



State of Illinois
Illinois Department of Public Health

The Burden of Cardiovascular Disease in Illinois

Mortality, Morbidity and Risk Factors

2013

BURDEN OF CARDIOVASCULAR DISEASE

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Executive Summary

This report describes the burden of cardiovascular disease by describing the mortality, morbidity, hospitalizations, risk factors, and control measures to prevent cardiovascular disease among Illinois adults.

While the mortality rate for cardiovascular disease is declining, cardiovascular disease remains the leading cause of death in Illinois. Cardiovascular disease is responsible for a third (more than 30,000) of all deaths in Illinois.

Morbidity from cardiovascular disease causes disability, years of potential life lost, and substantial health care costs. Heart disease and stroke are among the leading causes of disability in the United States. In Illinois, in 2010, there were nearly 158,000 years of potential life lost due to cardiovascular disease. The direct and indirect costs of cardiovascular disease are already in the billions of dollars and are expected to triple by 2030 in the United States.

Cardiovascular disease is responsible for 13 percent of all inpatient hospitalizations in Illinois and makes up 20 percent of all inpatient hospitalization costs. This equals nearly \$10 billion in inpatient hospitalization costs due to cardiovascular disease.

Several risk factors can increase the likelihood of developing cardiovascular disease. The current rates of these risk factors among Illinois adults are 38.2 percent have high cholesterol, 26.8 percent have high blood pressure, 16.9 percent smoke, 8.7 percent have diabetes, 28.7 percent are obese, 48.2 percent are physically inactive, 77.5 percent have poor nutrition, and 5.7 percent have excessive alcohol use.

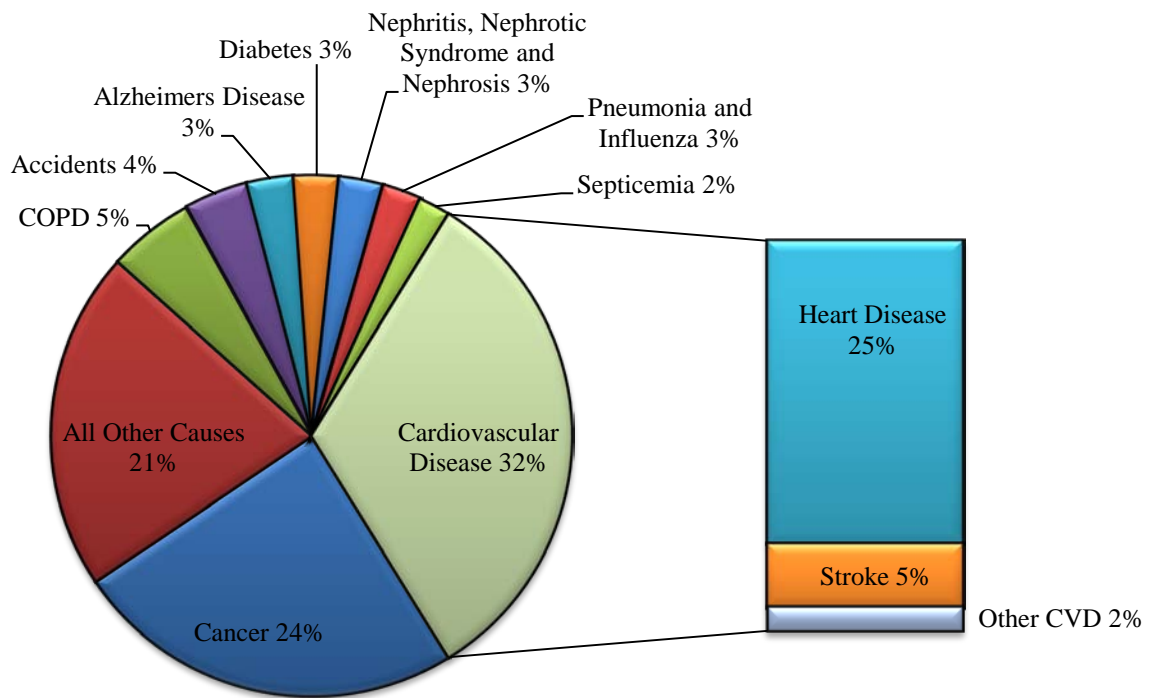
Addressing aspirin therapy, high blood pressure (including sodium reduction), high cholesterol, and smoking cessation, also known as the ABCS of cardiovascular health, are a priority of the Illinois Department of Public Health's Cardiovascular Health Program. In 2011, 23.3 percent of Illinois adults who had a heart attack were on an aspirin therapy, several behavioral changes were being taken by adults with high blood pressure to help reduce it, 77.3 percent of adults surveyed had their cholesterol checked in their lifetime, 69.6 percent had it checked within the past year, 59.5 percent of current smokers surveyed had a quit attempt within the last year, 30.4 percent of former smokers had last smoked regularly within the past five years and 69.6 percent last smoked regularly more than five years ago.

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Introduction

More than 80 million adults in the United States have one or more types of cardiovascular disease.¹ Cardiovascular disease refers to diseases of the heart and blood vessels, including heart disease, heart failure, stroke, hypertension, atherosclerosis, aortic aneurysm and dissection, congenital cardiovascular defects, and other diseases of the arteries. Cardiovascular disease, the leading cause of death in Illinois, is responsible for a third of all Illinois deaths (Figure 1). In 2009, slightly more than 32,000 deaths in adults age 35 and older were attributed to cardiovascular disease in Illinois. In 2010, more than 200,000 hospitalizations in Illinois were due to diseases and disorders of the circulatory system and resulted in nearly \$10 billion in hospital costs.²

Figure 1. Leading Causes of Death, Illinois, 2009



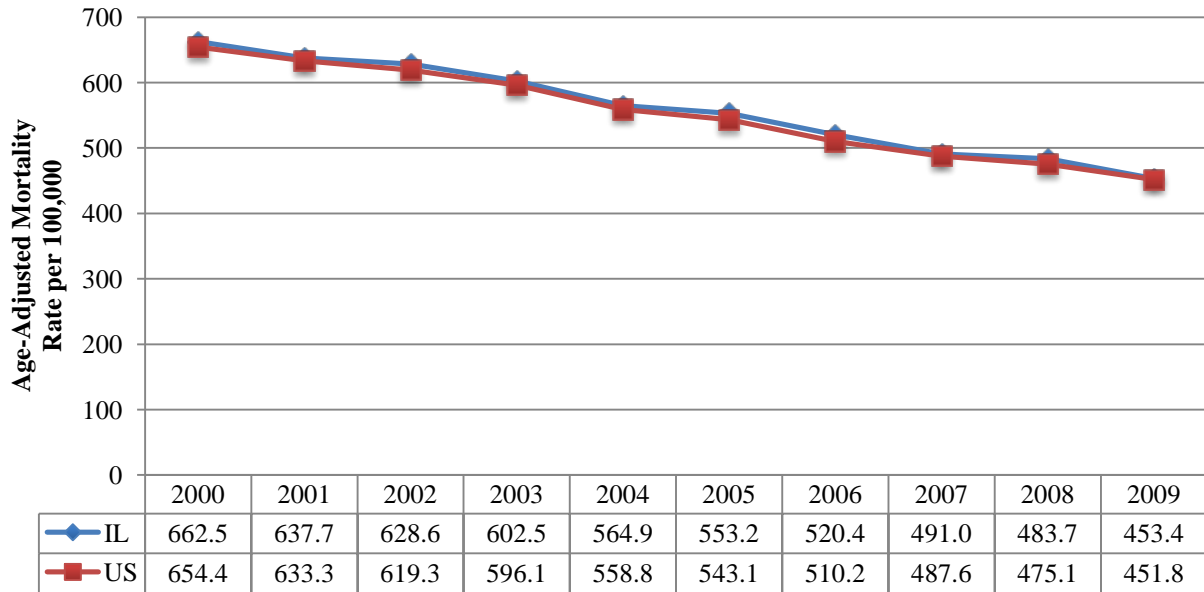
Source: National Center for Health Statistics, data release April 2012

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Cardiovascular Disease Mortality

Cardiovascular disease mortality has been declining in Illinois and nationally. From 2000 to 2009, the cardiovascular mortality rate in Illinois declined from 662.5 per 100,000 to 453.4 per 100,000. While the mortality rate is declining, there are still approximately 32,000 deaths in adults aged 35 and older annually in Illinois due to cardiovascular disease.

Figure 2. Age-adjusted Cardiovascular Disease Mortality Rate*, Illinois and U.S., 2000-2009



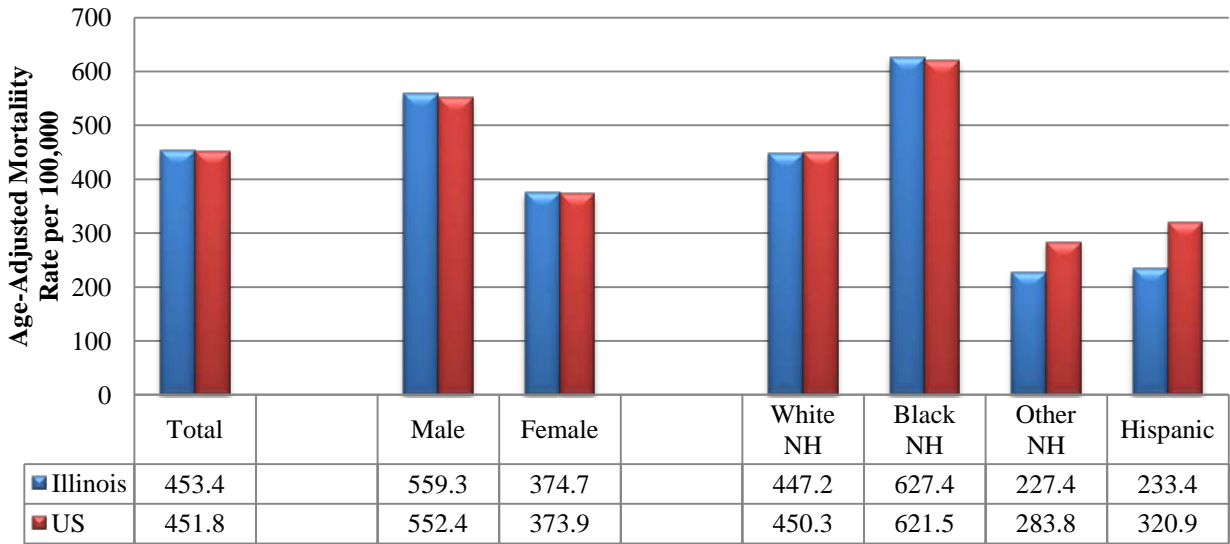
Source: National Center for Health Statistics, data release April 2012

*Rates are per 100,000 and age-adjusted to the 2000 U.S. standard population.

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When the cardiovascular mortality rate is broken down by demographics, differences are seen among groups. In Illinois, males have a higher cardiovascular mortality rate of 559.3 per 100,000 compared to females (374.7 per 100,000). By race and ethnicity, black non-Hispanics have the highest cardiovascular mortality rate of 627.4 per 100,000. Illinois cardiovascular mortality rates are similar among gender, non-Hispanic whites and non-Hispanic blacks when compared to the United States. However, the Hispanic and other non-Hispanic race/ethnicity groups experience lower rates in Illinois.

Figure 3. Age-adjusted Cardiovascular Disease Mortality Rate* by Sex and Race/Ethnicity, Illinois and U.S., 2009

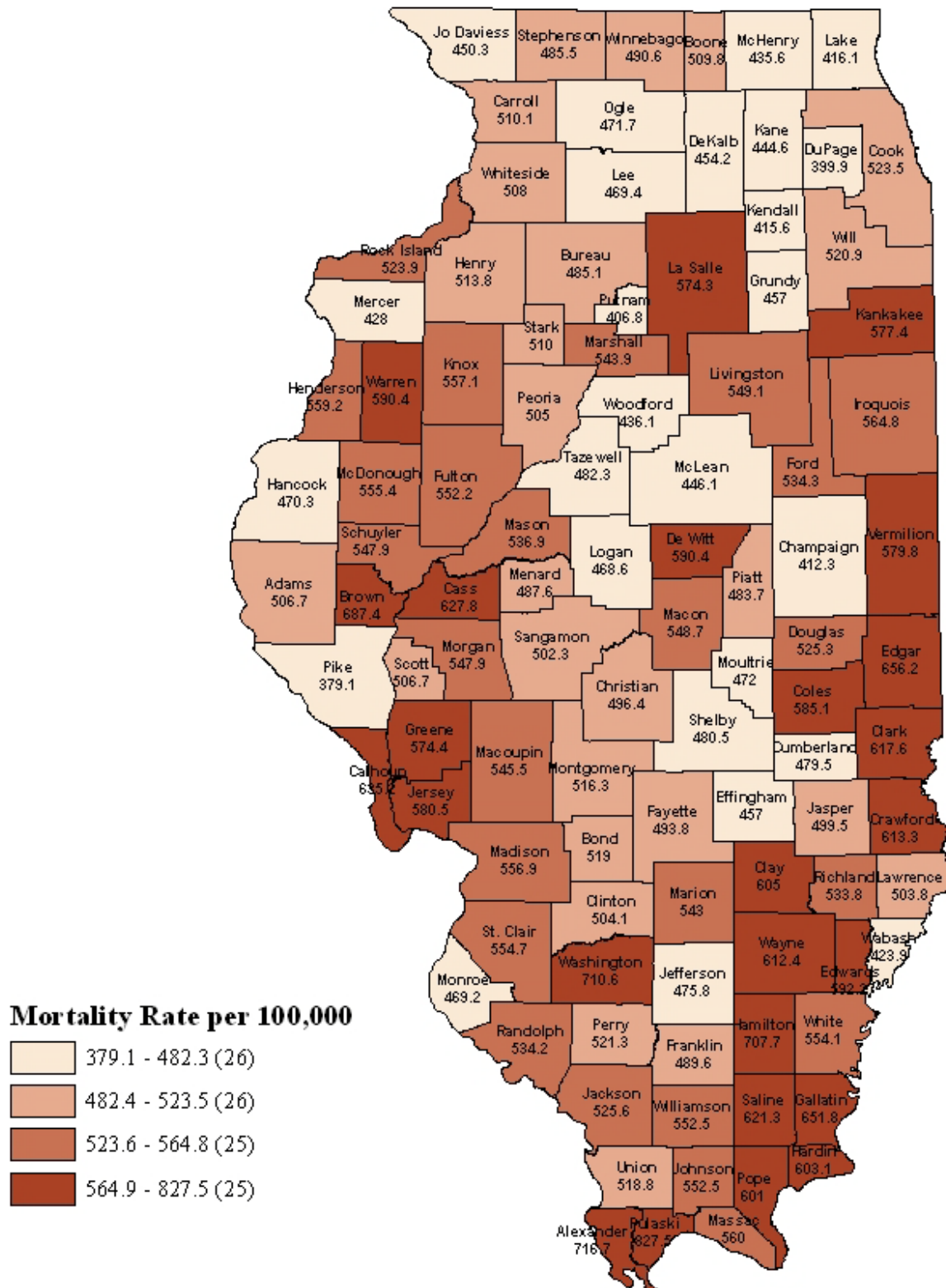


Source: National Center for Health Statistics, data release April 2012
 *Rates are per 100,000 and age-adjusted to the 2000 U.S. standard population.
 Note: NH stands for non-Hispanic.

Cardiovascular mortality rates also vary by county. Many southern and eastern counties have high cardiovascular mortality rates. Pulaski County has the highest rate (827.5 per 100,000) and Pike County has the lowest (379.1 per 100,000).

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Figure 4. Age-adjusted Cardiovascular Disease Mortality Rate* by County, Illinois, 2005-2009



Source: National Center for Health Statistics, data release April 2012
 *Rates are per 100,000 and age-adjusted to the 2000 U.S. standard population.

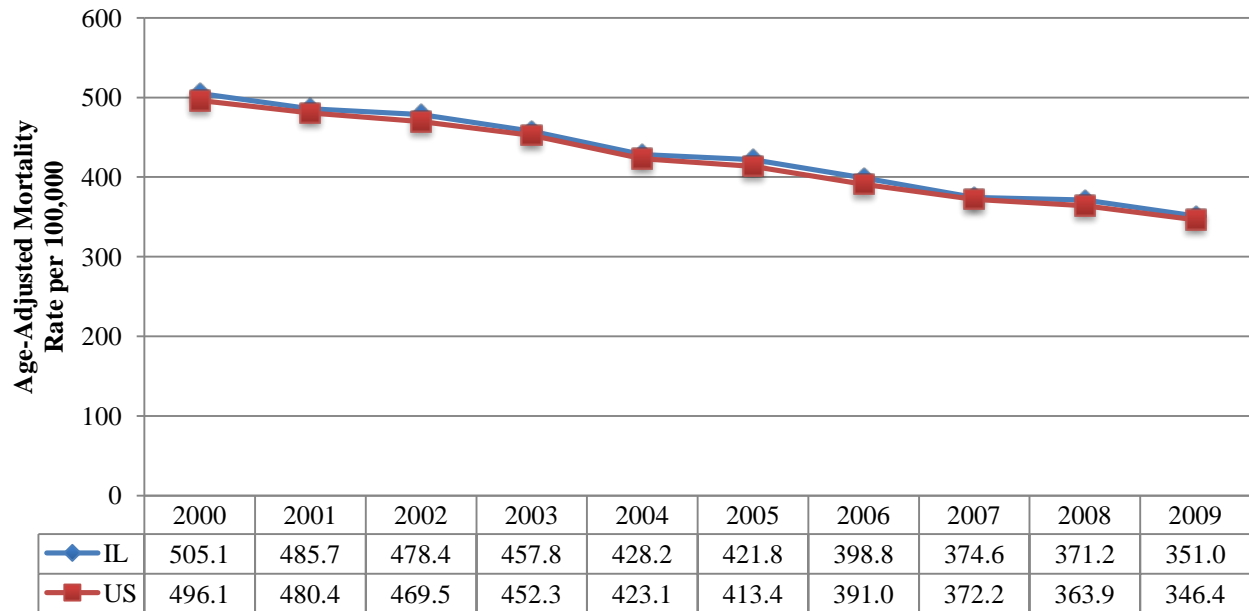
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Heart Disease Mortality

Heart disease refers to several diseases of the heart. The most common type of heart disease is coronary artery disease, which can cause a heart attack. Heart disease is the single leading cause of death in Illinois and the United States and is responsible for nearly 80 percent of cardiovascular deaths. In 2009, nearly 25,000 deaths in adults age 35 and older in Illinois were due to heart disease.

Heart disease mortality has been declining in Illinois and nationally. From 2000 to 2009, the heart disease mortality rate in Illinois declined from 505.1 per 100,000 to 351.0 per 100,000.

Figure 5. Age-adjusted Heart Disease Mortality Rate*, Illinois and U.S., 2000-2009



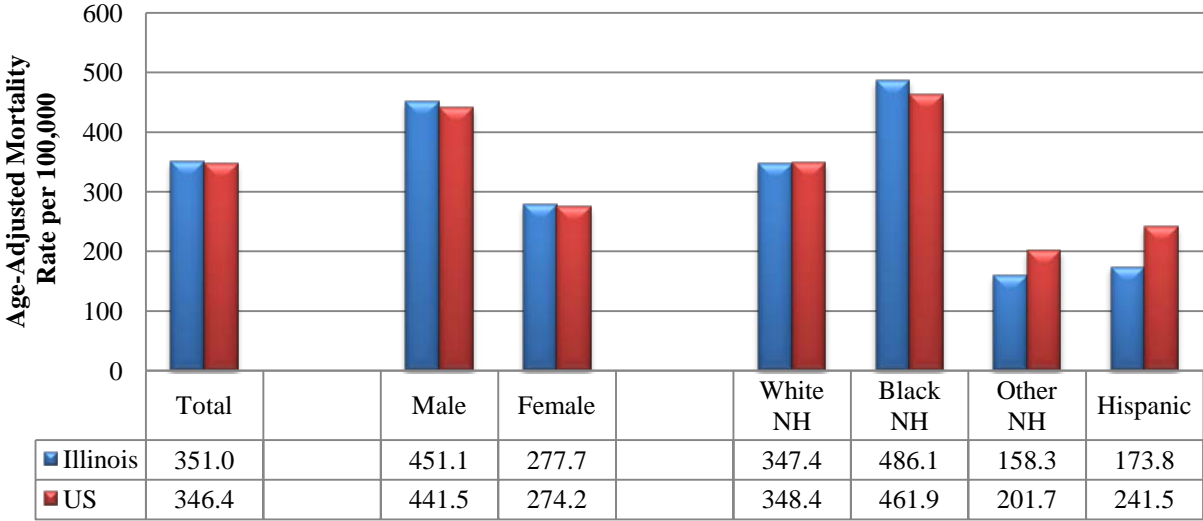
Source: National Center for Health Statistics, data release April 2012

*Rates are per 100,000 and age-adjusted to the 2000 U.S. standard population.

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When the heart disease mortality rate is broken down by demographics, differences are seen among groups. In Illinois, males have a higher heart disease mortality rate of 451.1 per 100,000 compared to females (277.7 per 100,000). By race and ethnicity, black non-Hispanics have the highest heart disease mortality rate of 486.1 per 100,000. Illinois heart disease mortality rates are similar or lower among white non-Hispanics, other non-Hispanics and Hispanics when compared to the United States. However, males, females and black non-Hispanics experience higher rates in Illinois.

Figure 6. Age-adjusted Heart Disease Mortality Rate* by Sex and Race/Ethnicity, Illinois and U.S., 2009

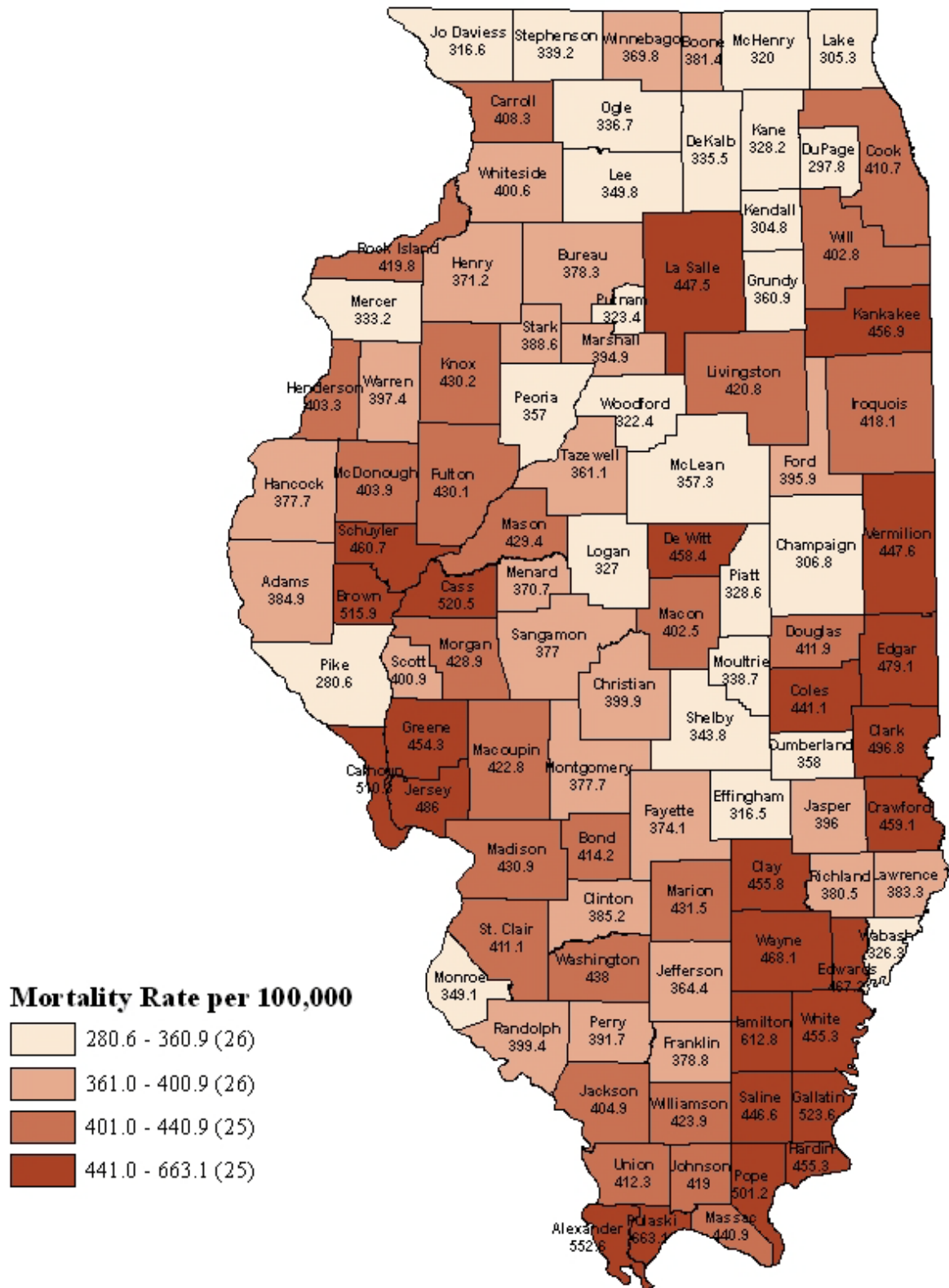


Source: National Center for Health Statistics, data release April 2012
 *Rates are per 100,000 and age-adjusted to the 2000 U.S. standard population.
 Note: NH stands for non-Hispanic.

Heart disease mortality rates also vary by county. Many southern and eastern counties have high heart disease mortality rates. Pulaski County has the highest rate (663.1 per 100,000) and Pike County has the lowest (280.6 per 100,000).

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Figure 7. Age-adjusted Heart Disease Mortality Rate* by County, Illinois, 2005-2009



Source: National Center for Health Statistics, data release April 2012

*Rates are per 100,000 and age-adjusted to the 2000 U.S. standard population.

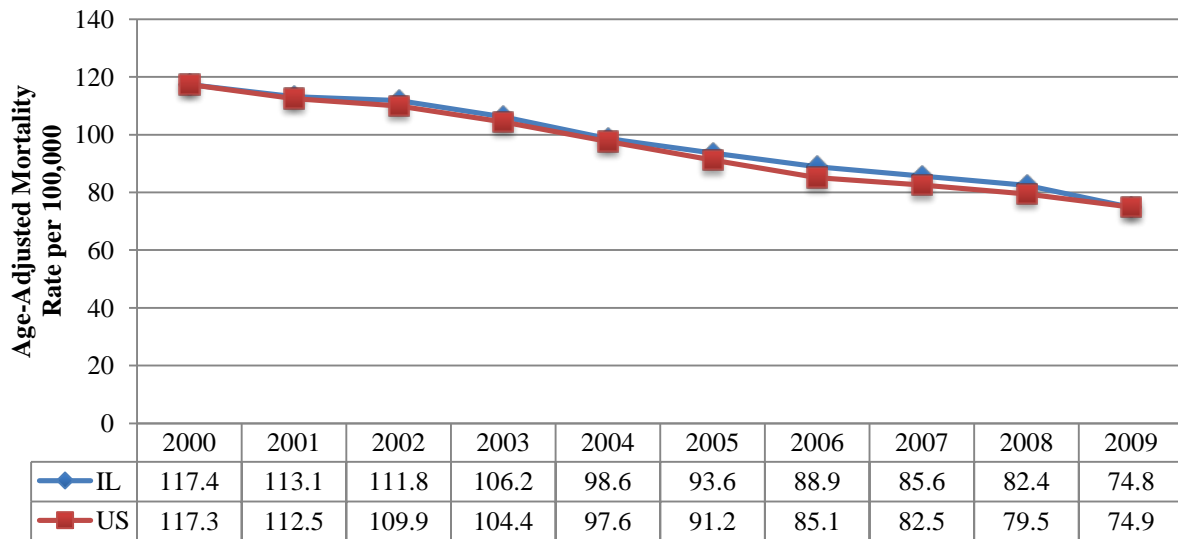
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Stroke Mortality

Stroke, also known as cerebrovascular disease, occurs when a clot blocks the blood supply to the brain or a blood vessel bursts in the brain.³ Stroke is a leading cause of disability in the United States and more women suffer from a disability after a stroke than men.¹ Stroke is the fourth leading cause of death in Illinois and the United States and is responsible for 16 percent of all cardiovascular disease deaths. In 2009, there were slightly more than 5,000 deaths in adults age 35 and older in Illinois due to stroke.

Stroke mortality has been declining in Illinois and nationally. From 2000 to 2009, the stroke mortality rate in Illinois declined from 117.4 per 100,000 to 74.8 per 100,000.

Figure 8. Age-adjusted Stroke Mortality Rate*, Illinois and U.S., 2000-2009



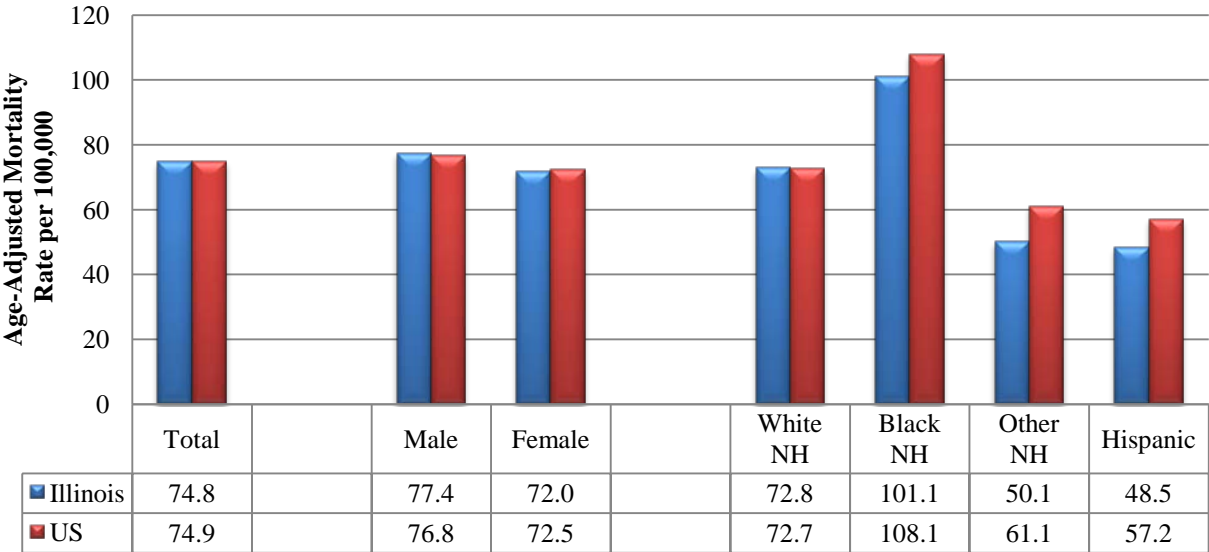
Source: National Center for Health Statistics, data release April 2012

*Rates are per 100,000 and age-adjusted to the 2000 U.S. standard population.

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When the stroke mortality rate is broken down by demographics, differences are seen among groups. In Illinois, males have a higher stroke mortality rate of 77.4 per 100,000 compared to females (72.0 per 100,000). By race and ethnicity, black non-Hispanics have the highest stroke mortality rate of 101.1 per 100,000. Illinois stroke mortality rates are similar or lower among gender, race, and ethnicity when compared to the United States.

Figure 9. Age-adjusted Stroke Mortality Rate* by Sex and Race/Ethnicity, Illinois and U.S., 2009



Source: National Center for Health Statistics, data release April 2012

*Rates are per 100,000 and age-adjusted to the 2000 U.S. standard population.

Note: NH stands for non-Hispanic.

Stroke mortality rates also vary by county. Washington County has the highest rate (180.1 per 100,000) and Schuyler County has the lowest (57.2 per 100,000).

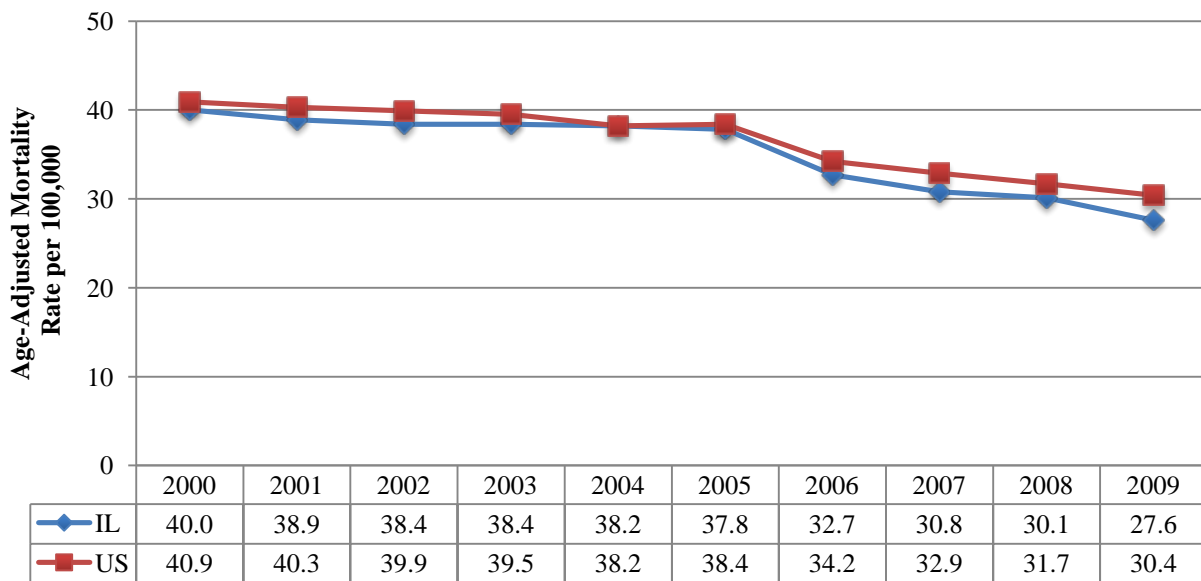
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Other Cardiovascular Diseases Mortality

The other cardiovascular disease group refers to the conditions of atherosclerosis; hypertension without heart disease; aortic aneurysm and dissection; and other diseases of the arteries, arterioles and capillaries. These diseases combined are the 11th leading cause of death in Illinois and the ninth leading cause of death in the United States. These other cardiovascular diseases make up 6 percent of all cardiovascular disease deaths. In 2009, they accounted for nearly 2,000 deaths in adults age 35 and older in Illinois.

Other cardiovascular diseases mortality has been declining in Illinois and nationally. From 2000 to 2009, the other cardiovascular diseases mortality rate in Illinois declined from 40.0 per 100,000 to 27.6 per 100,000.

Figure 11. Age-adjusted Other Cardiovascular Diseases Mortality Rate*, Illinois and U.S., 2000-2009



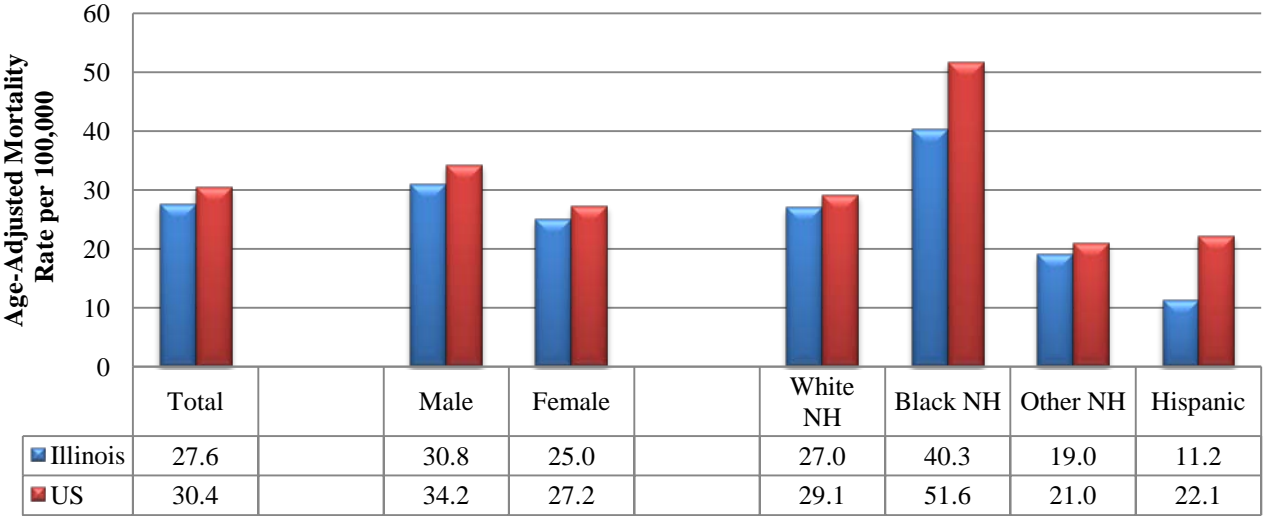
Source: National Center for Health Statistics, data release April 2012

*Rates are per 100,000 and age-adjusted to the 2000 U.S. standard population.

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When the other cardiovascular diseases mortality rate is broken down by demographics, differences are seen among groups. In Illinois, males have a higher other cardiovascular diseases mortality rate of 30.8 per 100,000 compared to females (28.0 per 100,000). By race and ethnicity, black non-Hispanics have the highest other cardiovascular diseases mortality rate of 40.3 per 100,000. Illinois other cardiovascular diseases mortality rates are lower among gender, race, and ethnicity when compared to the United States.

Figure 12. Age-adjusted Other Cardiovascular Diseases Mortality Rate* by Sex and Race/Ethnicity, Illinois and U.S., 2009



Source: National Center for Health Statistics, data release April 2012
 *Rates are per 100,000 and age-adjusted to the 2000 U.S. standard population.
 Note: NH stands for non-Hispanic.

Other cardiovascular disease mortality rates also vary by county. Washington County has the highest rate (92.6 per 100,000) and Douglas County has the lowest (16.6 per 100,000). For several counties data was suppressed due to fewer than 10 cases in the county for the time period of 2005-2009.

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Morbidity

Mortality is only the end result of cardiovascular disease. Morbidity from cardiovascular disease causes disability, years of potential life lost, and health care costs.

More than 3 million people reported having a disability from heart disease or stroke in the United States.⁴ Heart disease and stroke are among the leading causes of disability in the United States. The type of disability an individual may have following a stroke is paralysis, speech difficulties, or emotional problems. After a heart attack an individual may suffer from fatigue, depression, or limitations when engaging in physical activities.

Years of potential life lost (YPLL) is used to determine the impact of premature mortality on a population. The YPLL number represents the difference in years between a person's age at death and age 75. In 2010, nearly 158,000 YPLL in Illinois was due to cardiovascular disease. Of this, more than 131,000 YPLL was due to heart disease, more than 20,000 YPLL was due to stroke, and nearly 6,000 YPLL was due to other cardiovascular diseases.

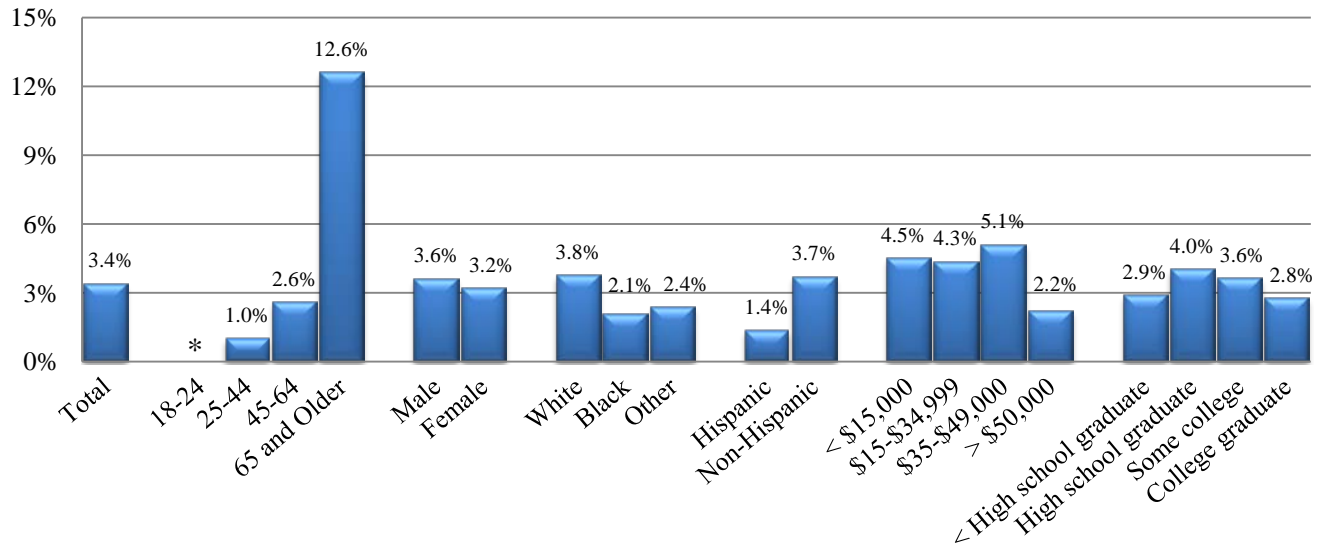
In 2012, it was estimated that the annual cost of care for cardiovascular disease and related conditions, such as high blood pressure, in the United States was \$494 billion.¹ Of this, \$309 billion is from direct costs, such as the cost of physicians, medication, hospital services, and home health care (not nursing home care) and \$185 billion is from future lost productivity. The direct and indirect medical costs from cardiovascular disease and related conditions are expected to triple from 2012 to 2030.

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Heart Disease Morbidity

The overall prevalence of heart disease in Illinois adults is 3.4 percent or more than 320,000 adults. The prevalence of heart disease increases with age. In 2011, adults age 65 and older had the highest prevalence of heart disease (12.6%). Males had a slightly higher percent of heart disease (3.6%) compared to females (3.2%). By race and ethnicity, whites and non-Hispanics had the highest percent of heart disease (3.8 and 3.7% respectively). There was no relationship seen between heart disease prevalence and income or education level. However, the heart disease prevalence in the income level of greater than \$50,000 (2.2%) was much lower than all other income groups.

Figure 14. Heart Disease Prevalence Among Illinois Adults by Select Demographics, 2011



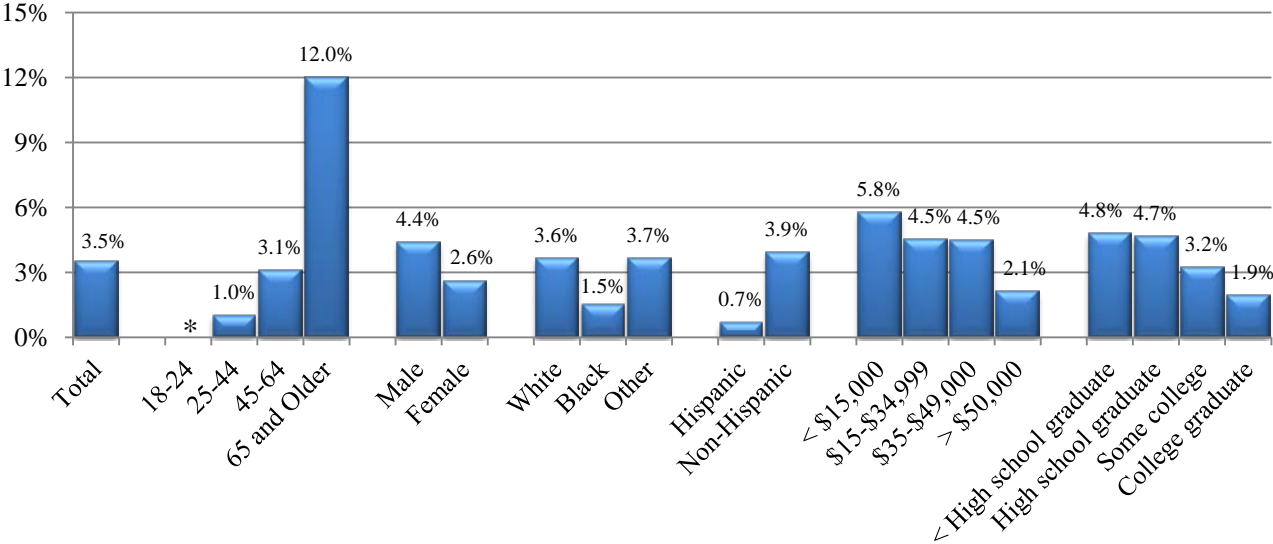
Source: Illinois Behavioral Risk Factor Surveillance System

*Fewer than 50 cases in category.

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Heart disease can lead to a person having a heart attack. In some cases, a heart attack may be the first sign of heart disease. The overall prevalence of heart attacks in Illinois adults is 3.5 percent or more than 330,000 adults. In 2011, adults age 65 and older had the highest prevalence of having a heart attack (12.0%). Males had a higher percent of having heart attacks (4.4%) compared to females (2.6%). By race, whites and adults of other races had the highest prevalence of heart attack (3.6 and 3.7% respectively). Non-Hispanics had a higher percent of heart attacks (3.9%) compared to Hispanics (0.7%). An inverse relationship was seen for prevalence of heart attack and income or education level. Adults in the lowest income category or lowest education level had the highest percentages of heart attack (5.8% and 4.8% respectively). Of the adults who had a heart attack, 41.2 percent had outpatient rehab after their hospital stay (data not shown).

Figure 15. Heart Attack Prevalence Among Illinois Adults by Select Demographics, 2011



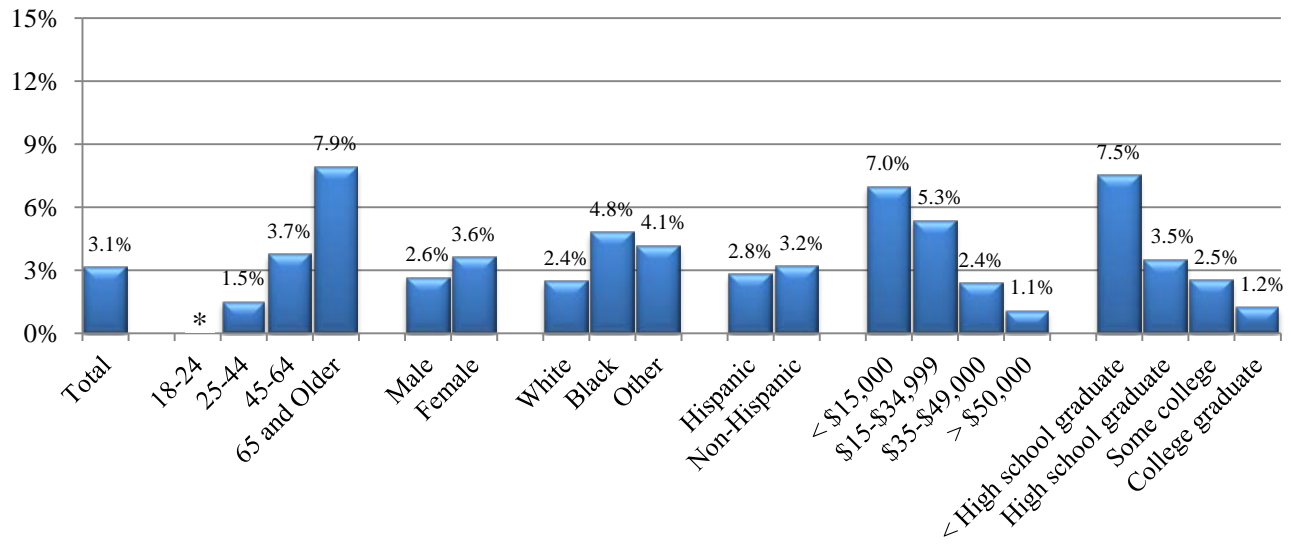
Source: Illinois Behavioral Risk Factor Surveillance System
 *Fewer than 50 cases in category.

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Stroke Morbidity

The overall prevalence of stroke in Illinois adults is 3.1 percent or slightly more than 300,000 adults. The prevalence of stroke increases with age. In 2011, adults age 65 and older had the highest prevalence of stroke (7.9%). Females had a higher percent of stroke (3.6%) compared to males (2.6%). By race and ethnicity, blacks and non-Hispanics had the highest prevalence of stroke (4.8 and 3.2% respectively). An inverse relationship is seen between stroke prevalence and income or education level. Adults in the lowest income category or lowest education level have the highest percent of stroke (7.0 and 7.5% respectively). Of adults who had a stroke, 35.7 percent had outpatient rehab after their hospital stay (data not shown).

Figure 16. Stroke Prevalence Among Illinois Adults by Select Demographics, 2011



Source: Illinois Behavioral Risk Factor Surveillance System

*Fewer than 50 cases in category.

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Cardiovascular Disease Hospitalizations

In 2010, there were slightly more than 5 million inpatient hospital discharges due to cardiovascular disease in the United States. The cost associated with these discharges was more than \$245 billion. In Illinois, in 2010, there were slightly more than 200,000 inpatient hospital discharges due to cardiovascular disease at a cost of nearly \$10 billion.

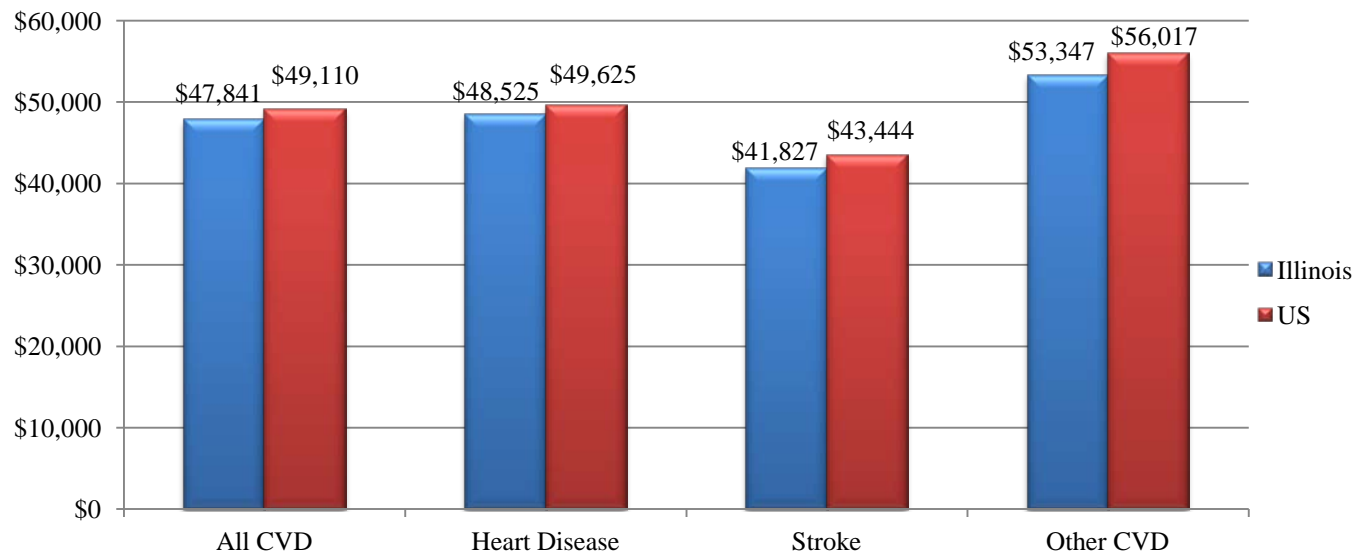
In 2010, 13 percent of all inpatient hospitalization discharges in Illinois were due to cardiovascular disease. The cost for these cardiovascular disease discharges made up 20 percent of all inpatient hospital discharge costs. The average stay and cost for a cardiovascular disease inpatient hospitalization was 4.4 days and \$47,841. The average inpatient hospitalization cost for all cardiovascular disease was lower in Illinois when compared to the United States.

Table 1. Cardiovascular Disease Inpatient Hospitalizations in Illinois, 2010

	Total Number of Discharges	Average Length of Stay (days)	Average Cost per Stay	Total Cost
All Causes	1,606,799	4.3	\$30,316	\$48,710,926,857
CVD	205,626	4.4	\$47,841	\$9,837,296,092
Heart Disease	146,086	4.4	\$48,525	\$7,088,800,424
Stroke	37,134	4.4	\$41,827	\$1,553,211,580
Other CVD	22,406	4.4	\$53,347	\$1,195,289,164

Source: Healthcare Cost and Utilization Project State Inpatient Databases, 2010

Figure 17. Average Cost per Stay for Cardiovascular Disease Inpatient Hospitalizations, Illinois and U.S., 2010



Source: Healthcare Cost and Utilization Project State Inpatient Databases, 2010

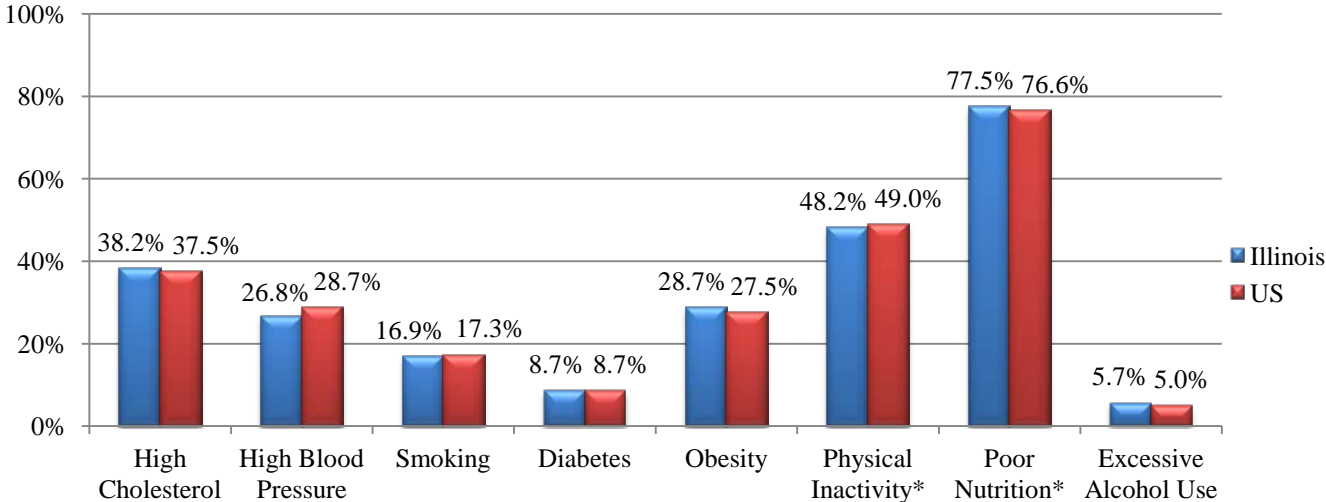
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Risk Factors

There are several risk factors that can increase the likelihood of developing cardiovascular disease. Some risk factors cannot be changed, such as family history, gender, ethnicity and age. Other risk factors can be managed to help prevent cardiovascular disease. These risk factors are high cholesterol, high blood pressure, smoking, diabetes, obesity, physical inactivity, poor nutrition, and excessive alcohol use.

When compared to the United States, Illinois has a higher prevalence for the risk factors of high cholesterol, obesity, poor nutrition, and excessive alcohol use. Illinois has a lower prevalence of the risk factors of high blood pressure, smoking, and physical inactivity than the United States. The prevalence of diabetes in Illinois and the United States are the same.

Figure 18. Cardiovascular Disease Risk Factor Prevalence Among Illinois Adults, 2010



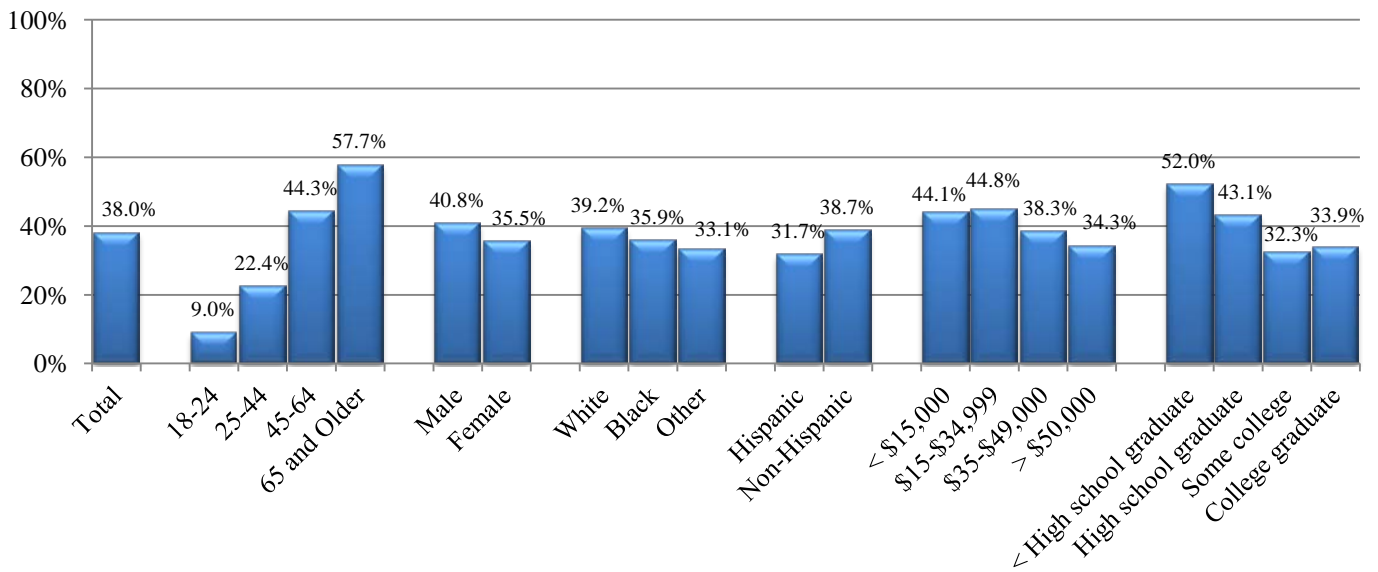
Source: Illinois Behavioral Risk Factor Surveillance System
*Denotes 2009 data

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High Cholesterol

The overall prevalence of high cholesterol in Illinois adults is 38.0 percent or slightly less than 3 million adults. The prevalence of high cholesterol increases with age. In 2011, adults age 65 and older had the highest prevalence of high cholesterol (57.7 %). Males had a higher percent of high cholesterol (40.8%) compared to females (35.5%). By race and ethnicity, whites and non-Hispanics had the highest prevalence of high cholesterol (39.2 and 38.7% respectively). An inverse relationship is seen between high cholesterol prevalence and income or education level. Adults in the lower income or education levels have the highest percent of high cholesterol.

Figure 19. High Cholesterol Prevalence Among Illinois Adults by Select Demographics, 2011



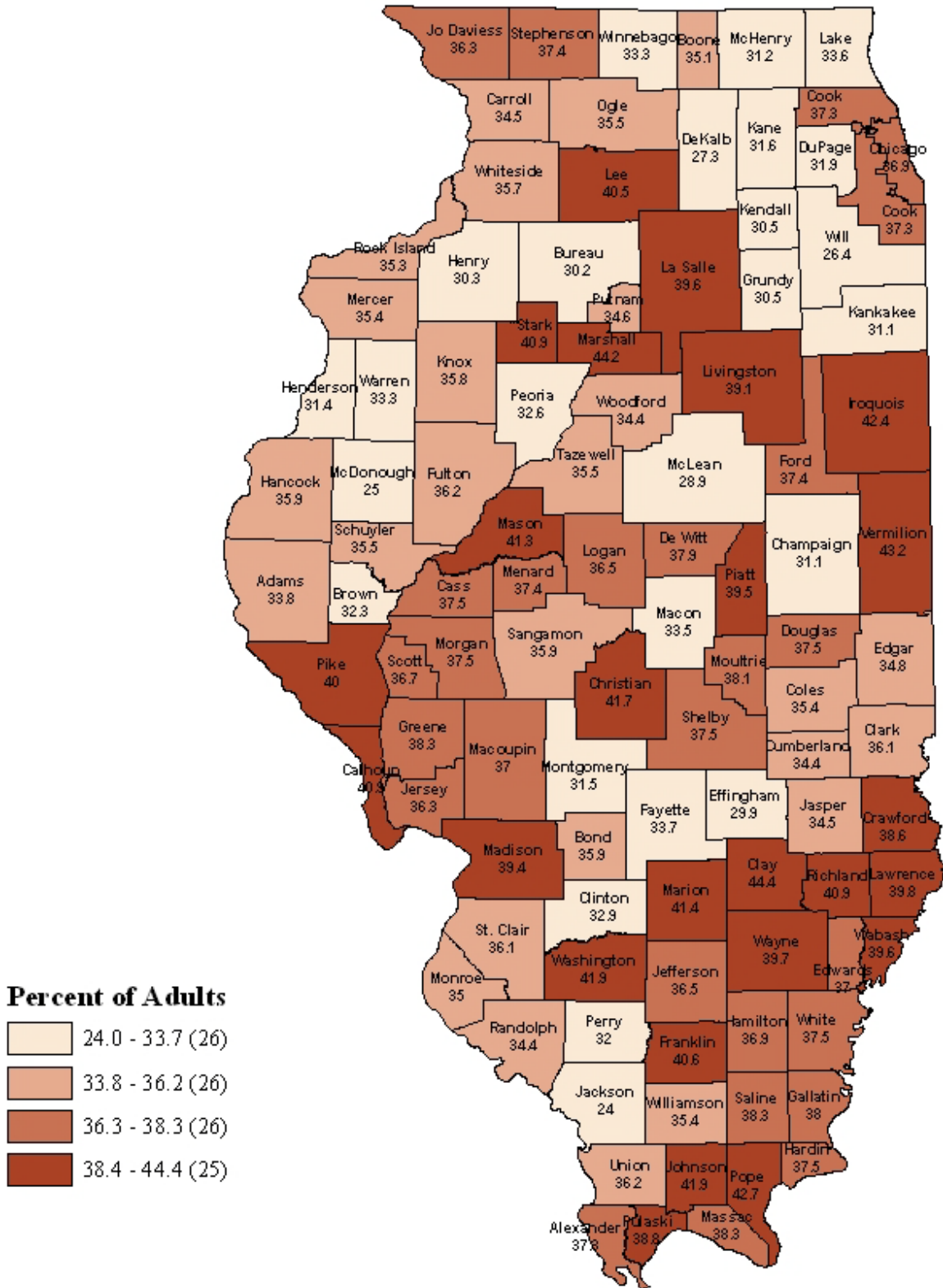
Source: Illinois Behavioral Risk Factor Surveillance System

Note: Adults with high cholesterol were those that responded “yes” to the survey question “Have you ever been told by a doctor, nurse, or other health professional that you have high cholesterol?”

High cholesterol prevalence also varies by county. Clay County has the highest percent of adults with high cholesterol (44.4%) and Jackson County has the lowest percent of adults with high cholesterol (24.0%).

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Figure 20. High Cholesterol Prevalence by County, Illinois, 2007-2009



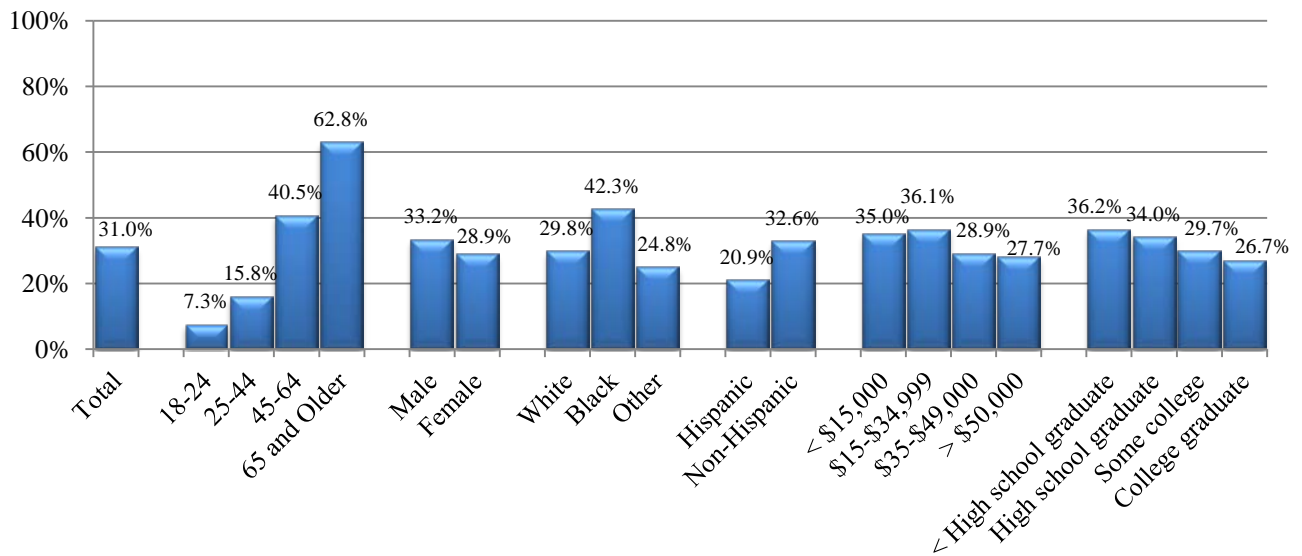
Source: Illinois County Behavioral Risk Factor Surveys
 Note: Chicago and Cook County values are from 2009 annual BRFSS.

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High Blood Pressure

The prevalence of high blood pressure increases with age. In 2011, adults age 65 and older had the highest prevalence of high blood pressure (62.8%). Males had a higher percent of high blood pressure (33.2%) compared to females (28.9%). By race and ethnicity, blacks and non-Hispanics had the highest prevalence of high blood pressure (42.3 and 32.6% respectively). An inverse relationship is seen between high blood pressure prevalence and income or education level. Adults in the lower income or education levels have the highest percent of high blood pressure.

Figure 21. High Blood Pressure Prevalence Among Illinois Adults by Select Demographics, Illinois, 2011



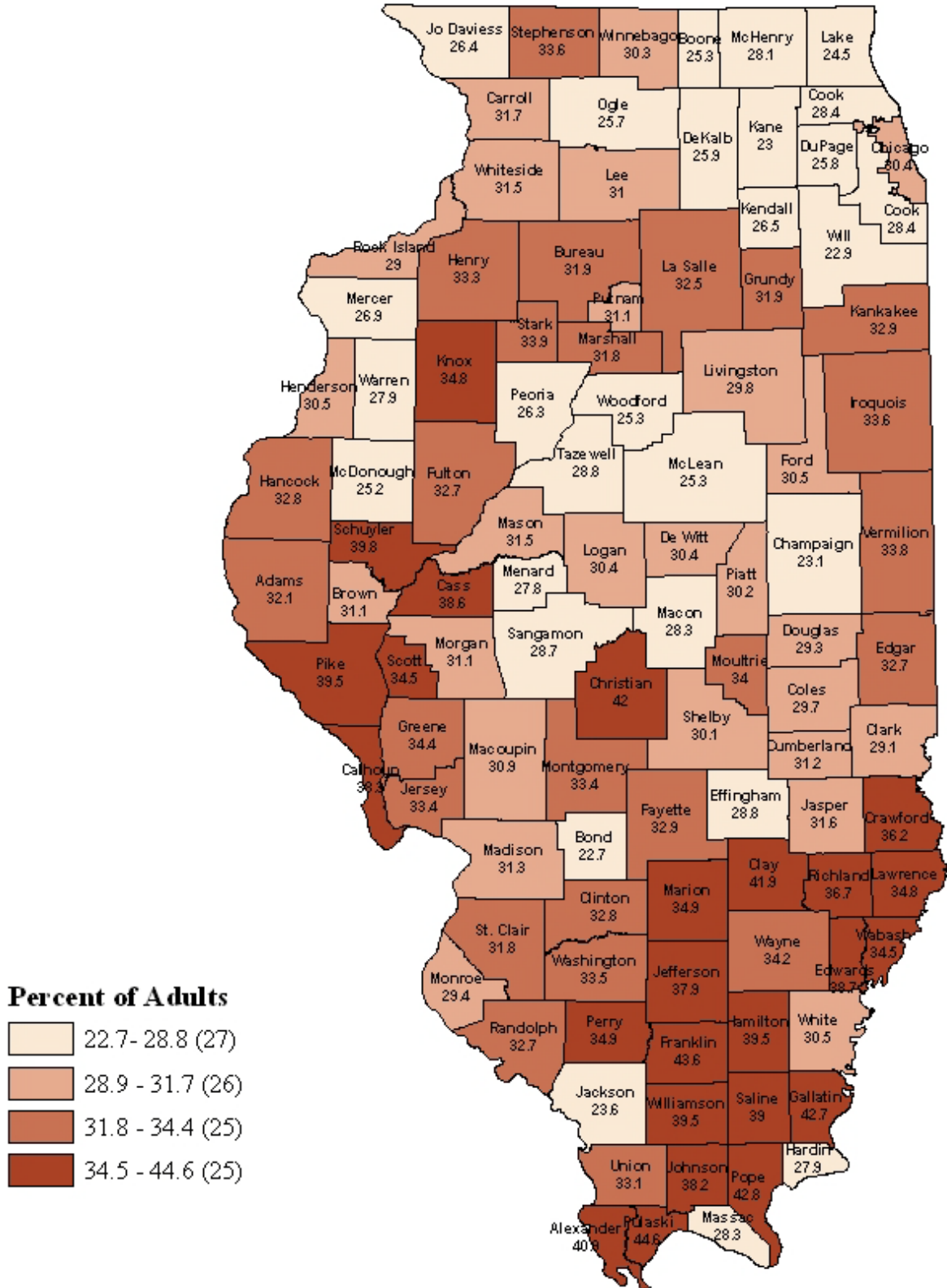
Source: Illinois Behavioral Risk Factor Surveillance System

Note: Adults with high blood pressure were those that responded “yes” to the survey question “Have you ever been told by a doctor, nurse, or other health professional that you have high blood pressure?”

High blood pressure prevalence also varies by county. There is a high prevalence of high blood pressure in the southern counties. Pulaski County has the highest percent of adults with high blood pressure (44.6%) and Bond County has the lowest (22.7%).

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Figure 22. High Blood Pressure Prevalence Among Illinois Adults by County, 2007-2009



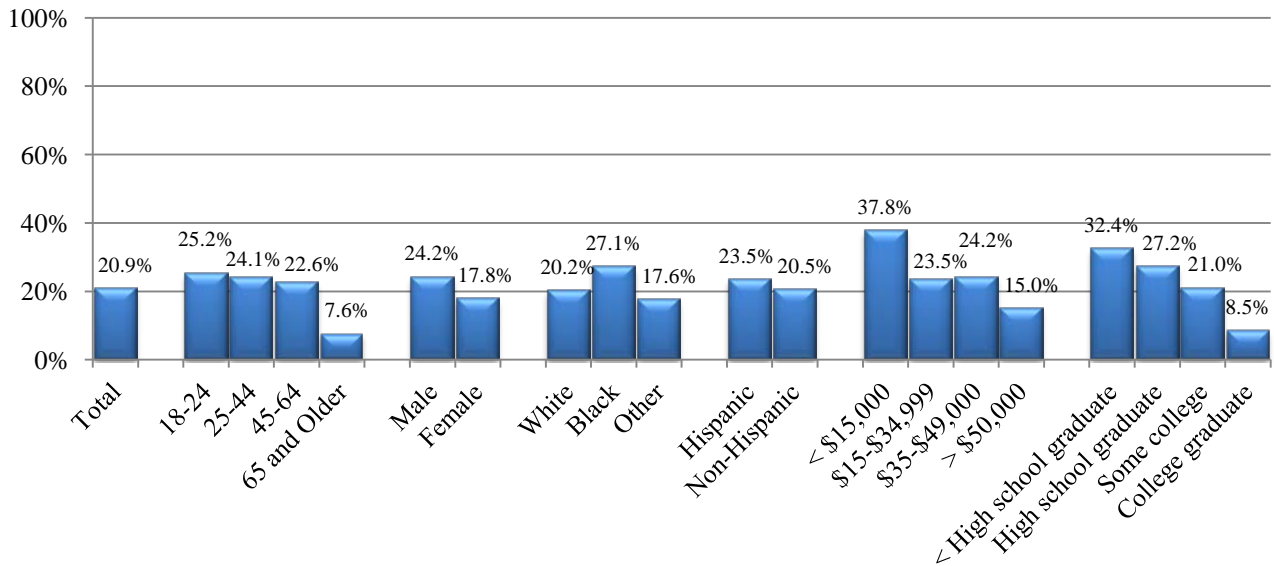
Source: Illinois County Behavioral Risk Factor Surveys
 Note: Chicago and Cook County values are from 2009 annual BRFS.

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Smoking

The prevalence of smoking decreases with age. In 2011, adults age 18 to 24 had the highest prevalence of smoking (25.2%). Males had a higher percent of smoking (24.2%) compared to females (17.8%). By race and ethnicity, blacks and Hispanics had the highest prevalence of smoking (27.1 and 23.5% respectively). An inverse relationship is seen between smoking prevalence and income or education level. Adults in the lower income or education levels have the highest percent of smoking.

Figure 23. Smoking Prevalence Among Illinois Adults by Select Demographics, 2011



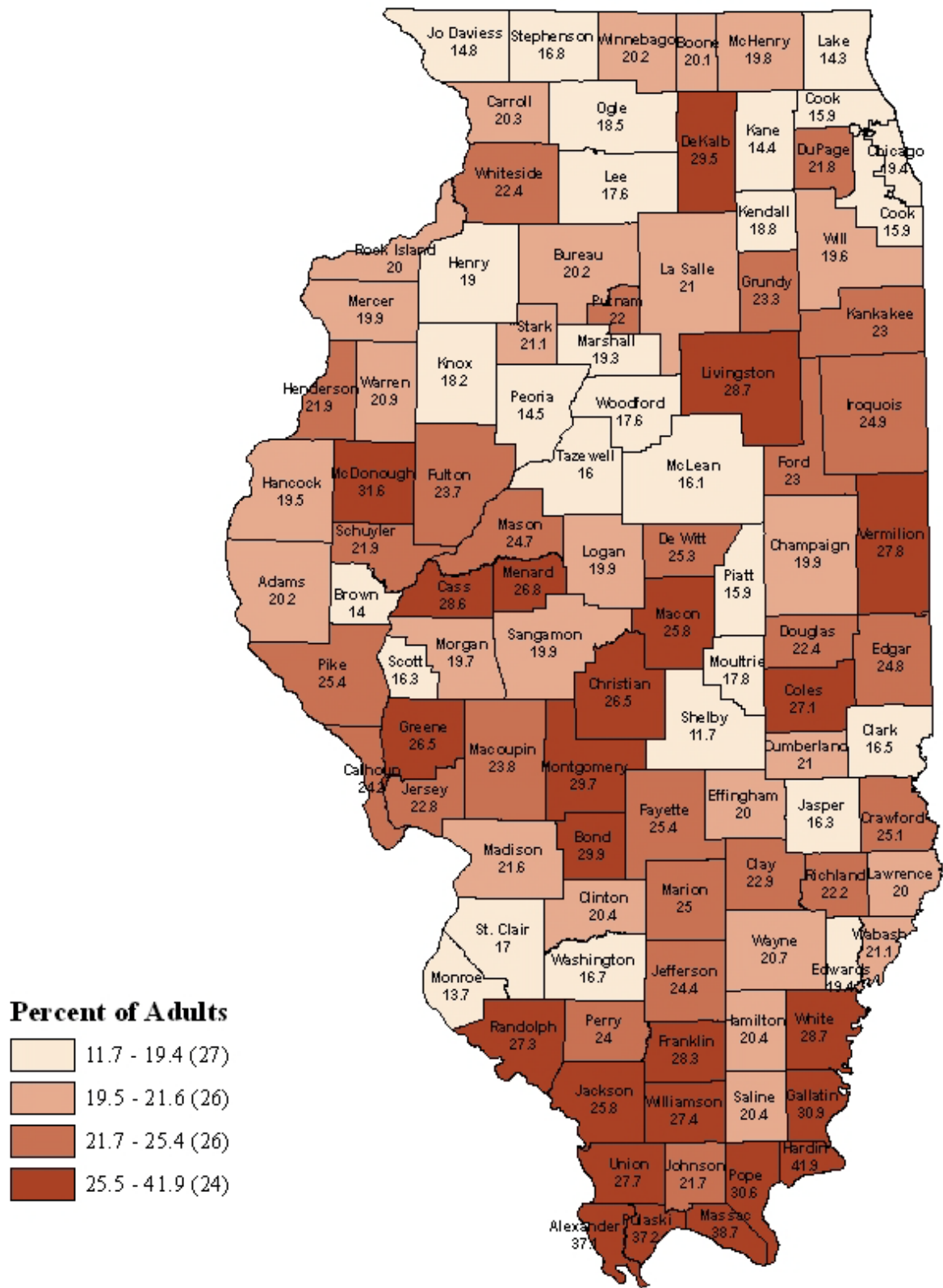
Source: Illinois Behavioral Risk Factor Surveillance System

Note: Adults who were current smokers were those that responded “every day” or “some days” to the question “Do you now smoke cigarettes every day, some days, or not at all?”

Smoking prevalence also varies by county. Hardin County has the highest percent of adults who smoke (41.9%) and Shelby County has the lowest percent of adults who smoke (11.7%). There is a high prevalence of smoking in the southern counties.

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Figure 24. Smoking Prevalence Among Illinois Adults by County, 2007-2009



Source: Illinois County Behavioral Risk Factor Surveys
 Note: Chicago and Cook County values are from 2009 annual BRFSS.

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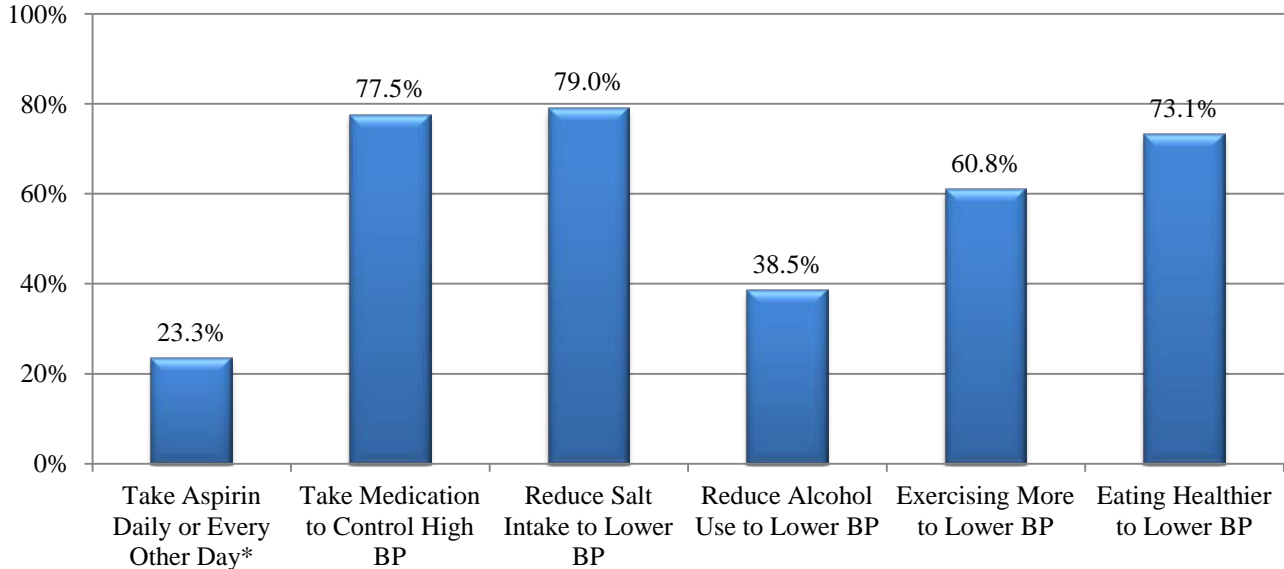
Cardiovascular Disease Control

The Illinois Cardiovascular Health Program has been charged with addressing the ABCS of cardiovascular health. The U.S. Centers for Disease Control and Prevention National Heart Disease and Stroke Prevention Program defines the ABCS of cardiovascular health as aspirin therapy, high blood pressure (including sodium reduction), high cholesterol, and smoking cessation. The CDC NHDSP guideline, *Strategies to Address the “ABCS,”* describes screening tests and behavioral changes around the ABCS that can be used to help diagnose, control and prevent further damage from cardiovascular disease.

Aspirin therapy is used to help prevent cardiovascular disease events. In 2011, of Illinois adults surveyed that had a heart attack, 23.3 percent stated they currently took aspirin daily or every other day.

Lower blood pressure can lower the risk of heart disease and stroke. Several behavioral changes to help control high blood pressure were reported among Illinois adults surveyed who responded they had high blood pressure. These behaviors were taking medication (77.5%), reducing salt intake (79.0%), reducing alcohol use (38.5%), exercising more (60.8%), and eating healthier (73.1%).

Figure 25. Prevalence of Cardiovascular Disease Control Measures Among Illinois Adults With High Blood Pressure (BP), 2011*



Source: Illinois Behavioral Risk Factor Surveillance System

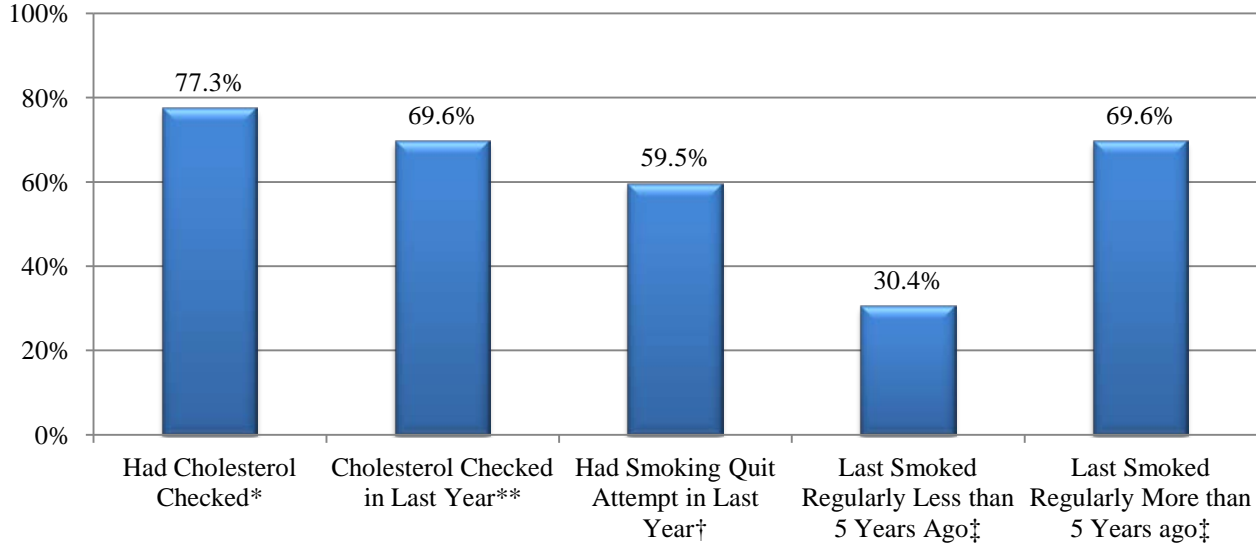
*Question asked to survey respondents that had a heart attack.

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Lower cholesterol can lower the risk of heart disease and stroke. In 2011, 77.3 percent of Illinois adults surveyed had their cholesterol checked in their lifetime. Of those that had ever had their cholesterol checked, 69.6 percent had it checked within the past year.

Smoking increases the risk of heart disease and increases blood pressure. In 2011, 59.5 percent of Illinois current smokers surveyed had a quit attempt within the last year. Of the former smokers surveyed, 30.4 percent had last smoked regularly within the past five years and 69.6 percent last smoked regularly more than five years ago.

Figure 26. Prevalence of Cardiovascular Disease Control Measures Among Illinois Adults, 2011



Source: Illinois Behavioral Risk Factor Surveillance System

*Question asked to all survey respondents.

**Question asked to survey respondents who responded that they had had their cholesterol checked.

†Question asked to survey respondents who were current smokers.

‡Question asked to survey respondents who were former smokers.

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References

- ¹ Heart Disease and Stroke Statistics-2012 Update: a report from the American Heart Association.
- ² Healthcare Cost and Utilization Project. State Inpatient Databases 2010, Agency for Healthcare Research and Quality (AHRQ) based on data collected by the Illinois Department of Public Health and provided to AHRQ.
- ³ CDC Stroke Fact Sheet http://www.cdc.gov/dhds/data_statistics/fact_sheets/fs_stroke.htm
- ⁴ Centers for Disease Control and Prevention. Consequences and Costs of Heart Disease and Stroke. <http://millionhearts.hhs.gov/about/hds/cost-consequences.html>

Definitions

For mortality and hospitalization data, the following ICD-9 and ICD-10 codes were used to categorize cardiovascular disease and heart disease, stroke, and other cardiovascular diseases.

Disease	ICD-9 Codes	ICD-10 Codes
Cardiovascular Disease	390-398, 401-438, 440-448	I00-I13, I15, I20-I52, I60-I78
Heart Disease	390-398, 402, 404-429	I00-I09, I11, I13, I20-I51
Stroke	430-438	I60-I69
Other Cardiovascular Diseases	401, 403, 440-448	I10, I12, I15, I52, I70-I78

Data Sources

Behavioral Risk Factor Surveillance System

The Behavioral Risk Factor Surveillance System (BRFSS) is a state-based system of health surveys that collects information on health risk behaviors, preventive health practices, and health care access primarily related to chronic disease and injury. The BRFSS is a cross-sectional telephone survey conducted by the Illinois Department of Public Health with technical and methodological assistance provided by the CDC. Every year, the state conducts monthly telephone surveillance using a standardized questionnaire to determine the distribution of risk behaviors and health practices among non-institutionalized adults. The state forwards the responses to CDC, where the monthly data are aggregated. The data is returned to the state, and then published on the BRFSS website. In addition, Illinois regularly conducts risk factor surveillance of each county. The county level data is used extensively at the sub-state/local governmental areas to formulate public health policies and prevention and health promotion programs. For more information on BRFSS, refer to <http://www.cdc.gov/brfss/index.htm>.

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Healthcare Cost and Utilization Project State Inpatient Databases

Healthcare Cost and Utilization Project State Inpatient Databases are accessed through HCUPnet. HCUPnet is part of the Healthcare Cost and Utilization Project (HCUP) of the Agency for Healthcare Research and Quality (AHRQ). HCUPnet generates statistics using data from Healthcare Cost and Utilization Project's Nationwide Inpatient Sample (NIS), the Kids' Inpatient Database (KID), the State Inpatient Databases (SID) and the State Emergency Department Databases (SEDD). These databases and HCUPnet would not be possible without the statewide data collection projects that provide data to Healthcare Cost and Utilization Project. State statistics are based on data collected by the Illinois Department of Public Health and provided to AHRQ. For more information on HCUPnet, refer to <http://hcupnet.ahrq.gov/>.

National Center for Health Statistics

Mortality data was obtained from the National Center for Health Statistics through SEER*Stat software developed by the National Cancer Institute. The mortality data available through SEER*Stat includes all causes of death, not just cancer deaths. Mortality data can be obtained from 1969-2009 at the national, state and county level. Racial categories that can be selected are white, black, other, American Indian/Alaska Native, Asian or Pacific Islander, or unknown. Ethnicity categories were added to the data in 1990. There are 19 age categories that can be selected. From SEER*Stat software the frequency, crude rate, age-adjusted rate, crude rate trend, and age-adjusted rate trend can be calculated for all causes of death. The standard error and confidence intervals are also calculated in this software to determine significance. For this report, the mortality all cause of death, aggregated with state, total U.S. 1990-2009 data was used. The data in this software was released in April 2012. For more information refer to <http://www.seer.cancer.gov/mortality/>.

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Appendix

Appendix A. County Mortality Rate and Prevalence

County	CVD Mortality Rate*	Heart Disease Mortality Rate*	Stroke Mortality Rate*	Other CVD Mortality Rate*	High Blood Pressure (%)	High Cholesterol (%)	Smokers (%)
Adams	506.7	384.9	80.6	41.1	32.1	33.8	20.2
Alexander	716.7	552.6	118.1	46.0	40.9	37.3	37.1
Bond	519.0	414.2	82.3	22.5	22.7	35.9	29.9
Boone	509.8	381.4	92.1	36.3	25.3	35.1	20.1
Brown	687.4	515.9	140.4	^	31.1	32.3	14.0
Bureau	485.1	378.3	68.2	38.6	31.9	30.2	20.2
Calhoun	635.2	510.3	98.3	^	38.3	40.9	24.2
Carroll	510.1	408.3	75.1	26.6	31.7	34.5	20.3
Cass	627.8	520.5	88.4	^	38.6	37.5	28.6
Champaign	412.3	306.8	73.2	32.3	23.1	31.1	19.9
Chicago	--	--	--	--	30.4	36.9	19.4
Christian	496.4	399.9	73.1	23.5	42.0	41.7	26.5
Clark	617.6	496.8	95.9	24.9	29.1	36.1	16.5
Clay	605.0	455.8	96.2	52.9	41.9	44.4	22.9
Clinton	504.1	385.2	90.0	28.9	32.8	32.9	20.4
Coles	585.1	441.1	109.4	34.6	29.7	35.4	27.1
Cook	523.5	410.7	82.3	30.4	28.4	37.3	15.9
Crawford	613.3	459.1	128.6	25.6	36.2	38.6	25.1
Cumberland	479.5	358.0	93.7	27.8	31.2	34.4	21.0
DeKalb	454.2	335.5	89.5	29.2	25.9	27.3	29.5
DeWitt	590.4	458.4	104.1	27.9	30.4	37.9	25.3
Douglas	525.3	411.9	96.8	16.6	29.3	37.5	22.4
DuPage	399.9	297.8	73.5	28.6	25.8	31.9	21.8
Edgar	656.2	479.1	127.1	50.1	32.7	34.8	24.8
Edwards	592.2	467.2	99.2	^	38.7	37.0	19.4
Effingham	457.0	316.5	106.0	34.5	28.8	29.9	20.0
Fayette	493.8	374.1	93.0	26.6	32.9	33.7	25.4
Ford	534.3	395.9	78.4	60.0	30.5	37.4	23.0
Franklin	489.6	378.8	81.2	29.7	43.6	40.6	28.3
Fulton	552.2	430.1	89.5	32.5	32.7	36.2	23.7
Gallatin	651.8	523.6	93.0	^	42.7	38.0	30.9
Greene	574.4	454.3	85.5	34.6	34.4	38.3	26.5
Grundy	457.0	360.9	76.2	19.8	31.9	30.5	23.3
Hamilton	707.7	612.8	81.1	^	39.5	36.9	20.4
Hancock	470.3	377.7	68.1	24.5	32.8	35.9	19.5
Hardin	603.1	455.3	137.6	^	27.9	37.5	41.9
Henderson	559.2	403.3	108.3	47.6	30.5	31.4	21.9

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County	CVD Mortality Rate*	Heart Disease Mortality Rate*	Stroke Mortality Rate*	Other CVD Mortality Rate*	High Blood Pressure (%)	High Cholesterol (%)	Smokers (%)
Henry	513.8	371.2	93.3	49.3	33.3	30.3	19.0
Iroquois	564.8	418.1	121.0	25.7	33.6	42.4	24.9
Jackson	525.6	404.9	77.9	42.8	23.6	24.0	25.8
Jasper	499.5	396.0	89.8	^	31.6	34.5	16.3
Jefferson	475.8	364.4	83.1	28.2	37.9	36.5	24.4
Jersey	580.5	486.0	62.1	32.3	33.4	36.3	22.8
Jo Daviess	450.3	316.6	107.3	26.4	26.4	36.3	14.8
Johnson	552.5	419.0	95.8	37.7	38.2	41.9	21.7
Kane	444.6	328.2	78.6	37.7	23.0	31.6	14.4
Kankakee	577.4	456.9	90.4	30.1	32.9	31.1	23.0
Kendall	415.6	304.8	65.3	45.5	26.5	30.5	18.8
Knox	557.1	430.2	101.6	25.3	34.8	35.8	18.2
Lake	416.1	305.3	84.4	26.4	24.5	33.6	14.3
LaSalle	574.3	447.5	84.9	41.9	32.5	39.6	21.0
Lawrence	503.8	383.3	93.8	26.7	34.8	39.8	20.0
Lee	469.4	349.8	93.0	26.6	31.0	40.5	17.6
Livingston	549.1	420.8	95.7	32.6	29.8	39.1	28.7
Logan	468.6	327.0	87.0	54.7	30.4	36.5	19.9
McDonough	555.4	403.9	122.5	29.0	25.2	25.0	31.6
McHenry	435.6	320.0	77.8	37.8	28.1	31.2	19.8
McLean	446.1	357.3	66.7	22.1	25.3	28.9	16.1
Macon	548.7	402.5	109.3	36.9	28.3	33.5	25.8
Macoupin	545.5	422.8	94.5	28.2	30.9	37.0	23.8
Madison	556.9	430.9	94.4	31.6	31.3	39.4	21.6
Marion	543.0	431.5	81.7	29.8	34.9	41.4	25.0
Marshall	543.9	394.9	116.8	32.2	31.8	44.2	19.3
Mason	536.9	429.4	78.0	29.5	31.5	41.3	24.7
Massac	560.0	440.9	97.1	22.0	28.3	38.3	38.7
Menard	487.6	370.7	92.4	^	27.8	37.4	26.8
Mercer	428.0	333.2	62.7	32.1	26.9	35.4	19.9
Monroe	469.2	349.1	83.9	36.2	29.4	35.0	13.7
Montgomery	516.3	377.7	116.1	22.5	33.4	31.5	29.7
Morgan	547.9	428.9	95.6	23.4	31.1	37.5	19.7
Moultrie	472.0	338.7	102.0	31.3	34.0	38.1	17.8
Ogle	471.7	336.7	91.7	43.3	25.7	35.5	18.5
Peoria	505.0	357.0	113.4	34.7	26.3	32.6	14.5
Perry	521.3	391.7	83.3	46.3	34.9	32.0	24.0
Piatt	483.7	328.6	100.5	54.7	30.2	39.5	15.9
Pike	379.1	280.6	73.9	24.5	39.5	40.0	25.4

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County	CVD Mortality Rate*	Heart Disease Mortality Rate*	Stroke Mortality Rate*	Other CVD Mortality Rate*	High Blood Pressure (%)	High Cholesterol (%)	Smokers (%)
Pope	601.0	501.2	70.7	^	42.8	42.7	30.6
Pulaski	827.5	663.1	127.1	^	44.6	38.8	37.2
Putnam	406.8	323.4	69.8	^	31.1	34.6	22.0
Randolph	534.2	399.4	84.4	50.4	32.7	34.4	27.3
Richland	533.8	380.5	96.6	56.7	36.7	40.9	22.2
Rock Island	523.9	419.8	75.6	28.5	29.0	35.3	20.0
St. Clair	554.7	411.1	101.8	41.7	31.8	36.1	17.0
Saline	621.3	446.6	124.8	49.8	39.0	38.3	20.4
Sangamon	502.3	377.0	81.7	43.7	28.7	35.9	19.9
Schuyler	547.9	460.7	57.2	^	39.8	35.5	21.9
Scott	506.7	400.9	78.7	^	34.5	36.7	16.3
Shelby	480.5	343.8	105.1	31.6	30.1	37.5	11.7
Stark	510.0	388.6	87.9	^	33.9	40.9	21.1
Stephenson	485.5	339.2	102.6	43.7	33.6	37.4	16.8
Tazewell	482.3	361.1	90.4	30.8	28.8	35.5	16.0
Union	518.8	412.3	80.5	25.9	33.1	36.2	27.7
Vermilion	579.8	447.6	93.7	38.5	33.8	43.2	27.8
Wabash	423.9	326.3	67.7	29.8	34.5	39.6	21.1
Warren	590.4	397.4	159.9	33.0	27.9	33.3	20.9
Washington	710.6	438.0	180.1	92.6	33.5	41.9	16.7
Wayne	612.4	468.1	105.1	39.1	34.2	39.7	20.7
White	554.1	455.3	76.0	22.8	30.5	37.5	28.7
Whiteside	508.0	400.6	89.3	18.1	31.5	35.7	22.4
Will	520.9	402.8	85.0	33.2	22.9	26.4	19.6
Williamson	552.5	423.9	100.2	28.4	39.5	35.4	27.4
Winnebago	490.6	369.8	88.9	32.0	30.3	33.3	20.2
Woodford	436.1	322.4	80.7	32.9	25.3	34.4	17.6

Underlying mortality data provided by NCHS (www.cdc.gov/nchs).

*Rates are per 100,000 and age-adjusted to the 2000 US Std Population (19 age groups - Census P25-1130) standard.

^ Statistic not displayed due to fewer than 10 cases.

--Data not available.

Note: Chicago and Cook County prevalence values are from 2009 annual BRFSS.

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Appendix B. Prevalence of Cardiovascular Disease and Risk Factors by Select Demographics

	Heart Disease (%)	Heart Attack (%)	Stroke (%)	High Cholesterol (%)	High Blood Pressure (%)	Smoke (%)
Total	3.4	3.5	3.1	38.0	31.0	20.9
18-24	*	*	*	9.0	7.3	25.2
25-44	1.0	1.0	1.5	22.4	15.8	24.1
45-64	2.6	3.1	3.7	44.3	40.5	22.6
65 and over	12.6	12.0	7.9	57.7	62.8	7.6
Male	3.6	4.4	2.6	40.8	33.2	24.2
Female	3.2	2.6	3.6	35.5	28.9	17.8
White	3.8	3.6	2.4	39.2	29.8	20.2
Black	2.1	1.5	4.8	35.9	42.3	27.1
Other	2.4	3.7	4.1	33.1	24.8	17.6
Hispanic	1.4	0.7	2.8	31.7	20.9	23.5
Non-Hispanic	3.7	3.9	3.2	38.7	32.6	20.5
<\$15,000	4.5	5.8	7.0	44.1	35.0	37.8
\$15,000-\$34,999	4.3	4.5	5.3	44.8	36.1	23.5
\$35,000-\$49,999	5.1	4.5	2.4	38.3	28.9	24.2
>\$50,000	2.2	2.1	1.1	34.3	27.7	15.0
<HS Graduate	2.9	4.8	7.5	52.0	36.2	32.4
HS Graduate	4.0	4.7	3.5	43.1	34.0	27.2
Some College	3.6	3.2	2.5	32.3	29.7	21.0
College Graduate	2.8	1.9	1.2	33.9	26.7	8.5

Source: Illinois Behavioral Risk Factor Surveillance System, 2011

*Fewer than 50 cases in subcategory

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Appendix C. Illinois Behavioral Risk Factor Surveillance System questions for data presented in Figure 18

High Cholesterol-Adults with high cholesterol were those that responded “yes” to the survey question “Have you ever been told by a doctor, nurse, or other health professional that you have high cholesterol?”

High Blood Pressure-Adults with high blood pressure were those that responded “yes” to the survey question “Have you ever been told by a doctor, nurse, or other health professional that you have high blood pressure?”

Smoking-Adults who were current smokers were those that responded “every day” or “some days” to the survey question “Do you now smoke cigarettes every day, some days, or not at all?”

Diabetes-Adults with diabetes were those that responded “yes” to the survey question “Have you ever been told you have diabetes?”

Obesity-Adults who were obese were those with a BMI greater than or equal to 30 calculated from self reported height and weight from survey respondents.

Physical Activity-Adults who were physically inactive were those that did not have 30 minutes of moderate physical activity five or more times per week or 20 minutes of vigorous physical activity three or more times per week.

Poor Nutrition-Adults with poor nutrition were those that did not eat five or more servings of fruits and vegetables per day.

Excessive Alcohol Use-Adults with excessive alcohol use were men consuming more than two drinks per day and women consuming more than one drink per day.