gain, reduction of abdominal obesity and maintenance of weight after weight loss.<sup>3</sup>
- Over five million adults in North Carolina (67%) are either overweight or obese.<sup>4</sup> (See Table 2.)

#### High Blood Pressure (Hypertension)

- High blood pressure, also known as hypertension, is a disease that occurs when blood pressure stays above normal for a long time. As a result, the walls of arteries get stretched beyond their healthy limit and damage occurs, creating a variety of other health problems.

**Table 1. Leading Causes of Death, NC, 2017**

Rank	Cause	Number	%
1	Cancer	19,474	20.9
2	Diseases of heart	18,840	20.2
3	Chronic lower respiratory diseases	5,545	5.9
4	Cerebrovascular diseases	5,100	5.5
5	All other unintentional injuries	4,526	4.9
6	Alzheimer's disease	4,291	4.6
7	Diabetes mellitus	2,908	3.1
8	Influenza and pneumonia	2,079	2.2
9	Nephritis, nephrotic syndrome and nephrosis	2,041	2.2
10	Intentional self-harm (suicide)	1,527	1.6
	All other causes (Residual)	26,871	28.9
<b>Total Deaths—All Causes</b>		<b>93,202</b>	<b>100</b>

Source: State Center for Health Statistics, North Carolina

- Unhealthy diet, especially eating foods high in sodium and low in potassium, and physical inactivity are risk factors for high blood pressure. There is strong evidence that links physical activity to a reduced risk of high blood pressure.<sup>3</sup>
- About 2.8 million adults in North Carolina (35%) have been diagnosed with high blood pressure.<sup>4</sup> (See Table 2.)

#### 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. With a lifestyle change program, people with prediabetes can lower their risk of developing type 2 diabetes by as much as 58%.<sup>5</sup>
- Nearly 1 million adults in North Carolina (12.5%) have been diagnosed with prediabetes.<sup>4</sup> (See Table 2.)

#### Diabetes

- Diabetes is a group of diseases 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.
- There is strong evidence that links physical activity to a lower risk of type 2 diabetes.<sup>3</sup>
- About 900,000 adults in North Carolina (11%) have been diagnosed with diabetes.<sup>4</sup> (See Table 2.)

#### Heart and Blood Vessel Disease

- Heart and blood vessel disease is a term used to describe all the abnormal conditions that affect the heart and blood vessels. This includes conditions such as coronary artery disease (CAD), myocardial infarction (commonly known as heart attack), heart failure, angina, arrhythmias (including atrial fibrillation), cardiomyopathy, and peripheral artery disease (PAD) among many other conditions.
- Daily consumption of fruits and vegetables and regular physical activity are associated with a reduced risk of heart attack.<sup>6</sup>
- About 340,000 adults in North Carolina (4%) have had angina or coronary heart disease in their lifetime. (See Table 2.) Nearly 7% had a heart attack, angina or coronary heart disease.<sup>4,7</sup>

## Stroke

- A stroke occurs when the blood supply to the brain is blocked or when a blood vessel in or around the brain ruptures, causing brain tissue to die.
- Healthy eating and physical activity are strongly associated with decreased risk of stroke:<sup>8</sup>
  - Increased consumption of fruit and fish has been found to reduce the risk of stroke. Inversely, increased consumption of red meat, organ meats, eggs, fried foods, pizza and salty snacks, as well as cooking with lard, is associated with an increased risk of stroke.
  - Regular physical activity is associated with a reduced risk of stroke.
- About 290,000 adults in North Carolina (4%) have had a stroke.<sup>4</sup> (See Table 2.)

To learn more about overweight and obesity, high blood pressure, prediabetes, diabetes, heart disease and stroke in North Carolina, visit [communityclinicalconnections.com/Data](http://communityclinicalconnections.com/Data).

## Cancer

- Healthy eating and physical activity are associated with reduce risk of several types of cancer.<sup>9</sup>
- There is evidence that links physical activity to a reduced risk of bladder, breast, colon, endometrium, esophagus, kidney, lung and stomach cancers.<sup>3</sup>
- The Cancer Prevention and Control Branch in the North Carolina Division of Public Health leads cancer prevention efforts for the state. To learn more about cancer prevention efforts in North Carolina, visit [publichealth.nc.gov/chronicdiseaseandinjury/cancerpreventionandcontrol](http://publichealth.nc.gov/chronicdiseaseandinjury/cancerpreventionandcontrol).

## What efforts are occurring in North Carolina to make healthy foods more easily available and increase opportunities for physical activity for the entire population?

- The Community and Clinical Connections for Prevention and Health Branch, North Carolina Division of Public Health leads statewide efforts to improve access to healthy eating and physical activity opportunities which include:
  - Increasing awareness, use and the number of parks, trails and greenways.
  - Increasing number of places with activity-friendly routes that connect to everyday, purposeful destinations.
  - Promoting and implementing food service guidelines in community settings.
  - Promoting and implementing policies and practices that integrate nutrition and physical activity standards in early child care education settings.
  - Promoting interventions supportive of breastfeeding including maternity care practices in birthing facilities, continuity of care, community support and workplace compliance with the federal lactation accommodation law.
- For more information about efforts occurring in North Carolina to make healthy foods more easily available and increase opportunities for physical activity, visit [communityclinicalconnections.com/pan](http://communityclinicalconnections.com/pan).

**Table 2. Estimated percentage of individuals with select chronic diseases/conditions who have poor diet and insufficient physical activity as a risk factor, BRFSS, NC, 2017**

	General Population	Overweight	Obesity	High Blood Pressure	Prediabetes	Diabetes	Heart Disease*	Stroke
Estimated number of individuals in population (18 years and above)	7,971,073	2,781,904	2,550,743	2,765,962	996,384	900,731	342,756	294,930
Percent not meeting aerobic physical activity recommendation	52	49	58	55	59	61	60	57
Percent not meeting muscle-strengthening recommendation	71	68	79	79	77	83	83	73
Percent not consuming vegetables at least one time a day	16	15	16	17	15	21	21	22
Percent not consuming fruits at least one time a day	37	36	42	41	35	40	38	33
Percent not watching salt	43	41	34	28	28	24	23	24

\*People who have had angina or coronary heart disease.

Source: Prevalence estimates from 2017 NC BRFSS survey results <https://schs.dph.ncdhhs.gov/data/brfss/2017/nc/all/topics.htm> and secondary analysis conducted by the North Carolina Department of Health and Human Services, Division of Public Health, State Center for Health Statistics upon request. Population estimates from: [www.schs.state.nc.us/interactive/query/population/nchspop.cfm](http://www.schs.state.nc.us/interactive/query/population/nchspop.cfm).

## REFERENCES

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