

## Background

- Healthy eating and physical activity play a positive role in the prevention and control of several chronic diseases and conditions, many of which are among the leading causes of death and major drivers of health care costs in the United States in general, and North Carolina in particular.
- According to the 2013 North Carolina Behavioral Risk Factor Surveillance System (BRFSS) survey:<sup>1</sup>
  - Over 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 (72%) do not meet the weekly muscle-strengthening exercise recommendations. (See Table 1 for adult physical activity guidelines.)
  - Almost one out of four (23.7%) adults does not consume vegetables at least once a day.
  - Four out of every ten (42.9%) adults do not consume fruits at least once a day.
  - Two out of five (40%) adults are not taking any steps to watch or reduce their sodium or salt intake.

## 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 2014 they accounted for over half of all deaths. (See Table 2.) These four conditions also accounted for 196,285 hospital admissions (21% of all admissions) and over \$8.5 billion in hospital charges (28% of total hospital charges) in North Carolina in 2014.<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 also 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>
- About five million adults in North Carolina (66%) are either overweight or obese.<sup>4</sup> (See Table 3.)

### 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

**Table 1. Adult Physical Activity Guidelines**

<ul style="list-style-type: none"> <li>• All adults should avoid inactivity. Some physical activity is better than none, and adults who participate in any amount of physical activity gain some health benefits.</li> </ul>
<ul style="list-style-type: none"> <li>• For substantial health benefits, adults should do at least 150 minutes (2 hours and 30 minutes) a week of moderate-intensity, or 75 minutes (1 hour and 15 minutes) a week of vigorous-intensity aerobic physical activity, or an equivalent combination of moderate- and vigorous-intensity aerobic activity. Aerobic activity should be performed in episodes of at least 10 minutes, and preferably, it should be spread throughout the week.</li> </ul>
<ul style="list-style-type: none"> <li>• For additional and more extensive health benefits, adults should increase their aerobic physical activity to 300 minutes (5 hours) a week of moderate-intensity, or 150 minutes a week of vigorous-intensity aerobic physical activity, or an equivalent combination of moderate- and vigorous-intensity activity. Additional health benefits are gained by engaging in physical activity beyond this amount.</li> </ul>
<ul style="list-style-type: none"> <li>• Adults should also do muscle-strengthening activities that are moderate or high intensity and involve all major muscle groups on 2 or more days a week, as these activities provide additional health benefits.</li> </ul>

Source: 2008 Physical Activity Guidelines for Americans. <http://health.gov/paguidelines/guidelines>

**Table 2. Leading Causes of Death, NC, 2014**

Rank	Cause	Number	%
1	Cancer	19301	22.7
2	Diseases of heart	17547	20.6
3	Chronic lower respiratory diseases	5020	5.9
4	Cerebrovascular diseases	4691	5.5
5	Alzheimer's disease	3240	3.8
6	All other unintentional injuries	3152	3.7
7	Diabetes mellitus	2685	3.2
8	Influenza and pneumonia	1869	2.2
9	Nephritis, nephrotic syndrome and nephrosis	1790	2.1
10	Motor vehicle injuries	1386	1.6
	All other causes (Residual)	24531	28.7
<b>Total Deaths—All Causes</b>		85212	100

Source: North Carolina State Center for Health Statistics. [www.schs.state.nc.us/interactive/query/lcd/lcd.cfm](http://www.schs.state.nc.us/interactive/query/lcd/lcd.cfm)

result, the walls of arteries get stretched beyond their healthy limit and damage occurs, creating a variety of other health problems.

- 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 2.7 million adults in North Carolina (35.5%) have been diagnosed with high blood pressure.<sup>4</sup> (See Table 3.)

### 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.
- About 630,000 adults in North Carolina (9.5%) have been diagnosed with prediabetes.<sup>4</sup> (See Table 3.)

## 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 750,000 adults in North Carolina (11.4%) have been diagnosed with diabetes.<sup>4</sup> (See Table 3.)

## 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, aortic aneurysm, arrhythmias (including atrial fibrillation), congenital heart defects, cardiomyopathy, peripheral artery disease (PAD) and rheumatic heart disease among many other conditions.
- Daily consumption of fruits and vegetables and regular physical activity are associated with a reduced risk of heart attack.<sup>5</sup>
- About 530,000 adults in North Carolina have had a heart attack, angina or coronary heart disease in their lifetime.<sup>4</sup> (See Table 3.)

## 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>6</sup>
  - Increased consumption of fruit and fish has been found to reduce the risk of stroke.
  - 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 238,000 adults in North Carolina (3.7%) have had a stroke.<sup>4</sup> (See Table 3.)

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>7</sup>
- There is evidence that links physical activity to a reduced risk of colon, breast, lung and endometrial cancer.<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 in the North Carolina Division of Public Health leads statewide efforts to improve healthy eating and physical activity which include:
  - Increasing access to farmers' markets in underserved areas.
  - Increasing awareness, use and the number of parks, trails and greenways in North Carolina.
  - Supporting communities in creating policies and environments where people have access to healthy foods and places to be physically active.
  - Promoting and implementing food service guidelines, nutrition standards, physical activity, and physical education standards in early care and education settings.
  - Promoting physical activity and healthy eating in faith communities.
  - Promoting and implementing policies and practices that create supportive nutrition environments, quality physical education and physical activity in K-12 schools.
  - Promoting physical activity and healthy eating in worksites.
- 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/What\\_We\\_Do/improve.html](http://communityclinicalconnections.com/What_We_Do/improve.html).

**Table 3. Estimated percentage of individuals with select chronic diseases/conditions who have poor diet and insufficient physical activity as a risk factor, BRFSS, NC, 2013**

	General Population	Overweight / Obesity	High Blood Pressure	Prediabetes	Diabetes	Heart Disease	Stroke
Estimated number of individuals in population (18 years and above)	7,564,838	5,000,000	2,700,000	630,000	750,000	530,000	238,000
Percent not meeting aerobic physical activity recommendation	52.0	52.3	50.9	52.1	51.3	52.3	51.9
Percent not meeting muscle-strengthening recommendation	73.3	74.3	75.0	77.3	76.2	78.3	80.6
Percent consuming vegetables less than one time a day	21.6	21.7	22.7	19.5	24.3	23.9	22.5
Percent consuming fruits less than one time a day	40.2	40.0	41.7	39.4	42.8	40.2	38.7
Percent not watching salt	39.8	N/A	25.7	N/A	N/A	N/A	N/A

Source: Prevalence estimates from 2013 NC BRFSS survey results and secondary analysis <http://www.schs.state.nc.us/data/brfss/2013/nc/all/topics.htm#chd>  
Population estimates from: <http://www.schs.state.nc.us/interactive/query/population/nchspop.cfm>.

## REFERENCES

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- BRFSS survey applied to the estimated 2013 NC population 18 years and above. The 2013 NC BRFSS survey results are available at <http://www.schs.state.nc.us/data/brfss/2013/nc/all/topics.htm#chd> and the dataset is available upon request to the NC State Center for Health Statistics: <http://www.schs.state.nc.us/contacts.htm>. The 2013 estimates of the NC population were obtained from: <http://www.schs.state.nc.us/interactive/query/population/nchspop.cfm>.
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