The Impact of Chronic Disease in Ohio: 2015

Ohio Department of Health

To protect and improve the health of all Ohioans by preventing disease, promoting good health and assuring access to quality health care.

Ohio Department of Health
246 North High Street
Columbus, OH 43215

For Information:
Chronic Disease Epidemiology and Evaluation Section
Bureau of Health Promotion
614-466-2144
HealthyOhio@odh.ohio.gov
http://www.healthy.ohio.gov/

Authors:
Carrie A. Hornbeck, MPH
John Kollman, MS, CIH, RS
Tyler J. Payne, MPH
Holly L. Sobotka, MS

Contributors:
Cassie Balasubramanian
Ashley Sweeny Davis, MA, RD, LD
Barbara Pryor, MS, RD, LD
Rhiannon M. Richman, MPH
Michele M. Shough
Andrew Wapner, DO, MPH
Maureen Wooton, MS, MPH

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Ohio Department of Health

Healthy Ohio

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Tables & Figures

Introduction

The Impact of Chronic Disease in Ohio: 2015 provides a comprehensive assessment of the burden and impact of chronic disease in the State of Ohio. This report was developed for public health professionals, researchers, policy makers and other stakeholders to provide recent and relevant data and information to guide chronic disease program planning, monitor trends, evaluate public health interventions and policies, identify health disparities and determine the financial costs of chronic disease in Ohio.

This report presents Ohio and U.S. data and information regarding chronic disease incidence, prevalence and mortality; behavioral risk factors; clinical risk factors; estimated costs; trends; and comorbid conditions. Multiple data sources (e.g., health surveys, vital statistics) were used throughout the report (see **Appendix B** for a detailed description of each data source). Data are presented by sex, race/ethnicity, age group, household income, education and geography to identify disparate populations and social determinants related to chronic disease in Ohio. Where available, data are presented for both adults and youth to better assess behavioral and clinical risk factors across the lifespan.

The Impact of Chronic Disease in Ohio: 2015 begins with an overview to present a high-level summary of the chronic disease burden in Ohio, risk factors, disparities, social determinants and costs, as well as Ohio's plan to prevent and reduce chronic disease across the state. This chapter is followed by sections on disease burden, behavioral risk factors and clinical risk factors, which include the following chapters:

Disease Burden:

- Heart Disease
- Stroke
- Diabetes
- Cancer
- Chronic Obstructive Respiratory Disease (COPD)/ Chronic Lower Respiratory Disease (CLRD)
- Asthma
- Arthritis

Behavioral Risk Factors:

- Tobacco Use
- Physical Activity
- Nutrition
- Alcohol Use

Clinical Risk Factors:

- Obesity
- Hypertension
- High Cholesterol

Each disease and risk factor is color-coded to a specific scheme throughout the report. In addition, each chapter begins with an introduction and key findings, and has a similar presentation of data and text for ease of readability and use.

Prevalence estimates are based on a sample of Ohio's population and are presented with 95 percent confidence intervals (CI). A 95 percent CI means that if the same survey was repeated 100 times, the estimated prevalence would fall within the range of the CI 95 times out of 100. Statistical significance between populations was determined by comparing CIs; if the CIs do not overlap, the difference is determined to be statistically significant. This is particularly important when comparing prevalence estimates for smaller populations, because they often have wider confidence intervals. U.S. prevalence estimates represent the median estimate of the 50 states, District of Columbia and U.S. territories.

Mortality rates are based on all deaths among Ohio residents for a given primary cause of death and time period, rather than a sample. For this reason, mortality rates do not include CIs, and tests for significant differences between populations were not conducted.

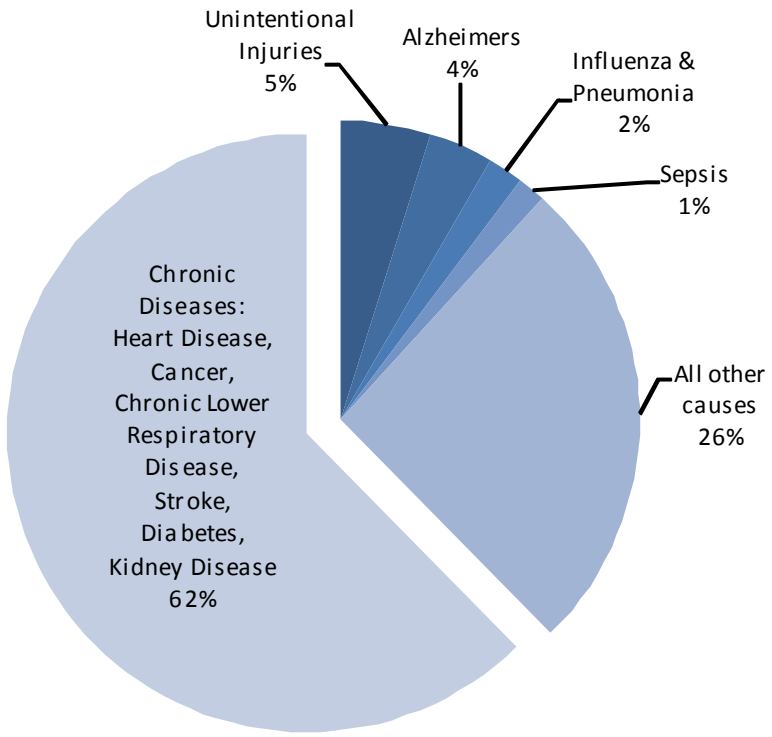
The findings of this report demonstrate the need for a coordinated approach to chronic disease prevention and health promotion due to shared causes and risk factors, similar high-need and disparate populations, and comorbid conditions. This report can be used in conjunction with *Ohio's Plan to Prevent and Reduce Chronic Disease in Ohio: 2014-2018* (see p. 16) to create a healthier future for all Ohioans.

Overview: Burden of Chronic Disease

Chronic diseases such as heart disease, stroke, diabetes and many cancers are among the most common, costly and preventable of all health problems in both the United States and Ohio. Chronic disease is associated with reduced quality of life, poor health outcomes, increased healthcare needs and higher healthcare costs. Ohio ranks 40th for overall health in the country, while spending more per person on health care than all but 17 other states.[1,2] In fact, Ohio ranks among the worst in the country for cancer deaths (41st), cardiovascular deaths (37th) and diabetes (45th).[3]

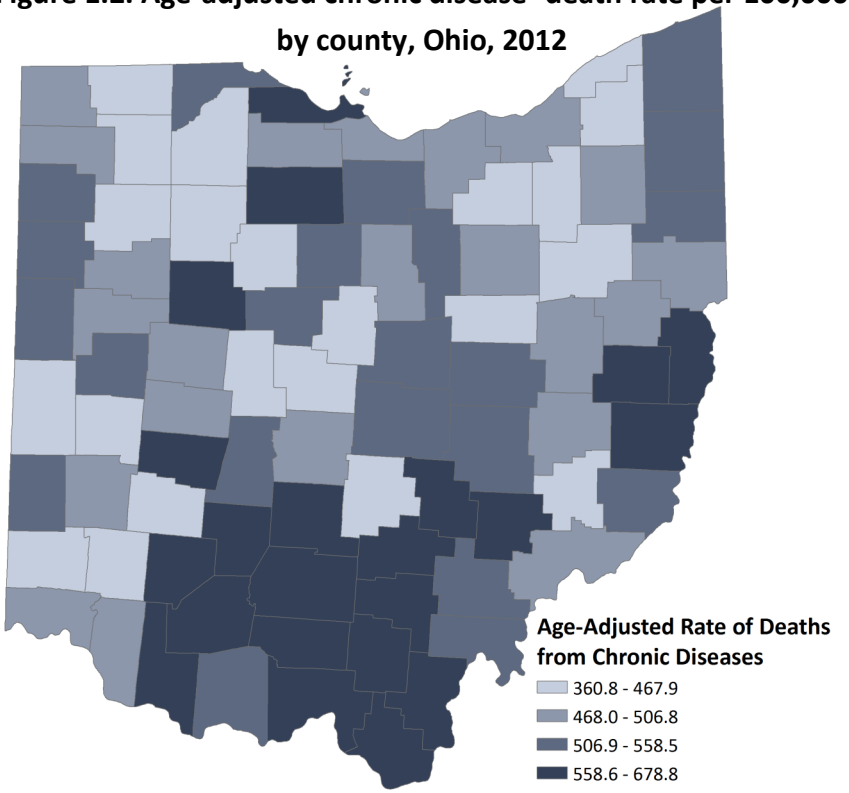
Chronic Disease Mortality: Death due to chronic disease represents a significant burden among Ohioans. In 2012, six of the 10 leading causes of death in Ohio were attributed to heart disease, cancer, CLRD, stroke, diabetes and kidney disease, accounting for 62 percent (69,211) of Ohio deaths (**Figure 1.1**).[4] Men in Ohio are more likely to die from chronic disease (596.8 per 100,000) than women (420.7 per 100,000). Black men had the highest chronic disease death rate in 2012 (691.8 per 100,000), with approximately 41 percent of these deaths occurring before age 65. The chronic disease death rate in Ohio varied greatly by county in 2012. The county with the highest age-adjusted death rate (Scioto County, 678.8 per 100,000) had a rate 1.9 times higher than the county with the lowest rate (Geauga County, 360.8 per 100,000). (**Figure 1.2**).

Figure 1.1. Leading causes of death, Ohio, 2012



Source: Ohio Bureau of Vital Statistics, Ohio Department of Health, 2014.

Figure 1.2. Age-adjusted chronic disease# death rate per 100,000 by county, Ohio, 2012



Source: Ohio Bureau of Vital Statistics, Ohio Department of Health, 2014.

Chronic diseases include: heart disease, stroke, diabetes, cancer, chronic lower respiratory disease, and kidney disease.

Overview: Burden of Chronic Disease

Table 1.1. Estimated prevalence of adults (age 18+) ever diagnosed with two or more chronic diseases[#], Ohio, 2012

	Ohio Prevalence (%)	95% CI
Total	20.5	19.6 - 21.4
Sex		
Male	18.7	17.4 - 20.0
Female	22.1	20.9 - 23.3
Race/Ethnicity		
White	20.5	19.5 - 21.5
Black	21.2	18.0 - 24.3
Other	14.9	9.8 - 19.9
Multi-Racial	27.8	19.1 - 36.5
Hispanic	18.7	12.5 - 24.8
Age Group		
18 - 24	3.6	2.1 - 5.0
25 - 34	7.0	5.1 - 8.8
35 - 44	11.0	8.9 - 13.1
45 - 54	19.2	17.1 - 21.3
55 - 64	30.2	27.9 - 32.5
65+	42.8	40.6 - 44.9
Household Income		
<$15,000	34.0	30.4 - 37.6
$15,000 - $24,999	29.4	26.9 - 31.9
$25,000 - $34,999	23.3	20.5 - 26.1
$35,000 - $49,999	19.6	17.1 - 22.1
$50,000 - $74,999	13.8	11.7 - 15.8
$75,000+	10.2	8.7 - 11.7
Education		
<High school	35.6	31.7 - 39.6
High school graduate	22.2	20.8 - 23.7
Some college	18.8	17.1 - 20.4
College graduate	11.4	10.2 - 12.6

Source: 2012 Ohio Behavioral Risk Factor Surveillance System, Ohio Department of Health, 2013.
[#] Chronic diseases include: coronary heart disease, heart attack, stroke, diabetes, cancer (except for skin cancer), chronic obstructive pulmonary disease, kidney disease, asthma and arthritis.

Chronic Disease Prevalence: Ohioans have a higher prevalence of chronic disease compared with the United States. According to 2012 data from the Ohio Behavioral Risk Factor Surveillance System (BRFSS), Ohioans age 18 and older had a higher prevalence of coronary heart disease (5.4 percent), stroke (3.1 percent), diabetes (11.7 percent), cancer (6.6 percent), COPD (8.6 percent) and arthritis (30.0 percent) compared with U.S. adults.[5]

When a person has more than one chronic disease, his or her disease progression is often complicated and the course of treatment is more complex and costly. People who live with more than one chronic disease are, in general, in poorer health and have higher rates of disability than those with one or no chronic diseases.

As shown in **Table 1.1**, in Ohio in 2012, 20.5 percent of adults reported having had two or more chronic diseases. Women had a significantly higher prevalence of multiple chronic diseases (22.1 percent) than men (18.7 percent). The prevalence of having multiple chronic diseases increases as individuals age. In 2012, only 3.6 percent of people age 18-24 had two or more chronic diseases, while more than two in five (42.8 percent) adults age 65 and older had two or more chronic diseases.

Table 1.1 also shows that the prevalence of multiple chronic diseases is highest among those with the lowest household income and lowest education. In 2012, Ohioans with a household income less than $15,000 per year were 3.3 times more likely to have had two or more chronic diseases compared with those earning $75,000 or more per year. Similarly, Ohioans who had not completed high school were 3.1 times more likely to report having had more than one chronic disease compared with those who earned a college degree.

Overview: Risk Factors

Risk Factors: Chronic diseases result primarily from four modifiable health behaviors—smoking and other tobacco use, poor diet, insufficient physical activity and heavy alcohol consumption—behaviors that often begin early in life. According to 2011 and 2012 data, nearly one in four Ohio adults (23.3 percent) were current smokers, 43.4 percent ate less than one fruit and 27.1 percent ate less than one vegetable daily, four in five (78.6 percent) did not meet physical activity guidelines and 6.3 percent were heavy drinkers.[5,6] In addition, the prevalence of many of these risk factors among adults was higher in Ohio than the U.S. median.[5,6,7]

Ohio high school students (grades 9-12) also have a high prevalence of chronic disease-associated risk factors. In 2013, approximately 15 percent of high school students currently smoked cigarettes, 38.3 percent did not eat vegetables one or more times per day, 13.2 percent were not physically active at least 60 minutes on one of the last seven days and 29.5 percent were current alcohol users.[8] As demonstrated in **Table 1.2**, many chronic disease risk factors are associated with not just one, but multiple chronic conditions.[9] In fact, tobacco use, insufficient physical activity and poor nutrition are each associated with heart disease, stroke, type 2 diabetes and cancer.[9] Thus, improvements in these risk factors will have a significant impact on the chronic disease burden in Ohio.

Chronic disease outcomes can also be improved through screening and early detection (e.g., mammography) and control of clinical risk factors such as obesity, high blood pressure and high cholesterol. Obesity is defined in this report as a body mass index (BMI) of 30 kg/m^2 or higher for adults and a BMI ≥95th percentile, by age and sex, for adolescents. The prevalence of obesity was higher in Ohio compared with the United States among both adults and adolescents. Nearly one in three (30.1 percent) Ohio adults and 13.0 percent of Ohio high school students were obese in 2012 and 2013, respectively.[5,8] In addition, nearly one in three Ohio adults (32.7 percent) had high blood pressure and more than one in three (38.9 percent) had high cholesterol in 2011.[6] Coordinated efforts targeting health behaviors and clinical risk factors are therefore necessary to reduce the burden of chronic disease in Ohio.

Table 1.2. Selected chronic diseases and associated risk factors

	Tobacco Use	Insufficient Physical Activity	Poor Nutrition	Heavy Alcohol Use
Heart Disease	X	X	X	X
Stroke	X	X	X	X
Diabetes	X	X	X	
Cancer	X	X	X	X
CLRD[#]	X			
Arthritis		X		
Asthma	X			

[#] CLRD = Chronic Lower Respiratory Disease

Overview: Disparities and Social Determinants

Disparities: Health disparities are differences in health conditions and health status between populations. Disparities most often occur among populations that are marginalized because of sex, race/ethnicity, age, socioeconomic status, geographic location, religion, disability, sexual orientation and/or other characteristics associated with discrimination. Prevalence, incidence and mortality data presented throughout this report demonstrate that the burden of many chronic diseases in Ohio is higher among disparate populations (e.g., older age, black race, low income and low education). For example, as shown in **Table 1.3**, prevalence estimates for each of the chronic diseases presented in this report (heart disease, stroke, diabetes, cancer, COPD, asthma and arthritis) are all significantly higher among populations with the lowest income and lowest education. In addition, chronic disease mortality rates by race/ethnicity indicate that blacks have higher death rates of heart disease, stroke, diabetes and cancer compared with other racial groups.

Social Determinants: Social determinants of health are the social, economic and physical conditions in the environment in which people are born, live, learn, play, work and age. Social determinants influence the health of people and communities and affect a wide range of health, functional and quality-of-life outcomes and risks (see **Table 1.4**).[10] These conditions are shaped by the amount of money, power and resources that people have and are influenced by policy choices.[11] Addressing the social determinants of health is a primary approach to reducing health disparities and achieving health equity, where everyone has the opportunity to attain their full health potential and no one is disadvantaged from achieving this potential because of their social position or other socially determined circumstance.[10]

Table 1.3. Populations with a significantly higher prevalence[#] of selected chronic diseases, Ohio, 2012

	Sex	Older Age	Black Race	Household Income <$15,000	<High School Education
Heart Disease	X (male)	X		X	X
Stroke		X		X	X
Diabetes		X	X	X	X
Cancer	X (male)	X		X	X
COPD[*]		X		X	X
Asthma	X (female)		X	X	X
Arthritis	X (female)	X		X	X

Source: 2012 Ohio Behavioral Risk Factor Surveillance System, Ohio Department of Health, 2013.
[#] This table reflects disparities in prevalence estimates only and does not account for disparities in incidence and/or mortality rates.
[*] COPD = Chronic Obstructive Pulmonary Disease

Table 1.4. Examples of social determinants of health

Social/Economic Factors

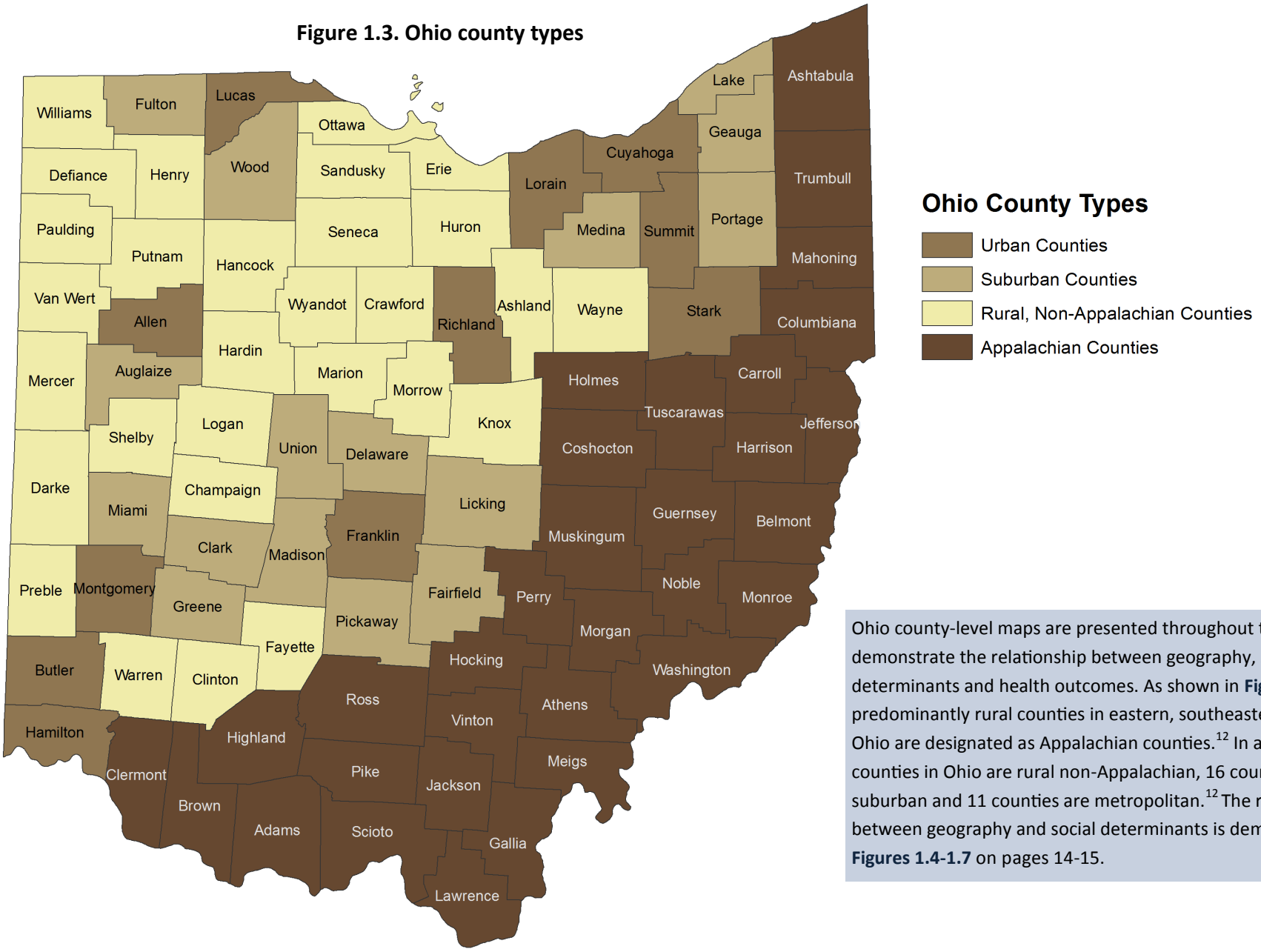
- Income
- Education
- Employment
- Access to/Quality of Health Care
- Discrimination (e.g., race, class)
- Social Support
- Access to/Availability of Food

Physical Conditions

- Environment (e.g., green space)
- Built Environment (e.g., sidewalks)
- Work/School/Recreational Settings
- Household/Community Design
- Toxic Substances (e.g., pollution)
- Physical Barriers (e.g., building accessibility)

Overview: Disparities and Social Determinants

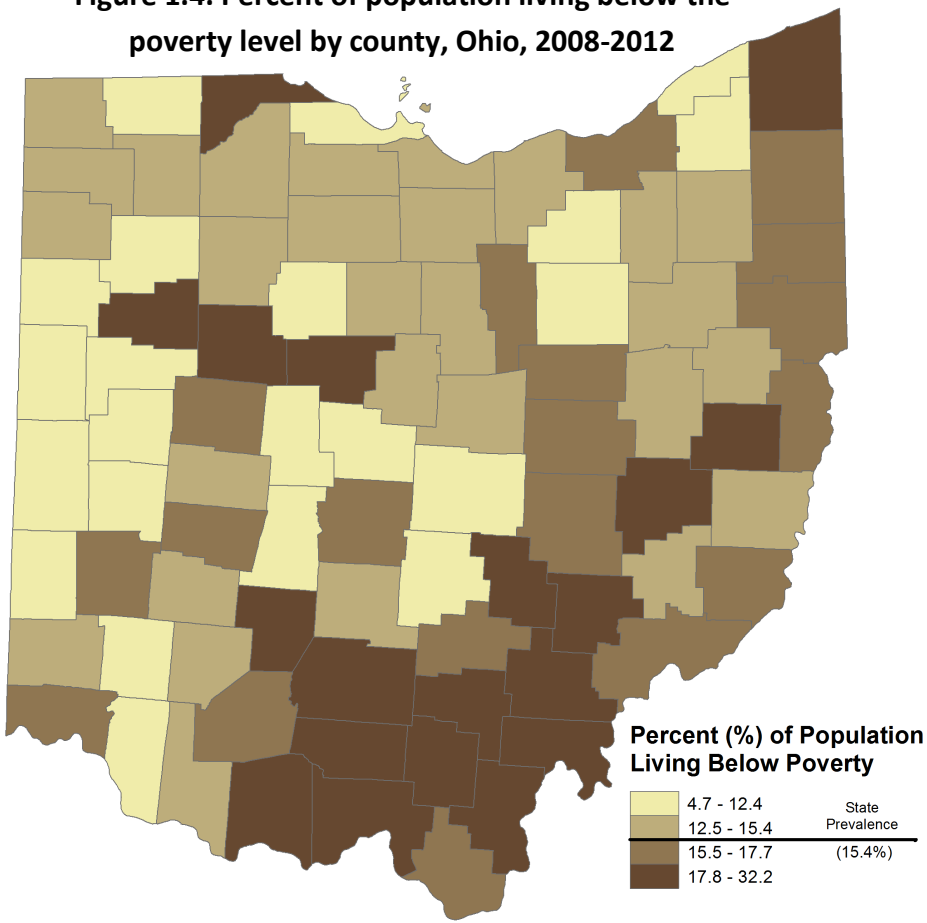
Figure 1.3. Ohio county types



Ohio county-level maps are presented throughout this report to demonstrate the relationship between geography, social determinants and health outcomes. As shown in **Figure 1.3**, 32 predominantly rural counties in eastern, southeastern and southern Ohio are designated as Appalachian counties.[12] In addition, 29 counties in Ohio are rural non-Appalachian, 16 counties are suburban and 11 counties are metropolitan.[12] The relationship between geography and social determinants is demonstrated in **Figures 1.4-1.7** on pages 14-15.

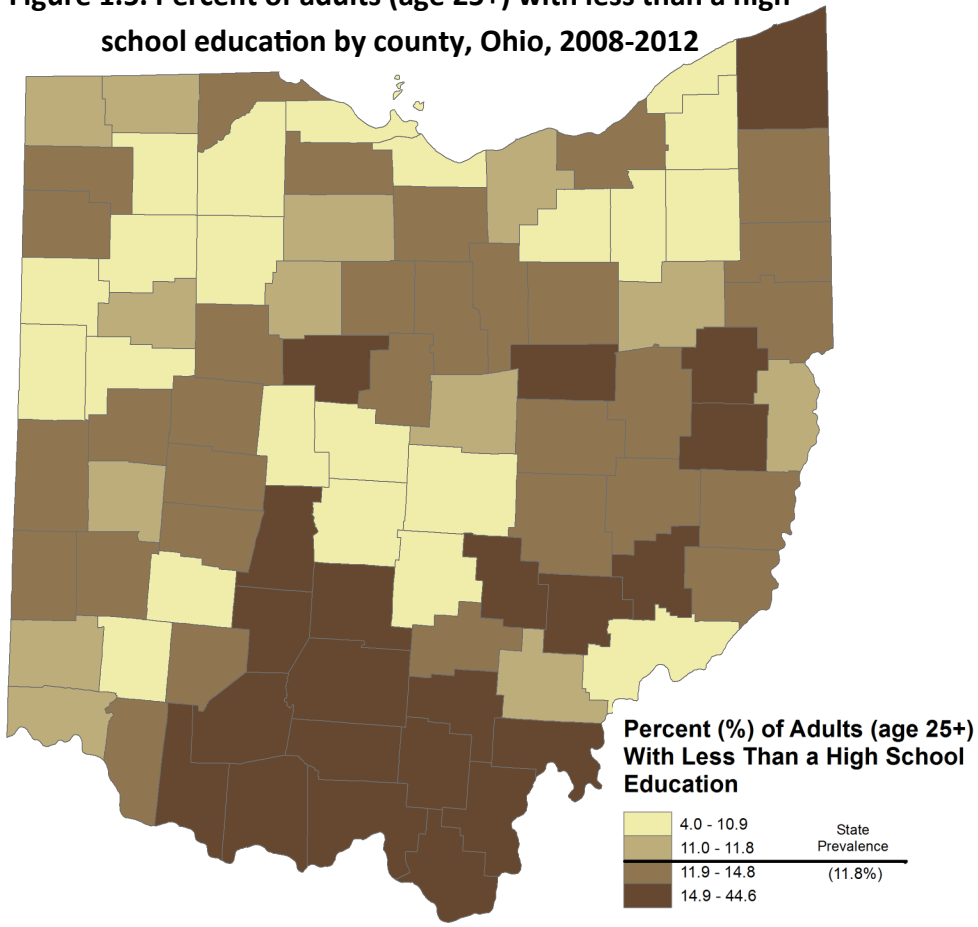
Overview: Disparities and Social Determinants

Figure 1.4. Percent of population living below the poverty level by county, Ohio, 2008-2012



Source: 2008-2012 American Community Survey 5-Year Estimates, 2014

Figure 1.5. Percent of adults (age 25+) with less than a high school education by county, Ohio, 2008-2012



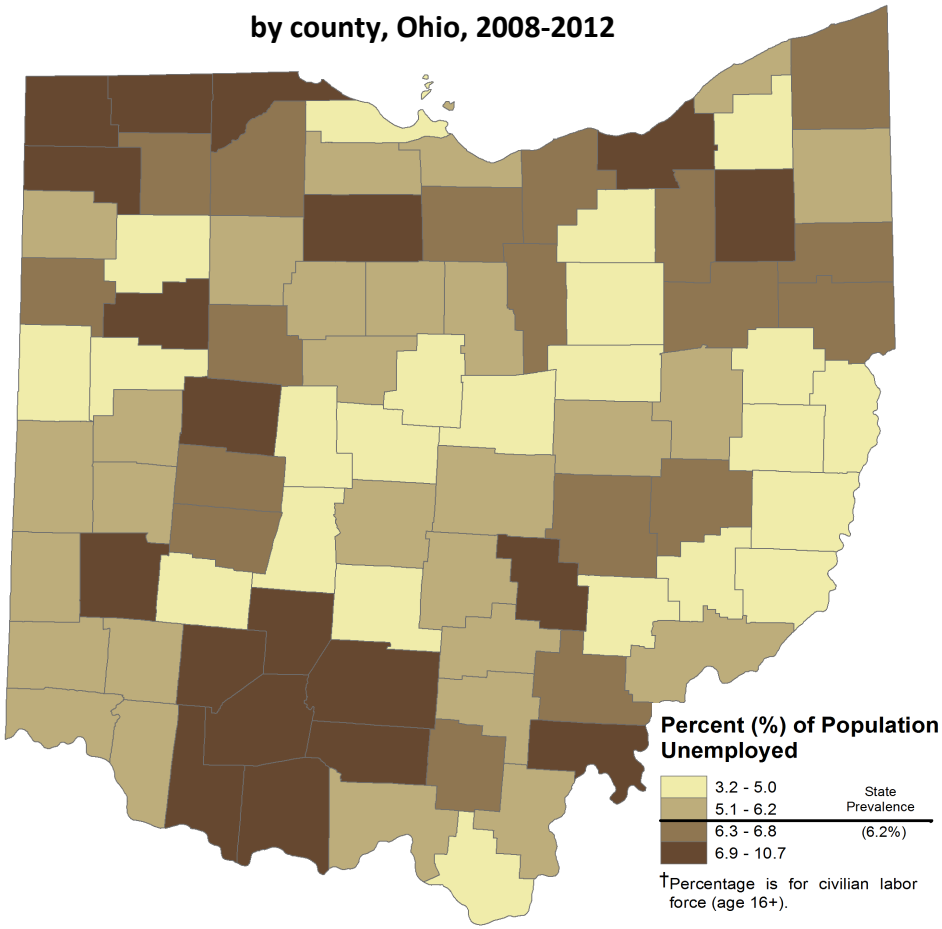
Source: 2008-2012 American Community Survey 5-Year Estimates, 2014

Figure 1.4 presents the percent of the population living below the poverty level in Ohio by county. In 2008-2012, 15.4 percent of Ohio's population were living below the poverty level, which is slightly higher than the percentage in the United States (14.9 percent). This percentage varies widely across the state, ranging from 4.7 percent in Delaware County to 32.2 percent in Athens County. **Figure 1.4** shows a cluster of counties with the highest poverty rates in the southern Appalachian region.

The percent of Ohio adults age 25 and older with less than a high school diploma or equivalency is presented by county in **Figure 1.5**. In Ohio, 11.8 percent of the population had less than a high school education in 2008-2012. Nearly all counties with the lowest educational attainment were located in the south and/or Appalachian region of Ohio.

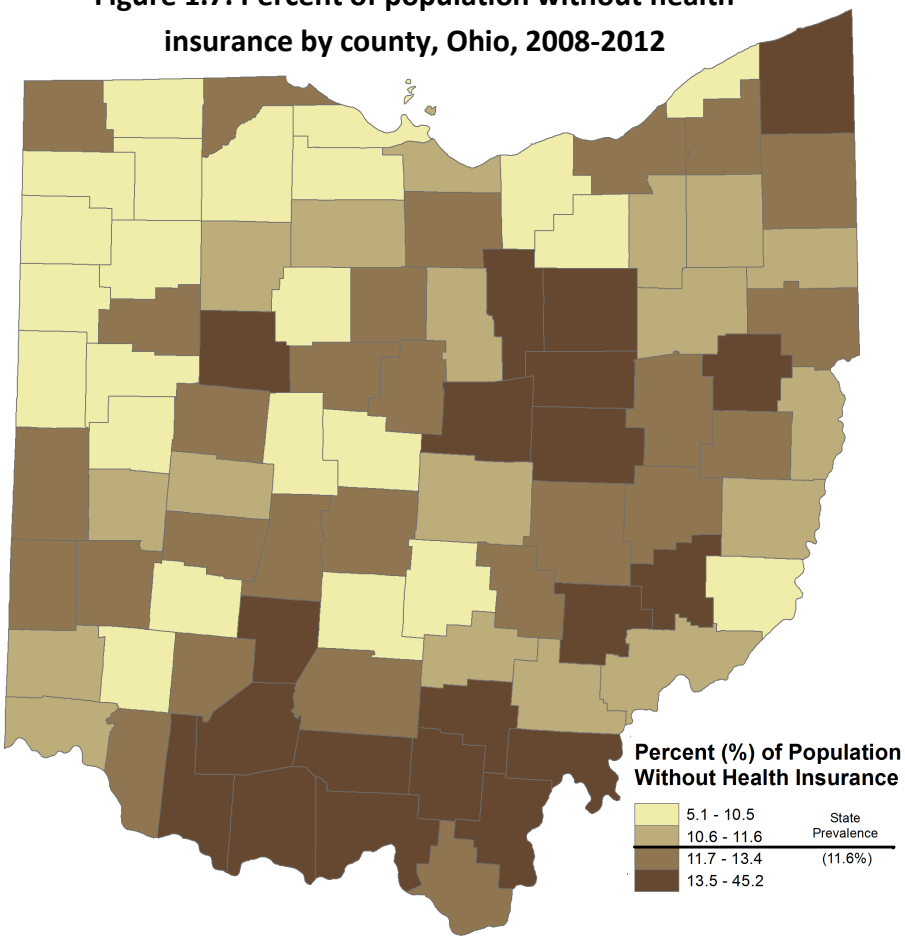
Overview: Disparities and Social Determinants

Figure 1.6. Percent of population currently unemployed by county, Ohio, 2008-2012



Source: 2008-2012 American Community Survey 5-Year Estimates, 2014

Figure 1.7. Percent of population without health insurance by county, Ohio, 2008-2012



Source: 2008-2012 American Community Survey 5-Year Estimates, 2014

Unemployment among the civilian labor force age 16 and older by Ohio county of residence is presented in **Figure 1.6**. The overall percentage of unemployment in the state was 6.2 percent in 2008-2012 and ranged from 3.2 percent in Delaware County to 10.7 percent in Pike County. Pockets of counties with high rates of unemployment were located in southern and northwest Ohio.

Figure 1.7 presents the percent of Ohio's population without health insurance in 2008-2012. Statewide, 11.6 percent of the population was without health insurance during this time period. Residents of southern Ohio counties as well as a few counties in the central northeast region were least likely to have health insurance. Holmes County, which includes a large Amish population, was found to have a significantly higher uninsured rate (45.2 percent) compared with any other county in Ohio.

Overview: Costs

Costs: The majority of healthcare costs in Ohio and the United States are associated with chronic disease and related health behaviors. In 2006, 84 percent of all healthcare spending in the United States was for people with one or more chronic medical conditions.[13] Thus, chronic disease presents a real economic threat to Ohio, both now and in the future.

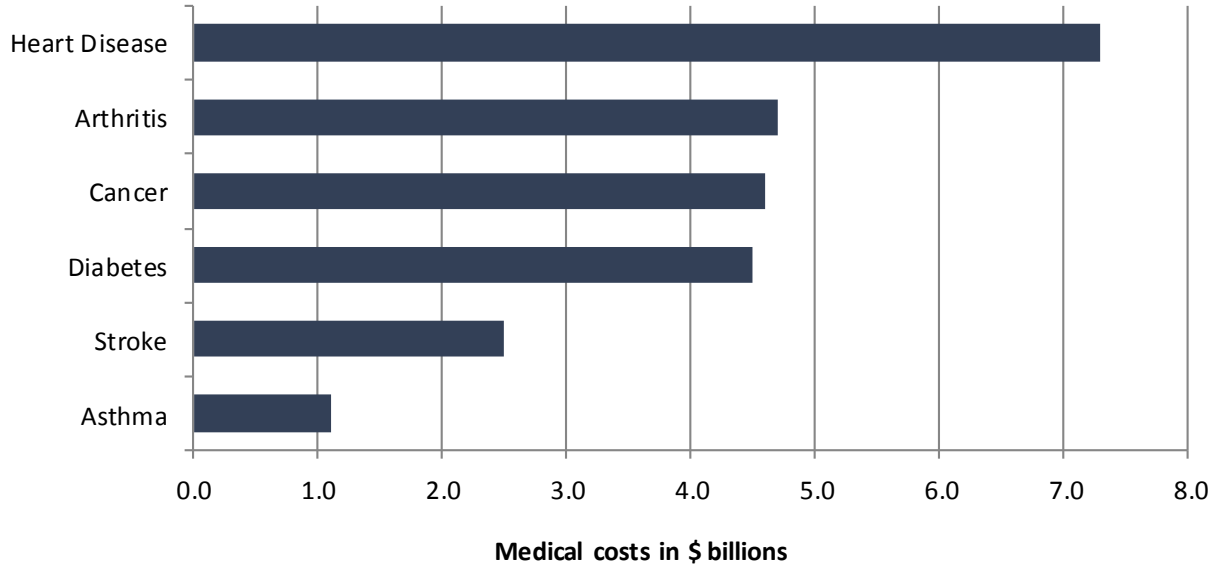
Costs associated with six of the leading chronic diseases in Ohio—heart disease, stroke, diabetes, cancer, arthritis and asthma—were estimated using the Chronic Disease Cost Calculator developed by the Centers for Disease Control and Prevention (CDC) (version 2).[14] In 2010, chronic diseases cost the state of Ohio an estimated $26.7 billion in medical costs and absenteeism from the workplace.

In 2010, direct medical costs associated with these chronic diseases were more than $25 billion, of which $7.3 billion was due to heart disease, $4.7 billion was due to arthritis and $4.6 billion was due to cancer (**Figure 1.8**).[14] These costs are expected to rise to nearly $44 billion in 2020, representing a 73 percent increase in only 10 years.[14]

Chronic diseases and associated risk factors, particularly high blood pressure, high cholesterol, heart disease and diabetes, are highly prevalent among the Medicare population.[15] More than two-thirds of Medicare beneficiaries have at least two chronic conditions.[15] Similar to Medicare, the Medicaid population also has a disproportionate burden of chronic disease, with higher rates of diabetes, cardiovascular disease and respiratory disease compared with people who are uninsured.[16] Therefore, the costs of chronic health conditions among Medicare and Medicaid beneficiaries have far-reaching implications for the healthcare system.

However, if Ohioans achieve even modest improvements in chronic disease prevention and early detection services, the state could save billions of dollars in healthcare spending and prevent multiple cases of chronic disease. It is estimated that a 5 percent reduction in BMI would save Ohio $1.2 billion and prevent 650,000 cases of diabetes, heart disease and cancer by 2030.[17] Please note that cost data presented throughout this report are not reflective of a number of changes in healthcare delivery due to the Affordable Care Act, including Medicaid expansion in Ohio.

Figure 1.8. Estimated annual medical costs due to selected chronic diseases, Ohio, 2010



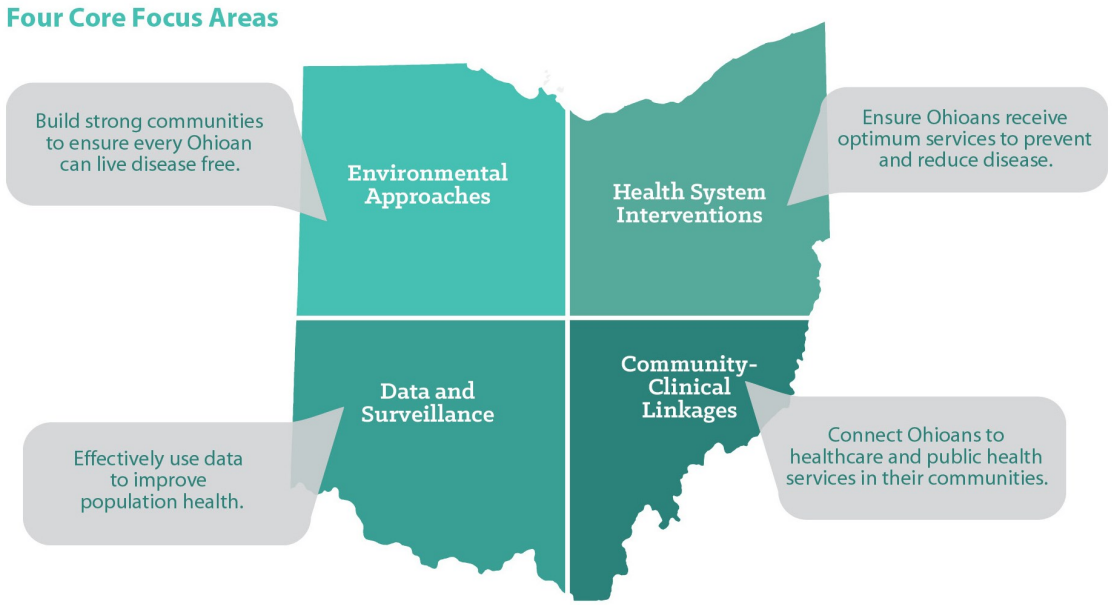
Medical costs associated with chronic disease are expected to rise from $25 billion in 2010 to $44 billion in 2020.

Source: Chronic Disease Cost Calculator version 2, Centers for Disease Control and Prevention, 2014.

Overview: Chronic Disease Plan

Chronic Disease Plan: In 2014, Ohio released a new chronic disease state plan, *Ohio's Plan to Prevent and Reduce Chronic Disease: 2014-2018* (Chronic Disease Plan).[18] This plan is a five-year, priority-driven guide to prevent and reduce chronic disease in Ohio. It includes cross-cutting objectives to impact the policies, systems and environments that influence chronic disease outcomes and health behavior change.

The purpose of the Chronic Disease Plan is to guide stakeholders within multiple sectors—schools and universities, community organizations, state and local governments, worksites and healthcare systems—in aligning activities and leveraging resources to build communities that support health. The objectives chosen for the Chronic Disease Plan fall within four core focus areas:



The plan includes long-term outcomes that Ohio hopes to achieve by 2020. These long-term outcomes are focused on:

- Reducing the rates of the leading causes of death and disability: heart disease, stroke, diabetes and cancer;
- Increasing effective screening for many cancers, diabetes, blood pressure and cholesterol; and
- Reducing risk factors such as tobacco use, obesity, physical inactivity and poor nutrition.

To lead implementation of the plan, the Ohio Chronic Disease Collaborative (OCDC) was formed. Additional information on the plan and how to join the OCDC can be found at: www.healthy.ohio.gov/CDPlan.

OCDC Ohio Chronic Disease COLLABORATIVE

GET WITH THE PLAN

Heart Disease: Introduction and Key Findings

Heart disease is the leading cause of death in Ohio and the United States. In 2012, heart disease killed more than 26,000 Ohioans, which accounted for nearly a quarter of all resident deaths in Ohio.

Heart disease includes coronary heart disease, myocardial infarction (MI or heart attack) and heart failure. Coronary heart disease is the most common type of heart disease and is caused by a buildup of plaque along the walls of arteries, reducing blood flow to the heart. This reduction in blood flow can cause recurrent chest pain (angina) or, if severe, can deprive heart muscle of oxygen and cause an MI. Heart failure occurs when the heart muscle is too weak to pump blood well enough to supply the body with enough oxygenated blood. Heart failure is irreversible, but can be treated with medications and by maintaining a healthy lifestyle.

Heart disease is caused by a complex set of risk factors that include genetics, environment, clinical risk factors and behaviors such tobacco use. Individuals are more likely to have heart disease if they have high blood pressure, high cholesterol or other chronic diseases (e.g., diabetes, kidney disease), are obese, use tobacco, drink alcohol in excess, eat a poor diet or are not physically active. People can decrease their risk for developing heart disease by maintaining healthy nutrition and an active lifestyle, by not using tobacco products, and by controlling high blood pressure and diabetes.

Key Findings

How does Ohio compare with the United States?

- The age-adjusted heart disease death rate in Ohio (187.3 per 100,000) was 10 percent higher than the United States (170.5 per 100,000) in 2012.
- The estimated prevalence of coronary heart disease among adults was also higher in Ohio (5.4 percent) than the U.S. median prevalence (4.3 percent) in 2012.
- In 2012, Ohio had the 14th highest age-adjusted heart disease death rate in the United States.

Who is most at risk?

- The prevalence of heart disease increases with increasing age. In 2012, Ohioans age 65 and older had a significantly higher prevalence of coronary heart disease or MI (20.8 percent) than any other age group.
- The estimated prevalence of coronary heart disease or MI among adult men (9.7 percent) was significantly higher compared with women (6.5 percent) in 2012.
- In Ohio in 2012, black men had the highest age-adjusted heart disease death rate (260.6 per 100,000), followed by white men (232.4 per 100,000).
- Ohio adults with lower household incomes and lower educational attainment had a higher prevalence of heart disease in 2012 compared with those having higher incomes and more education.

How is it associated with other diseases and risk factors?

- The prevalence of heart disease among Ohio adults with high blood pressure (16.6 percent) was more than 5.5 times higher than those without high blood pressure (3.0 percent) in 2011.
- In 2012, Ohio adults with diabetes had a heart disease prevalence (24.3 percent) more than four times higher than those without diabetes (5.5 percent).
- Ohio adults who were obese had more than double the prevalence of heart disease (10.6 percent) than normal weight (BMI of 18.0-24.9 kg/m^2) adults (4.7 percent) in 2012.

How much does it cost?

- According to 2010 estimates, heart disease costs about $7.6 billion per year in medical expenses and absenteeism from the workplace in Ohio.
- In Ohio, Medicare and private insurers paid $2.6 billion and $2.3 billion, respectively, in medical costs for heart disease in 2010.
- The costs associated with employee absenteeism from work due to heart disease, either to care for themselves or a family member, totaled $268 million in Ohio in 2010.

Heart Disease: Prevalence

Table 2.1. Estimated prevalence of adults (age 18+) ever diagnosed with heart disease*, Ohio, 2012

	Ohio Prevalence (%)	95% CI
Total	8.0	7.4 - 8.6
Sex		
Male	9.7	8.7 - 10.7
Female	6.5	5.8 - 7.1
Race/Ethnicity		
White	8.1	7.4 - 8.7
Black	7.0	5.2 - 8.8
Other	5.6	2.7 - 8.4
Multi-Racial	10.3	5.0 - 15.7
Hispanic	9.7	5.2 - 14.2
Age Group		
18 - 24	-	-
25 - 34	-	-
35 - 44	3.7	2.4 - 5.0
45 - 54	6.4	5.1 - 7.7
55 - 64	11.2	9.6 - 12.8
65+	20.8	18.9 - 22.6
Household Income		
<$15,000	10.9	8.9 - 12.9
$15,000 - $24,999	12.7	10.9 - 14.5
$25,000 - $34,999	10.1	8.0 - 12.1
$35,000 - $49,999	6.4	5.0 - 7.9
$50,000 - $74,999	6.4	4.9 - 7.8
$75,000+	3.8	2.8 - 4.7
Education		
<High school	12.6	11.0 - 16.1
High school graduate	9.3	8.3 - 10.3
Some college	7.1	6.0 - 8.1
College graduate	4.3	3.7 - 5.0

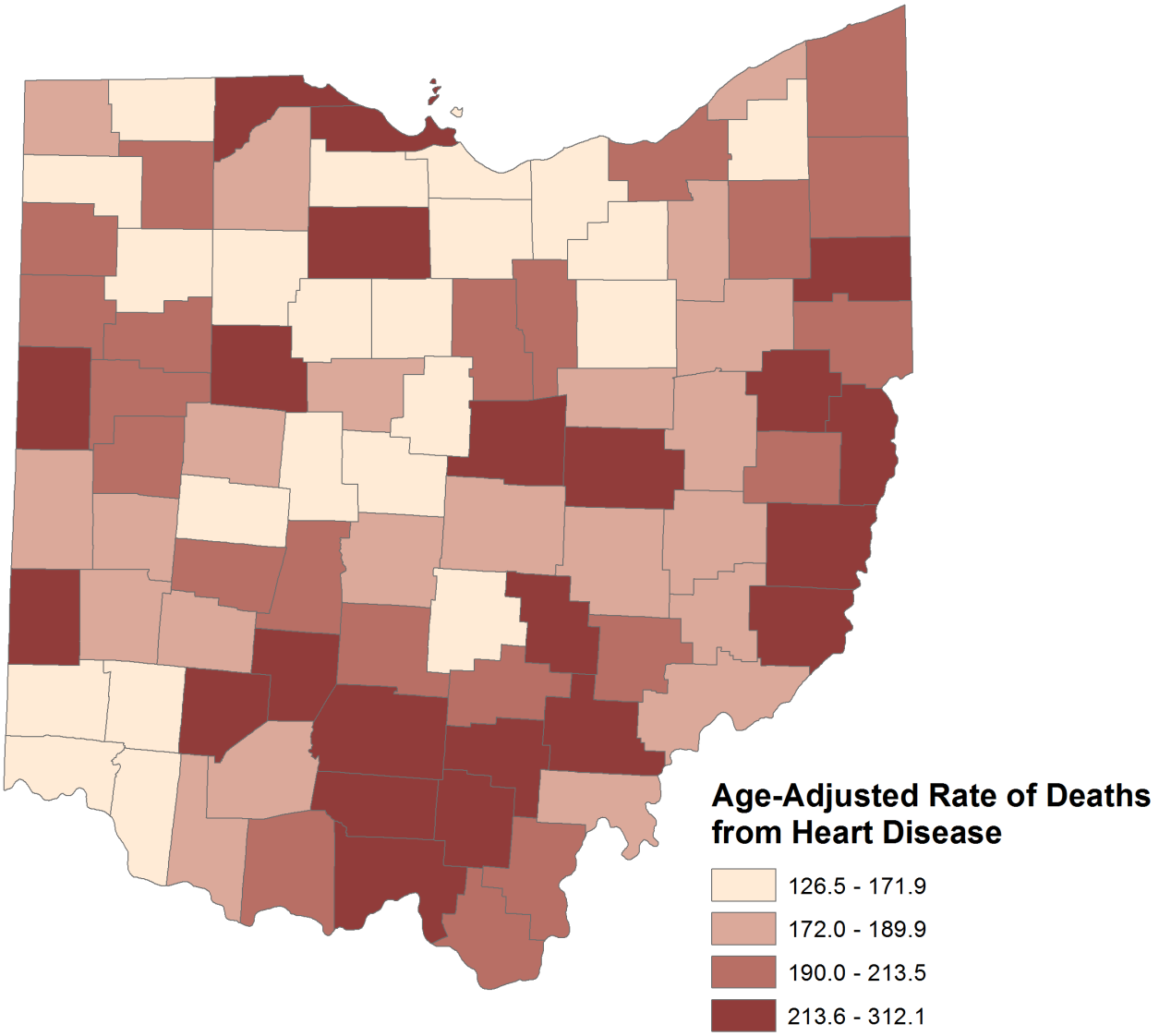
Source: 2012 Ohio Behavioral Risk Factor Surveillance System, Ohio Department of Health, 2013; 2012 Behavioral Risk Factor Surveillance System, Centers for Disease Control and Prevention, 2013.
* "Heart Disease" includes any respondent who indicated that they had been diagnosed with coronary heart disease or had a myocardial infarction.

- As shown in **Table 2.1**, in Ohio in 2012, 8.0 percent of adults reported having coronary heart disease or an MI, according to data from the Ohio BRFSS. This estimated prevalence is an underrepresentation of the true prevalence of heart disease because it does not include all forms of heart disease.
- In Ohio in 2012, men had a significantly higher prevalence of heart disease (9.7 percent) than women (6.5 percent).
- The prevalence of heart disease in 2012 did not differ significantly by race/ethnicity.
- Heart disease prevalence increases as individuals age. In 2012, more than one in five adults age 65 and older had heart disease.
- The prevalence of heart disease decreases with increasing household income. Ohioans with a household income of less than $15,000 per year were 2.9 times more likely to have had heart disease compared with those earning $75,000 or more per year, according to 2012 data.
- Similar to household income, heart disease prevalence decreases as educational attainment increases. In 2012, Ohioans who had not completed high school were 2.9 times more likely to report having heart disease compared with those who earned a college degree.

Heart Disease: Mortality

- In Ohio in 2012, heart disease was the leading cause of death.
- Heart disease killed 26,383 Ohioans in 2012, which equates to an age-adjusted death rate of 187.3 per 100,000.
- Men in Ohio were 57 percent more likely to die from heart disease than women (234.8 per 100,000 and 149.5 per 100,000 in 2012, respectively).
- Black Ohioans had a 13 percent higher age-adjusted heart disease death rate in 2012 compared with whites (209.0 per 100,000 and 184.7 per 100,000, respectively).
- Black men in Ohio had the highest rate of heart disease deaths in 2012 (260.6 per 100,000).
- More than 45 percent of heart disease deaths among black men in Ohio occurred before age 65 in 2012; whereas, approximately 25 percent of heart disease deaths occurred before age 65 in white men.
- In 2012, the heart disease death rate for black women (171.1 per 100,000) was 16 percent higher than that of white women (147.2 per 100,000).
- The heart disease death rate in Ohio varied greatly by county in 2012. The county with the highest age-adjusted death rate (Fayette County, 312.1 per 100,000) had a rate 2.5 times higher than the county with the lowest rate (Delaware County, 126.5 per 100,000) (**Figure 2.1**).

Figure 2.1. Age-adjusted heart disease death rate per 100,000 by county, Ohio, 2012

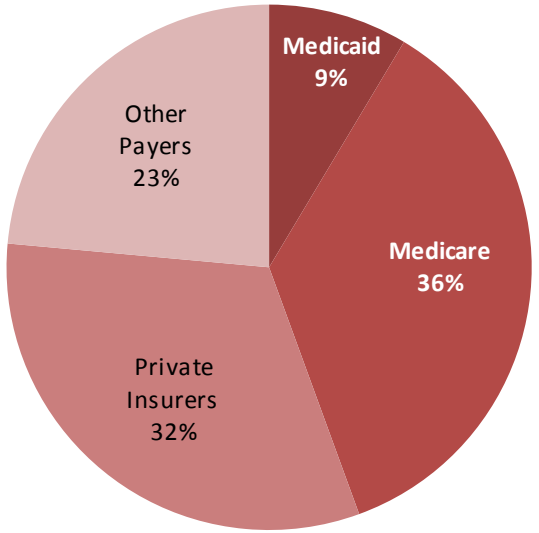


Source: Ohio Bureau of Vital Statistics, Ohio Department of Health, 2014.

Heart Disease: Costs and Trends

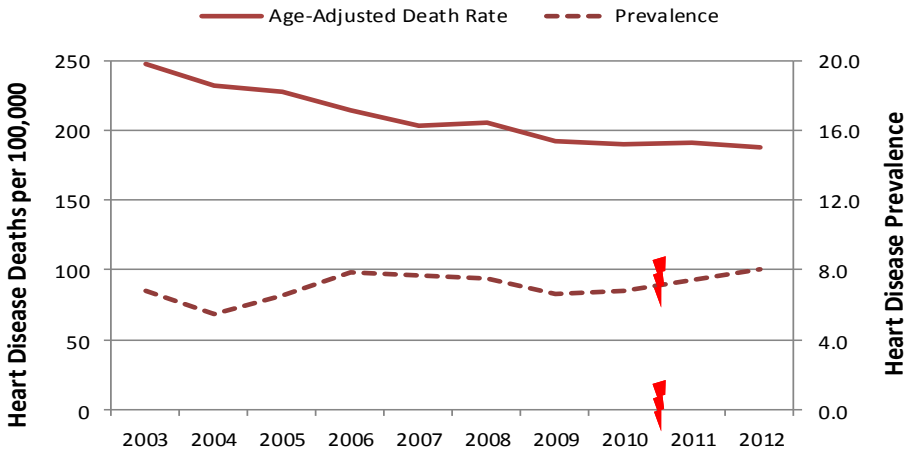
- Heart disease cost the state of Ohio approximately $7.6 billion in 2010 in medical costs and absenteeism from the workplace.
- The vast majority of the costs associated with heart disease ($7.3 billion) were medical costs, including office visits, outpatient visits, emergency room visits, inpatient hospitalizations, home health care, vision aids, medical equipment, prescription medications and nursing homes.
- As shown in **Figure 2.2**, among insurance payers, Medicare spent the highest amount for medical costs due to heart disease in 2010 ($2.6 billion), followed by private insurers ($2.3 billion) and Medicaid ($628 million). The remaining $1.7 billion in medical costs were paid by all other insurance payers, including those who self-pay, the uninsured, charity payers and others (e.g., Tricare, Indian Health Service, etc.).
- Absenteeism from places of employment due to heart disease cost an additional $268 million in 2010. These costs are associated with missed days of work only and do not account for lost productivity, premature mortality and reduced quality of life.

Figure 2.2. Estimated percentage of medical costs due to heart disease by payer, Ohio, 2010



Source: Chronic Disease Cost Calculator version 2, Centers for Disease Control and Prevention, 2014.

Figure 2.3. Age-adjusted heart disease death rate per 100,000 and estimated prevalence of adults (age 18+) ever diagnosed with heart disease, Ohio, 2003-2012

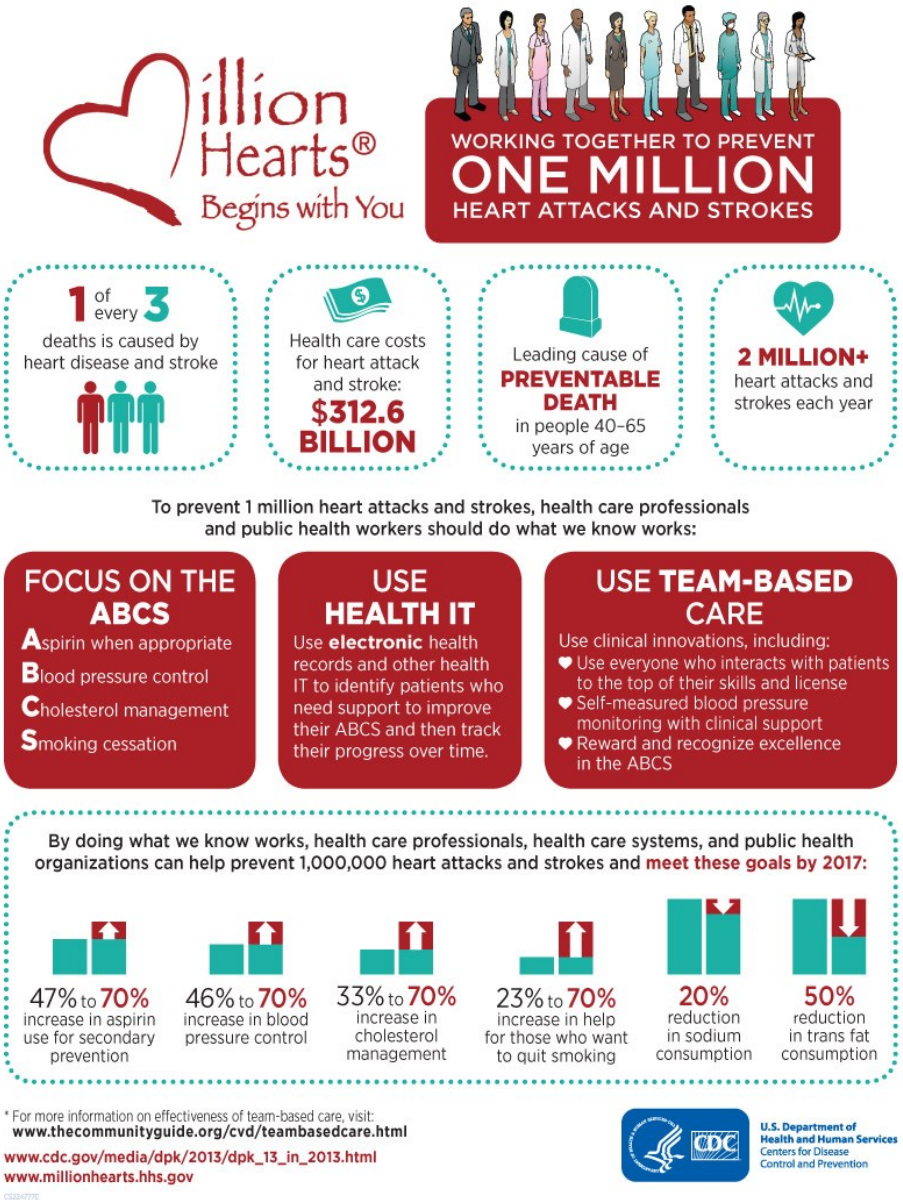


Source: Ohio Bureau of Vital Statistics, Ohio Department of Health, 2014; 2003-2012 Ohio Behavioral Risk Factor Surveillance System, Ohio Department of Health, 2013.

BRFSS data prior to 2011 cannot be compared with data for 2011 and after due to changes in weighting methodology.

- As shown in **Figure 2.3**, in Ohio, the age-adjusted heart disease death rate has declined 24 percent, from 247.4 per 100,000 in 2003 to 187.3 per 100,000 in 2012.
- In contrast to death rates, the proportion of adults in Ohio who reported having coronary heart disease or an MI was the same in 2003 compared with 2010 and appeared to increase slightly from 2011 to 2012.
- The decreasing heart disease death rate coincides with a national focus on decreasing death and disability due to heart disease. These efforts are led nationally by the CDC and the American Heart Association.

Heart Disease: Million Hearts



Spotlight: Million Hearts Initiative

In 2011, the CDC and Centers for Medicare and Medicaid Services launched the Million Hearts initiative, a coordinated and multifaceted approach to prevent one million heart attacks and strokes by 2017. Communities, organizations, state health departments, healthcare providers and individuals partnered together to reduce the number of people who need treatment for heart attack and stroke by following the ABCS (Aspirin when appropriate, Blood pressure control, Cholesterol management, and Smoking cessation). The Million Hearts effort is also focused on improving access to care and focusing the attention of the public and healthcare providers on preventing heart disease and stroke.

Ohio is an active partner in the national Million Hearts initiative. At the Ohio Department of Health (ODH), several prevention projects that bolster the aims of Million Hearts are underway or have recently concluded. Ohio participated in an early learning collaborative of states that worked with primary care providers to increase their quality of care for individuals with hypertension and increase the proportion of those people who had their blood pressure under control. The lessons learned in that collaborative are being used to create more networks of primary care providers across the state who are leading the effort to control hypertension. In addition, work on team-based care utilizing pharmacists, quality improvement for acute stroke care and transitions of care, and primary prevention projects focused on nutrition, physical activity and smoking prevention and cessation are all ongoing projects to prevent heart attack and stroke among Ohioans.

Stroke: Introduction and Key Findings

In the United States, nearly 800,000 people experience stroke and 135,000 die from stroke every year. It is the fourth leading cause of death in the United States and one of the leading causes of serious disability. Risk of stroke increases with age and is more common among blacks compared with other races in the United States.

Stroke, also called a brain attack, occurs when blood flow to part of the brain is reduced or completely blocked, typically causing the affected brain tissue to die. The symptoms of stroke depend on the parts of the brain affected and can include confusion, headache, sudden numbness or weakness especially on one side of the body, dizziness and trouble talking, walking or seeing.

The most important aspects of stroke care are early recognition of the signs and symptoms and immediate access to appropriate care. Because the blockage is often reversible, appropriate emergency medical services and timely care at either a stroke-capable hospital or a hospital participating in a telestroke program can prevent severe disability and death from stroke.

Aggressive rehabilitation is needed to reduce the risk of falls and other long-term disabilities.

A person's risk of stroke depends on his or her genetics, environment, clinical risk factors and unhealthy behaviors. Prevention and control of high blood pressure and high cholesterol, and appropriate prevention and control of diabetes, can dramatically reduce stroke risk. Further protection comes from healthy lifestyle behaviors, such as not smoking, eating healthy and being physically active.

Key Findings

How does Ohio compare with the United States?

- The overall prevalence of stroke among adults in Ohio (3.1 percent) was similar to the U.S. median prevalence (2.9 percent) in 2012.
- Stroke prevalence by sex, age group, household income and educational attainment was also similar in Ohio compared with the U.S. median, with the exception of a higher prevalence in Ohio among people age 55-64 and those with a household income of $15,000-$24,999 per year.
- In contrast to prevalence, the age-adjusted stroke death rate in Ohio (40.9 per 100,000) was 11 percent higher than the United States (36.9 per 100,000) in 2012.

Who is most at risk?

- In 2012, Ohioans age 65 and older (8.2 percent) had a stroke prevalence 6.3 times higher than Ohioans age 35-44 (1.3 percent).
- Men in Ohio were slightly more likely to die of stroke in 2012 than women (42.5 per 100,000 versus 39.2 per 100,000, respectively).
- In Ohio in 2012, black men had the highest age-adjusted stroke death rate (62.3 per 100,000), followed by black women (47.2 per 100,000).
- Ohio adults with lower household incomes and lower educational attainment had a higher prevalence of stroke in 2012 compared with those having higher incomes and more education.

How is it associated with other diseases and risk factors?

- The prevalence of stroke among Ohio adults with high blood pressure (6.9 percent) was nearly four times higher than those without high blood pressure (1.8 percent) in 2011.
- In 2012, Ohio adults with diabetes (10.1 percent) had a stroke prevalence 4.8 times higher than those without diabetes (2.1 percent).
- Ohio adults with heart disease (defined as coronary heart disease and/or MI) had a stroke prevalence of 15.6 percent, while those without heart disease had a stroke prevalence of 2.0 percent in 2012.

How much does it cost?

- In Ohio in 2010, stroke cost nearly $2.7 billion in medical expenses and absenteeism from the workplace.
- In Ohio, Medicare and private insurers paid $820 million and $484 million, respectively, in medical costs for stroke in 2010.
- The costs associated with employee absenteeism from work due to stroke, either to care for themselves or a family member, totaled $180 million in Ohio in 2010.

Stroke: Prevalence

Table 3.1. Estimated prevalence of adults (age 18+) ever diagnosed with stroke, Ohio and the United States, 2012

	Ohio Prevalence (%)	95% CI	U.S. Prevalence (%)[#]
Total	3.1	2.8 - 3.5	2.9
Sex			
Male	3.1	2.5 - 3.6	2.9
Female	3.2	2.7 - 3.6	2.9
Race/Ethnicity			
White	3.1	2.8 - 3.5	2.9
Black	2.6	1.6 - 3.5	3.9
Other	-	-	3.3
Multi-Racial		-	3.9
Hispanic	-	-	1.7
Age Group			
18 - 24	-	-	0.0
25 - 34	-	-	0.9
35 - 44	1.3	0.7 - 1.9	1.3
45 - 54	2.0	1.3 - 2.7	2.5
55 - 64	4.9	3.7 - 6.0	3.6
65+	8.2	7.1 - 9.3	7.6
Household Income			
<$15,000	5.9	4.5 - 7.3	6.0
$15,000 - $24,999	5.6	4.4 - 6.8	4.0
$25,000 - $34,999	3.6	2.4 - 4.8	3.2
$35,000 - $49,999	1.9	1.2 - 2.5	2.5
$50,000 - $74,999	1.3	0.8 - 1.9	1.4*
$75,000+	0.9	0.4 - 1.3	
Education			
<High school	5.8	4.2 - 7.4	5.8
High school graduate	3.8	3.2 - 4.4	3.4
Some college	2.3	1.7 - 2.8	2.6
College graduate	1.6	1.2 - 2.0	1.6

Source: 2012 Ohio Behavioral Risk Factor Surveillance System, Ohio Department of Health, 2013; 2012 Behavioral Risk Factor Surveillance System, Centers for Disease Control and Prevention, 2013.

[#] U.S. prevalence is the median prevalence of the 50 states, D.C. and U.S. territories.

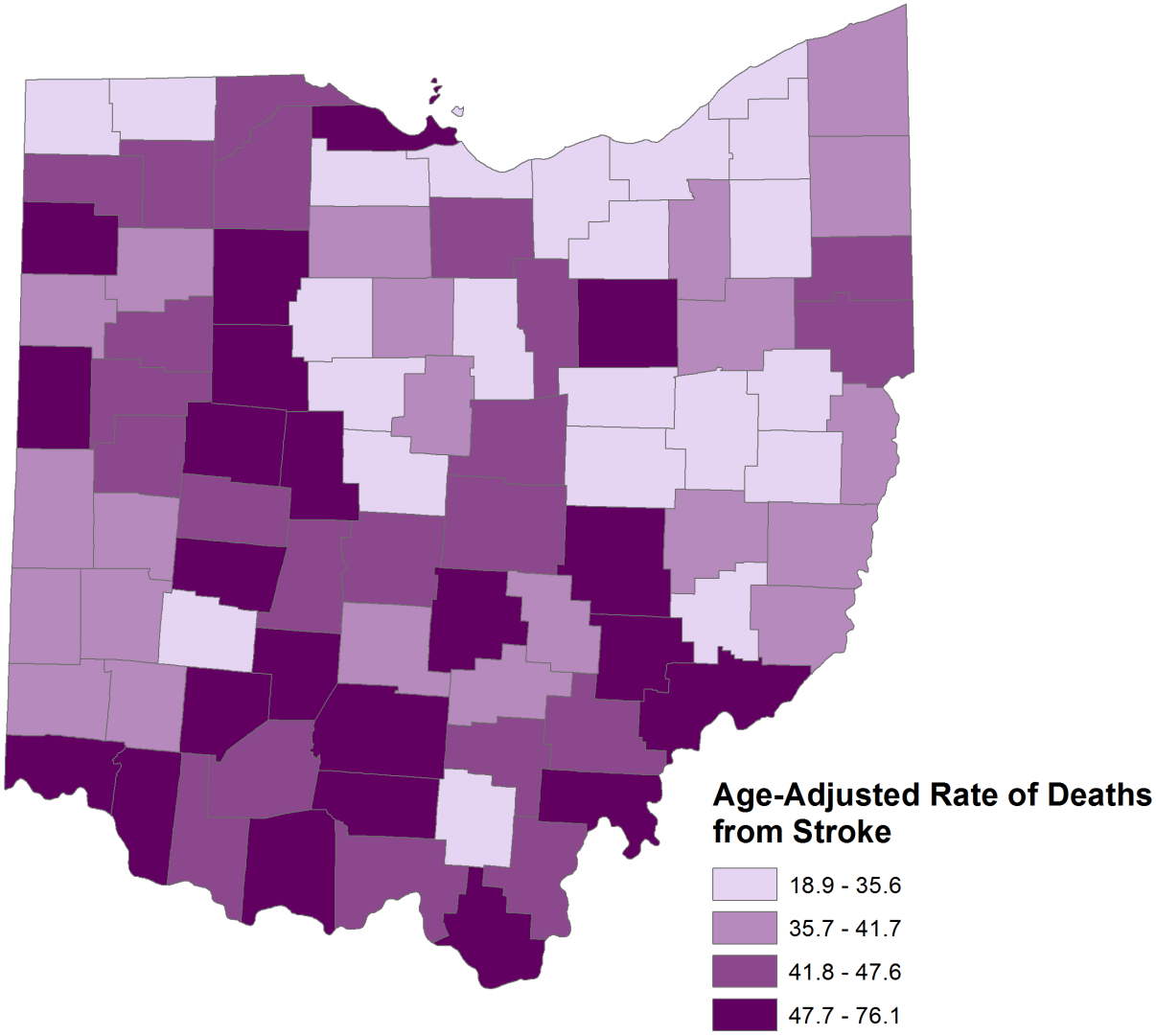
* U.S. estimate is for $50,000+.

- As shown in **Table 3.1**, in Ohio in 2012, 3.1 percent of adults reported having had a stroke, according to data from the Ohio BRFSS. However, the prevalence of stroke may be underestimated because the BRFSS is less likely to capture adults who have been disabled by a stroke (such as those living in an institution or who are unable to respond to a phone survey).
- In Ohio in 2012, men and women as well as whites and blacks had a similar prevalence of stroke.
- Stroke prevalence increases as individuals age. In 2012, very few Ohio adults under age 35 reported having had a stroke, while nearly one in 12 adults age 65 and older had experienced a stroke.
- The prevalence of stroke decreases with increasing household income. Ohioans with a household income less than $15,000 per year were 6.6 times more likely to have had a stroke compared with those earning $75,000 or more per year, according to 2012 data.
- Similar to household income, stroke prevalence decreases as educational attainment increases. In 2012, Ohioans who had not completed high school were 3.6 times more likely to report ever having had a stroke compared with those who earned a college degree.

Stroke: Mortality

- In Ohio in 2012, stroke was the fourth leading cause of death.
- Stroke claimed the lives of 5,744 Ohioans in 2012, which equates to an age-adjusted death rate of 40.9 per 100,000.
- Men in Ohio were slightly more likely to die of stroke than women (42.5 per 100,000 and 39.2 per 100,000 in 2012, respectively).
- In Ohio, blacks had a 36 percent higher age-adjusted stroke death rate in 2012 compared with whites (53.4 per 100,000 and 39.4 per 100,000, respectively).
- Black men in Ohio had the highest rate of stroke death in 2012 (62.3 per 100,000).
- More than 30 percent of stroke deaths among black men in Ohio occurred before age 65 in 2012; whereas, approximately 15 percent of stroke deaths occurred before age 65 in white men.
- Black women in Ohio are also disparately affected by stroke. In 2012, the stroke death rate for black women (47.2 per 100,000) was 24 percent higher than that of white women (38.1 per 100,000).
- The stroke death rate in Ohio varied greatly by county in 2012. The county with the highest age-adjusted death rate (Morgan County, 76.1 per 100,000) had a rate four times higher than the county with the lowest rate (Geauga County, 18.9 per 100,000) (**Figure 3.1**).

Figure 3.1. Age-adjusted stroke death rate per 100,000 by county, Ohio, 2012

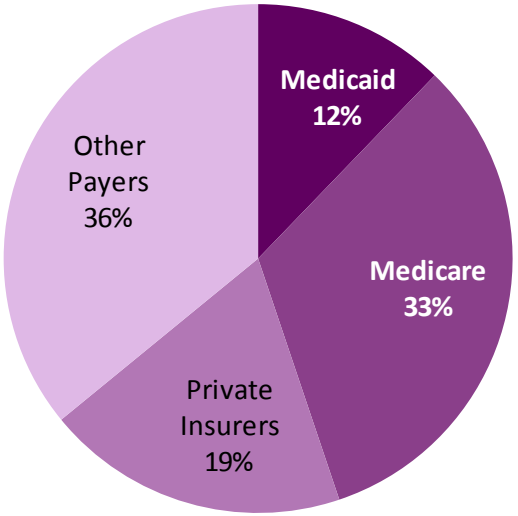


Source: Ohio Bureau of Vital Statistics, Ohio Department of Health, 2014.

Stroke: Costs and Trends

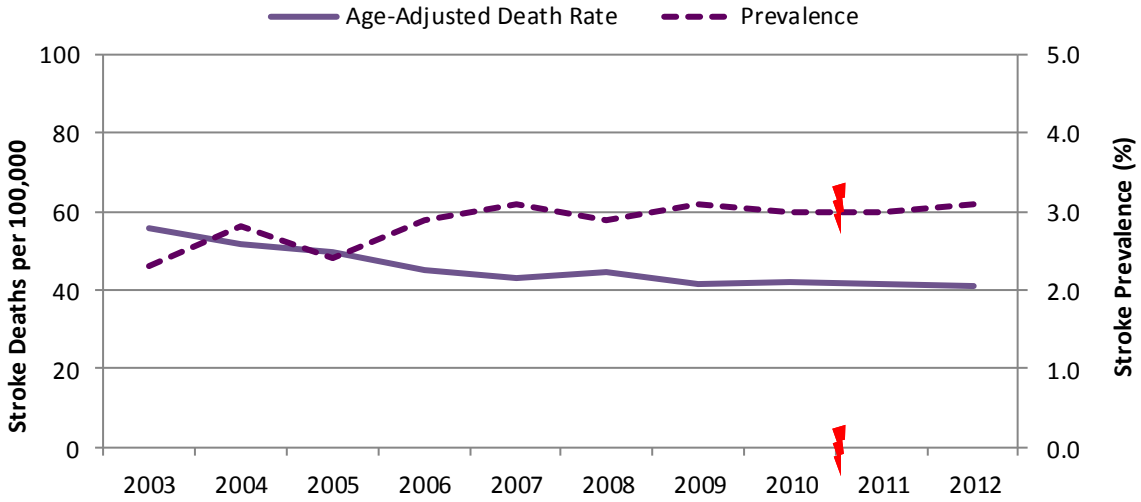
- Stroke costs the state of Ohio approximately $2.7 billion in 2010 in medical costs and absenteeism from the workplace.
- The vast majority of the costs associated with stroke ($2.5 billion) were medical costs, including office visits, outpatient visits, emergency room visits, inpatient hospitalizations, home health care, vision aids, medical equipment, prescription medications and nursing homes.
- As shown in **Figure 3.2**, among insurance payers, "Other Payers", including those who self-pay, the uninsured, charity payers and others (e.g., Tricare, Indian Health Service, etc.) spent $900 million in medical costs in 2010. Medicare spent the second-highest amount for medical costs due to stroke per year ($820 million), followed by private insurers ($484 million) and Medicaid ($300 million).
- Absenteeism from places of employment due to stroke costs an additional $180 million in 2010. These costs are associated with missed days of work only and do not account for lost productivity, premature mortality and reduced quality of life.

Figure 3.2. Estimated percentage of medical costs due to stroke by payer, Ohio, 2010



Source: Chronic Disease Cost Calculator version 2, Centers for Disease Control and Prevention, 2014.

Figure 3.3. Age-adjusted stroke death rate per 100,000 and estimated prevalence of adults (age 18+) ever diagnosed with stroke, Ohio, 2003-2012



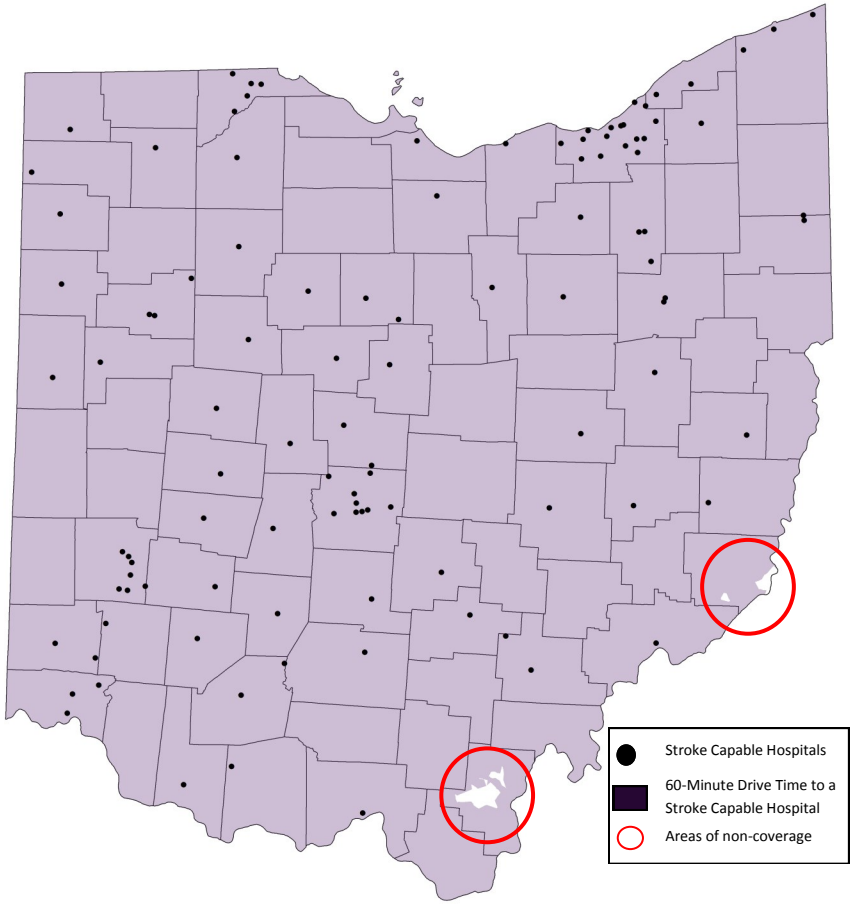
Source: Ohio Bureau of Vital Statistics, Ohio Department of Health, 2014; 2003-2012 Ohio Behavioral Risk Factor Surveillance System, Ohio Department of Health, 2013.

BRFSS data prior to 2011 cannot be compared with data for 2011 and after due to changes in weighting methodology.

- As shown in **Figure 3.3**, in Ohio, the age-adjusted stroke death rate has declined 26 percent, from 55.6 per 100,000 in 2003 to 40.9 per 100,000 in 2012. The decline leveled off, and has remained relatively steady, since 2009.
- In contrast to death rates, the proportion of adults in Ohio who reported ever having had a stroke increased 30 percent from 2003 to 2010 and was steady from 2011 to 2012.
- Stroke trends may be attributed to many factors, including advances in acute medical care, increases in public awareness of stroke signs and symptoms and appropriate responses, and enhanced emergency medical service and 9-1-1 access across the state.

Stroke: Telemedicine

Figure 3.4. Population coverage within a 60-minute drive time of a stroke capable hospital, Ohio, July 2013



Source: Joint Commission, Healthcare Facilities Accrediting Program and DNV, 2013.

Spotlight: Stroke Telemedicine in Ohio

In Ohio, hospitals can be certified as a primary stroke center or comprehensive stroke center by a number of accrediting bodies, including the Joint Commission, the Healthcare Facilities Accrediting Program or DNV. The majority of stroke centers in Ohio are located in metropolitan areas, where the majority of Ohio's population is concentrated. This, however, leaves a relative lack of access to high-level stroke care in rural areas, where the nearest stroke center may be hours away.

In 2011, several hospital systems in Ohio launched telemedicine projects to increase access of small rural hospitals to life-saving stroke care. In these systems, the "hub" hospital and the "spoke" hospitals are connected electronically to share records, medical tests and real-time physical exams via video. This allows the spoke hospital 24-hour/7-day access to the resources to best care for patients experiencing stroke. As of July 2013, there were more than 50 spoke hospitals connected to a primary or comprehensive stroke center participating in telestroke networks that serve Ohio residents.

Utilizing geospatial analytic tools, it was determined that only a few very small areas in southeast Ohio were not within a 60-minute drive time of a stroke-capable hospital (**Figure 3.4**). As of July 2013, 99.95 percent of Ohioans lived within a 60-minute drive time of a stroke center or telestroke spoke hospital.

Diabetes: Introduction and Key Findings

Diabetes mellitus is the seventh leading cause of death in Ohio and the United States. Diabetes was the primary cause of death for 3,600 Ohioans and was a contributing cause of many more deaths. In addition, it is estimated that more than 8 million Americans have type 2 diabetes but do not know it and another 86 million Americans are at risk for developing it (known as prediabetes).

Diabetes occurs when the pancreas can no longer make enough insulin to control blood sugar. While this can happen for a number of reasons, the most common reasons are from auto-immune pancreatic cell destruction (type 1), or an inability of cells to respond to insulin correctly (type 2). Type 2 diabetes accounts for the vast majority (90-95 percent) of diabetes cases in the United States, with type 1 diabetes accounting for about 5 percent of cases.

Risk of type 2 diabetes is associated with both genetic and lifestyle factors including obesity, poor diet, lack of physical activity and tobacco use. Uncontrolled, diabetes can lead to damage of the eyes, kidneys, blood vessels and nerves, and often complicates many other diseases. Successful control of blood sugars throughout one's life is the cornerstone of diabetes care. Good nutrition, blood sugar monitoring, medications and proper healthcare screenings are critical for success, and regular physical activity and tobacco cessation greatly improves both diabetes control and quality of life.

Key Findings

How does Ohio compare with the United States?

- The overall prevalence of diabetes among adults in Ohio (11.7 percent) was higher than the U.S. median prevalence (9.7 percent) in 2012.
- In Ohio, diabetes prevalence by sex, race/ethnicity, age group, household income and educational attainment was higher compared with the U.S. median, with the exception of "Other" races (Asian, Pacific Islander, Native Hawaiian and Native American), which had a lower prevalence in Ohio compared with the U.S. median.
- Among the 50 states and District of Columbia in 2012, Ohio had the sixth highest age-adjusted diabetes death rate.

Who is most at risk?

- The prevalence of diabetes increases as individuals age. In 2012, Ohioans age 65 and older (23.3 percent) had a diabetes prevalence 19.4 times higher than Ohioans age 18-24 (1.2 percent).
- Black Ohioans were more likely to die of diabetes in 2012 than their white peers (43.4 per 100,000 versus 24.3 per 100,000, respectively).
- Ohio adults with lower household incomes and lower educational attainment had a higher prevalence of diabetes in 2012 compared with those having higher incomes and more education.

How is it associated with other diseases and risk factors?

- The prevalence of diabetes in Ohio among obese adults (21.9 percent) was nearly five times higher than adults in the normal BMI range (4.5 percent) in 2012.
- Ohio adults who reported no physical activity outside of their regular job in the past 30 days had more than two times the prevalence of diabetes compared with those that did report engaging in physical activity (19.6 percent and 8.9 percent, respectively) in 2012.
- Ohio adults with diabetes are much more likely to also report having had a heart attack (16.6 percent) than adults without diabetes (3.9 percent) in 2012.

How much does it cost?

- In Ohio, diabetes cost more than $4.6 billion in 2010 in medical expenses and absenteeism from the workplace.
- In Ohio, Medicare and Medicaid paid a total of nearly $1.8 billion in medical expenses related to diabetes care in 2010.
- The costs associated with employee absenteeism from work due to diabetes, either to care for themselves or a family member, totaled $172 million in Ohio in 2010.

Diabetes: Prevalence

Table 4.1. Estimated prevalence of adults (age 18+) ever diagnosed with diabetes, Ohio and the United States, 2012

	Ohio Prevalence (%)	95% CI	U.S. Prevalence (%)[#]
Total	11.7	11.0 - 12.4	9.7
Sex			
Male	12.5	11.4 - 13.6	10.3
Female	10.9	10.0 - 11.8	9.4
Race/Ethnicity			
White	11.3	10.5 - 12.0	9.4
Black	16.0	13.1 - 19.0	13.6
Other	5.1	2.4 - 7.8	9.6
Multi-Racial	11.6	6.2 - 17.0	9.3
Hispanic	11.6	6.6 - 16.6	9.8
Age Group			
18 - 24	1.2	0.3 - 2.1	-
25 - 34	2.9	1.7 - 4.0	2.2
35 - 44	6.9	5.1 - 8.7	5.3
45 - 54	11.1	9.5 - 12.6	9.9
55 - 64	19.0	17.0 - 21.1	16.3
65+	23.3	21.5 - 25.1	20.8
Household Income			
<$15,000	15.5	13.0 - 18.1	14.8
$15,000 - $24,999	15.7	13.6 - 17.8	13.1
$25,000 - $34,999	13.3	11.1 - 15.4	11.2
$35,000 - $49,999	13.5	11.3 - 15.6	10.0
$50,000 - $74,999	8.1	6.6 - 9.6	6.8*
$75,000+	6.7	5.4 - 7.9	
Education			
<High school	17.0	14.1 - 19.9	15.0
High school graduate	12.6	11.4 - 13.7	11.0
Some college	11.6	10.3 - 13.0	9.4
College graduate	7.2	6.2 - 8.2	6.8

Source: 2012 Ohio Behavioral Risk Factor Surveillance System, Ohio Department of Health, 2013; 2012 Behavioral Risk Factor Surveillance System, Centers for Disease Control and Prevention, 2013.

[#] U.S. prevalence is the median prevalence of the 50 states, D.C. and U.S. territories.

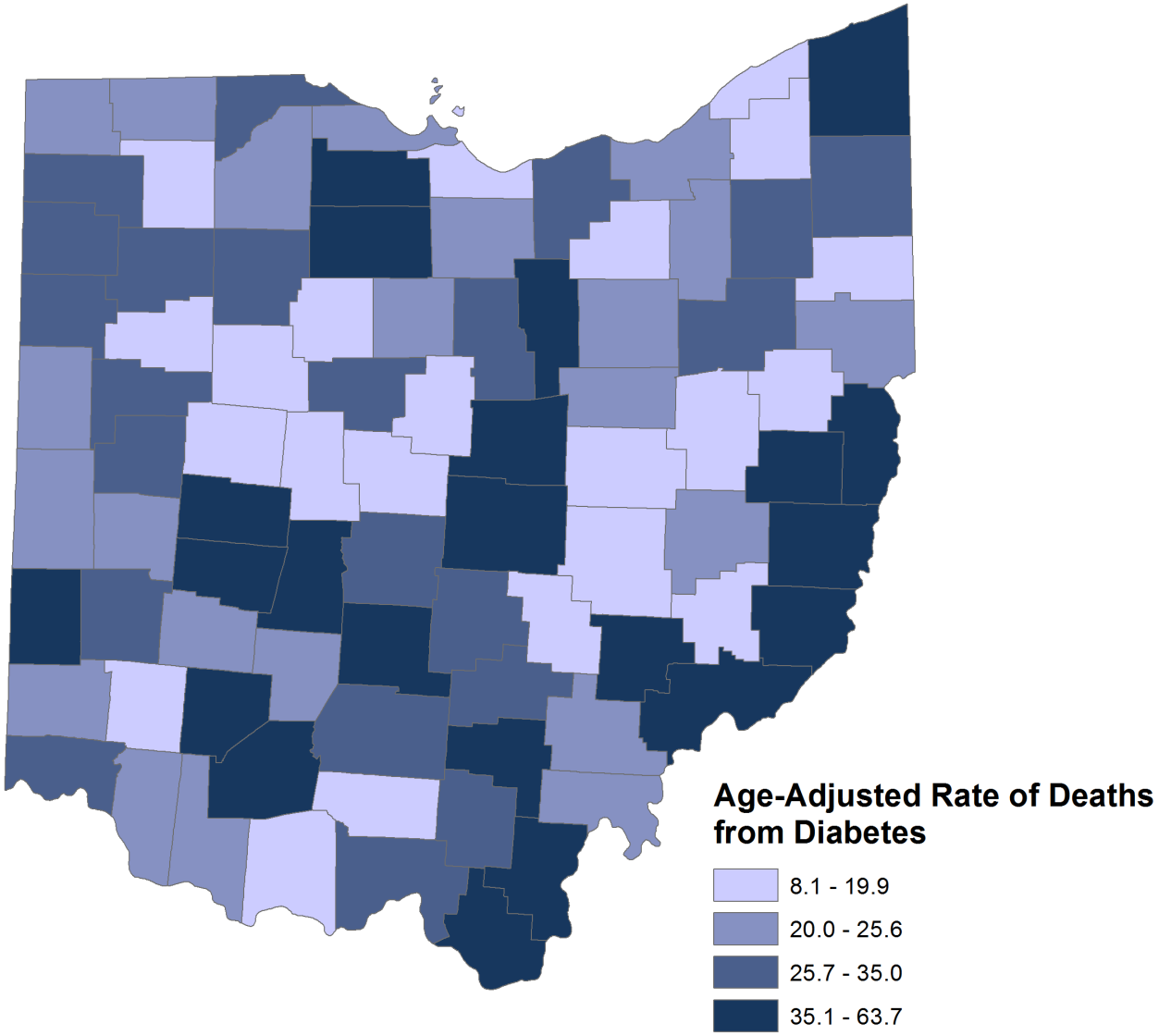
* U.S. estimate is for $50,000+.

- As shown in **Table 4.1**, in Ohio in 2012, 11.7 percent of adults reported having ever been diagnosed with diabetes, according to data from the Ohio BRFSS.
- In Ohio in 2012, men had a similar prevalence of diabetes compared with women.
- In 2012, black Ohioans had the highest prevalence of diabetes (16.0 percent) while Ohioans of "Other" races had the lowest prevalence (5.1 percent).
- Diabetes prevalence increases as individuals age. In 2012, only about 1 percent of Ohioans age 18-24 had ever been diagnosed with diabetes, while nearly one quarter of adults age 65 and older had been diagnosed.
- The prevalence of diabetes decreases with increasing household income. Ohioans with a household income less than $15,000 per year were 2.3 times more likely to have diabetes compared with those earning $75,000 or more per year, according to 2012 data.
- Similar to household income, diabetes prevalence decreases as educational attainment increases. In 2012, Ohioans who had not completed high school were 2.4 times more likely to report being diagnosed with diabetes compared with those who earned a college degree.

Diabetes: Mortality

- In Ohio in 2012, diabetes was the seventh leading cause of death.
- Diabetes claimed the lives of 3,616 Ohioans in 2012, which equates to an age-adjusted death rate of 26.1 per 100,000.
- Men in Ohio were more likely to die of diabetes than women (31.4 per 100,000 and 22.0 per 100,000 in Ohio in 2012, respectively).
- In Ohio, blacks had a 79 percent higher age-adjusted diabetes death rate in 2012 compared with whites (43.4 per 100,000 and 24.3 per 100,000, respectively).
- Black men in Ohio had the highest rate of diabetes deaths in 2012 (52.0 per 100,000).
- In 2012, 43.5 percent of diabetes deaths among black men in Ohio occurred before age 65; whereas, 28.9 percent of diabetes deaths occurred before age 65 in white men.
- Black women in Ohio are also disparately affected by diabetes. In 2012, the diabetes death rate for black women (37.2 per 100,000) was 82 percent higher than that of white women (20.4 per 100,000).
- The diabetes death rate in Ohio varied greatly by county in 2012. The county with the highest age-adjusted death rate (Harrison County, 63.7 per 100,000) had a rate nearly eight times higher than the county with the lowest rate (Wyandot County, 8.1 per 100,000) (**Figure 4.1**).

Figure 4.1. Age-adjusted diabetes death rate per 100,000 by county, Ohio, 2012

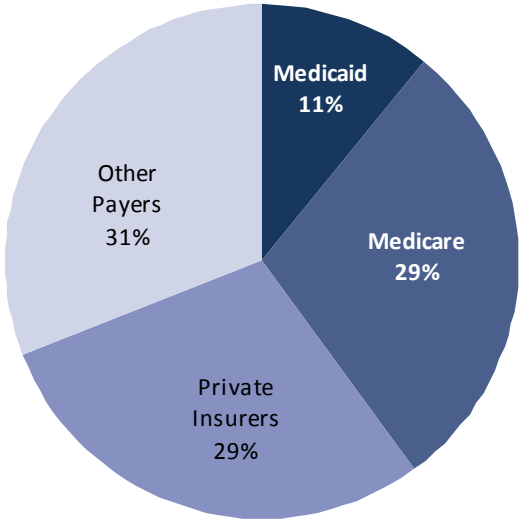


Source: Ohio Bureau of Vital Statistics, Ohio Department of Health, 2014.

Diabetes: Costs and Trends

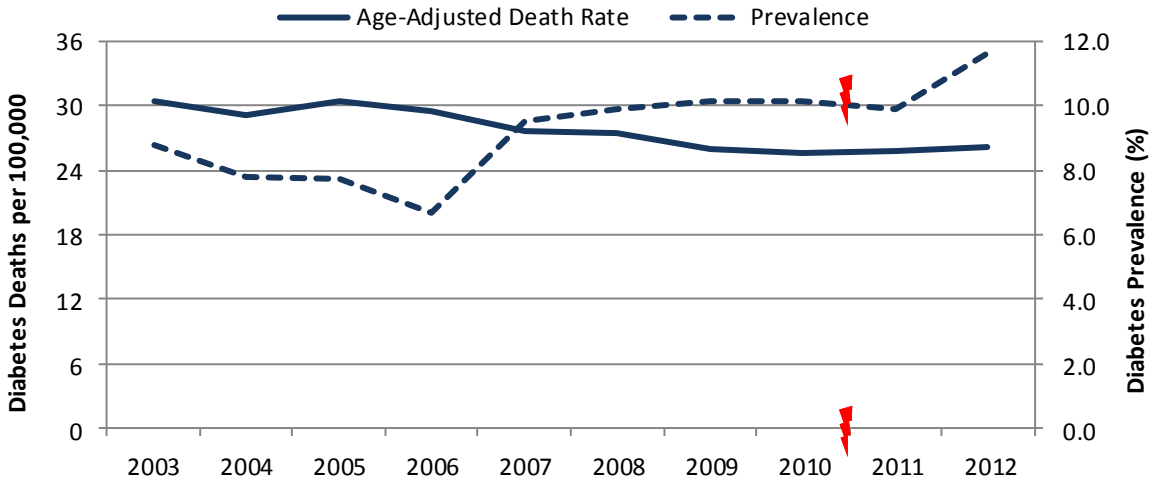
- Diabetes cost the state of Ohio approximately $4.6 billion in medical costs and absenteeism from the workplace in 2010.
- The vast majority of the costs associated with diabetes ($4.5 billion) were medical costs, including office visits, outpatient visits, emergency room visits, inpatient hospitalizations, home health care, vision aids, medical equipment, prescription medications and nursing homes.
- As shown in **Figure 4.2**, among insurance payers, "Other Payers", including those who self-pay, the uninsured, charity payers and others (e.g., Tricare, Indian Health Service, etc.), spent the most for medical costs due to diabetes in 2010 ($1.4 billion), followed by private insurers ($1.3 billion), Medicare ($1.3 billion) and Medicaid ($486 million).
- Absenteeism from places of employment due to diabetes cost an additional $172 million in 2010. These costs are associated with missed days of work only and do not account for lost productivity, premature mortality and reduced quality of life.

Figure 4.2. Estimated percentage of medical costs due to diabetes by payer, Ohio, 2010



Source: Chronic Disease Cost Calculator version 2, Centers for Disease Control and Prevention, 2014.

Figure 4.3. Age-adjusted diabetes death rate per 100,000 and estimated prevalence of adults (age 18+) ever diagnosed with diabetes, Ohio, 2003-2012



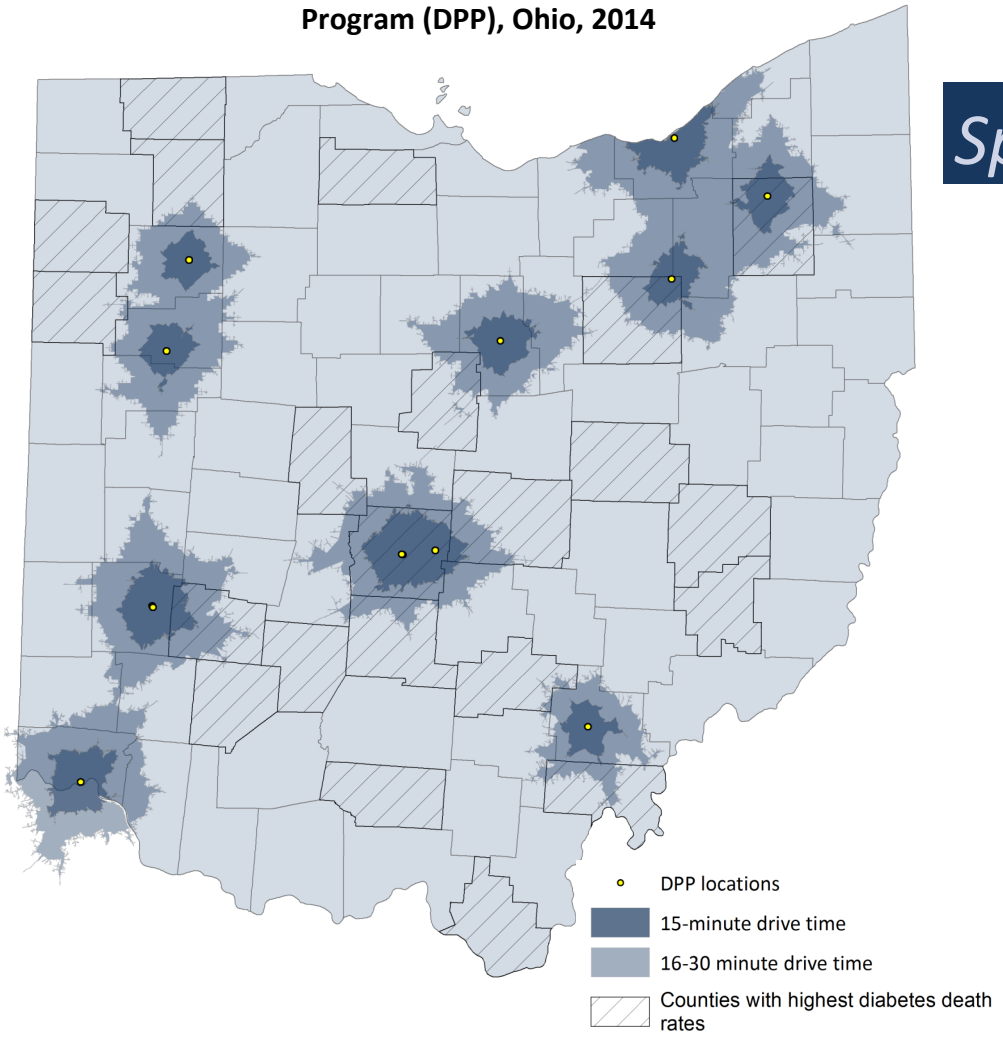
Source: Ohio Bureau of Vital Statistics, Ohio Department of Health, 2014; 2003-2012 Ohio Behavioral Risk Factor Surveillance System, Ohio Department of Health, 2013.

BRFSS data prior to 2011 cannot be compared with data for 2011 and after due to changes in weighting methodology.

- As shown in **Figure 4.3**, in Ohio, the age-adjusted diabetes death rate declined 14 percent, from 30.4 per 100,000 in 2003 to 26.1 per 100,000 in 2012. However, the age-adjusted death rate has remained relatively steady since 2009.
- In contrast to death rates, the proportion of adults in Ohio who reported ever having diabetes increased from 2003 (8.8 percent) to 2010 (10.1 percent) and increased from 9.9 percent in 2011 to 11.6 percent in 2012.
- It is important to note that diabetes often contributes to death and disability from other diseases and conditions (e.g., heart disease and stroke), and thus is not often classified as the underlying cause of death.

Diabetes: Prevention

Figure 4.4. Population coverage within a 15-minute and 30-minute drive time of an Ohio, CDC-recognized Diabetes Prevention Program (DPP), Ohio, 2014



Source: National Center for Chronic Disease Prevention and Health Promotion, Division of Diabetes Translation, Centers for Disease Control and Prevention, 2014; Ohio Bureau of Vital Statistics, Ohio Department of Health, 2014.

Spotlight: Diabetes Prevention in Ohio

The CDC provides recognition to lifestyle change programs that focus on the prevention of type 2 diabetes among individuals who have been diagnosed with prediabetes or who are at risk for developing diabetes. Diabetes Prevention Programs (DPP) can become recognized when they meet a specific set of criteria set forth by the CDC Diabetes Prevention Recognition Program including standardized curricula, participant eligibility, staff training and capacity among many other standards (http://www.cdc.gov/diabetes/prevention/).

CDC-funded efforts to prevent and control diabetes at ODH include increasing the availability of DPP, promoting available resources and utilization of classes by individuals with prediabetes or at risk for diabetes, increasing referrals and supporting health insurance coverage of DPP services. Ohio has 13 locations that are CDC-recognized DPP providers as of December 2014.

Utilizing the population-weighted centroid of census block groups and the locations of the 13 CDC-recognized DPPs in Ohio, this geospatial analysis shows that only 27.3 percent of Ohioans live within a 15-minute drive of an Ohio DPP location (**Figure 4.4**). An additional 29.9 percent live within a 30-minute drive. Thus, only 57.2 percent of Ohioans live within 30 minutes of an Ohio, CDC-recognized DPP provider, leaving nearly five million Ohioans without ready access to these services. In addition, the majority of counties with the highest diabetes death rates do not currently have a DPP located within the county.

Cancer: Introduction and Key Findings

Cancer is the second leading cause of death in Ohio and the United States, accounting for nearly one of every four deaths. Cancer claimed the lives of more than 25,000 Ohioans in 2012. In addition, the American Cancer Society estimates that 1,665,540 new cancer cases (incidence) will be diagnosed in the United States and 67,000 incident cases will be diagnosed in Ohio in 2014. The lifetime risk of developing cancer is 40 percent for men and 33 percent for women.

Cancer is a group of more than 100 different diseases characterized by uncontrolled growth and spread of abnormal cells. Cancer cells will often clump together and form tumors that can invade and destroy normal cells and tissues.

Everyone is at risk of developing cancer. Risk factors for cancer include a person's age, sex and family medical history (genetics). Other major risk factors are related to lifestyle choices such as using tobacco, drinking a lot of alcohol, eating a poor diet, not getting enough physical activity and having unprotected exposure to the sun. However, the causes of cancer vary greatly by type of cancer, and the causes of many cancers have yet to be identified.

Regular cancer screenings can result in the detection of cancer at earlier stages, when treatment is more likely to be successful and lead to long-term survival.

Key Findings

How does Ohio compare with the United States?

- The incidence of cancer in Ohio (466.3 per 100,000) was similar to the United States (460.4 per 100,000) in 2007-2011. However, the incidence of lung and bronchus cancer was 21 percent higher in Ohio (72.5 per 100,000) compared with the United States (60.1 per 100,000).
- Comparable to incidence, the prevalence of cancer was similar in Ohio (6.6 percent) compared with the U.S. median prevalence (6.5 percent) in 2012.
- In contrast, in 2011, the age-adjusted cancer death rate in Ohio (181.9 per 100,000) was 9 percent higher than the U.S. death rate (166.5 per 100,000).

Who is most at risk?

- Although cancer may strike at any age, it is mostly a disease of middle and older age. In Ohio, about 87 percent of all cancers were diagnosed at age 50 and older in 2011.
- Men in Ohio were more likely to develop cancer in 2007-2011 than women (532.3 per 100,000 versus 421.7 per 100,000, respectively).
- In Ohio, blacks had an 11 percent higher age-adjusted cancer death rate in 2012 compared with whites (200.7 per 100,000 and 180.4 per 100,000, respectively).

How is it associated with other diseases and risk factors?

- Other medical conditions that exist at the time of cancer diagnosis (comorbidities) influence the probability of dying from other causes and cancer survival.
- Nationally, the most common comorbid conditions among cancer patients were diabetes, COPD, congestive heart failure and cerebrovascular disease.
- Among women with late stage breast cancer, about 69 percent died from cancer within five years after diagnosis regardless of comorbidities.

How much does it cost?

- Cancer cost the state of Ohio nearly $4.9 billion in 2010 in medical expenses and absenteeism from the workplace.
- In Ohio, private insurers and Medicare paid $2.0 billion and $1.6 billion respectively, in medical costs for cancer in 2010.
- Other insurance payers, including those who self-pay, the uninsured, charity payers and others accounted for 21 percent of medical costs due to cancer, while Medicaid paid 5 percent of the costs in 2010.

Cancer: Incidence

Table 5.1. Average annual age-adjusted cancer incidence rate per 100,000, Ohio and the United States, 2007–2011

	Ohio Incidence	U.S. (SEER) Incidence
All Sites/Types	466.3	460.4
Sex		
Male	532.3	529.4
Female	421.7	411.3
Race/Ethnicity		
White	457.4	468.9
Black	481.3	480.8
Age Group		
<65	229.2	223.8
65+	2,105.7	2,095.8
Leading Types		
Lung and Bronchus	72.5	60.1
Colon and Rectum	44.5	43.7
Breast (Females)	120.1	124.6
Prostate	136.3	147.8

Source: Ohio Cancer Incidence Surveillance System, Ohio Department of Health, 2014; Surveillance, Epidemiology and End Results (SEER) Program, National Cancer Institute, 2014.

- In 2007-2011, a yearly average of 61,086 new invasive cancer cases were diagnosed in Ohio and reported to the Ohio Cancer Incidence Surveillance System (OCISS).
- As shown in **Figure 5.1**, for all cancer sites/types combined, the incidence rate in 2007-2011 in Ohio (466.3 per 100,000) was similar to the U.S. rate (460.4 per 100,000).
- The overall estimate of completeness of case reporting to OCISS was 93 percent in 2007-2011. Thus, incidence rates in Ohio may actually be higher than reported.
- In 2007-2011, males had a 26 percent higher cancer incidence rate (532.3 per 100,000) compared with females (421.7 per 100,000).
- Black Ohioans were more likely to develop cancer than whites in 2007-2011.
- Most cancer cases occur in adults who are middle-aged or older. In Ohio, the cancer incidence rate among people age 65 and older was 2,015.7 per 100,000 in 2007-2011.
- The incidence rate of lung and bronchus cancer in Ohio in 2007-2011 (72.5 per 100,000) was 21 percent higher than the U.S. incidence rate of 60.1 per 100,000.
- The incidence rate of colon and rectum cancer in Ohio was 44.5 per 100,000, which was similar to the U.S. rate of 43.7 per 100,000 during this same time period.

Cancer: Prevalence

- As shown in **Table 5.2**, in Ohio in 2012, 6.6 percent of adults (age 18 and older) reported having had cancer (excluding skin cancer), according to data from the Ohio BRFSS. This is similar to the U.S. median prevalence (6.5 percent).
- In 2012, cancer prevalence by sex, race, age group, household income and education was similar in Ohio compared with the U.S. median, with the exception of a higher prevalence in Ohio among people with a household income of $15,000-$24,999.
- The prevalence of cancer increases with age. In 2012, very few Ohio adults under age 25 reported having had cancer, while nearly one in six adults age 65 and older had cancer.
- In 2012, cancer prevalence was significantly lower among Ohioans with an annual household income of $50,000 or more per year compared with those earning $15,000-$24,999.
- Cancer prevalence decreases with increasing education. In 2012, college graduates reported a 26 percent lower prevalence of cancer (5.7 percent) compared with those who had not completed high school (7.7 percent).

Table 5.2. Estimated prevalence of adults (age 18+) ever diagnosed with cancer (excluding skin cancer), Ohio and the United States, 2012

	Ohio Prevalence (%)	95% CI	U.S. Prevalence (%)[#]
Total	6.6	6.1 - 7.1	6.5
Sex			
Male	4.8	4.1 - 5.4	5.2
Female	8.3	7.6 - 9.1	7.6
Race/Ethnicity			
White	6.9	6.3 - 7.4	7.4
Black	5.2	3.7 - 6.7	4.4
Other	4.1	1.3 - 7.0	4.5
Multi-Racial	5.9	1.1 - 10.7	8.0
Hispanic	6.8	2.7 - 10.8	3.1
Age Group			
18 - 24	0.7	0.0 - 1.5	0.0
25 - 34	3.1	1.9 - 4.4	2.3
35 - 44	2.1	1.3 - 2.9	2.8
45 - 54	5.3	4.2 - 6.4	5.2
55 - 64	8.8	7.5 - 10.0	8.7
65+	16.3	14.8 - 17.9	16.9
Household Income			
<$15,000	7.0	5.3 - 8.7	7.0
$15,000 - $24,999	9.1	7.7 - 10.6	7.0
$25,000 - $34,999	7.1	5.5 - 8.7	7.1
$35,000 - $49,999	6.7	5.4 - 8.1	6.8
$50,000 - $74,999	4.9	3.8 - 6.0	5.2*
$75,000+	5.1	4.1 - 6.0	
Education			
<High school	7.7	5.8 - 9.5	7.5
High school graduate	7.4	6.5 - 8.3	6.6
Some college	5.8	5.0 - 6.7	6.3
College graduate	5.7	4.9 - 6.6	6.0

Source: 2012 Ohio Behavioral Risk Factor Surveillance System, Ohio Department of Health, 2013; 2012 Behavioral Risk Factor Surveillance System, Centers for Disease Control and Prevention, 2013.

[#] U.S. prevalence is the median prevalence of the 50 states, D.C. and U.S. territories.

* U.S. estimate is for $50,000+.

Cancer: Stage

in situ: Non-invasive cancer present only in the layer of tissue where it developed and has not spread.

Local: Cancer confined entirely to the organ of origin.

Regional: Cancer extending beyond the organ of origin directly into surrounding organs or tissues or into regional lymph nodes.

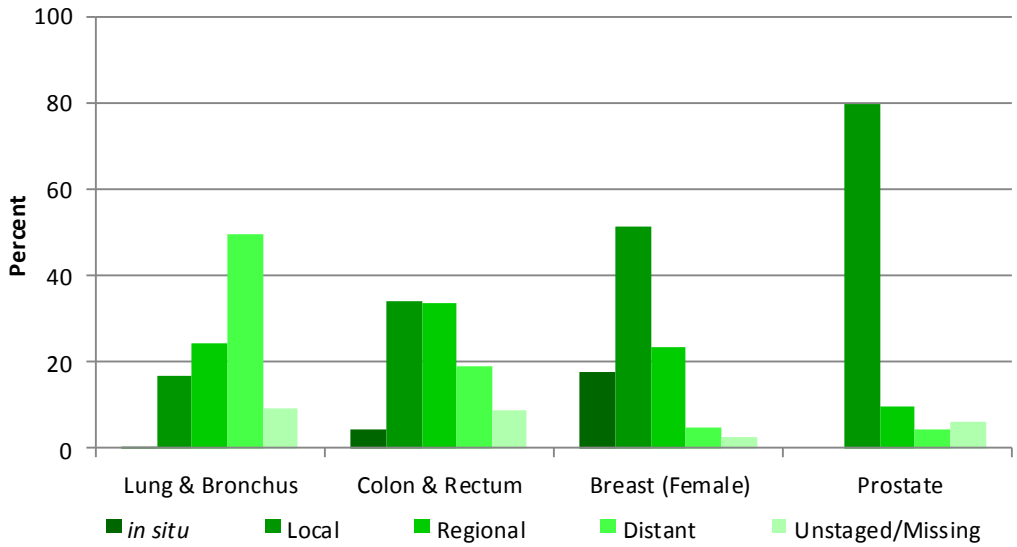
Distant: Cancer that has spread to distant organs, tissues and/or lymph nodes remote from the primary tumor.

Table 5.3. Stage at diagnosis for all cancers combined, Ohio and the United States, 2011

	Ohio (%)	U.S. (SEER) (%)
Stage at Diagnosis		
in situ	8.5	9.9
Local	41.3	41.2
Regional	19.5	18.5
Distant	21.6	21.6
Unstaged/Missing	9.0	8.8

Source: Ohio Cancer Incidence Surveillance System, Ohio Department of Health, 2014; Surveillance, Epidemiology and End Results (SEER) Program, National Cancer Institute, 2014.

Figure 5.1. Stage at diagnosis for selected cancer sites/types, Ohio, 2011



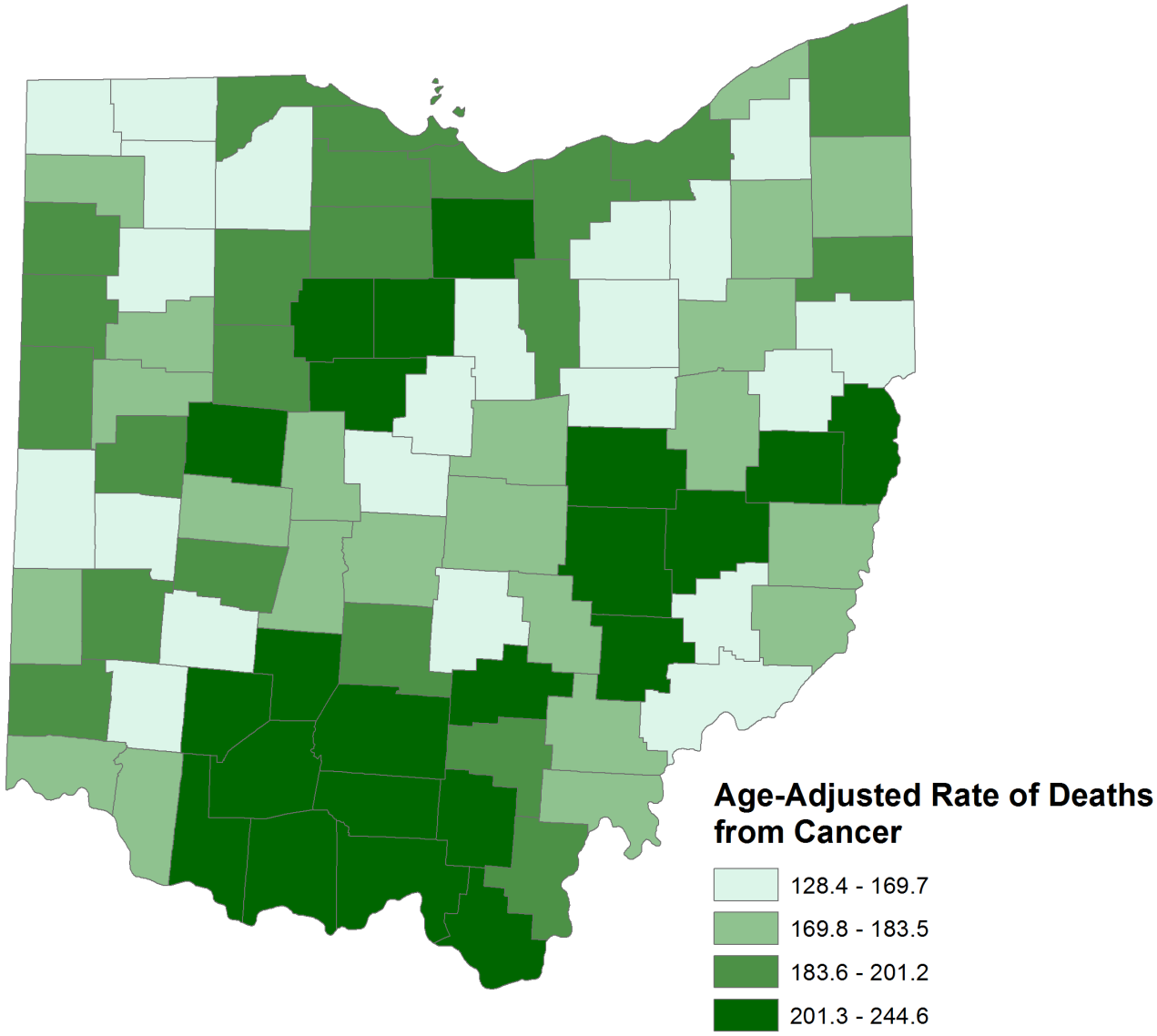
Source: Ohio Cancer Incidence Surveillance System, Ohio Department of Health, 2014.

- A cancer's stage at diagnosis is based on the primary tumor's size and location in the body and whether it has spread to other areas of the body (see definitions at left).
- As shown in **Table 5.3**, 41.3 percent of cancers diagnosed in 2011 were local stage, 19.5 percent were regional stage and 21.6 percent were distant stage at diagnosis.
- In Ohio in 2011, 69 percent of breast cancers among women were diagnosed early (*in situ* or local stage) (**Figure 5.1**). The five-year relative survival probability for localized breast cancer was 99 percent in 2004-2010.
- In Ohio in 2011, 33.9 percent of colon and rectum cancers were diagnosed local stage and 33.8 percent were regional stage. When colon and rectum cancers are diagnosed local stage, the five-year survival probability is 90 percent. If the cancer has spread regionally to involve nearby organs or lymph nodes at the time of diagnosis, the five-year survival probability drops to 70 percent.
- Only about 17 percent of lung and bronchus cancers in Ohio in 2011 were diagnosed local stage, for which the five-year survival probability is 54 percent.
- In 2011, the majority (89.2 percent) of prostate cancers in Ohio were diagnosed local or regional stage, for which the five-year relative survival probability is 100 percent.

Cancer: Mortality

- Cancer is the second most common cause of death in Ohio and the United States, accounting for nearly one of every four deaths.
- Cancer claimed the lives of 25,246 Ohioans in 2012. The age-adjusted cancer death rate (181.9 per 100,000 persons) was 9 percent higher than the U.S. rate (166.5 per 100,000).
- Men in Ohio are more likely to die of cancer than women (219.1 per 100,000 and 155.4 per 100,000 in Ohio in 2012, respectively).
- In Ohio, blacks had an 11 percent higher age-adjusted cancer death rate in 2012 compared with whites (200.7 per 100,000 and 180.4 per 100,000, respectively).
- About 69 percent of all cancer deaths in Ohio occurred among those age 65 and older in 2012.
- Lung and bronchus cancer remained the leading cause of cancer death in Ohio in 2012, followed by colon and rectum cancer, breast cancer, pancreatic cancer and prostate cancer.
- The cancer death rate in Ohio varied by county in 2012. The county with the highest age-adjusted cancer death rate (Brown County, 244.6 per 100,000) had a rate nearly two times higher than the county with the lowest rate (Noble County, 128.4 per 100,000) (**Figure 5.2**).

Figure 5.2. Age-adjusted cancer death rate per 100,000 by county, Ohio, 2012

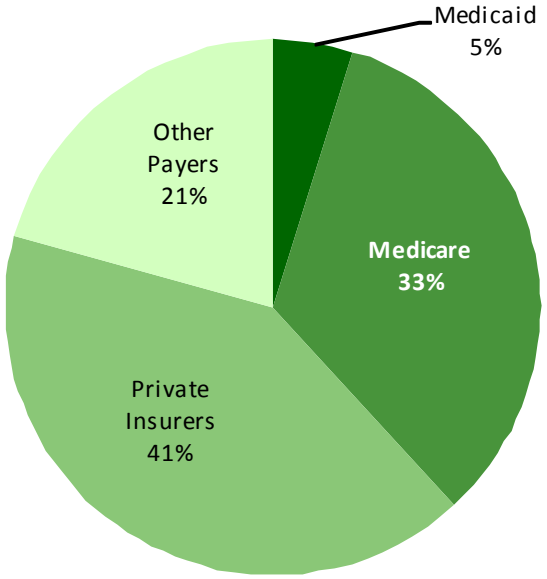


Source: Ohio Bureau of Vital Statistics, Ohio Department of Health, 2014.

Cancer: Costs and Trends

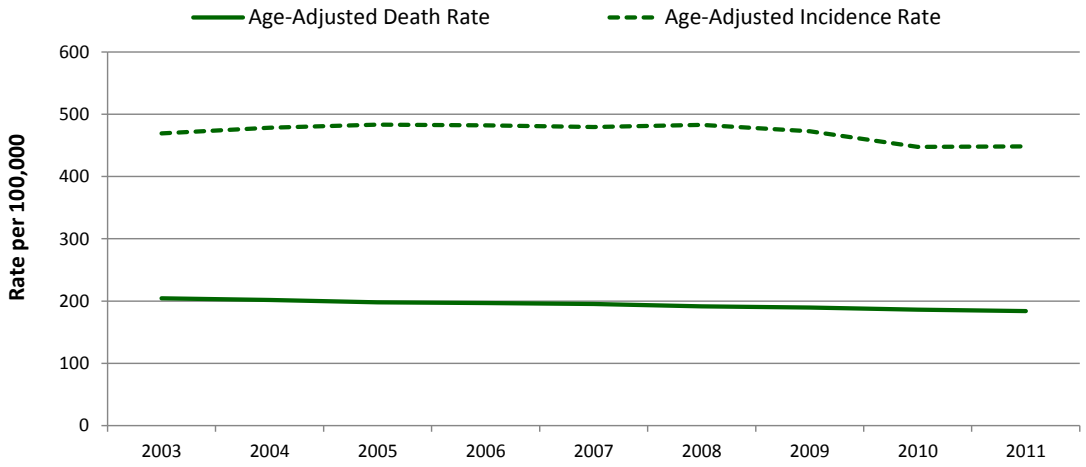
- Cancer cost the state of Ohio nearly $4.9 billion in 2010 in medical expenses and absenteeism from the workplace.
- In Ohio, private insurers and Medicare paid $2.0 billion and $1.6 billion, respectively, in medical costs for cancer in 2010.
- As shown in **Figure 5.3**, private insurers spent the highest percentage (41 percent) of medical costs due to cancer in 2010, followed by Medicare (33 percent).
- Other insurance payers, including those who self-pay, the uninsured, charity payers and others, accounted for 21 percent of medical costs due to cancer, while Medicaid paid 5 percent of the costs in 2010.
- The costs associated with employee absenteeism from work due to cancer, either to care for themselves or a family member, totaled $293 million in Ohio in 2010.

Figure 5.3. Estimated percentage of medical costs due to cancer by payer, Ohio, 2010



Source: Chronic Disease Cost Calculator version 2, Centers for Disease Control and Prevention, 2014.

Figure 5.4. Age-adjusted cancer incidence and death rates per 100,000, Ohio, 2003-2011

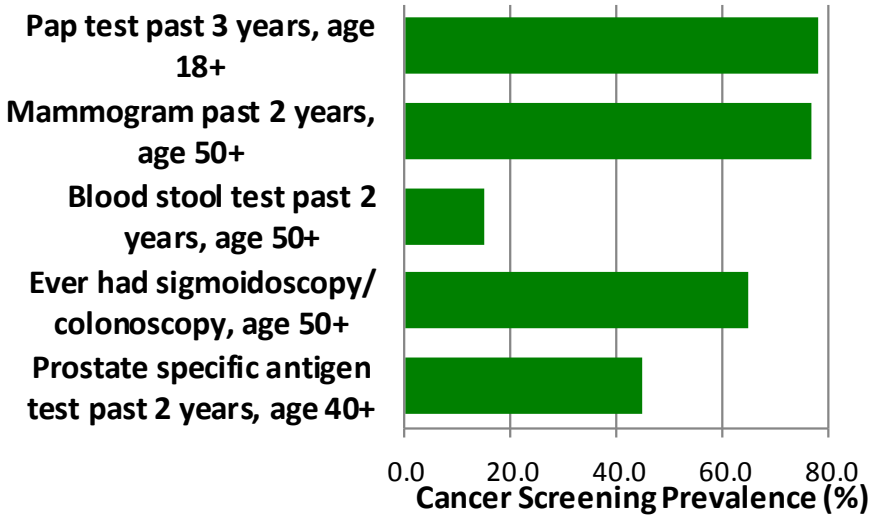


Source: Ohio Bureau of Vital Statistics, Ohio Department of Health, 2014; Ohio Cancer Incidence Surveillance System, Ohio Department of Health, 2014.

- As shown in **Figure 5.4**, the age-adjusted cancer mortality rate decreased 10 percent from 2003 (204.2 per 100,000) to 2011 (183.8 per 100,000).
- The age-adjusted cancer incidence rate decreased 5 percent from 2003 (469.2 per 100,000) to 2011 (448.3 per 100,000); however, this may be due to underreporting of cancer cases to OCISS in more recent years.

Cancer: Screening

Figure 5.5. Estimated prevalence of adults who received selected cancer screenings, Ohio, 2012



Source: 2012 Ohio Behavioral Risk Factor Surveillance System, Ohio Department of Health, 2013.

Spotlight: Cancer Screening

- Screening offers the ability for primary and secondary prevention of cancer through the removal of precancerous lesions (e.g., colon polyps) and by detecting cancer early, before symptoms appear. Early detection usually results in less extensive treatment and better outcomes. Screening is known to reduce mortality for cancers of the breast, cervix, colon and rectum, and lung (among heavy smokers). For more information on the survival for early versus late stage cancers, see the "Cancer: Stage" section on page 39.
- CDC and the U.S. Preventive Services Task Force (USPSTF) recommend screening for breast, cervical, colon and rectum, and lung cancers:
  - **Breast Cancer**: Mammograms are the best way to find breast cancer early, when it is easier to treat.
  - **Cervical Cancer**: The Pap test can find abnormal cells in the cervix which may turn into cancer. Pap tests can also find cervical cancer early, when the chance of being cured is very high.
  - **Colon and Rectum Cancer**: Colon and rectum cancer almost always develops from precancerous polyps (abnormal growths) in the colon or rectum. Screening tests can find precancerous polyps that can be removed before they turn into cancer. Screening tests also can find colon and rectum cancer early, when treatment is more likely to lead to long-term survival.
  - **Lung Cancer**: Lung cancer screening with low-dose computed tomography (LDCT) is recommended for people who have a history of heavy smoking, smoke now or have quit within the past 15 years and are between 55 and 80 years old.
- The USPSTF does not recommend screening for ovarian, prostate and skin cancers, as screening has not been shown to reduce deaths from these cancers. However, the American Cancer Society recommends periodic examination by a healthcare professional for cancers of the thyroid, testicles, ovaries, lymph nodes, oral cavity and skin.

COPD/CLRD: Introduction and Key Findings

It is estimated that 15 million Americans have been diagnosed with chronic obstructive pulmonary disease (COPD), and another 10 million have COPD but have not been diagnosed.

COPD is a groups of diseases that involve inflammation and thickening of the airways and destruction of the tissue of the lung where oxygen is exchanged. COPD typically includes chronic bronchitis and emphysema.

Chronic lower respiratory disease (CLRD) was the third leading cause of death in Ohio and the United States in 2012. CLRD claimed more than 7,000 lives in Ohio and more than 143,000 lives in the United States in 2012.

Similar to COPD, CLRD is a groups of diseases that are characterized by shortness of breath caused by airway obstruction. In addition to chronic bronchitis and emphysema, CLRD typically includes asthma.

The main symptoms of COPD/CLRD are shortness of breath, cough and sputum. Smoking tobacco is the leading cause of chronic bronchitis and emphysema in the United States with other, lesser contributions from air pollution and genetic factors. Most cases of COPD/CLRD can be prevented by decreasing exposure to tobacco smoke and air pollution.

Key Findings

How does Ohio compare with the United States?

- The overall prevalence of COPD among adults in Ohio (8.6 percent) was higher than the U.S. median prevalence (6.1 percent) in 2012.
- COPD prevalence by sex, race/ethnicity, age group, household income and educational attainment was also higher in Ohio compared with the U.S. median.
- Among the 50 states and District of Columbia, Ohio ranked 13th highest in the United States for the age-adjusted rate of CLRD deaths.

Who is most at risk?

- The prevalence of COPD increases with increasing age. In 2012, Ohioans age 65 and older (13.0 percent) had a COPD prevalence more than two times higher compared with Ohioans age 35-44 (6.1 percent).
- In 2012, Ohio adults with lower household incomes had a higher prevalence of COPD compared with those having higher incomes. Adults whose household income was less than $15,000 per year had a COPD prevalence of 18.5 percent, compared with just 2.4 percent for adults whose household income was $75,000 or more.
- Adults who did not complete high school had nearly six times the prevalence of COPD (17.2 percent) than those who had a college degree or higher educational attainment (2.9 percent).
- Men in Ohio were more likely to die of CLRD in 2012 than women (57.5 per 100,000 versus 47.0 per 100,000, respectively).
- In Ohio in 2012, white men had the highest age-adjusted CLRD death rate (58.8 per 100,000), followed by white women (48.7 per 100,000).

How is it associated with other diseases and risk factors?

- The prevalence of heart attack among Ohio adults with COPD (16.4 percent) was nearly four times higher than those without COPD (4.3 percent) in 2012.
- In 2012, Ohio adults with COPD had a stroke prevalence nearly five times higher than those without COPD (11.3 percent and 2.3 percent, respectively).
- Adults who were current smokers had a COPD prevalence (17.7 percent) more than three times higher than that of non-smokers (5.6 percent) in Ohio in 2012.

COPD: Prevalence

Table 6.1. Estimated prevalence of adults (age 18+) ever diagnosed with chronic obstructive pulmonary disease, Ohio and the United States, 2012

	Ohio Prevalence (%)	95% CI	U.S. Prevalence (%)[#]
Total	8.6	7.9 - 9.2	6.1
Sex			
Male	7.7	6.7 - 8.7	5.8
Female	9.4	8.5 - 10.2	6.6
Race/Ethnicity			
White	8.5	7.8 - 9.2	6.7
Black	8.3	6.1 - 10.6	6.4
Other	-	-	5.8
Multi-Racial	-	-	12.7
Hispanic	-	-	3.7
Age Group			
18 - 24	-	-	2.5
25 - 34	-	-	3.1
35 - 44	6.1	4.4 - 7.7	3.7
45 - 54	9.1	7.5 - 10.7	5.9
55 - 64	12.7	11.1 - 14.3	8.8
65+	13.0	11.6 - 14.3	11.9
Household Income			
<$15,000	18.5	15.6 - 21.3	13.8
$15,000 - $24,999	13.2	11.2 - 15.2	9.6
$25,000 - $34,999	8.7	7.0 - 10.4	7.5
$35,000 - $49,999	7.3	5.7 - 8.9	5.7
$50,000 - $74,999	4.8	3.4 - 6.1	2.9*
$75,000+	2.4	1.6 - 3.2	
Education			
<High school	17.2	14.2 - 20.1	11.3
High school graduate	9.7	8.6 - 10.8	7.3
Some college	7.8	6.7 - 8.9	6.1
College graduate	2.9	2.2 - 3.5	2.8

Source: 2012 Ohio Behavioral Risk Factor Surveillance System, Ohio Department of Health, 2013; 2012 Behavioral Risk Factor Surveillance System, Centers for Disease Control and Prevention, 2013.

[#] U.S. prevalence is the median prevalence of the 50 states, D.C. and U.S. territories.

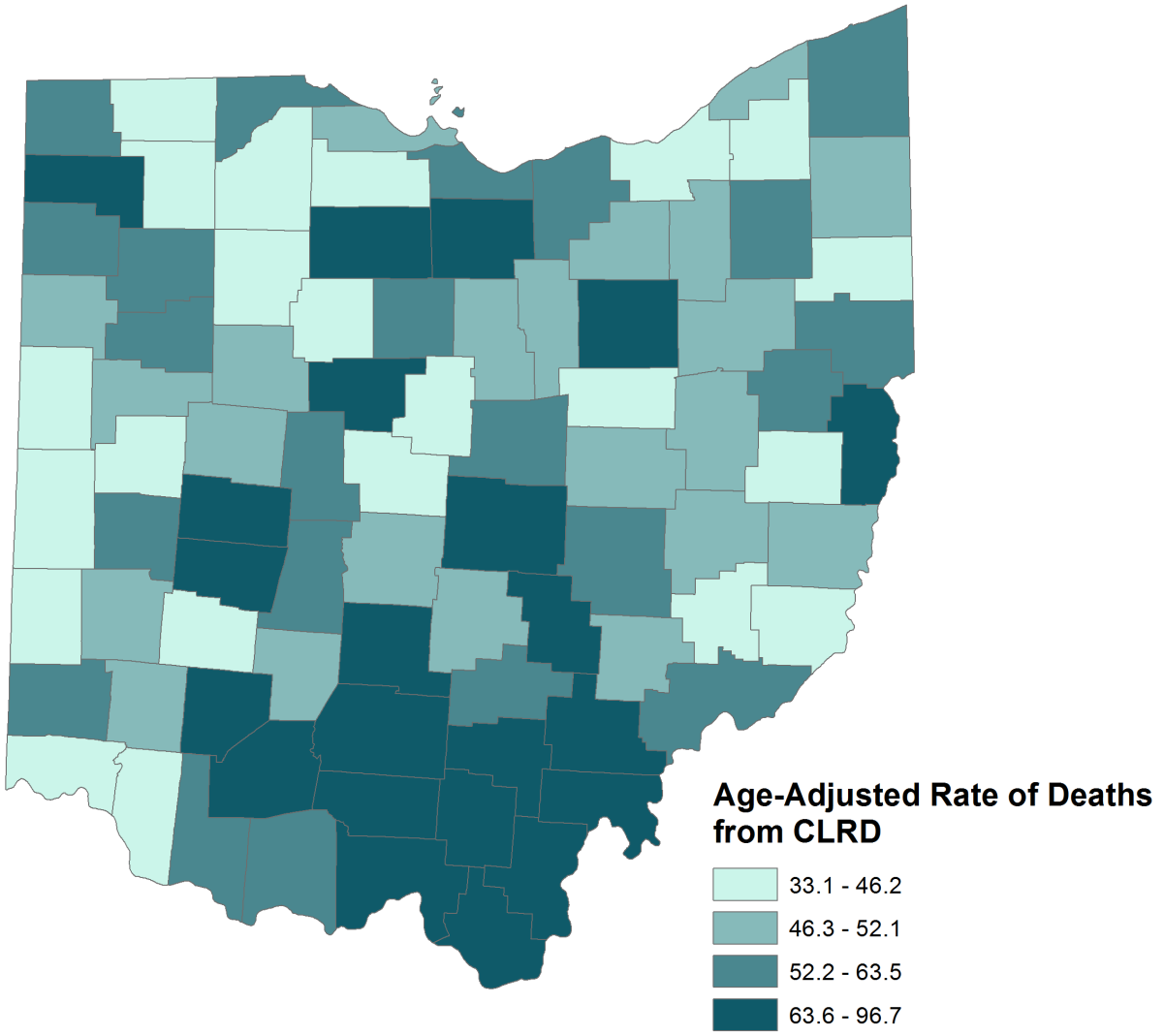
* U.S. estimate is for $50,000+.

- As shown in **Table 6.1**, in Ohio in 2012, 8.6 percent of adults reported having had COPD, according to data from the Ohio BRFSS.
- In Ohio in 2012, the prevalence of COPD was similar among women (9.4 percent) and men (7.7 percent).
- Similarly, differences between whites and blacks in the prevalence of COPD were not statistically significant.
- COPD prevalence increases as individuals age. In 2012, the prevalence of COPD in adults age 65 and older (13.0 percent) was more than twice as high as those 35-44 years old (6.1 percent).
- The prevalence of COPD decreases with increasing household income. Ohioans with a household income of less than $15,000 per year were 7.7 times more likely to have had COPD compared with those earning $75,000 or more per year, according to 2012 data.
- Similar to household income, COPD prevalence decreases as educational attainment increases. In 2012, Ohioans who had not completed high school were 5.9 times more likely to report having COPD compared with those who earned a college degree.

CLRD: Mortality

- In Ohio in 2012, CLRD was the third leading cause of death.
- CLRD claimed the lives of 7,060 Ohioans in 2012, which equates to an age-adjusted death rate of 51.1 per 100,000.
- Men in Ohio were more likely to die of CLRD than women (57.5 per 100,000 and 47.0 per 100,000 in 2012, respectively).
- In Ohio, whites had a 37 percent higher age-adjusted CLRD death rate in 2012 compared with blacks (52.6 per 100,000 and 38.5 per 100,000, respectively).
- White men in Ohio had the highest rate of CLRD death in 2012 (58.8 per 100,000).
- White women in Ohio are also disparately affected by CLRD. In 2012, the CLRD death rate for white women (48.7 per 100,000) was 45 percent higher than that of black women (33.6 per 100,000).
- The CLRD death rate in Ohio varied greatly by county in 2012. A grouping of counties with high CLRD death rates was located in southern Ohio. The county with the highest age-adjusted death rate (Vinton County, 96.7 per 100,000) had a rate 2.9 times higher than the county with the lowest rate (Mercer County, 33.1 per 100,000) (**Figure 6.1**).

Figure 6.1. Age-adjusted chronic lower respiratory disease (CLRD) death rate per 100,000 by county, Ohio, 2012



Source: Ohio Bureau of Vital Statistics, Ohio Department of Health, 2014.

CLRD: Trends

Figure 6.2. Age-adjusted chronic lower respiratory disease (CLRD) death rate per 100,000 by sex, Ohio, 2003-2012

Source: Ohio Bureau of Vital Statistics, Ohio Department of Health, 2014.

- In Ohio, the age-adjusted rate of deaths due to CLRD remained relatively stable from 2003 (48.2 per 100,000) to 2012 (51.1 per 100,000), increasing just 6 percent during the time period.
- The age-adjusted CLRD death rate also remained stable for men but increased 11 percent among women during that same time period.
- From 2003 to 2012, men in Ohio had a higher CLRD death rate each year compared with women.

Asthma: Introduction and Key Findings

According to 2014 estimates from the National Health Interview Survey, 9.3 percent of children and 8.0 percent of adults in the United States have asthma. In 2009, there were nearly nine million doctor visits in the United States for asthma.

Asthma is a chronic inflammatory disease of the airways. The main symptoms of asthma, which are inconsistent and come and go periodically, include difficultly breathing, wheezing, coughing and tightness in the chest. The symptoms are caused by spasms of the passageways in the lungs and obstructed airways that can be reversed with medications.

The causes of asthma are complex and not entirely understood, with both genetics and environment playing a role. Environmental factors such as poor air quality, smoking during pregnancy and indoor allergens such as dust mites and cockroaches can all contribute to the development or severity of asthma. Family history of asthma is also a major risk factor.

Asthma exacerbation, commonly called asthma attacks, are often brought on by triggers such as respiratory infections, exercise, perfumes, dust, animal dander and even stress. When an individual is experiencing an asthma exacerbation, they experience coughing, wheezing and extreme shortness of breath. Severe exacerbations can require hospitalization. Asthma can be managed by oral medications, inhaled bronchodilators and the identification and avoidance of triggers.

Key Findings

How does Ohio compare with the United States?

- The overall prevalence of current asthma among adults in Ohio (10.5 percent) was higher compared with the U.S. median prevalence (8.9 percent) in 2012.
- Current asthma prevalence among adults was also higher for most demographic subgroups in Ohio compared with the U.S. median.
- The overall prevalence of current asthma among children in Ohio (12.2 percent) was similar to that of the United States (13.7 percent) in 2012.

Who is most at risk?

- The prevalence of current asthma was significantly higher in women than men in 2012; adult female Ohioans had a current asthma prevalence 62 percent higher than adult male Ohioans.
- Ohio adults with less educational attainment and lower household income had a higher prevalence of current asthma than their peers with more education and higher household income in 2012.
- Black adults in Ohio had a significantly higher prevalence of current asthma compared with white adults in 2012; however, this difference was not statistically significant for black and white children.

How is it associated with other diseases and risk factors?

- The prevalence of stroke among Ohio adults who were ever diagnosed with asthma (6.9 percent) was nearly three times higher than those who had never been diagnosed with asthma (2.4 percent) in 2012.
- In 2012, Ohio adults who had ever been diagnosed with asthma had a higher prevalence of heart attack (8.1 percent) than those who had never been diagnosed with asthma (4.9 percent).
- Ohio adults with asthma had a COPD prevalence more than five times higher than adults who had never been diagnosed with asthma during their lifetime (27.8 percent and 5.3 percent, respectively) in 2012.

How much does it cost?

- In 2010 in Ohio, asthma cost nearly $1.3 billion in medical expenses and absenteeism from the workplace.
- In Ohio, private insurers and Medicaid paid $365 million and $334 million, respectively, in medical costs for asthma in 2010.
- The costs associated with employee absenteeism from work due to asthma, either to care for themselves or a family member, totaled $134 million in Ohio in 2010.

Table 7.1. Estimated prevalence of adults (age 18+) who currently have asthma, Ohio and the United States, 2012

	Ohio Prevalence (%)	95% CI	U.S. Prevalence (%)[#]
Total	10.5	9.7 - 11.2	8.9
Sex			
Male	7.9	6.9 - 9.0	6.5
Female	12.8	11.7 - 13.9	11.1
Race/Ethnicity			
White	9.6	8.8 - 10.4	8.7
Black	15.2	12.2 - 18.3	12.0
Other	10.9	6.6 - 16.4	8.7
Multi-Racial	-	-	16.7
Hispanic	12.8	7.2 - 18.4	7.8
Age Group			
18 - 24	14.3	11.3 - 17.3	9.7
25 - 34	9.2	7.1 - 11.2	8.6
35 - 44	11.6	9.5 - 13.7	8.6
45 - 54	9.9	8.3 - 11.4	9.3
55 - 64	10.9	9.3 - 12.5	9.5
65+	8.2	7.1 - 9.4	8.2
Household Income			
<$15,000	19.0	16.0 - 22.0	14.8
$15,000 - $24,999	13.8	11.6 - 16.0	10.8
$25,000 - $34,999	9.3	7.3 - 11.3	8.4
$35,000 - $49,999	8.4	6.5 - 10.2	7.8
$50,000 - $74,999	7.6	5.7 - 9.4	6.9[*]
$75,000+	6.3	5.1 - 7.5	
Education			
<High school	19.3	15.9 - 22.8	12.1
High school graduate	8.8	7.7 - 9.9	8.8
Some college	10.6	9.2 - 12.0	9.2
College graduate	8.1	7.0 - 9.1	7.2

Source: 2012 Ohio Behavioral Risk Factor Surveillance System, Ohio Department of Health, 2013; 2012 Behavioral Risk Factor Surveillance System, Centers for Disease Control and Prevention, 2013.

[#] U.S. prevalence is the median prevalence of the 50 states, D.C. and U.S. territories.

* U.S. estimate is for $50,000+.

- As shown in **Table 7.1**, in Ohio in 2012, 10.5 percent of adults reported that they currently have asthma, according to data from the Ohio BRFSS.
- The Ohio prevalence of adults with asthma in 2012 (10.5 percent) was higher compared with the U.S. median (8.9 percent).
- In Ohio in 2012, women were significantly more likely to report having asthma than men.
- White adults were significantly less likely to report currently having asthma than black adults.
- The prevalence of asthma decreases with increasing household income. Ohioans with a household income less than $15,000 per year were three times more likely to currently have asthma compared with those earning $75,000 or more per year, according to 2012 data.
- Similar to household income, asthma prevalence was lowest among those with higher educational attainment. In 2012, Ohioans who had not completed high school were 2.4 times more likely to report having asthma compared with those who earned a college degree.

Asthma: Child Prevalence

- As shown in **Figure 7.2,** in 2012 in Ohio, 12.2 percent of children (age 0-17) had ever been diagnosed with asthma.
- The prevalence of childhood asthma in Ohio in 2012 was similar to the U.S. median (13.7 percent).
- The prevalence of childhood asthma in Ohio did not significantly differ by sex or race/ethnicity in 2012.
- In Ohio in 2012, the youngest children (age 0-4 years) had a significantly lower prevalence of asthma compared with children 5 and older.

Table 7.2. Estimated prevalence of children (age 0-17) ever diagnosed with asthma, Ohio, 2012

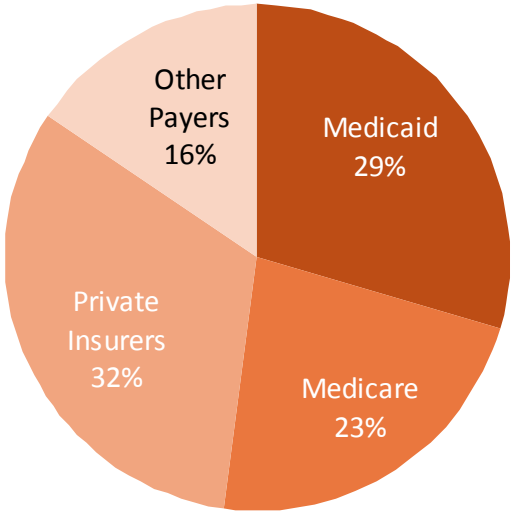
	Ohio Prevalence (%)	95% CI	U.S. Prevalence (%)[#]
Total	12.2	10.8 - 13.7	13.7
Sex			
Male	12.5	10.7 - 14.6	16.0
Female	11.9	10.0 - 14.1	11.4
Race/Ethnicity			
White	11.0	9.7 - 12.5	12.4
Black	17.0	12.4 - 22.9	19.8
Other	8.2	4.2 - 15.5	11.9
Multi-Racial	18.9	11.7 - 29.1	20.0
Age group			
0 - 4	6.3	4.4 - 8.8	7.3
5 - 9	12.8	10.0 - 16.2	14.6
10 - 14	16.0	13.0 - 19.5	17.5
15 - 17	16.0	12.8 - 19.7	17.4

Source: 2012 Ohio Behavioral Risk Factor Surveillance System, Ohio Department of Health, 2013; 2012 Behavioral Risk Factor Surveillance System, Centers for Disease Control and Prevention, 2013.
[#] U.S. prevalence is the median prevalence of the 50 states, D.C. and U.S. territories.

Asthma: Costs and Trends

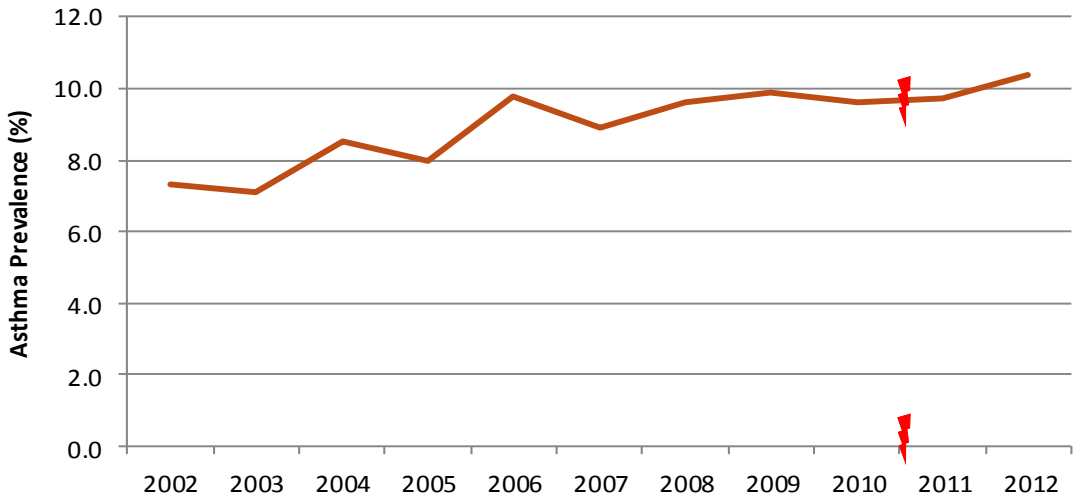
- Asthma cost the state of Ohio approximately $1.3 billion in 2010 in medical costs and absenteeism from the workplace.
- The vast majority of the costs associated with asthma ($1.1 billion) were medical costs, including office visits, outpatient visits, emergency room visits, inpatient hospitalizations, home health care, vision aids, medical equipment, prescription medications and nursing homes.
- As shown in **Figure 7.1**, among insurance payers, private insurers spent the highest amount for medical costs due to asthma in 2010 ($365 million), followed by Medicaid ($334 million) and Medicare ($256 million). The remaining $176 million in medical costs were paid by all other insurance payers, including those who self-pay, the uninsured, charity payers and others (e.g., Tricare, Indian Health Service, etc.).
- Absenteeism from places of employment due to asthma cost an additional $134 million in 2010. These costs are associated with missed days of work only and do not account for lost productivity, premature mortality and reduced quality of life.

Figure 7.1. Estimated percentage of medical costs due to asthma by payer, Ohio, 2010



Source: Chronic Disease Cost Calculator version 2, Centers for Disease Control and Prevention, 2014.

Figure 7.2. Estimated prevalence of adults (age 18+) who currently have asthma, Ohio, 2002-2012



Source: 2002-2012 Ohio Behavioral Risk Factor Surveillance System, Ohio Department of Health, 2013.

BRFSS data prior to 2011 cannot be compared with data for 2011 and after due to changes in weighting methodology.

- As shown in **Figure 7.2**, in Ohio, the prevalence of adults who currently have asthma increased 32 percent from 2002 to 2010 and 7 percent from 2011 to 2012.

Arthritis: Introduction and Key Findings

Arthritis is the leading cause of disability in the United States. According to the Ohio BRFSS, nearly one-third of Ohio adults have arthritis (including arthritis, rheumatoid arthritis, gout, lupus, fibromyalgia, rheumatism, polymyalgia rheumatic, osteoarthritis, tendonitis, bursitis, bunion, tennis elbow, carpal tunnel syndrome, tarsal tunnel syndrome and joint infection).

Arthritis is a group of more than 100 diseases that affect the joints and cause inflammation and pain. The most common type of arthritis is osteoarthritis, affecting more than 27 million people in the United States. Individuals with arthritis can face limitations that hamper their daily functioning. In addition, people with arthritis tend to have decreased physical activity, higher rates of absenteeism from work and see their physicians more than average.

In nearly all forms of arthritis, the major symptoms are pain, swelling and stiffness of joints often localized to just the affected joint. Some arthritic diseases such as rheumatoid arthritis and lupus can have other, more severe symptoms because they can affect other organs of the body.

The risk of developing arthritis increases with age, and most types of arthritis are more common in women. Other risk factors include specific genes, excess weight, joint injuries, infections and certain occupations involving repetitive knee bending and squatting.

Arthritis can be treated with physical and occupational therapy, medication and, in severe cases, joint replacement surgery.

Key Findings

How does Ohio compare with the United States?

- The overall prevalence of arthritis among adults in Ohio (30.0 percent) was 18 percent higher compared with the U.S. median prevalence (25.5 percent) in 2012.
- Arthritis prevalence in younger adults (age 18-24) was similar in Ohio compared with the U.S. median, but was significantly higher in Ohio than the U.S. median among people 25 and older.

Who is most at risk?

- Arthritis prevalence dramatically increases as individuals age. In 2012, 4.1 percent of Ohioans age 18-24 ever had arthritis, while more than half of adults age 65 and older ever had arthritis.
- In Ohio in 2012, women had a significantly higher prevalence of arthritis than men (34.3 percent and 25.4 percent, respectively).
- The prevalence of arthritis decreases with increasing household income. Ohioans with a household income less than $15,000 per year had a 90 percent higher prevalence of arthritis compared with those earning $75,000 or more per year, according to 2012 data.

How is it associated with other diseases and risk factors?

- Ohio adults with arthritis had a prevalence of heart attack (10.8 percent) more than three times higher than those without arthritis (3.1 percent) in 2012.
- In 2012, Ohio adults with arthritis also had a COPD prevalence (16.9 percent) more than three times higher than those without arthritis (5.0 percent).
- Ohio adults with arthritis had a stroke prevalence of 6.5 percent, while those without arthritis had a stroke prevalence of 1.6 percent in 2012.

How much does it cost?

- In Ohio in 2010, arthritis cost more than $5.4 billion in medical expenses and absenteeism from the workplace.
- In Ohio, private insurers and Medicare paid $1.8 billion and $1.4 billion, respectively, in medical costs for arthritis in 2010.
- The costs associated with employee absenteeism from work due to arthritis, either to care for themselves or a family member, totaled $671 million in Ohio in 2010.

Arthritis: Prevalence

Table 8.1. Estimated prevalence of adults (age 18+) ever diagnosed with arthritis, Ohio and the United States, 2012

	Ohio Prevalence (%)	95% CI	U.S. Prevalence (%)[#]
Total	30.0	29.0 - 31.1	25.5
Sex			
Male	25.4	23.9 - 27.0	21.7
Female	34.3	32.8 - 35.7	28.9
Race/Ethnicity			
White	30.9	29.7 - 32.0	28.1
Black	27.9	24.3 - 31.5	25.2
Other	22.2	16.0 - 28.3	18.6
Multi-Racial	31.8	22.6 - 41.0	28.8
Hispanic	17.2	11.6 - 22.8	15.0
Age group			
18 - 24	4.1	2.4 - 5.9	4.1
25 - 34	11.8	9.5 - 14.2	8.0
35 - 44	18.7	16.3 - 21.2	14.2
45 - 54	30.6	28.2 - 33.0	27.2
55 - 64	45.4	43.0 - 47.7	40.8
65+	56.8	57.7 - 58.9	53.8
Household Income			
<$15,000	37.8	34.0 - 41.5	34.8
$15,000 - $24,999	36.8	34.1 - 39.5	30.6
$25,000 - $34,999	33.4	30.1 - 36.6	28.4
$35,000 - $49,999	30.9	28.0 - 33.8	26.8
$50,000 - $74,999	27.8	24.9 - 30.6	20.9*
$75,000+	19.9	18.0 - 21.9	
Education			
<High school	39.8	35.6 - 43.9	32.2
High school graduate	34.0	32.2 - 35.8	28.5
Some college	28.8	26.9 - 30.7	25.5
College graduate	20.2	18.7 - 21.6	20.0

Source: 2012 Ohio Behavioral Risk Factor Surveillance System, Ohio Department of Health, 2013; 2012 Behavioral Risk Factor Surveillance System, Centers for Disease Control and Prevention, 2013.

[#] U.S. prevalence is the median prevalence of the 50 states, D.C. and U.S. territories.

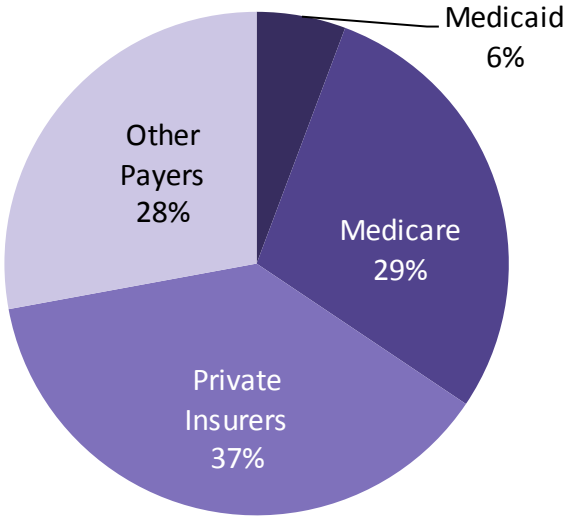
* U.S. estimate is for $50,000+.

- As shown in **Table 8.1**, in Ohio in 2012, 30.0 percent of adults reported having arthritis, according to data from the Ohio BRFSS. Ohio's prevalence was 18 percent higher compared with the U.S. median (25.5 percent) in 2012.
- In Ohio in 2012, women had a significantly higher prevalence of arthritis than men (34.3 percent and 25.4 percent, respectively).
- White Ohioans had a significantly higher prevalence of arthritis in 2012 compared with "Other" races and Hispanics.
- Arthritis prevalence dramatically increases as individuals age. In 2012, 4.1 percent of 18-24 year olds reported having arthritis, while more than half of adults age 65 and older had arthritis.
- The prevalence of arthritis decreases with increasing household income. Ohioans with a household income less than $15,000 per year had a 90 percent higher prevalence of arthritis compared with those earning $75,000 or more per year, according to 2012 data.
- Similar to household income, arthritis prevalence decreases as educational attainment increases. In 2012, Ohioans who had not completed high school were nearly two times more likely to report having arthritis compared with those who earned a college degree (39.8 percent versus 20.2 percent).

Arthritis: Costs and Trends

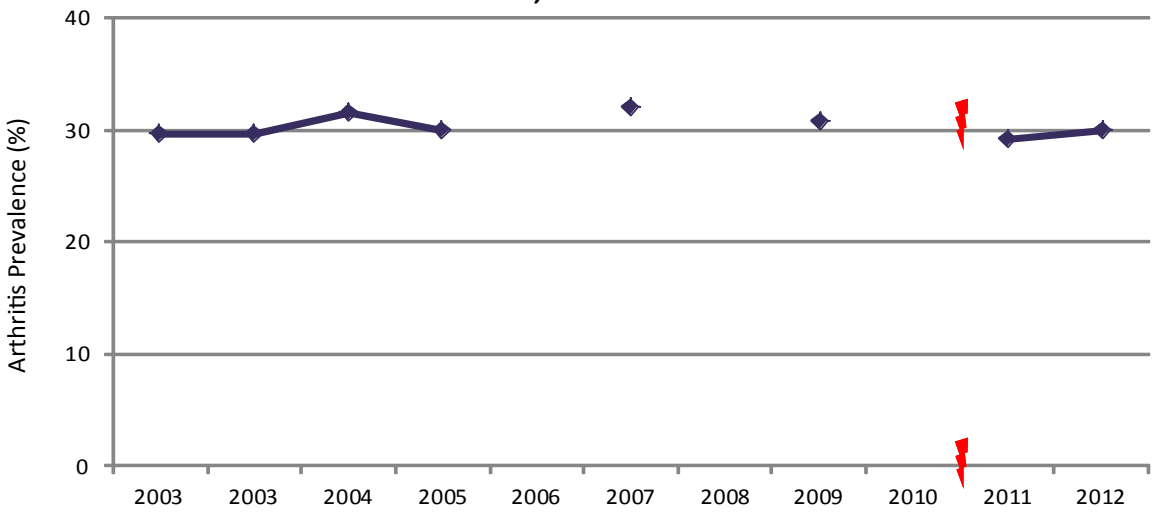
- Arthritis costs the state of Ohio approximately $5.4 billion in 2010 in medical costs and absenteeism from the workplace.
- The vast majority of the costs associated with arthritis ($4.7 billion) were medical costs, including office visits, outpatient visits, emergency room visits, inpatient hospitalizations, home health care, vision aids, medical equipment, prescription medications and nursing homes.
- As shown in **Figure 8.1**, among insurance payers, private insurers spent the highest amount for medical costs due to arthritis in 2010 ($1.8 billion), followed by Medicare ($1.4 billion) and "Other Payers" (including those who self-pay, the uninsured, charity payers and others e.g., Tricare, Indian Health Service, etc.) at $1.3 billion.
- Absenteeism from places of employment due to arthritis cost an additional $671 million in 2010. These costs are associated with missed days of work only and do not account for lost productivity, premature mortality and reduced quality of life.

Figure 8.1. Estimated percentage of medical costs due to arthritis by payer, Ohio, 2010



Source: Chronic Disease Cost Calculator version 2, Centers for Disease Control and Prevention, 2014.

Figure 8.2. Estimated prevalence of adults (age 18+) ever diagnosed with arthritis, Ohio, 2003-2012



Source: 2003-2012 Ohio Behavioral Risk Factor Surveillance System, Ohio Department of Health, 2013.

BRFSS data prior to 2011 cannot be compared with data for 2011 and after due to changes in weighting methodology.

- As shown in **Figure 8.2**, in Ohio, the prevalence of arthritis remained relatively stable at about 30 percent from 2003 to 2012.
- Data regarding the prevalence of arthritis was not collected by the Ohio BRFSS in 2006, 2008 and 2010.

Behavioral Risk Factors

The majority of chronic diseases result from four unhealthy behaviors — tobacco use, poor diet, insufficient physical activity and excessive alcohol use. In Ohio in 2012, few Ohioans met guidelines for fruit and vegetable intake or daily physical activity. Nearly one in four adults in Ohio were current smokers and more than 16 percent of young adults reported binge drinking in the past 30 days.

Poor nutrition is considered to be an overall diet that includes less than five servings of fruits and vegetables daily, processed carbohydrates instead of a variety of whole grains, and too much sugar and unhealthy fats. Guidelines also include drinking low or non-fat dairy and adequate water, and for some people, moderate alcohol consumption. While poor nutrition is a significant risk factor for obesity, eating healthy can have a profound impact on chronic disease outcomes, even without weight change.

Insufficient physical activity among adults is defined as failure to meet recommended guidelines for aerobic activity (150 minutes of moderate or 75 minutes of vigorous aerobic activity per week) and muscle strengthening activity (2 or more days per week). Physical activity can be in many forms, including walking, bike riding and gardening, and can be done in as little as 10-minute increments. The effects of physical activity extend beyond weight control, as simply walking more every day can improve blood sugar control and help prevent diabetes.

Although most people know that smoking increases the risk of getting lung and other cancers, smoking affects nearly every organ of the body, directly causes heart disease, stroke, COPD, poor asthma control, diabetes and rheumatoid arthritis, and is associated with many other diseases and disabilities.

Key Findings

How does Ohio compare with the United States?

- Youths in Ohio were 13 percent less likely to report engaging in at least 60 minutes of physical activity in the last seven days (13.2 percent) compared with youths in the United States (15.2 percent) in 2013.
- In 2012, the estimated prevalence of heavy drinking in Ohio was higher than the U.S. median prevalence among younger adults (age 18-24), those earning less than $35,000 per year and those with a high school education or less.

Who is most at risk?

- Among adults in Ohio, blacks had a significantly higher prevalence of current smoking and consuming less than one serving of vegetables per day compared with whites in 2012.
- The estimated prevalence of current smoking, poor nutrition and insufficient physical activity among adults decreased with increasing household income and educational attainment, both in Ohio and the United States.
- In Ohio, there is a significantly higher estimated prevalence of heavy drinking among adults age 18-24 compared with adults age 55 and older.
- In Ohio, the estimated prevalence of consuming less than one serving of fruit or one serving of vegetables per day was significantly lower among adults who graduated from college compared with adults with less education.

How is it associated with other diseases and risk factors?

- In Ohio, 33.7 percent of current smokers reported eating less than one serving of vegetables per day, which is 34 percent higher compared with nonsmokers. This disparity is even greater for fruit consumption, with current smokers reporting a 48 percent higher estimated prevalence of eating less than one serving of fruit per day compared with nonsmokers.
- Ohio adults who were heavy drinkers were 2.5 times more likely to be current smokers than nonsmokers in 2012.
- Adult current smokers in Ohio reported having a 29 percent higher estimated prevalence of being diagnosed with multiple (two or more) chronic diseases compared with nonsmokers.

Behavioral Risk Factors: Adult Tobacco Use

Table 9.1. Estimated prevalence of adults (age 18+) who are current smokers, Ohio and the United States, 2012

	Ohio Prevalence (%)	95% CI	U.S. Prevalence (%)[#]
Total	23.3	22.2 - 24.4	19.6
Sex			
Male	25.4	23.7 - 27.1	21.6
Female	21.3	20.0 - 22.7	17.4
Race/Ethnicity			
White	22.4	21.2 - 23.5	19.0
Black	28.9	24.9 - 33.0	22.7
Other	22.1	15.9 - 28.3	21.3
Multi-Racial	-	-	30.6
Hispanic	-	-	18.9
Age Group			
18 - 24	24.4	20.5 - 28.3	21.2
25 - 34	31.4	28.2 - 34.7	26.5
35 - 44	26.0	23.1 - 28.9	21.5
45 - 54	27.0	24.5 - 29.5	22.1
55 - 64	23.7	21.6 - 25.8	18.4
65+	10.2	8.8 - 11.5	8.8
Household Income			
<$15,000	42.7	38.6 - 46.8	32.7
$15,000 - $24,999	35.5	32.4 - 38.5	27.3
$25,000 - $34,999	27.4	24.0 - 30.8	23.1
$35,000 - $49,999	21.9	19.1 - 24.7	20.1
$50,000 - $74,999	17.8	15.3 - 20.3	12.9*
$75,000+	10.0	8.5 - 11.5	
Education			33.0
<High school	42.5	38.0 - 47.0	24.0
High school graduate	26.9	25.1 - 28.7	19.6
Some college	22.6	20.7 - 24.5	8.5
College graduate	8.2	7.2 - 9.3	8.2

Source: 2012 Ohio Behavioral Risk Factor Surveillance System, Ohio Department of Health, 2013; 2012 Behavioral Risk Factor Surveillance System, Centers for Disease Control and Prevention, 2013.

[#] U.S. prevalence is the median prevalence of the 50 states, D.C. and U.S. territories.

* U.S. estimate is for $50,000+.

- As shown in **Table 9.1**, the prevalence of current smoking was 23.3 percent in Ohio, which was 19 percent higher than the U.S. median prevalence of 19.6 percent.
- There was a significantly higher prevalence of current smoking among males in Ohio compared with females in 2012.
- The prevalence of current smoking in Ohio is highest among adults age 25-34 and lowest among those age 65 and older.
- Black adults in Ohio had a significantly higher prevalence of current smoking (28.9 percent) compared with whites (22.4 percent). In addition, current smoking prevalence among blacks was 27 percent higher in Ohio than the U.S. median (22.7 percent).
- Current smoking prevalence among households earning less than $15,000 per year was 4.3 times higher than those with a household income of $75,000 or more per year in 2012.
- Similarly, the estimated prevalence of current smoking among Ohioans with less than a high school education was 5.2 times higher compared with those who have graduated college.

Behavioral Risk Factors: Adolescent Tobacco Use

Table 9.2. Estimated prevalence of adolescents (grades 9-12) who are current smokers, Ohio and the United States, 2013

	Ohio Prevalence (%)	95% CI	U.S. Prevalence (%)
Total	15.1	11.5 - 19.6	15.7
Sex			
Male	16.7	11.6 - 23.5	16.4
Female	13.4	10.5 - 16.9	15.0
Race/Ethnicity			
White	15.9	12.0 - 20.7	18.6
Black	9.8	5.6 - 16.4	8.3
Hispanic	24.9	17.4 - 34.2	14.0
Grade			
9th	10.0	7.1 - 13.9	10.2
10th	12.8	7.7 - 20.5	13.2
11th	20.1	14.0 - 28.0	21.1
12th	18.4	10.9 - 29.3	19.2

Source: 2013 Youth Risk Behavior Survey, Ohio Department of Health, 2014; Youth Risk Behavior Surveillance—United States, 2013.

- As shown in **Table 9.2**, the prevalence of current smoking among adolescents (grades 9-12) in Ohio was 15.1 percent in 2013, according to the Ohio Youth Risk Behavior Survey (YRBS).
- Adolescent males in Ohio had a similar prevalence of current smoking (16.7 percent) compared with females (13.4 percent) in 2013.
- Hispanic adolescents had a significantly higher prevalence of current smoking in Ohio (24.9 percent) compared with blacks (9.8 percent).
- Black adolescents, in both Ohio and the United States, had the lowest current smoking prevalence (9.8 percent and 8.3 percent, respectively).
- In general, the prevalence of current smoking among adolescents increased with increasing age, with 11th graders having a significantly higher prevalence of current smoking (20.1 percent) compared with 9th graders (10.0 percent).

Table 9.3. Estimated prevalence of adults (age 18+) who consume less than one serving of fruits and vegetables per day, Ohio, 2012

	<1 Fruit/Day (%)	95% CI	<1 Vegetable/Day (%)	95% CI
Total	43.4	41.9 - 44.9	27.1	25.7 - 28.5
Sex				
Male	49.8	47.5 - 52.1	32.5	30.3 - 34.7
Female	37.7	35.8 - 39.6	22.2	20.6 - 23.9
Race/Ethnicity				
White	43.2	41.7 - 44.8	25.8	24.3 - 27.2
Black	44.5	39.2 - 49.8	38.0	32.8 - 43.2
Other	-	-	-	-
Multi-Racial	41.6	32.8 - 50.4	23.0	15.7 - 30.3
Hispanic	-	-	-	-
Age Group				
18 - 24	47.0	41.3 - 52.7	38.6	33.1 - 44.2
25 - 34	44.1	40.0 - 48.2	26.9	23.1 - 30.7
35 - 44	49.8	45.9 - 53.7	28.2	24.6 - 31.7
45 - 54	45.0	41.8 - 48.2	24.9	22.0 - 27.7
55 - 64	43.9	41.1 - 46.8	22.3	19.9 - 24.7
65+	33.8	31.1 - 36.5	25.9	23.3 - 28.5
Household Income				
<$15,000	51.6	46.6 - 56.7	39.8	34.7 - 44.8
$15,000 - $24,999	50.2	46.6 - 53.9	32.6	29.1 - 36.2
$25,000 - $34,999	42.3	38.0 - 46.7	26.3	22.2 - 30.5
$35,000 - $49,999	43.2	39.3 - 47.0	27.4	23.8 - 31.0
$50,000 - $74,999	42.4	38.5 - 46.3	21.9	18.7 - 25.1
$75,000+	34.8	32.0 - 37.7	17.6	15.3 - 19.9
Education				
<High school	54.0	48.5 - 59.6	42.8	37.1 - 48.5
High school graduate	48.2	45.8 - 50.6	31.2	28.9 - 33.6
Some college	41.2	38.4 - 43.9	24.3	21.9 - 26.7
College graduate	33.8	31.5 - 36.2	16.9	15.0 - 18.9

- As shown in **Table 9.3**, in Ohio, 43.4 percent of adults consumed less than one serving of fruit per day, and 27.1 percent of Ohio adults consumed less than one serving of vegetables per day in 2012.
- Ohio males were 46 percent more likely to eat less than one serving of vegetables per day than females.
- In Ohio, adults who were white or multi-racial had a significantly lower prevalence of consuming less than one serving of vegetables per day compared with blacks.
- A significantly higher prevalence of Ohio adults age 18-24 ate less than one serving of vegetables per day compared with adults age 25 and older.
- In general, as household income increases, the prevalence of consuming less than one serving of fruit or one serving of vegetables per day decreases.
- The percentage of college graduates who ate less than one serving of vegetables per day (16.9 percent) was significantly lower than those with some college education or less.

Source: 2012 Ohio Behavioral Risk Factor Surveillance System, Ohio Department of Health, 2013; 2012 Behavioral Risk Factor Surveillance System, Centers for Disease Control and Prevention, 2013.

Behavioral Risk Factors: Adolescent Nutrition

Table 9.4. Estimated prevalence of adolescents (grades 9-12) who did not consume vegetables during the past seven days, Ohio and the United States, 2013

	Ohio Prevalence (%)	95% CI	U.S. Prevalence (%)
Total	5.8	4.4 - 7.6	6.6
Sex			
Male	7.5	5.7 - 9.8	7.5
Female	4.0	2.6 - 6.1	5.7
Race/Ethnicity			
White	5.3	3.6 - 7.7	4.5
Black	7.9	3.8 - 15.7	11.3
Hispanic	-	-	9.3
Grade			
9th	8.7	6.5 - 11.5	7.4
10th	5.3	3.0 - 9.0	7.2
11th	4.8	2.6 - 8.7	6.2
12th	4.0	2.0 - 7.9	5.5

Source: 2013 Youth Risk Behavior Survey, Ohio Department of Health, 2014; Youth Risk Behavior Surveillance—United States, 2013.

- An estimated 5.8 percent of Ohio adolescents in 2013 reported not consuming any vegetables in the past seven days (**Table 9.4**), according to data from the Ohio YRBS.
- The prevalence of not consuming any vegetables in the past seven days was similar among adolescent females (4.0 percent) and males (7.5 percent) in Ohio.
- Black Ohioans reported a similar prevalence of not consuming any vegetables in the past seven days (7.9 percent) compared with whites (5.3 percent).
- In 2013, the estimated prevalence of adolescents not consuming vegetables in the past seven days decreased with increasing grade level in both Ohio and the United States.

Behavioral Risk Factors: Adult Physical Activity

Table 9.5. Estimated prevalence of adults (age 18+) who do not meet physical activity guidelines for both aerobic and muscle strengthening activities, Ohio and the United States, 2011

	Ohio Prevalence (%)	95% CI	U.S. Prevalence (%)[#]
Total	78.6	77.3 - 79.9	79.1
Sex			
Male	75.1	73.0 - 77.2	77.1
Female	81.9	80.4 - 83.4	82.1
Race/Ethnicity			
White	78.8	77.4 - 80.1	79.1
Black	78.2	73.8 - 82.5	78.9
Other	-	-	82.0
Multi-Racial	-	-	78.4
Hispanic	82.0	72.3 - 91.7	75.0
Age group			
18 - 24	63.7	57.6 - 69.8	70.7
25 - 34	75.1	71.3 - 78.8	77.9
35 - 44	76.8	73.6 - 80.0	80.0
45 - 54	82.9	80.7 - 85.2	81.4
55 - 64	82.6	80.6 - 84.5	82.6
65+	84.8	83.1 - 86.6	84.3
Household Income			
<$15,000	86.4	82.9 - 90.0	84.8
$15,000 - $24,999	80.5	77.3 - 83.7	84.6
$25,000 - $34,999	83.3	79.7 - 87.0	82.1
$35,000 - $49,999	78.9	75.3 - 82.5	80.6
$50,000 - $74,999	77.6	74.3 - 81.0	75.1*
$75,000+	71.4	68.6 - 74.1	
Education			
<High school	87.5	83.4 - 91.5	87.6
High school graduate	81.7	79.6 - 83.9	83.4
Some college	77.4	74.9 - 79.9	77.8
College graduate	70.6	68.3 - 72.8	73.4

Source: 2011 Ohio Behavioral Risk Factor Surveillance System, Ohio Department of Health, 2012; 2011 Behavioral Risk Factor Surveillance System, Centers for Disease Control and Prevention, 2012.

[#] U.S. prevalence is the median prevalence of the 50 states, D.C. and U.S. territories.

* U.S. estimate is for $50,000+.

- As shown in **Table 9.5**, in 2011, 78.6 percent of Ohioans failed to meet current physical activity guidelines for both aerobic and muscle strengthening activities.
- In Ohio, 81.9 percent of females failed to meet physical activity guidelines, which was significantly higher than the prevalence among males (75.1 percent).
- Ohio adults age 65 and older had a significantly higher prevalence of not meeting physical activity guidelines compared with adults age 18-44 in 2012.
- Approximately 71 percent of households with an income of $75,000 or more per year failed to meet physical activity guidelines; whereas, 86.4 percent of households earning less than $15,000 per year failed to meet guidelines.
- Ohio adults who never finished high school had a significantly higher prevalence of not meeting physical activity guidelines (87.5 percent) compared with adults with some college or higher education.

Behavioral Risk Factors: Adolescent Physical Activity

Table 9.6. Estimated prevalence of adolescents (grades 9-12) who did not participate in at least 60 minutes of physical activity on at least one of the last seven days, Ohio and the United States, 2013

	Ohio Prevalence (%)	95% CI	U.S. Prevalence (%)
Total	13.2	10.8 - 16.0	15.2
Sex			
Male	8.0	5.7 - 11.0	11.2
Female	18.4	14.9 - 22.5	19.2
Race/Ethnicity			
White	11.8	9.1 - 15.0	12.7
Black	19.1	13.9 - 25.8	21.5
Hispanic	-	-	16.2
Grade			
9th	9.7	6.6 - 14.2	12.3
10th	11.9	8.6 - 16.2	14.4
11th	12.6	9.6 - 16.5	16.7
12th	18.6	14.6 - 23.5	17.8

Source: 2013 Youth Risk Behavior Survey, Ohio Department of Health, 2014; Youth Risk Behavior Surveillance—United States, 2013.

- The prevalence of adolescents in Ohio who did not engage in at least 60 minutes of physical activity on at least one of the past seven days was 13.2 percent in 2013 (Table 9.6).
- Female adolescents in Ohio were significantly more likely than males to not engage in at least 60 minutes of physical activity on at least one of the last seven days (18.4 percent versus 8.0 percent, respectively).
- Blacks had a similar prevalence of not having engaged in at least 60 minutes of physical activity on at least one of the past seven days (19.1 percent) compared with whites (11.8 percent).
- There is an increasing trend in the prevalence of physical inactivity among adolescents with increasing grade level, both in Ohio and the United States.

Behavioral Risk Factors: Alcohol Use

Table 9.7. Estimated prevalence of adults (age 18+) who are heavy alcohol users, Ohio and the United States, 2012

	Ohio Prevalence (%)	95% CI	U.S. Prevalence (%)[#]
Total	6.3	5.7 - 6.9	6.1
Sex			
Male	7.1	6.1 - 8.1	6.9
Female	5.6	4.8 - 6.4	5.1
Race/Ethnicity			
White	6.1	5.5 - 6.8	6.4
Black	7.8	5.2 - 10.4	4.5
Other	8.2	3.7 - 12.6	4.8
Multi-Racial	4.4	1.7 - 7.0	4.4
Hispanic	3.9	0.0 - 7.8	8.8
Age Group			
18 - 24	10.6	7.9 - 13.3	7.5
25 - 34	7.4	5.6 - 9.2	7.2
35 - 44	6.5	4.8 - 8.2	6.1
45 - 54	7.3	5.9 - 8.8	6.2
55 - 64	4.4	3.5 - 5.4	5.6
65+	3.2	2.5 - 4.0	3.8
Household Income			
<$15,000	6.7	4.5 - 8.8	5.4
$15,000 - $24,999	7.2	5.3 - 9.0	5.5
$25,000 - $34,999	7.4	5.2 - 9.6	6.5
$35,000 - $49,999	5.1	3.8 - 6.5	6.3
$50,000 - $74,999	6.4	4.8 - 7.9	6.8*
$75,000+	7.1	5.8 - 8.5	
Education			
<High school	5.8	3.6 - 8.0	5.1
High school graduate	6.6	5.5 - 7.6	5.9
Some college	6.7	5.5 - 7.9	6.5
College graduate	5.6	4.6 - 6.6	5.9

Source: 2012 Ohio Behavioral Risk Factor Surveillance System, Ohio Department of Health, 2013; 2012 Behavioral Risk Factor Surveillance System, Centers for Disease Control and Prevention, 2013.

[#] U.S. prevalence is the median prevalence of the 50 states, D.C. and U.S. territories.

* U.S. estimate is for $50,000+.

- As shown in **Table 9.7**, in Ohio, the prevalence of heavy alcohol use (adult men having more than two drinks per day and adult women having more than one drink per day) was 6.3 percent, which was similar to the U.S. median prevalence of 6.1 percent.
- Ohio men were 27 percent more likely to be heavy drinkers than women.
- The estimated prevalence of heavy alcohol use did not significantly differ by race/ethnicity in Ohio in 2012.
- More than one in 10 Ohio adults age 18-24 were heavy drinkers in 2012.
- The prevalence of heavy alcohol use generally decreased with increasing age in both Ohio and the United States.
- There was no significant difference in the prevalence of heavy alcohol use by household income or education in Ohio in 2012.

Behavioral Risk Factors: Adolescent Alcohol Use

Table 9.8. Estimated prevalence of adolescents (grades 9-12) who had at least one drink of alcohol during the previous 30 days, Ohio and the United States, 2013

	Ohio Prevalence (%)	95% CI	U.S. Prevalence (%)
Total	29.5	25.1 - 34.2	34.9
Sex			
Male	32.2	25.6 - 39.5	34.4
Female	26.8	22.3 - 31.8	35.5
Race/Ethnicity			
White	29.7	24.8 - 35.1	36.3
Black	29.1	20.4 - 39.6	29.6
Hispanic	-	-	37.5
Grade			
9th	21.5	17.4 - 26.3	24.4
10th	21.7	15.4 - 29.6	30.9
11th	36.0	31.4 - 40.9	39.2
12th	40.1	31.4 - 49.5	46.8

Source: 2013 Youth Risk Behavior Survey, Ohio Department of Health, 2014; Youth Risk Behavior Surveillance—United States, 2013.

- The prevalence of adolescents in Ohio who reported having at least one drink of alcohol on at least one day during the previous 30 days was 29.5 percent in 2013 (**Table 9.8**).
- Male and female adolescents in Ohio had a similar prevalence of alcohol use (32.2 percent and 26.8 percent, respectively) in 2013.
- In Ohio, whites had a similar prevalence of adolescent alcohol use (29.7 percent) compared with blacks (29.1 percent). Nationally, the difference between blacks and whites was greater, with whites having a higher prevalence of alcohol use in 2013.
- There was an increasing trend in the prevalence of alcohol use among adolescents with increasing grade level, in both Ohio and the United States, in 2013.

Behavioral Risk Factors: Prevention

Spotlight: Creating Healthy Communities

Creating Healthy Communities (CHC) is a nationally-recognized program at the Ohio Department of Health with a mission to address health disparities by reducing some of the fundamental causes of chronic disease: tobacco use, physical inactivity and poor nutrition. It is based on a coalition-driven approach to make the healthy choice the easy choice throughout neighborhoods that are most at risk for chronic disease, the leading cause of death and disability in Ohio. The CHC priorities are to increase access to healthy, affordable foods; increase opportunities to be active at school, at work and in the community; and to ensure everyone can live, play and work tobacco free.

In 2014 alone, CHC impacted over 1.1 million Ohioans and leveraged over $2 million. Beginning in 2015, CHC is expanding its reach from 16 counties to 23. Examples of 2015 funded CHC projects include a focus on increasing healthy food options in corner stores; increasing access to local farmers' markets and community gardens; increasing community bike and pedestrian infrastructure (including paths, lighting, sharrows, etc.); and increasing the number of tobacco-free schools, universities and community housing. CHC projects prioritize their work in neighborhoods of highest need, including those with high rates of poverty and at highest risk for chronic diseases and conditions.

Clinical Risk Factors: Introduction

Clinical risk factors are medical conditions that can put individuals at higher risk for developing a chronic disease. These conditions, however, can be managed, and when they are under control, do not impact the risk for chronic disease. In this report, obesity, hypertension and high blood cholesterol are categorized as clinical risk factors.

Obesity in the adult population is defined as having a BMI of 30 kg/m^2 or higher. For children and adolescents, obesity is defined as a BMI that is greater than or equal to the 95th percentile for age and sex. Obesity can increase a person's risk for cardiovascular disease, cancer, type 2 diabetes, asthma and arthritis, among other diseases.

High blood pressure, or hypertension, is defined as a blood pressure of 140/90 mmHg or higher. Consistently elevated blood pressure can put strain on the heart muscle and vascular system. High blood pressure that is not controlled by lifestyle changes or medications can increase an individual's risk for heart disease, stroke and kidney disease, among other conditions.

High blood cholesterol, also called hyperlipidemia, is the persistent presence of high levels of cholesterol in the blood. There are two types of cholesterol—LDL, or low density lipoproteins, and HDL, or high density lipoproteins. High levels of LDL can increase the risk of heart disease while high levels of HDL are protective.

Key Findings

How does Ohio compare with the United States?

- Ohio had the 17th highest prevalence of adult obesity and high cholesterol and the 15th highest prevalence of hypertension among the 50 states in 2011.
- The overall prevalence of obesity among adults in Ohio (30.1 percent) was higher than the U.S. median (28.1 percent) in 2012.
- Among high school students, the prevalence of obesity in Ohio (13.0 percent) was similar to the United States (13.7 percent) in 2013.
- In 2011, adults in Ohio had a higher prevalence of hypertension (32.7 percent) compared with the U.S. median (30.8 percent).
- Adults in Ohio and the United States had a similar prevalence of high cholesterol in 2011 (38.9 percent and 38.3 percent, respectively).

Who is most at risk?

- The prevalence of hypertension and high cholesterol increases with increasing age. In 2011, adults age 65 and older had a 9.6 times higher hypertension prevalence and a six times higher cholesterol prevalence than adults age 18-24.
- Black Ohio adults had the highest prevalence of obesity in 2012 (39.4 percent) among reported racial/ethnic groups. Black adolescents also had a higher prevalence of obesity (18.0 percent) compared with whites (11.3 percent) in 2013.
- Adults who did not complete high school had the highest prevalence of obesity, hypertension and high cholesterol in Ohio in 2011.

How is it associated with other diseases and risk factors?

- In 2011, 28.4 percent of Ohio adults reported having one clinical risk factor (obesity, hypertension, high cholesterol), and an additional 27.1 percent reported having two or more. Adults with two or more clinical risk factors are at even higher risk for developing chronic disease.
- Ohio adults with two or more clinical risk factors were 2.7 times more likely to have had a stroke, 2.9 times more likely to have had heart disease and 3.7 times more likely to have had diabetes compared with adults with only one clinical risk factor, according to the 2011 BRFSS.
- Ohio adults who were obese had a 2.5 times higher estimated prevalence of heart disease and a 4.9 times higher estimated prevalence of diabetes than adults who were normal weight.

Clinical Risk Factors: Adult Obesity

Table 10.1. Estimated prevalence of adults (age 18+) who are obese, Ohio and the United States, 2012

	Ohio Prevalence (%)	95% CI	U.S. Prevalence (%)[#]
Total	30.1	29.0 - 31.2	28.1
Sex			
Male	30.5	28.8 - 32.3	27.8
Female	29.7	28.2 - 31.2	27.5
Race/Ethnicity			
White	29.2	28.0 - 30.4	26.4
Black	39.4	35.1 - 43.7	36.6
Other	20.4	14.1 - 26.7	21.1
Multi-Racial	32.9	23.6 - 42.3	30.3
Hispanic	27.8	20.2 - 35.4	29.3
Age Group			
18 - 24	14.0	10.6 - 17.3	14.7
25 - 34	28.8	25.6 - 32.0	25.4
35 - 44	35.3	32.1 - 38.4	25.4
45 - 54	34.4	31.8 - 37.1	32.8
55 - 64	35.2	32.8 - 37.5	33.3
65+	28.8	26.8 - 30.7	26.3
Household Income			
<$15,000	33.5	29.7 - 37.4	32.8
$15,000 - $24,999	32.6	29.7 - 35.4	30.2
$25,000 - $34,999	30.6	27.4 - 33.9	28.9
$35,000 - $49,999	33.9	30.8 - 37.0	29.6
$50,000 - $74,999	31.5	28.4 - 34.7	26.2*
$75,000+	25.5	23.3 - 27.8	
Education			
<High school	35.6	31.3 - 39.9	32.3
High school graduate	31.1	29.3 - 33.0	30.7
Some college	31.1	28.9 - 33.2	29.0
College graduate	24.3	22.5 - 26.0	22.5

Source: 2012 Ohio Behavioral Risk Factor Surveillance System, Ohio Department of Health, 2013; 2012 Behavioral Risk Factor Surveillance System, Centers for Disease Control and Prevention, 2013.

[#] U.S. prevalence is the median prevalence of the 50 states, D.C. and U.S. territories.

* U.S. estimate is for $50,000+.

- As shown in **Table 10.1**, in Ohio in 2012, 30.1 percent of adults were obese, based on their self-reported height and weight, according to data from the Ohio BRFSS. This prevalence was slightly higher than the U.S. prevalence in 2012 (28.1 percent).
- In Ohio in 2012, men and women had a similar prevalence of obesity, both in Ohio and the United States.
- Black adults were significantly more likely to be obese than whites and "Other" races in Ohio in 2012.
- Young adults in Ohio (age 18-24) were significantly less likely to be obese in 2012 (14.0 percent) compared with other age groups.
- In general, the prevalence of obesity decreases with increasing household income. Ohioans with a household income less than $15,000 per year were 31 percent more likely to be obese compared with those earning $75,000 or more per year, according to 2012 data.
- Similar to household income, obesity prevalence decreases as educational attainment increases. In 2012, Ohioans who had not completed high school were 47 percent more likely to be obese compared with those who earned a college degree.

Clinical Risk Factors: Adolescent Obesity

Table 10.2. Estimated prevalence of adolescents (grades 9-12) who are obese, Ohio and the United States, 2013

	Ohio Prevalence (%)	95% CI	U.S. Prevalence (%)
Total	13.0	10.8 - 15.5	13.7
Sex			
Male	17.4	13.8 - 21.7	16.6
Female	8.3	6.7 - 10.2	10.9
Race/Ethnicity			
White	11.3	8.4 - 15.0	13.1
Black	18.0	12.8 - 24.7	15.7
Hispanic	-	-	15.2
Grade			
9th	15.3	11.5 - 20.2	13.2
10th	16.4	11.8 - 22.3	13.6
11th	9.7	6.5 - 14.3	14.5
12th	10.2	6.7 - 15.3	13.5

Source: 2013 Youth Risk Behavior Survey, Ohio Department of Health, 2014; Youth Risk Behavior Surveillance—United States, 2013.

- As shown in **Table 10.2**, in Ohio in 2013, 13.0 percent of high school students were obese, according to data from the Ohio YRBS. The prevalence of obesity was similar in Ohio compared with the United States (13.7 percent).
- In Ohio in 2013, male high school students were significantly more likely to be obese than their female peers.
- In 2013, there were no significant differences in obesity prevalence among adolescents by race/ethnicity or grade level.

Clinical Risk Factors: Hypertension

Table 10.3. Estimated prevalence of adults (age 18+) ever diagnosed with hypertension, Ohio and the United States, 2011

	Ohio Prevalence (%)	95% CI	U.S. Prevalence (%)[#]
Total	32.7	31.5 - 34.0	30.8
Sex			
Male	33.7	31.7 - 35.7	31.9
Female	31.8	30.3 - 33.4	29.9
Race/Ethnicity			
White	32.3	30.9 - 33.6	31.7
Black	38.6	34.1 - 43.1	39.2
Other	-	-	25.2
Multi-Racial	-	-	29.1
Hispanic	20.7	11.9 - 29.6	22.4
Age Group			
18 - 24	6.5	3.1 - 9.8	7.2
25 - 34	13.2	10.4 - 16.1	12.7
35 - 44	20.3	17.4 - 23.2	19.5
45 - 54	33.9	31.0 - 36.7	32.1
55 - 64	49.4	46.8 - 52.0	47.1
65+	62.7	60.4 - 65.0	61.2
Household Income			
<$15,000	38.1	33.6 - 42.5	38..1
$15,000 - $24,999	34.8	31.7 - 37.9	36.1
$25,000 - $34,999	41.0	36.7 - 45.2	35.1
$35,000 - $49,999	35.4	31.8 - 39.0	32.0
$50,000 - $74,999	30.6	27.4 - 33.8	26.1*
$75,000+	22.6	20.2 - 24.9	
Education			
<High school	42.2	37.2 - 47.3	38.8
High school graduate	36.4	34.3 - 38.5	34.3
Some college	30.9	28.6 - 33.2	30.0
College graduate	23.8	22.0 - 25.6	25.6

Source: 2011 Ohio Behavioral Risk Factor Surveillance System, Ohio Department of Health, 2012; 2011 Behavioral Risk Factor Surveillance System, Centers for Disease Control and Prevention, 2012.

[#] U.S. prevalence is the median prevalence of the 50 states, D.C. and U.S. territories.

* U.S. estimate is for $50,000+.

- As shown in **Table 10.3**, in Ohio in 2011, 32.7 percent of adults reported having had hypertension, according to data from the Ohio BRFSS. The Ohio prevalence of hypertension was higher than the U.S. median (30.8 percent) in 2011.
- In Ohio in 2011, men and women had a similar prevalence of hypertension (33.7 percent and 31.8 percent, respectively).
- Black Ohioans reported a significantly higher prevalence of hypertension (38.6 percent) than white Ohioans (32.3 percent) and Hispanic Ohioans (20.7 percent) in 2011.
- Hypertension prevalence increases dramatically as individuals age. In 2011, only 6.5 percent of Ohio adults under age 25 reported having hypertension, while nearly two-thirds of adults age 65 and older had hypertension.
- The prevalence of hypertension decreases with increasing levels of education. Ohioans who did not graduate from high school were 77 percent more likely to have hypertension compared with those who earned a college degree, according to 2011 data.

Clinical Risk Factors: High Cholesterol

Table 10.4. Estimated prevalence of adults (age 18+) ever diagnosed with high cholesterol, Ohio and the United States, 2011

	Ohio Prevalence (%)	95% CI	U.S. Prevalence (%)[#]
Total	38.9	37.4 - 40.3	38.3
Sex			
Male	40.8	38.5 - 43.1	39.9
Female	37.1	35.4 - 38.9	36.7
Race/Ethnicity			
White	39.0	37.5 - 40.5	39.2
Black	35.4	30.3 - 40.5	34.7
Other	-	-	32.8
Multi-racial	-	-	33.7
Hispanic	-	-	35.7
Age Group			
18-24	9.1	2.1 - 16.2	11.1
25-34	15.2	11.3 - 19.0	16.8
35-44	27.8	24.2 - 31.5	27.4
45-54	41.1	37.9 - 44.2	39.4
55-64	50.9	48.2 - 53.6	50.8
65+	54.8	52.3 - 57.2	54.7
Household Income			
<$15,000	46.9	41.5 - 52.3	44.1
$15,000-24,999	43.3	39.5 - 47.0	42.3
$25,000-$34,999	38.1	33.8 - 42.4	39.0
$35,000-$49,999	41.2	37.1 - 45.4	38.9
$50,000-$74,999	38.8	35.2 - 42.5	34.3*
$75,000 +	30.5	27.9 - 33.1	
Education			
<High school	47.6	41.7 - 53.4	45.7
High school graduate	44.5	42.1 - 46.9	41.2
Some college	35.0	32.4 - 37.6	36.7
College graduate	31.8	29.6 - 33.9	33.3

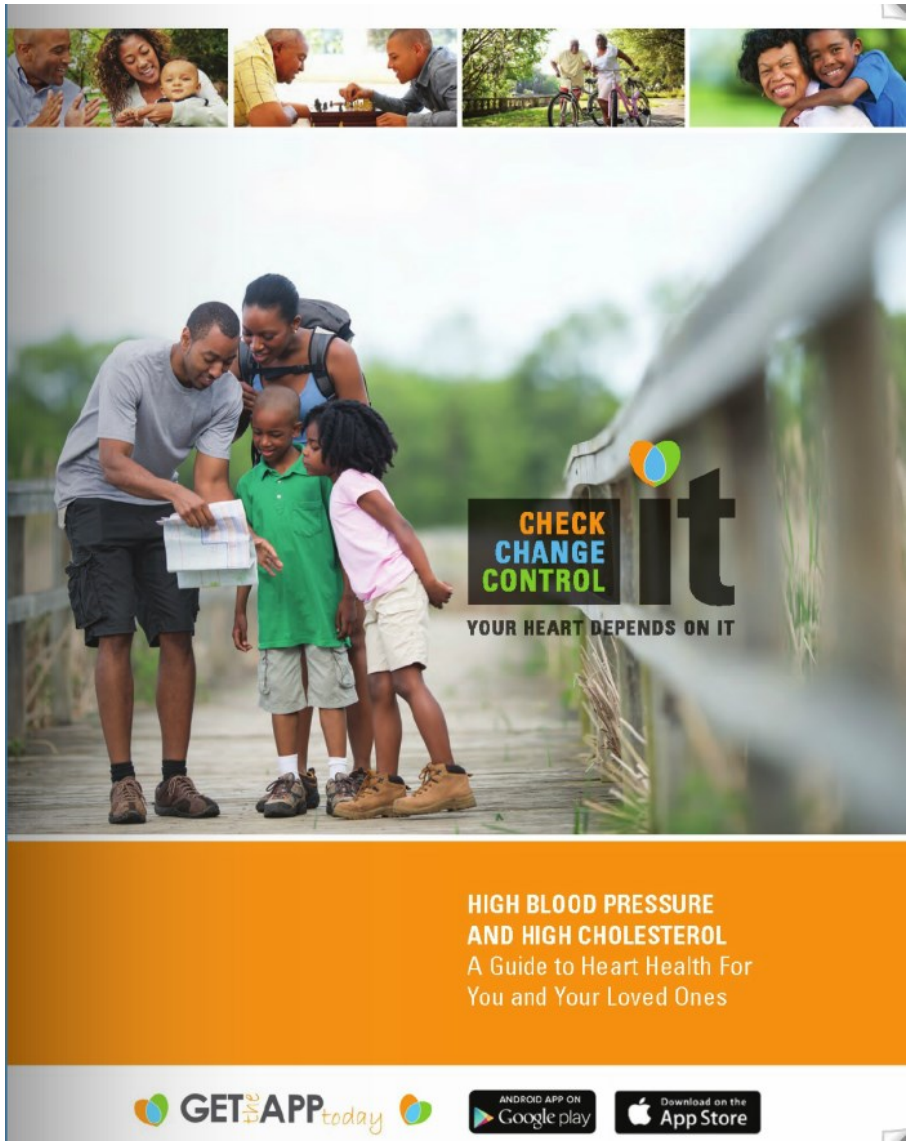
Source: 2011 Ohio Behavioral Risk Factor Surveillance System, Ohio Department of Health, 2012; 2011 Behavioral Risk Factor Surveillance System, Centers for Disease Control and Prevention, 2012.

[#] U.S. prevalence is the median prevalence of the 50 states, D.C. and U.S. territories.

* U.S. estimate is for $50,000+.

- As shown in **Table 10.4**, in Ohio in 2011, 38.9 percent of adults reported being diagnosed with high cholesterol, according to data from the Ohio BRFSS. The Ohio prevalence is similar to the U.S. median (38.3 percent) in 2011.
- In Ohio in 2011, men and women had a similar prevalence of high cholesterol (40.8 percent and 37.1 percent, respectively).
- In Ohio, white adults had a similar prevalence of high cholesterol compared with black adults in 2011.
- The prevalence of high cholesterol increases as individuals age. In 2011, less than one in ten Ohio adults under age 25 reported having high cholesterol, while more than half of adults age 65 and older had high cholesterol.
- Prevalence of high cholesterol decreases as educational attainment increases. In 2011, Ohioans who had not completed high school were 1.5 times more likely to report having had high cholesterol compared with those who earned a college degree.

Hypertension and High Cholesterol: Prevention and Control



Spotlight: Check It Toolkit

The "Check It, Change It, Control It: Your Heart Depends on It" toolkit was produced through a collaboration between ODH and the Ohio Academy of Family Physicians to address the high rates of death from stroke among black men. It was designed to increase screening for hypertension and high cholesterol and improve preventive behaviors and treatment among black men by focusing on both patient education and physician training in care management and cultural sensitivity.

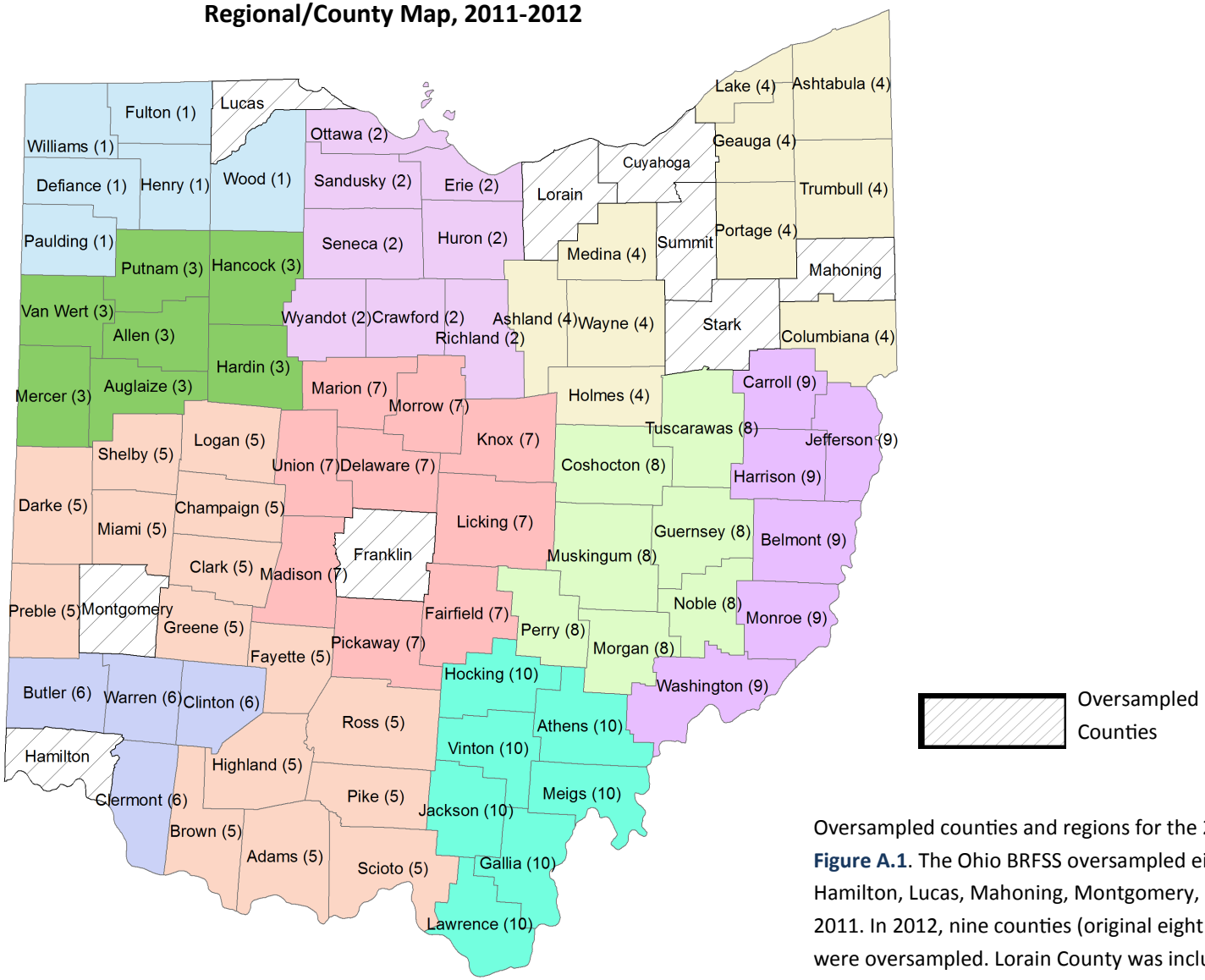
The toolkit's concept was developed in 2011 after ODH conducted a series of focus groups with black men and primary care physicians about perceptions, knowledge, attitudes and beliefs regarding blood pressure management. The findings from the focus groups indicated the need for culturally-appropriate educational materials for patients and guidance for physicians on communicating with their black male patients.

The toolkit contains materials and information about high blood pressure and cholesterol specific to black men, why it is important to track blood pressure and cholesterol, tips for improving lifestyle behaviors, questions to ask a doctor and resources to help track and control blood pressure and cholesterol. A companion piece, "Physician's Guide to Reducing High Blood Pressure and High Cholesterol for Your African-American Male Patients," was also developed for primary care physicians. In addition, a "Check It: Control Your Blood Pressure" app is now available for android and iPhone devices to help patients track, monitor and control blood pressure.

Because black women experience similar mortality disparities from stroke, in 2014 a series of focus groups were held with black women and primary care physicians to determine their perceptions, knowledge and beliefs about blood pressure and cholesterol management. While the participants had similar health concerns as the men, feedback indicated that rather than focus exclusively on black women, the new toolkit should have a family focus. The updated patient toolkit now includes information for the entire family that has been broken out into easy-to-understand sections allowing patients and physicians the ability to customize a plan of action specific to that patient.

Appendix A: Regional/County Prevalence

Figure A.1. Ohio Behavioral Risk Factor Surveillance System (BRFSS) Regional/County Map, 2011-2012



Oversampled counties and regions for the 2011-2012 Ohio BRFSS are shown in **Figure A.1**. The Ohio BRFSS oversampled eight counties (Cuyahoga, Franklin, Hamilton, Lucas, Mahoning, Montgomery, Stark and Summit) and 10 regions in 2011. In 2012, nine counties (original eight counties plus Lorain) and 10 regions were oversampled. Lorain County was included in Region 4 in 2011. The region number is shown in parentheses next to the county name, where applicable.

Source: 2011-2012 Ohio Behavioral Risk Factor Surveillance System, Ohio Department of Health, 2014.

Appendix A: Regional/County Prevalence

Table A.1. Estimated prevalence of adults (age 18+) ever diagnosed with heart disease, stroke, diabetes and cancer by region and county, Ohio, 2012

	Heart Disease		Stroke		Diabetes		Cancer	
	Prevalence (%)	95% CI	Prevalence (%)	95% CI	Prevalence (%)	95% CI	Prevalence (%)	95% CI
Region 1	6.2	4.1 - 8.3	3.2	1.6 - 4.9	10.8	7.9 - 13.7	4.0	2.6 - 5.4
Region 2	6.0	4.1 - 8.0	3.3	1.7 - 5.0	12.9	9.8 - 16.0	8.8	6.0 - 11.6
Region 3	6.4	4.4 - 8.5	2.8	1.5 - 4.2	9.2	6.9 - 11.5	6.5	4.5 - 8.5
Region 4	5.7	3.7 - 7.7	2.2	0.9 - 3.4	9.8	7.4 - 12.2	5.7	4.0 - 7.4
Region 5	6.9	4.4 - 9.4	2.9	1.5 - 4.3	14.2	11.1 - 17.3	6.0	4.3 - 7.8
Region 6	4.0	2.6 - 5.3	4.5	2.7 - 6.4	11.1	8.5 -13.7	6.2	4.4 - 8.0
Region 7	4.9	3.3 - 6.5	3.8	2.4 - 5.1	9.7	7.4 - 12.0	5.8	3.9 - 7.7
Region 8	8.5	5.9 - 11.1	2.7	1.4 - 4.0	13.2	9.8 - 16.5	8.5	5.8 - 11.2
Region 9	6.1	4.1 - 8.2	3.7	2.0 - 5.3	12.9	9.8 - 16.1	6.1	4.1 - 8.2
Region 10	6.0	4.1 - 7.8	3.9	2.2 - 5.5	12.9	9.7 - 16.1	6.2	3.5 - 8.8
Cuyahoga County	5.0	3.3 - 6.7	2.8	1.6 - 4.1	14.0	10.9 - 17.1	6.6	4.7 - 8.6
Franklin County	5.1	3.1 - 7.1	2.4	1.4 - 3.4	9.5	7.1 - 11.8	5.5	3.9 - 7.1
Hamilton County	5.4	3.7 - 7.2	3.9	2.5 - 5.2	12.6	9.8 - 15.4	8.7	6.2 - 11.1
Lorain County	6.4	4.0 - 8.7	4.4	2.3 - 6.4	9.9	7.1 - 12.7	8.3	5.6 - 10.9
Lucas County	5.6	3.4 - 7.8	1.7	0.5 - 3.0	15.3	10.7 - 20.0	7.6	4.8 - 10.4
Mahoning County	5.0	3.1 - 6.8	2.8	1.5 - 4.1	13.8	10.3 - 17.4	6.7	4.7 - 8.7
Montgomery County	3.5	2.2 - 4.8	2.4	1.3 - 3.6	12.8	9.9 - 15.8	6.5	4.6 - 8.4
Stark County	6.5	4.2 - 8.8	4.0	2.1 - 5.8	14.6	11.2 - 18.0	8.3	5.9 - 10.7
Summit County	4.1	2.6 - 5.7	3.1	1.7 - 4.6	9.3	6.7 - 11.9	8.3	6.0 - 10.6

Source: 2012 Ohio Behavioral Risk Factor Surveillance System, Ohio Department of Health, 2013.

Counties included in Region 1 are: Defiance, Fulton, Henry, Paulding, Williams and Wood.

Counties included in Region 2 are: Crawford, Erie, Huron, Ottawa, Richland, Sandusky, Seneca and Wyandot.

Counties included in Region 3 are: Allen, Auglaize, Hancock, Hardin, Mercer, Putnam and Van Wert.

Counties included in Region 4 are: Ashland, Ashtabula, Columbiana, Geauga, Holmes, Lake, Medina, Portage, Trumbull and Wayne.

Counties included in Region 5 are: Adams, Brown, Champaign, Clark, Darke, Fayette, Greene, Highland, Logan, Miami, Pike, Preble, Ross, Scioto and Shelby.

Counties included in Region 6 are: Butler, Clermont, Clinton and Warren.

Counties included in Region 7 are: Delaware, Fairfield, Knox, Licking, Madison, Marion, Morrow, Pickaway and Union.

Counties included in Region 8 are: Coshocton, Guernsey, Morgan, Muskingum, Noble, Perry and Tuscarawas.

Counties included in Region 9 are: Belmont, Carroll, Harrison, Jefferson, Monroe and Washington.

Counties included in Region 10 are: Athens, Gallia, Hocking, Jackson, Lawrence Meigs, and Vinton.

Appendix A: Regional/County Prevalence

Table A.2. Estimated prevalence of adults (age 18+) ever diagnosed with chronic obstructive pulmonary disease (COPD), asthma, arthritis and multiple (two or more) chronic diseases by region and county, Ohio, 2012

	COPD		Asthma		Arthritis		Multiple Chronic Diseases	
	Prevalence (%)	95% CI	Prevalence (%)	95% CI	Prevalence (%)	95% CI	Prevalence (%)	95% CI
Region 1	5.9	3.8 - 8.0	12.6	8.2 - 17.1	29.0	24.1 - 33.8	17.5	13.9 - 21.2
Region 2	10.4	7.6 - 13.2	13.4	9.9 - 16.9	32.0	27.4 - 36.7	24.5	20.3 - 28.7
Region 3	10.8	7.2 - 14.3	13.6	9.1 - 18.1	28.7	24.1 - 33.4	19.2	15.4 - 23.0
Region 4	8.5	6.0 - 11.0	12.9	9.8 - 15.9	32.7	28.7 - 36.8	20.1	16.7 - 23.5
Region 5	11.7	8.9 - 14.6	15.3	12.0 - 18.6	33.7	29.6 - 37.9	23.9	20.2 - 27.7
Region 6	7.0	4.8 - 9.2	14.9	11.6 - 18.3	27.2	23.4 - 30.9	17.6	14.6 - 20.7
Region 7	6.6	4.7 - 8.6	12.3	9.2 - 15.4	29.4	25.6 - 33.1	18.0	14.9 - 21.1
Region 8	9.2	6.4 - 11.9	11.1	7.8 - 14.4	33.2	28.5 - 37.9	24.6	20.4 - 28.8
Region 9	13.0	9.5 - 16.5	11.3	8.0 - 14.6	34.5	29.2 - 39.7	22.4	18.3 - 26.5
Region 10	15.0	10.9 - 19.1	16.9	12.2 - 21.7	36.2	30.7 - 41.6	28.1	23.1 - 33.0
Cuyahoga County	7.9	5.4 - 10.4	14.8	11.6 - 18.1	30.7	26.8 - 34.6	22.3	18.7 - 25.9
Franklin County	6.9	4.8 - 9.1	13.7	10.8 - 16.5	26.3	22.6 - 29.9	17.3	14.3 - 20.3
Hamilton County	6.5	4.5 - 8.5	13.3	10.2 - 16.3	26.6	23.0 - 30.3	20.1	16.78 - 23.4
Lorain County	8.3	5.6 - 10.9	16.4	10.6 - 22.1	30.9	25.4 - 36.4	19.4	15.5 - 23.4
Lucas County	7.2	4.0 - 10.3	11.8	7.7 - 15.9	36.3	30.1 - 42.5	23.1	18.0 - 28.1
Mahoning County	7.1	4.9 - 9.3	17.5	12.7 - 22.3	31.5	26.4 - 36.7	19.4	15.6 - 23.2
Montgomery County	6.7	4.5 - 8.9	14.7	10.9 - 18.5	30.5	26.2 - 34.8	19.2	15.7 - 22.6
Stark County	10.9	8.1 - 13.8	15.3	10.9 - 19.6	35.0	30.1 - 40.0	25.9	21.5 - 30.2
Summit County	10.1	7.1 - 13.1	11.7	8.3 - 15.1	26.6	22.2 - 30.8	19.4	15.6 - 23.3

Source: 2012 Ohio Behavioral Risk Factor Surveillance System, Ohio Department of Health, 2013.

Counties included in Region 1 are: Defiance, Fulton, Henry, Paulding, Williams and Wood.

Counties included in Region 2 are: Crawford, Erie, Huron, Ottawa, Richland, Sandusky, Seneca and Wyandot.

Counties included in Region 3 are: Allen, Auglaize, Hancock, Hardin, Mercer, Putnam and Van Wert.

Counties included in Region 4 are: Ashland, Ashtabula, Columbiana, Geauga, Holmes, Lake, Medina, Portage, Trumbull and Wayne.

Counties included in Region 5 are: Adams, Brown, Champaign, Clark, Darke, Fayette, Greene, Highland, Logan, Miami, Pike, Preble, Ross, Scioto and Shelby.

Counties included in Region 6 are: Butler, Clermont, Clinton and Warren.

Counties included in Region 7 are: Delaware, Fairfield, Knox, Licking, Madison, Marion, Morrow, Pickaway and Union.

Counties included in Region 8 are: Coshocton, Guernsey, Morgan, Muskingum, Noble, Perry and Tuscarawas.

Counties included in Region 9 are: Belmont, Carroll, Harrison, Jefferson, Monroe and Washington.

Counties included in Region 10 are: Athens, Gallia, Hocking, Jackson, Lawrence Meigs, and Vinton.

Appendix A: Regional/County Prevalence

Table A.3. Estimated prevalence of adults (age 18+) who are current smokers, consume less than one vegetable per day, do not meet physical activity (PA) guidelines for aerobic and muscle strengthening activities and are heavy alcohol users by region and county, Ohio, 2011 and 2012

	Current Smoker		Consume <1 Vegetable/Day		Do Not Meet PA Guidelines		Heavy Alcohol User	
	Prevalence (%)	95% CI	Prevalence (%)	95% CI	Prevalence (%)	95% CI	Prevalence (%)	95% CI
Region 1	17.5	13.2 - 21.8	28.2	21.8 - 34.6	79.9	71.2 - 88.6	5.5	2.9 - 8.1
Region 2	22.6	17.9 - 27.3	30.7	24.7 - 36.7	78.5	71.9 - 85.1	7.9	4.6 - 11.2
Region 3	22.2	16.6 - 27.9	26.9	20.2 - 33.5	83.4	77.8 - 89.0	6.1	2.9 - 9.3
Region 4	23.2	19.4 - 27.1	25.3	20.5 - 30.1	75.2	71.1 - 79.2	5.7	3.7 - 7.7
Region 5	26.6	22.5 - 30.6	28.5	23.8 - 33.3	83.4	78.9 - 87.8	5.2	3.3 - 7.2
Region 6	24.4	20.3 - 28.5	24.9	19.8 - 30.0	82.6	77.5 - 87.7	3.7	2.1 - 5.4
Region 7	20.2	16.6 - 23.8	24.6	19.6 - 29.7	77.6	73.3 - 81.9	5.1	3.2 - 7.1
Region 8	28.9	23.3 - 34.4	28.8	22.7 - 35.0	83.3	77.3 - 89.3	4.1	1.7 - 6.4
Region 9	25.2	19.9 - 30.4	32.3	24.5 - 40.2	86.9	81.2 - 92.6	4.1	1.6 - 6.6
Region 10	21.3	16.3 - 26.3	33.4	25.8 - 40.9	79.0	70.6 - 87.4	5.1	2.3 - 8.0
Cuyahoga County	23.2	19.3 - 27.1	28.4	23.3 - 33.5	77.6	73.4 - 81.8	7.5	5.0 - 10.1
Franklin County	20.6	17.0 - 24.2	27.8	23.0 - 32.6	78.2	74.0 - 82.3	6.1	4.2 - 8.1
Hamilton County	20.0	16.3 - 23.7	27.5	22.7 - 32.4	79.5	74.8 - 84.1	6.7	4.3 - 9.1
Lorain County*	29.2	21.5 - 36.9	28.3	20.2 - 36.4	-	-	8.0	4.2 - 11.7
Lucas County	26.5	20.3 - 32.7	21.1	15.2 - 27.1	79.5	73.3 - 85.6	9.1	4.4 - 13.8
Mahoning County	25.2	19.5 - 30.9	26.1	19.8 - 32.5	77.3	71.8 - 82.8	6.2	2.8 - 9.5
Montgomery County	25.7	20.8 - 30.7	21.1	15.8 - 26.3	76.5	71.0 - 82.1	10.9	6.8 - 14.9
Stark County	27.8	22.4 - 33.3	24.9	19.0 - 30.8	79.1	73.9 - 84.2	6.9	3.9 - 10.0
Summit County	22.8	17.9 - 27.7	30.0	23.9 - 36.0	69.0	62.7 - 75.3	7.9	4.4 - 11.4

Source: 2011 and 2012 Ohio Behavioral Risk Factor Surveillance System, Ohio Department of Health, 2012, 2013. PA data are from 2011; current smoking, vegetable consumption and alcohol use data are from 2012.

Counties included in Region 1 are: Defiance, Fulton, Henry, Paulding, Williams and Wood.

Counties included in Region 2 are: Crawford, Erie, Huron, Ottawa, Richland, Sandusky, Seneca and Wyandot.

Counties included in Region 3 are: Allen, Auglaize, Hancock, Hardin, Mercer, Putnam and Van Wert.

Counties included in Region 4 are: Ashland, Ashtabula, Columbiana, Geauga, Holmes, Lake, Medina, Portage, Trumbull and Wayne. *Lorain County is included in Region 4 for "Do Not Meet PA Guidelines."

Counties included in Region 5 are: Adams, Brown, Champaign, Clark, Darke, Fayette, Greene, Highland, Logan, Miami, Pike, Preble, Ross, Scioto and Shelby.

Counties included in Region 6 are: Butler, Clermont, Clinton and Warren.

Counties included in Region 7 are: Delaware, Fairfield, Knox, Licking, Madison, Marion, Morrow, Pickaway and Union.

Counties included in Region 8 are: Coshocton, Guernsey, Morgan, Muskingum, Noble, Perry and Tuscarawas.

Counties included in Region 9 are: Belmont, Carroll, Harrison, Jefferson, Monroe and Washington.

Counties included in Region 10 are: Athens, Gallia, Hocking, Jackson, Lawrence, Meigs and Vinton.

Appendix A: Regional/County Prevalence

Table A.4. Estimated prevalence of adults (age 18+) who are obese, ever diagnosed with hypertension and ever diagnosed with high cholesterol by region and county, Ohio, 2011 and 2012

	Obese		Hypertension		High Cholesterol	
	Prevalence (%)	95% CI	Prevalence (%)	95% CI	Prevalence (%)	95% CI
Region 1	28.3	23.4 - 33.3	29.3	20.8 - 37.7	42.0	33.1 - 50.9
Region 2	38.0	32.7 - 43.3	33.2	27.5 - 39.0	43.7	36.9 - 50.5
Region 3	32.8	27.4 - 38.1	41.3	34.2 - 48.4	41.3	33.5 - 49.1
Region 4	25.4	21.6 - 29.1	28.6	25.1 - 32.1	37.0	32.9 - 41.1
Region 5	30.5	26.2 - 34.8	36.6	31.5 - 41.8	43.1	37.1 - 49.1
Region 6	28.5	24.4 - 32.6	33.8	27.7 - 40.0	36.5	30.1 - 43.0
Region 7	30.9	26.8 - 35.0	34.7	29.9 - 39.6	39.6	34.7 - 44.5
Region 8	33.0	28.0 - 38.0	35.3	28.9 - 41.7	43.2	35.7 - 50.6
Region 9	27.7	22.6 - 32.8	43.1	35.4 - 50.7	44.4	36.1 - 52.8
Region 10	35.4	29.3 - 41.4	33.7	25.7 - 41.7	47.9	38.8 - 52.8
Cuyahoga County	29.9	25.7 - 34.1	31.3	27.2 - 35.3	37.6	32.9 - 42.3
Franklin County	30.7	26.4 - 35.0	29.2	35.1 - 33.3	32.5	28.0 - 37.1
Hamilton County	28.7	24.6 - 32.8	31.5	27.1 - 35.9	33.6	28.9 - 38.3
Lorain County*	26.3	20.8 - 31.8	-	-	-	-
Lucas County	35.6	28.9 - 42.4	32.6	26.9 - 38.4	44.0	36.9 - 51.1
Mahoning County	32.8	26.9 - 38.7	32.3	27.2 - 37.5	37.0	31.1 - 42.9
Montgomery County	28.7	24.0 - 33.4	34.9	29.9 - 39.9	46.1	40.4 - 51.8
Stark County	30.1	25.1 - 35.1	36.1	30.7 - 41.4	40.9	35.3 - 46.6
Summit County	31.7	26.4 - 36.9	31.5	26.6 - 36.5	38.9	33.2 - 44.6

Source: 2011 and 2012 Ohio Behavioral Risk Factor Surveillance System, Ohio Department of Health, 2012, 2013. Hypertension and high cholesterol data are from 2011; obesity data are from 2012.

Counties included in Region 1 are: Defiance, Fulton, Henry, Paulding, Williams and Wood.

Counties included in Region 2 are: Crawford, Erie, Huron, Ottawa, Richland, Sandusky, Seneca and Wyandot.

Counties included in Region 3 are: Allen, Auglaize, Hancock, Hardin, Mercer, Putnam and Van Wert.

Counties included in Region 4 are: Ashland, Ashtabula, Columbiana, Geauga, Holmes, Lake, Medina, Portage, Trumbull and Wayne. *Lorain County is included in Region 4 for "Hypertension" and "High Cholesterol."

Counties included in Region 5 are: Adams, Brown, Champaign, Clark, Darke, Fayette, Greene, Highland, Logan, Miami, Pike, Preble, Ross, Scioto and Shelby.

Counties included in Region 6 are: Butler, Clermont, Clinton and Warren.

Counties included in Region 7 are: Delaware, Fairfield, Knox, Licking, Madison, Marion, Morrow, Pickaway and Union.

Counties included in Region 8 are: Coshocton, Guernsey, Morgan, Muskingum, Noble, Perry and Tuscarawas.

Counties included in Region 9 are: Belmont, Carroll, Harrison, Jefferson, Monroe and Washington.

Counties included in Region 10 are: Athens, Gallia, Hocking, Jackson, Lawrence Meigs, and Vinton.

Appendix B: Data Sources

Ohio Vital Statistics: Death data were obtained from the Ohio Bureau of Vital Statistics, Ohio Department of Health (ODH). Data represent the underlying cause of death and are coded using the International Classification of Diseases, version 10 (ICD-10). Death rates are age-adjusted to the 2000 U.S. Standard Population using 11 age groups (except for cancer, which uses 19 age groups) and are presented per 100,000 population.

Behavioral Risk Factor Surveillance System (BRFSS): The BRFSS is an annual survey designed to collect data on diseases, health behaviors, clinical risk factors and injuries through landline and cell phone interviews of randomly selected adults age 18 and older. ODH conducts the Ohio BRFSS in conjunction with the Centers for Disease Control and Prevention (CDC). National BRFSS data were obtained from the CDC BRFSS Program Prevalence and Trends database (http://apps.nccd.cdc.gov/brfss/). Data from 2011-present were weighted by age, sex, race/ethnicity, geography, marital status, education, home ownership and telephone source using an iterative proportional fitting (raking) method. Data prior to 2011 were weighted by age and sex using a post-stratification method. Thus, BRFSS data for 2011-present should not be compared with data prior to 2011. Respondents who answered "don't know/not sure" or refused the question were excluded from the analyses for that question. Prevalence estimates are not presented if the unweighted sample size for the denominator is <50 or the confidence interval half-width is >10.

Youth Risk Behavior Survey (YRBS): The YRBS, developed by the CDC, is a population-based survey of students in grades 9 through 12 conducted every two years. The YRBS provides information on health risks and behaviors among adolescents to more effectively target and improve health programs. The Ohio YRBS is conducted by ODH, and data were obtained from the ODH YRBS website (http://www.odh.ohio.gov/odhprograms/chss/ad_hlth/youthrsk/youthrsk1.aspx). U.S. data were obtained from CDC's Youth Risk Behavior Surveillance System website and were published in *Youth Risk Behavior Surveillance — United States, 2013* (http://www.cdc.gov/mmwr/pdf/ss/ss6304.pdf).

Cancer Incidence: Ohio cancer incidence data were obtained from the Ohio Cancer Incidence Surveillance System (OCISS), ODH. OCISS is a population-based registry that collects data on all cancers diagnosed among Ohio residents, with the exception of basal and squamous cell skin cancer and carcinoma *in situ* of the cervix. Cancer incidence data for the United States were obtained from the Surveillance, Epidemiology and End Results (SEER) Program, and were published in *SEER Cancer Statistics Review, 1975-2011*, National Cancer Institute, 2014 (http://www.seer.cancer.gov/csr/1975_2011/). SEER currently collects and publishes cancer incidence and survival data from population-based cancer registries covering approximately 28 percent of the U.S. population. Cancer cases are coded using the International Classification of Diseases for Oncology, version 3 (ICD-O-3). Cancer incidence rates are age-adjusted to the 2000 U.S. Standard Population using 19 age groups and are presented per 100,000 population.

Chronic Disease Cost Calculator: The Chronic Disease Cost Calculator version 2, developed by CDC and RTI International, is a downloadable tool that provides state-level estimates of medical expenditures and absenteeism costs for arthritis, asthma, cancer, cardiovascular diseases (congestive heart failure, coronary heart disease, hypertension, stroke and other cerebrovascular disease), depression and diabetes (http://www.cdc.gov/chronicdisease/resources/calculator/).

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Ohio Department of Health
246 North High Street
Columbus, Ohio 43215
http://www.healthy.ohio.gov/