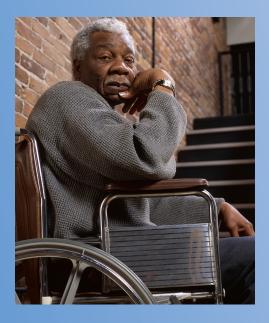
State of Illinois Rod R. Blagojevich, Governor Department of Public Health Eric E. Whitaker, M.D., M.P.H., Director

**Burden of** 

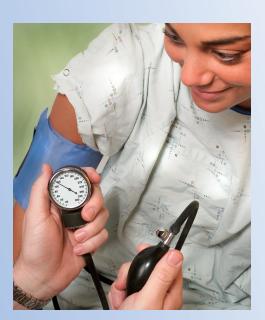


# Heart Disease and Stroke in Illinois

# MORTALITY, MORBIDITY AND RISK FACTORS



February 2007





Illinois Heart Disease and Stroke Prevention Program Illinois Department of Public Health

Division of Chronic Disease Prevention and Control

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| Executive Sur | nmary   | i  |
|---------------|---|----|
|               | ·   |    |
| Cardiovascula | ar Disease Mortality                                    |    |
|               | Gender, Race, Age, County                               |    |
|               | Trends  |    |
| Heart Disease | e Mortality   |    |
|               | Gender, Race, Age, County                               |    |
|               | Trends  | 10 |
| Stroke Mortal | ity   | 12 |
|               | Gender, Race, Age, County                               | 12 |
|               | Trends  | 15 |
| Atheroscleros | sis Mortality   | 17 |
|               | Gender, Race, Age, County                               | 17 |
|               | Trends  | 20 |
| Place of Deat | th  |    |
|               | Heart Disease   |    |
|               | Stroke  | 23 |
| Morbidity     |   |    |
|               | History of Heart Attack, Coronary Heart Disease, Stroke | 23 |
|               | Years of Potential Life Lost                            | 24 |
|               | Hospital Billing Charges                                | 24 |
| Risk Factors  |   | 25 |
|               | High Cholesterol  | 26 |
|               | High Blood Pressure                                     | 29 |
|               | Smoking   | 33 |
|               | Diabetes  | 37 |
|               | Obesity   | 41 |
|               | Physical Inactivity                                     | 45 |
|               | Poor Nutrition  | 49 |
| Signs and Sy  | mptoms of a Heart Attack and Stroke                     | 53 |
| Awareness of  | f Signs and Symptoms of a Heart Attack                  | 54 |
| Awareness of  | f Signs and Symptoms of a Stroke                        | 55 |
| Conclusion    |   | 56 |
| References    |   | 57 |
| Appendix      |   | 58 |



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Although heart disease and stroke are largely preventable, these diseases continue to exact an unacceptably high toll. This report details this burden by describing the mortality, morbidity and risk factors associated with heart disease and stroke. In this report, cardiovascular disease is categorized into heart disease, stroke and atherosclerosis.

Cardiovascular disease accounts for more deaths (39,079) in Illinois than any other cause of death – representing 37 percent of all deaths. In 2003, 29,704 people died of heart disease and 6,883 more of stroke. For those over the age of 34, cardiovascular disease deaths include 32,707 whites, 5,679 African Americans, and 385 individuals of non-white, non-African American races.

While age-adjusted mortality rates are declining for both the United States and Illinois, the rate of decline is slowing. From 1979-1991, cardiovascular disease age-adjusted mortality rates in Illinois declined approximately 2.2 percent per year. Since 1991, this decline has slowed to 1.5 percent per year.

In Illinois, although men have higher cardiovascular disease age-adjusted mortality rates (801.3/100,000) than women (558.1/100,000), cardiovascular disease remains the leading cause of death in women, claiming 21,000 lives in 2003 compared to almost 18,000 men in that same year. African Americans have the highest cardiovascular disease age-adjusted mortality rates (863.0/100,000) in Illinois – more than 35.2 percent higher compared to whites (638.4/100,000) and 158.8 percent higher compared to other races (333.5/100,000)

Heart disease is the most common form of cardiovascular disease and is the single leading cause of death in Illinois and the United States. In Illinois during 2003, 14,144 men and 15,310 women over the age of 34 died of heart disease.

Although heart disease age-adjusted mortality rates for all race groups in Illinois are declining, gaps are still evident. African American men have the highest heart disease age-adjusted mortality rate (807.5/100,000). Furthermore, while overall heart disease mortality rates are declining, rates for African Americans are declining at an average of 1.5 percent per year compared to whites at 2.0 percent per year. African American women die of heart disease at 1.4 times the rate of white women.

Stroke is the third single leading cause of death in Illinois and accounts for 18 percent of all deaths due to cardiovascular disease. Illinois stroke age-adjusted mortality rates have closely matched rates for the United States for the last 20 years. However, the rate of decline is slowing. In Illinois, from 1979 to 1993, stroke age-adjusted mortality rates declined at an average of 2.3 percent per year. However, from 1994 to 2002 the decline in stroke age-adjusted mortality rates slowed sharply to just 1.4 percent per year on average.

In Illinois, many more women (4,260) over the age of 34 died from stroke than men (2,585) during 2003. Differences in stroke age-adjusted mortality rates are most noted between age groups and race groups. Although more than 5,800 whites in Illinois died from stroke, compared to 959 African Americans and 85 of other races, stroke age-adjusted mortality rates for African Americans are 27.8 percent greater than whites, and 96.3 percent greater than other races.

Illinois atherosclerosis age-adjusted mortality rates remain close to those of the United States. Since 1979, atherosclerosis age-adjusted mortality rates have decreased by 36.8 percent for the United States and 39.5 percent for Illinois. Overall, 2,472 adults, ages 35 years and older, died of atherosclerosis in 2003 in Illinois.



Heart disease and stroke also place a heavy burden in terms of economics, years of potential life lost and quality of life issues. In 2004, billing charges for heart disease and stroke exceeded \$7.5 billion in Illinois, accounting for 14 percent of all hospital charges that year. Heart disease and stroke tax the health care system with more than 1.1 million days spent in hospitals by Illinoisans with heart disease and stroke, 14 percent of the total days spent in the hospital for any cause in 2004. Although quantitative and qualitative data is not readily available to describe the impact of heart disease and stroke, numerous national studies indicate a large proportion of heart attack and stroke survivors experience a diminished quality of life. In Illinois during 2003, more than 342,800 years of potential life was lost due to heart disease and stroke.

Cardiovascular disease is the leading cause of disability among adults in the United States. Of those who have a heart attack or stroke, many may experience a diminished quality of life due to discomfort and disability. Among stroke survivors, 15 percent-30 percent suffer some form of permanent disability.

In Illinois, cardiovascular disease was responsible for 400,000 years of potential life lost (YPLL represents the years between a person's age at death and age 85) in 2003; approximately 23 percent of the total years of potential life lost from all causes during that year.

Much of the burden of heart disease and stroke could be prevented through reduction of risk factors, recognizing the signs and symptoms of a heart attack or stroke, and seeking immediate medical attention at the onset of signs and symptoms.

The most common risk factors for heart disease and stroke among adults in Illinois are poor nutrition and physical inactivity. More than 77 percent of the Illinois adult population does not get the recommended five servings of fruits and vegetables a day and 60 percent do not get the recommended amount of physical activity. These two risk factors have a synergistic effect on other risk factors including obesity, high cholesterol and high blood pressure. One in three (34.1 percent) adults in Illinois has high cholesterol, and one in four has high blood pressure. Many adults (22.2 percent) in Illinois are current smokers, another risk factor that increases a person's chances for developing heart disease and/or having a stroke.

In addition to reducing the prevalence of these risk factors for heart disease and stroke, seeking immediate medical assistance for a stroke or heart attack will result in improved mortality and morbidity outcomes. In 2003, almost 21,000 Illinoisans died of heart disease before reaching the hospital, accounting for 66 percent of all deaths related to heart disease, while more than half (3,491) of all stroke deaths (6,845) in Illinois occurred before admittance to the hospital.

One of the factors known to adversely influence the outcome of an acute heart disease and stroke event is the time between the onset of symptoms and receiving treatment. Therefore knowing the signs and symptoms of a heart attack or stroke is crucial. However, less than half of all adults in Illinois can recognize all the signs and symptoms of a heart attack and only 51 percent can correctly recognize five to six signs and symptoms of a stroke.

While great strides have been made in the reducing deaths due to heart attack and stroke, the decline in mortality rates is slowing. This trend can be reversed by focusing prevention efforts on several specific goals:

- reducing a person's risk factors;
- increasing public awareness of the warning signs of heart attack and stroke; and
- decreasing the time between when a person experiences any of the warning signs and when he/she receives appropriate medical attention.

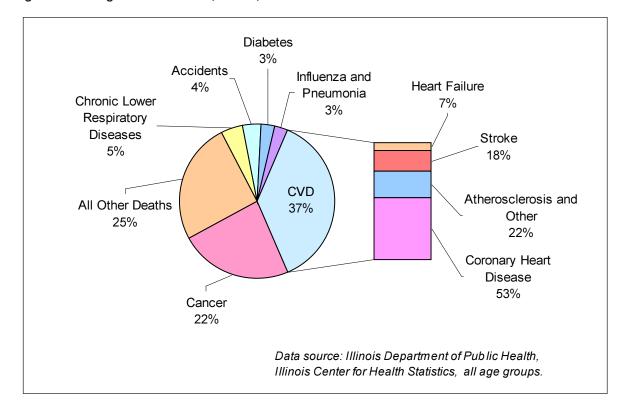


Although heart disease and stroke are largely preventable, these diseases continue to exact an unacceptable high toll. This report details this burden by describing the mortality, morbidity and risk factors associated with heart disease and stroke.

### Introduction

Cardiovascular disease (CVD) refers to a wide variety of heart and blood vessel diseases, including ischemic heart disease, hypertension, stroke and rheumatic heart diseases. Every hour in Illinois, approximately five people die from heart disease, stroke or other CVD.<sup>1</sup> CVD accounts for more deaths in Illinois than any other cause of death (Figure 1). In 2004, more than \$7.5 billion of hospital charges were attributed to cardiovascular diseases – accounting for more than 23 percent of all hospital charges.<sup>1</sup> While CVD remains the No. 1 threat as cause of death for Illinoisans, many adults do not recognize the signs and symptoms of heart attack or stroke. Most victims surviving a heart attack or stroke often require long-term, expensive medical treatment and experience a compromised quality of life.

More deaths (39,079)<sup>1</sup> in Illinois were due to CVD than any other cause of death in 2003. Heart disease and stroke were the first and third leading causes of death, respectively. CVD accounted for 37 percent of all deaths – equal to deaths due to cancer, chronic lower respiratory diseases, accidents, diabetes and influenza/pneumonia combined (Figure 1).



### Figure 1. Leading Causes of Death, Illinois, 2003

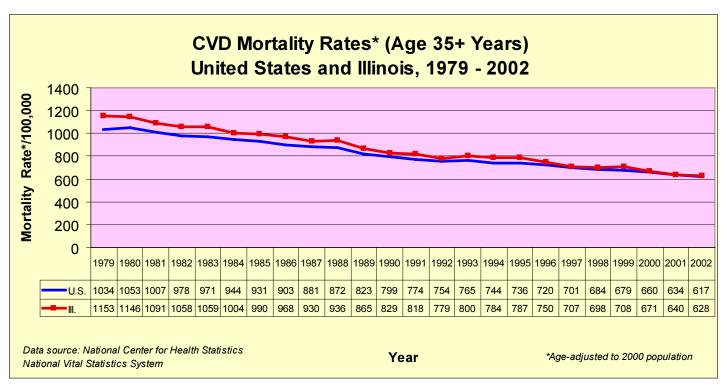
## **BURDEN OF HEART DISEASE AND STROKE**



Heart disease accounts for more than half of all deaths due to CVD. In 2003, more than 29,000 people died of heart disease in Illinois.<sup>1</sup> It is the most common type of heart disease and can lead to angina (chest pain) and heart attacks (myocardial infarction). Atherosclerosis, the narrowing of arteries due to plaque build-up, is the major cause of coronary artery, cerebrovascular, peripheral vascular diseases and aneurysms. A large proportion (22 percent) of adults died of atherosclerosis and other related conditions in 2003. Stroke was responsible for 18 percent of CVD deaths – more than 6,800 deaths in Illinois alone.<sup>1</sup>

### **Cardiovascular Disease Mortality**

In both the United States and Illinois, CVD age-adjusted mortality rates are declining (Figure 2). Although there is no conclusive evidence to explain this decline, advancements in the treatment of heart disease and stroke may be important contributors.



### Figure 2. CVD Mortality Trends

CVD age-adjusted mortality rates for Illinois remain close to those of the United States. Illinois is ranked 31 among the 50 states for CVD age-adjusted mortality rates.<sup>2</sup> However, the rate of decline is slowing. From 1979-1991, CVD age-adjusted mortality rates in Illinois declined approximately 2.2 percent per year. Since 1991, this decline has slowed to 1.5 percent per year.

In 2003, CVD claimed a total of 38,771 lives of men and women over the age of 34 in Illinois. This included 32,707 whites, 5,679 African Americans and 385 individuals of other races.<sup>1</sup>



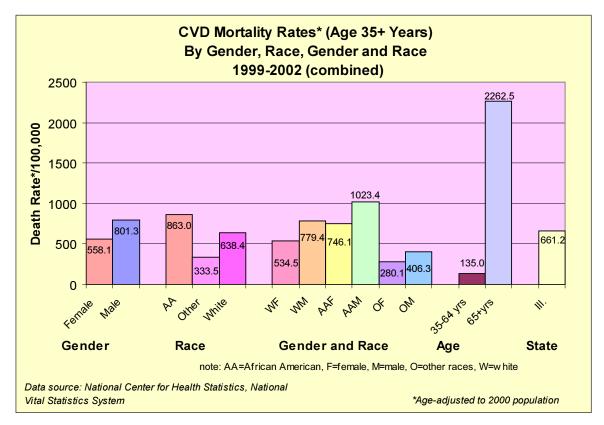
### CVD Age-adjusted Mortality Rates by Gender, Race, Age and County

Mortality data from 1999 to 2002 were combined in order to produce gender and race age-adjusted mortality rates (Figure 3). CVD age-adjusted mortality rates vary by gender, race and age. Although men have higher CVD age-adjusted mortality rates (801.3/100,000) than women (558.1/100,000), CVD remains the leading cause of death in women, claiming 21,000 lives in 2003 compared to almost 18,000 men in that same year.<sup>1</sup>

African Americans have the highest CVD age-adjusted mortality rates (863.0/100,000) – more than 35.2 percent higher compared to whites (638.4/100,000) and 158.8 percent higher compared to other races (333.5/100,000). Despite the differences in age-adjusted mortality rates by race, CVD remains the leading cause of death for all races.

African American men are especially at risk for dying from CVD. The age-adjusted mortality rate for African American men is 1,023.4/100,000, higher than any other race-gender group. Women of other races have the lowest CVD age-adjusted mortality rate at 280.1/100,000.



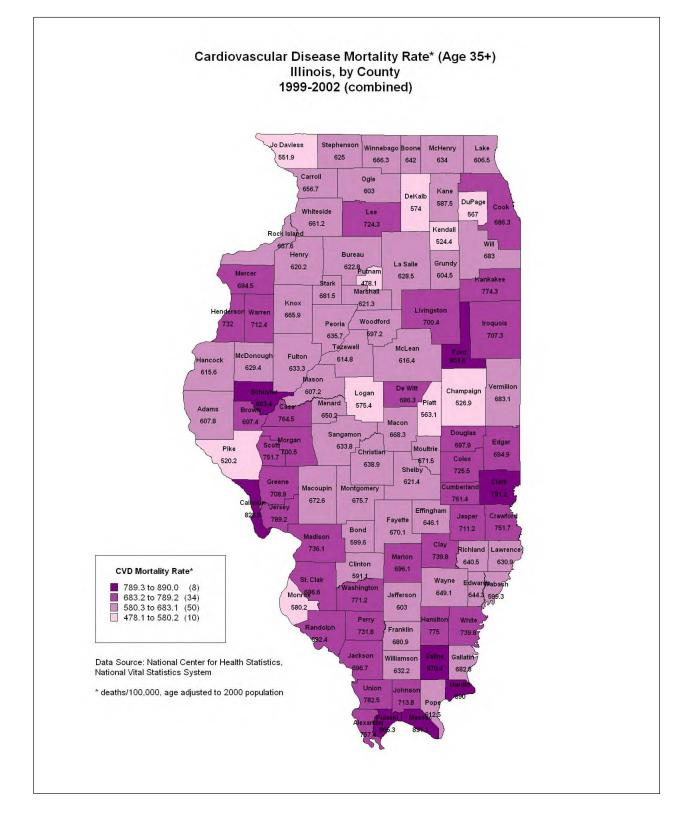


The CVD age-adjusted mortality rate for the 35-to-64-year-old age group is 135.0/100,000 compared to 2,262.5/100,000 for the 65 years and older age group (Figure 3). Although the age-adjusted mortality rate for the 35-64 year age group may seem small, more than 6,300 people ages 35-64 die each year of CVD.<sup>1</sup>

CVD age-adjusted mortality rates vary by county as well (Figure 4). Putnam (478.1), Pike (520.2), Kendall (524.4), Champaign (526.9) and Jo Daviess (551.9) counties have the lowest CVD age-adjusted mortality rates compared to Calhoun (822.9), Massac (831.1), Saline (870.4), Schuyler (883.4) and Hardin (890.0) counties, which have the highest CVD age-adjusted mortality rates.

CVD age-adjusted mortality rates appear to be highest in those counties bordering Indiana, the southern tip of the state bordering Kentucky, and near the Iowa-Missouri-Illinois border (Figure 4).







### Trends in CVD Age-adjusted Mortality Rates by Population Group

CVD age-adjusted mortality rates are declining across all population groups by gender, race, and age (Figures 5, 6, 7).

Since the early 1980s, the wide gap in CVD mortality between men and women has decreased. Men experienced a greater decrease in CVD age-adjusted mortality rates (2.0 percent per year) compared to women (1.8 percent per year) (Figure 5).

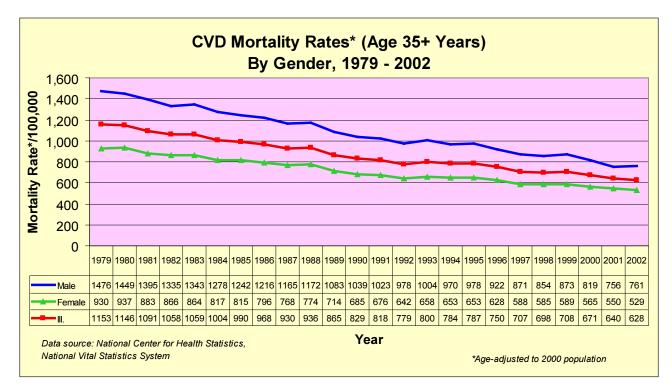
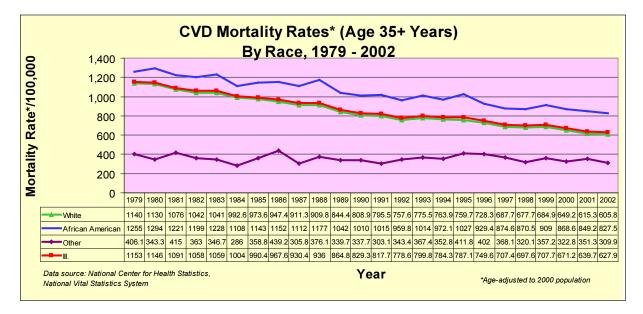


Figure 5. CVD Mortality Trends, by Gender

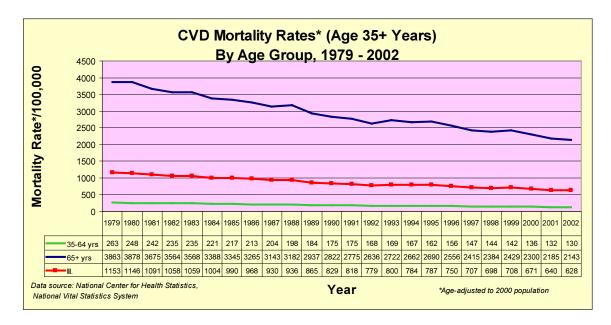
Across all race groups (white, African American, other), CVD age-adjusted mortality rates have declined (Figure 6). CVD age-adjusted mortality rates for whites are close to the Illinois average. However, CVD age-adjusted mortality rates for African Americans continues to be higher than the Illinois average. The CVD age-adjusted mortality rates for whites decreased an average of 2.0 percent per year compared to African Americans at only 1.4 percent pear year. This differential has resulted in a furthering of the gap between CVD age-adjusted mortality rates for African Americans and whites since 1979. The CVD age-adjusted mortality rate for other races has remained steady with an average decrease of 0.9 percent per year.



### Figure 6. CVD Mortality Trends, by Race



CVD age-adjusted mortality rates are declining for both age groups (35- 64 years, 65+ years). Within the 35-64 age group, the CVD age-adjusted mortality rate is declining at an average of 2.1 percent per year. The older group (65+ years) is declining at an average of 1.9 percent per year.



### Figure 7. CVD Mortality Trends, by Age Groups

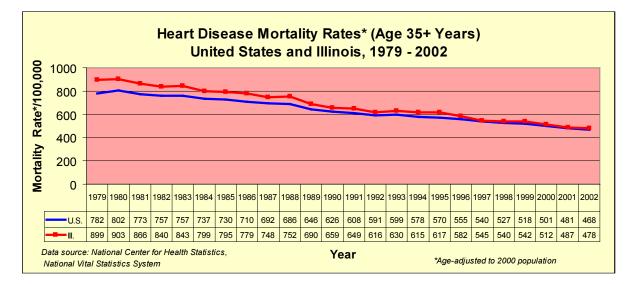


### **Heart Disease Mortality**

Heart disease, which includes ischemic heart disease, coronary heart failure and other diseases of the heart, is the leading cause of death in Illinois and the United States. It is the most common form of CVD and can cause angina (chest pain), heart attacks (myocardial infarction) and sudden cardiac arrest. Unfortunately, a heart attack is usually the first sign of heart disease.<sup>3</sup>

Since 1979, the heart disease age-adjusted mortality rates in Illinois and the United States have decreased (Figure 8). In 2002, these mortality rates for Illinois and the United States were 478.3/100,000 and 467.6/100,000, respectively.





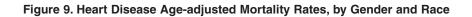
### Heart disease Age-adjusted Mortality Rates by Gender, Race, Age and County

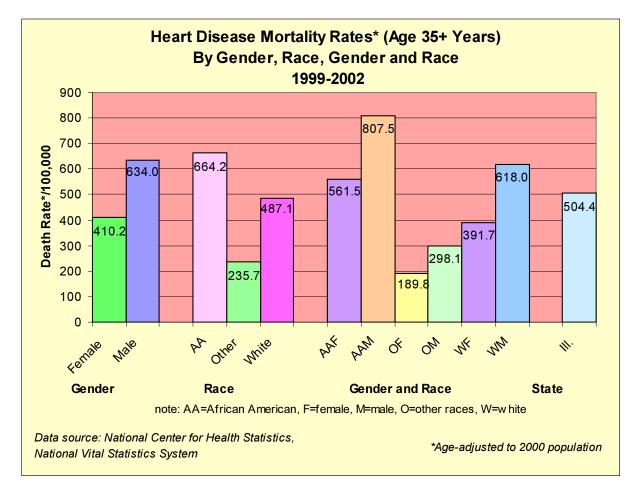
In 2003, 14,144 men and 15,310 women died of heart disease.<sup>1</sup> Males (overall), African Americans (overall), white men, African American women and African American men have higher heart disease age-adjusted mortality rates than the state as a whole (Figure 9). African American men have the highest heart disease age-adjusted mortality rate (807.5/100,000) and women in the other races category (189.8/100,000) have the lowest rate.

African American women die of heart disease at 1.4 times the rate of white women. African American men die of heart disease at 1.3 times the rate of white men.

The heart disease age-adjusted mortality rate for the 35-to-64-year-old age group is 108.4.0/100,000 and for those 65 years and older is 1,604.3/100,000. Although heart disease age-adjusted mortality rates are lower for the 35-to-64-year-old age group, in 2003, heart disease was responsible for more than 5,200 deaths in this age category.<sup>1</sup>

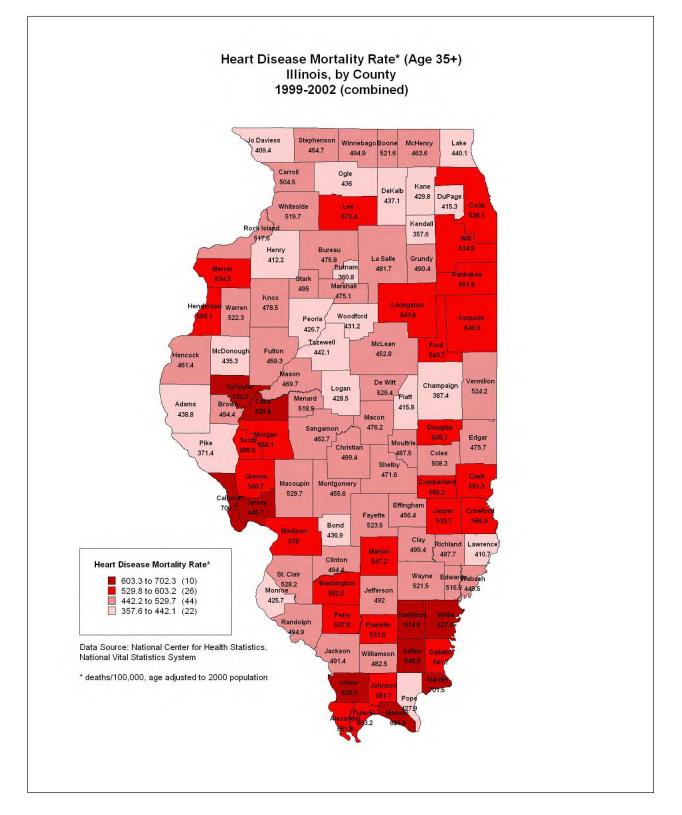






Champaign, Jo Daviess, Kendall, Pike and Putnam, counties have the lowest age-adjusted mortality rates due to heart disease – all less than 410.0 deaths/100,000 (Figure 10). Calhoun, Hamilton, Hardin, Saline and Schuyler counties had the highest heart disease mortality rates ranging from 648.9 to 702.3/100,000. The counties bordering, or near, Indiana, Kentucky and Missouri have the areas with the highest rates of heart disease death.



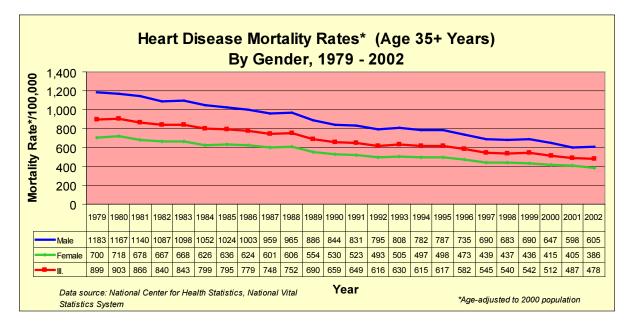




### Trends in Heart Disease Age-adjusted Mortality Rates by Population Group

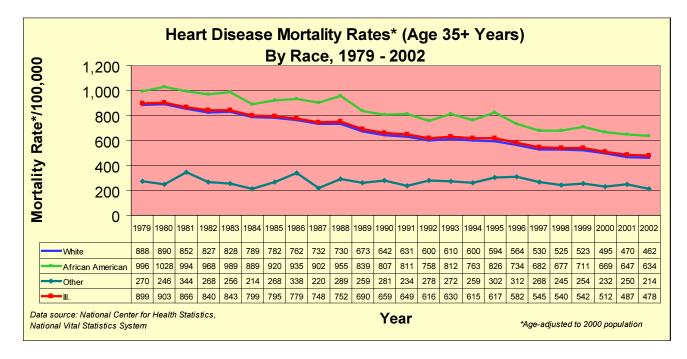
Heart disease age-adjusted mortality rates have decreased for all population groups (i.e., race, gender, age) since 1979 (Figures 11, 12, 13). Heart disease age-adjusted mortality rates have declined for women at an average of 1.9 percent per year and 2.0 percent for men (Figure 11).

### Figure 11. Heart Disease Mortality Trends, by Gender



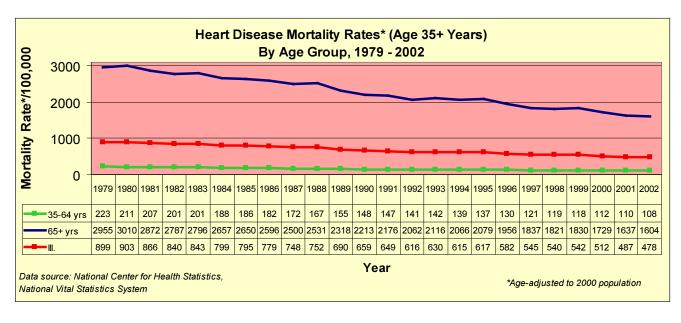
Although heart disease age-adjusted mortality rates for all race groups are declining, gaps are still evident (Figure 12). African Americans have the highest heart disease age-adjusted mortality rates, which are declining at an average of 1.5 percent per year. The heart disease age-adjusted mortality rates for whites, however, show a greater decline at an average of 2.0 percent per year.





Heart disease age-adjusted mortality rates remain much higher for older age groups (65 years or older) than younger (35-64 years of age) age groups (Figure 13). The rate of decline in heart disease mortality is 2.1 percent per year for the younger age group and 1.9 percent for the older age group.



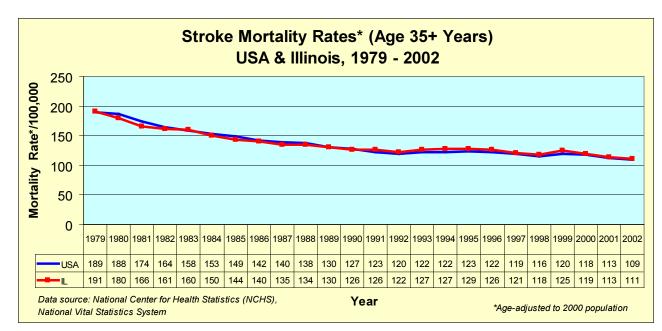




### Stroke Mortality

Stroke is the third single leading cause of death in Illinois and accounts for 18 percent of all deaths due to CVD (Figure 1). According to the National Stroke Association, stroke is a leading cause of disability in the United States. A stroke (or brain attack) occurs when an artery in the brain is either clogged or ruptured.

Illinois' stroke age-adjusted mortality rates have closely matched rates for the United States for the last 20 years. However, the rate of decline is slowing. In Illinois, from 1979 to 1993, stroke age-adjusted mortality rates declined at an average of 2.3 percent per year (Figure 14). However, from 1994 to 2002 this decline slowed sharply to just 1.4 percent per year on average.



### Figure 14. Stroke Mortality Trends

### Stroke Age-adjusted Mortality Rates by Gender, Race, Age and County

Differences in stroke age-adjusted mortality rates are most notable between age groups and race groups (Figure 15). Stroke age-adjusted mortality rates for men (120.9/100,000) are 7.0 percent greater than for women (113.0/100,000). In 2003, more than 6,800 adults ages 35 years and older died from stroke in Illinois. Many more women (4,260) died from stroke than men (2,585).<sup>1</sup>

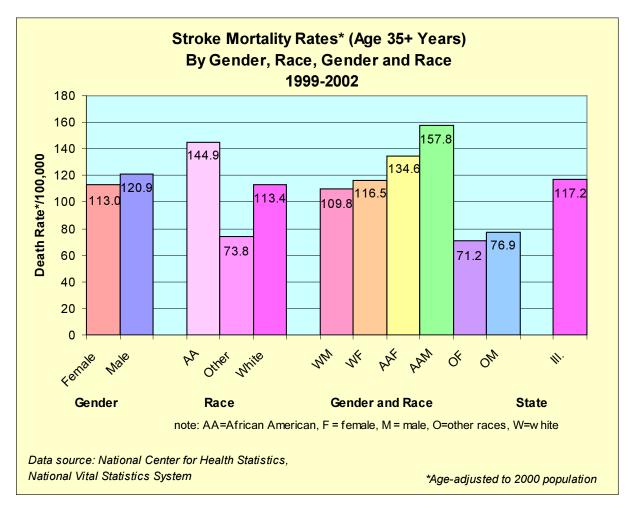
Although more than 5,800 whites in Illinois died from stroke, compared to 959 African Americans and 85 of other races,<sup>1</sup> stroke age-adjusted mortality rates for African Americans are 27.8 percent greater than for whites, and 96.3 percent greater than for other races. Noticeable differences are also found in gender/race groups. African American men have stroke age-adjusted mortality rates that are 43.7 percent higher than for white men, and African American women have stroke age-adjusted mortality rates that are 15.5 percent greater than those for white women.

# BURDEN OF HEART DISEASE AND STROKE



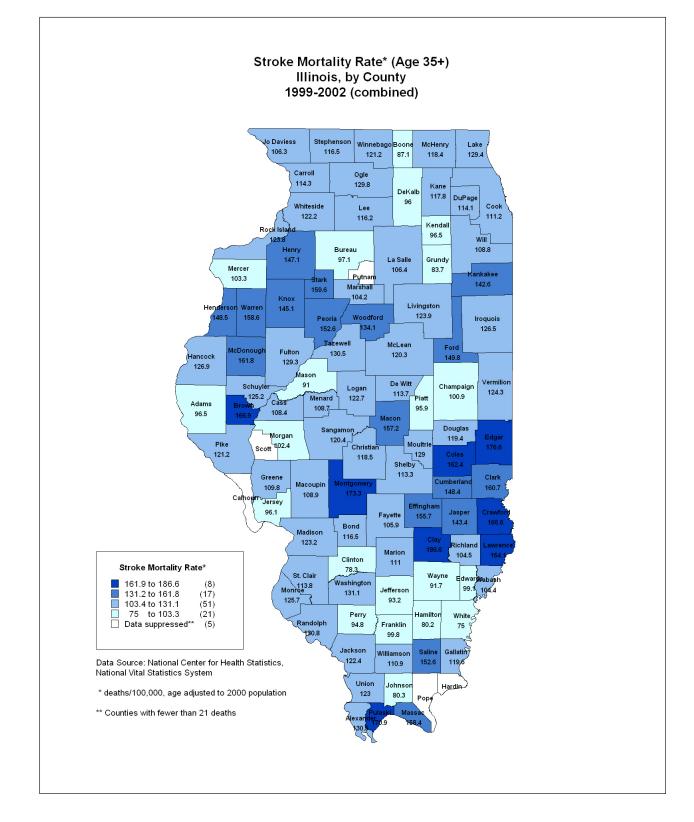
Stroke mortality affects older populations (65+ years) disproportionately compared to younger populations (35-64 years). In 2003, only 11 percent of all stroke deaths were among those ages 35-64.<sup>1</sup> The stroke age-adjusted mortality rate for those older than 65 years was 402.5/100,000 compared to 15.8/100,000 for those ages 35-64 years. Furthermore, of the total 6,845 deaths in Illinois due to stroke among those 35 years and older in 2003, approximately 6,000 were over the age of 64.<sup>1</sup>





Age-adjusted stroke mortality rates vary across the state (Figure 16). Clinton, Grundy, Hamilton, Johnson and White counties have the lowest age-adjusted stroke mortality rates in the state – all under 84.0/100,000. Brown, Clay, Edgar, Montgomery and Pulaski counties have the highest age-adjusted mortality rates, ranging from 166.9/100,000 to 186.6/100,000. High stroke age-adjusted mortality rates can be found along the mid-lower Illinois-Indiana border.

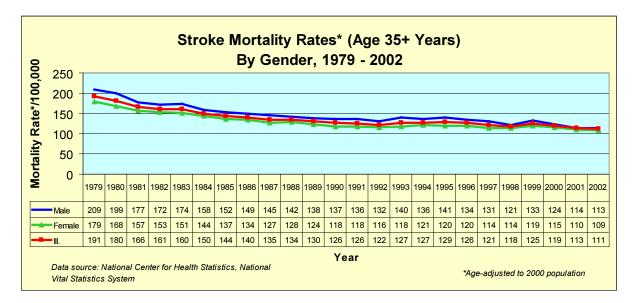
### Figure 16. Stroke Mortality Rates, by County





### Trends in Stroke Age-adjusted Mortality Rates by Population Group

The gap between stroke age-adjusted mortality rates for men and women is disappearing (Figure 17). Stroke age-adjusted mortality rates for men have declined at an annual average of 1.9 percent for men and for women at 1.6 percent.

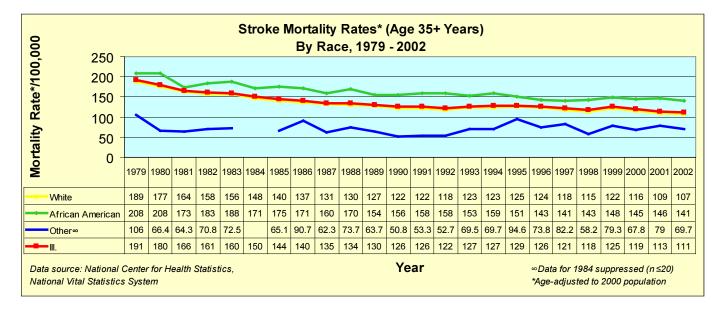


### Figure 17. Stroke Mortality Trends, by Gender

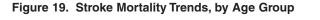
Stroke age-adjusted mortality trends for whites remain close to the average for Illinois, while rates for African Americans remain above the state average. Those of other races have the lowest age-adjusted stroke mortality rate (Figure 18). Stroke age-adjusted mortality rates have decreased (1979-2002) by 43 percent for whites and only 32 percent for African Americans. Age-adjusted stroke mortality rates have remained stable for other races.

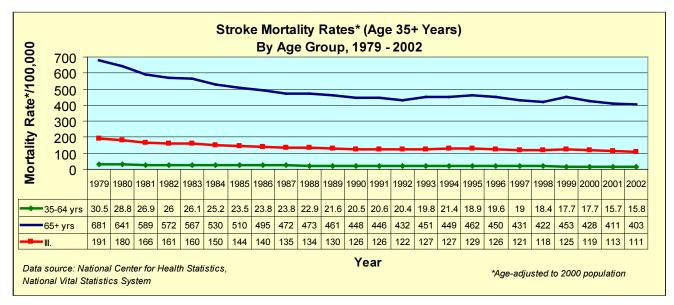


### Figure 18. Stroke Mortality Trends, by Race



From 1979-2002, stroke age-adjusted mortality rates remained high for the 65 years or older age group (Figure 19). The stroke age-adjusted mortality rate for the 35-to-64-year-old age group has decreased at a rate of 2.0 percent per year compared to an average of 1.7 percent per year for those ages 65 years and older.



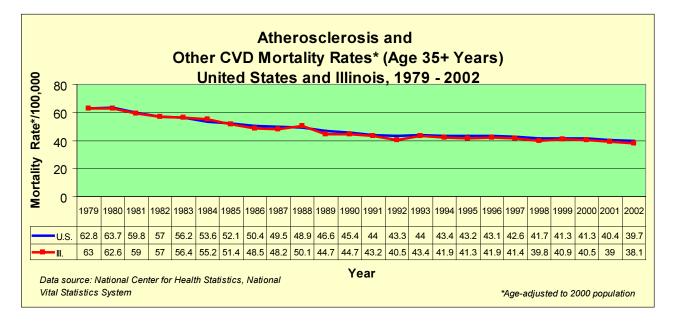




### **Atherosclerosis Mortality**

Atherosclerosis is commonly referred to as hardening of the arteries. It is caused by a process in which plaque is slowly deposited on the artery walls. Also represented in this group are hypertensive diseases and other heart diseases related to bacterial disorders.

### Figure 20. Atherosclerosis Mortality Trends



Illinois atherosclerosis age-adjusted mortality rates remain close to those of the United States (Figure 20). Since 1979, atherosclerosis age-adjusted mortality rates have decreased by 36.8 percent for the United States and 39.5 percent for Illinois. Overall, 2,472 adults, ages 35 years and older, died of atherosclerosis in 2003 in Illinois.<sup>1</sup>

### Atherosclerosis Age-adjusted Mortality Rates by Gender, Race, Age and County

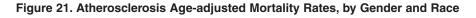
Disparities in atherosclerosis age-adjusted mortality rates exist between race, age, gender and gender-race groups (Figure 21). Males have an atherosclerosis age-adjusted mortality rate 1.3 times higher than women (46.3/100,000 and 34.9/100,000, respectively), although more women (1,440) died from atherosclerosis than men (1,032)<sup>1</sup> in 2003.

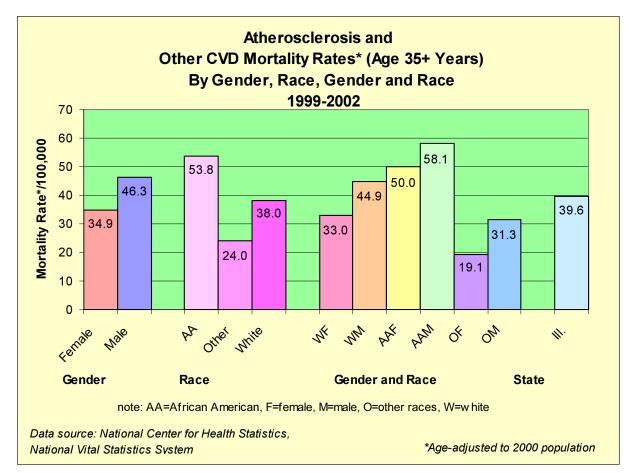
Although 2,096 whites over the age of 34 died of atherosclerosis in Illinois in 2003 compared to 358 African Americans and 18 of other races,<sup>1</sup> atherosclerosis age-adjusted mortality rates for African Americans are 41.6 percent higher than for whites (53.8/100,000 vs. 38.0/100,000, respectively). Furthermore, African American men and women are more likely to die from atherosclerosis than their white counterparts. Atherosclerosis age-adjusted mortality rates for African American for African American men (58.1/100,000) are 29.4 percent higher than those for white men (44.9/100,000) and rates for African American women (50.0/100,000) are 51.5 percent higher than those for white women (33.0/100,000).

# **BURDEN OF HEART DISEASE AND STROKE**



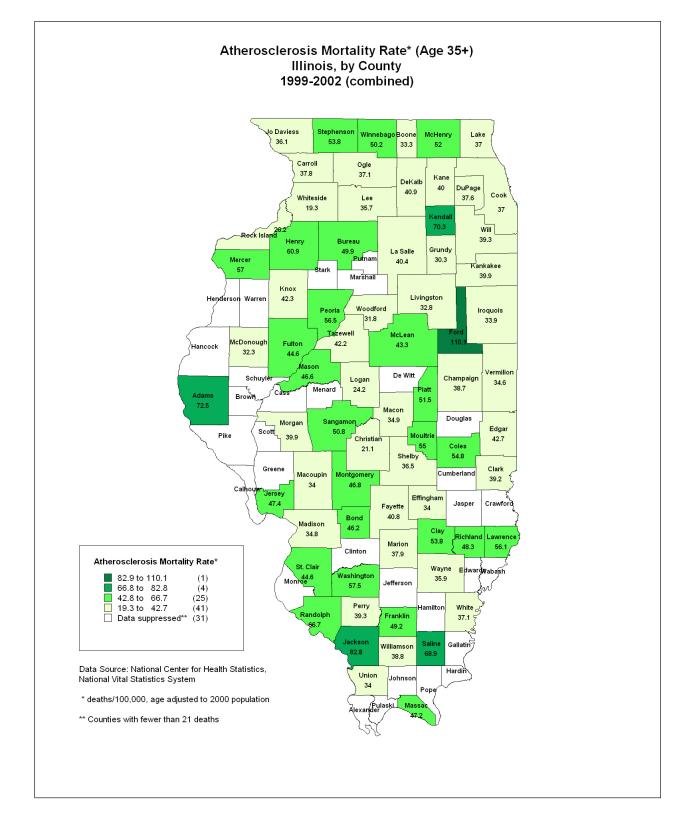
Because atherosclerosis is a slow process, mortality usually does not occur until later in life. Thus, it is not surprising that the atherosclerosis age-adjusted mortality rate for those 35-64 years of age is 5.9/100,000 and that of adults 65 years of age and older is 136.2/100,000. To further highlight this point, in 2003, of the total 2,472 atherosclerosis deaths among those ages 35 years and higher in Illinois, approximately 2,150 (85.0 percent) deaths were among those ages 65 years and older.<sup>1</sup>





Christian, Grundy, Logan, Rock Island, and Whiteside counties have the lowest atherosclerosis age-adjusted mortality rates ranging from 19.0/100,000 to 31.0/100,000 (Figure 22). Adams, Ford, Jackson, Kendall and Saline counties have the highest age-adjusted mortality rates due to atherosclerosis, ranging from 68.9/100,000 to 110.1/100,000.

### Figure 22. Atherosclerosis Mortality Rates, by County

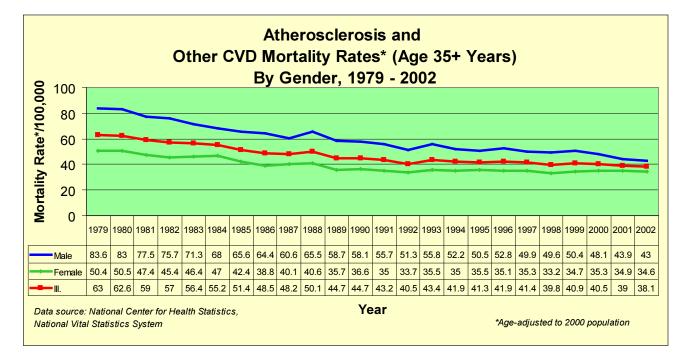




### Trends in Atherosclerosis Age-adjusted Mortality Rates by Population Groups

The gap in atherosclerosis age-adjusted mortality rates between men and women is closing (Figure 23). In 1979, the atherosclerosis age-adjusted mortality rate for men (83.6/100,000) was almost 66 percent higher than for women (50.4/100,000). In 2002, the rate for men had decreased to 43.0/100,000 – approximately 24 percent higher than the rate for women (34.6/100,000).

### Figure 23. Atherosclerosis Mortality Trends, by Gender

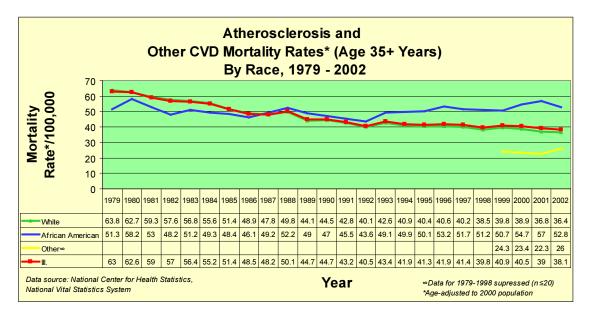


The atherosclerosis age-adjusted mortality rate for whites has followed closely the rate for the state as a whole (Figure 24). The state rate and the rate for whites have declined approximately, on average, 1.7 percent per year.

Atherosclerosis mortality trends for African Americans are unstable. Due to the relative few African Americans who die each year (approximately 282 each year)<sup>1</sup> from atherosclerosis, even small changes in the numbers of African Americans deaths due to atherosclerosis could have an effect on the overall age-adjusted mortality rate.

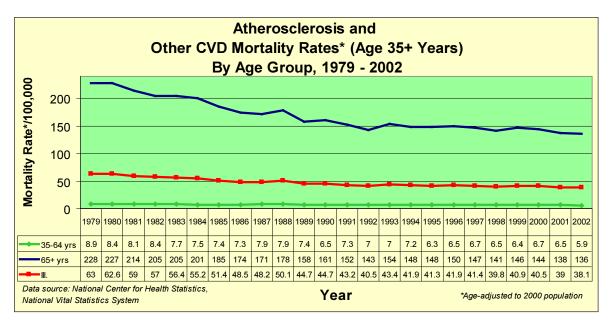
While it is clear from Figure 24 that atherosclerosis age-adjusted mortality rates are higher among African Americans, more statistical analysis is needed to make conclusions regarding trends in African American age-adjusted mortality rates due to atherosclerosis.

### Figure 24. Atherosclerosis Mortality Trends, by Race



Only 13 percent of all atherosclerosis deaths occur in those 35 to 64 years of age.<sup>1</sup> Since 1979, atherosclerosis death rates have decreased by 15.5 percent for those 35 to 64 years of age (see Figure 25). The death rate for the group 65 years and older has decreased by 10.2 percent.





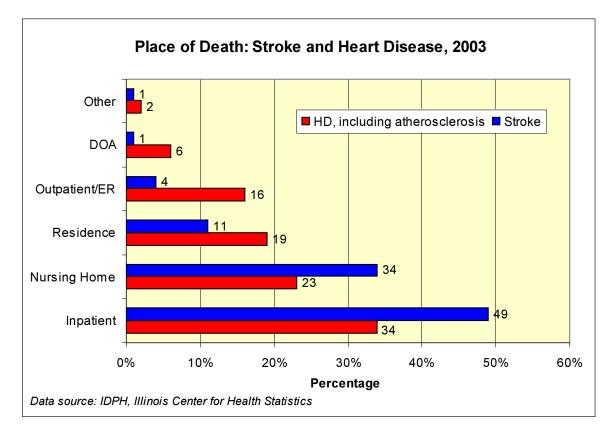


### **Place of Death**

### **Heart Disease Mortality**

For some acute heart disease events, such as myocardial infarction, prompt treatment can make a substantial difference in outcome. For example, primary percutaneous coronary intervention (PCI) is recommended within ninety minutes for some types of myocardial infarction events. If PCI is received within this time frame, it has shown to greatly improve short- and long-term patient outcomes.<sup>4</sup> Therefore, it is essential to recognize the signs and symptoms of a heart attack and seek medical assistance immediately or call 9-1-1.

In 2003, almost 16,000 Illinoisans died of heart disease before reaching the hospital, accounting for 50 percent of all deaths related to heart disease (Figure 26). Included among these deaths were more than 7,300 people who died in a nursing home facility.<sup>1</sup>



### Figure 26. Place of Death



### **Place of Death**

### **Stroke Mortality**

As with acute heart disease events, time between onset of symptoms and medical treatment is critical. For example, patients treated with thrombolytics within one hour of stroke symptoms had a 45 percent reduction in mortality rates compared to those that did not.<sup>5</sup>

### Figure 27. Prevalence of Heart Attack, CVD and/or Stroke among Adults in Illinois, 2005

|  | Heart<br>Attack | CHD   | Stroke |
|--|-----------------|-------|--------|
| Total                                      |                 |       |        |
| Illinois                                   | 3.4%            | 3.0%  | 2.3%   |
| Geographical                               |                 |       |        |
| Cook and Collar                            | 2.7%            | 3.2%  | 1.6%   |
| Downstate                                  | 4.9%            | 2.6%  | 3.4%   |
| Gender                                     |                 |       |        |
| Male                                       | 5.7%            | 4.3%  | 2.3%   |
| Female                                     | 1.3%            | 1.8%  | 2.2%   |
| Age Groups                                 |                 |       |        |
| 18-29                                      | 0.0%            | 0.7%  | 0.0%   |
| 30-39                                      | 0.5%            | 1.3%  | 0.8%   |
| 40-49                                      | 0.6%            | 0.0%  | 0.0%   |
| 50-59                                      | 4.5%            | 3.6%  | 2.3%   |
| 60-69                                      | 8.2%            | 8.0%  | 5.7%   |
| 70+  | 16.7%           | 11.1% | 10.9%  |
| Race/Ethnicity                             |                 |       |        |
| White Non-Hisp                             | 3.7%            | 3.5%  | 2.4%   |
| Other                                      | 2.6%            | 1.2%  | 1.9%   |
| Income Groups                              |                 |       |        |
| <\$25,000                                  | 9.3%            | 7.1%  | 3.6%   |
| \$25-35,000                                | 0.0%            | 2.2%  | 1.1%   |
| \$36-50,000                                | 3.7%            | 0.9%  | 0.7%   |
| \$51-75,000                                | 0.4%            | 3.4%  | 0.0%   |
| >\$75,000                                  | 1.7%            | 1.6%  | 1.4%   |
| Education                                  |                 |       |        |
| ≤HS  | 6.6%            | 4.5%  | 4.6%   |
| Some College                               | 2.4%            | 2.5%  | 1.4%   |
| College Grad                               | 1.2%            | 2.0%  | 0.3%   |
| Data source: IDPH Pe<br>adults using BRFSS |                 |       |        |

Almost half (3,222) of all stroke deaths (6,845) in Illinois occurred before reaching the hospital.<sup>1</sup> A substantial proportion (34 percent) of deaths occurred in nursing home facilities (2,323 deaths).<sup>1</sup> Approximately 720 stroke deaths occurred at home, accounting for 10.6 percent of all stroke deaths, and 299 deaths, or 4.4 percent of all stroke deaths, were reported in the emergency room (Figure 26).<sup>1</sup>

### Morbidity

Mortality is only one part of the health burden of CVD. Other aspects include disability, years of potential life lost (YPLL) and cost.

CVD is the leading cause of disability among adults in the United States.<sup>6</sup> Approximately one of three survivors of a heart attack or stroke will die within one year.<sup>6</sup> Of those who have a heart attack or stroke, many may experience a diminished quality of life due to discomfort and disability. Among stroke survivors, 15 percent-30 percent are permanently disabled.<sup>6</sup>

According to a study conducted by the Illinois Department of Public Health, 3.4 percent of the state's adults have been told by a health professional that they have had a heart attack, 3 percent were told they have CHD, and 2.3 percent were told they have had a stroke (Figure 27). Note that these categories are not mutually exclusive; it is possible for one respondent to have been told he/she has had one, two or three of these acute events. That data is not presented in this report. It also should be noted that these numbers grossly underestimate the number of stroke, CHD and heart attack survivors. Survivors in nursing homes, assisted living facilities or other institutional environments were not included in the survey. Additionally, the survey was conducted by telephone, thereby excluding adults whose disabilities prevent them from using or communicating with a telephone.



Disparities, however, are evident. Those in lower income groups (<\$25,000) and those with a high school education or less, have higher proportions of stroke, CHD, and heart attack histories. A higher proportion of the older age group also reported CVD event histories. A larger proportion of males and white non-Hispanics reported a history of a CVD event than their counterparts.

In addition to disabilities, CVD was responsible for 342,875 years of potential life lost (YPLL represents the years between a person's age at death and age 85) in 2003, approximately 23 percent of the total years of potential life lost from all causes during that year.<sup>7</sup> Approximately 85 percent of all YPLL due to CVD are caused by heart disease. Heart disease accounted for 292,379 YPLL. If the 18,9488<sup>7</sup> individuals who prematurely died due to heart disease in Illinois in 2003 had instead lived to the age of 84, the result would be 292,379 years of combined additional life. Approximately 50,500 YPLL was due to stroke in 2003 in Illinois.

### Figure 28. Billing Charges for Hospitalization in Illinois, 2004

|                        | Total<br>Number of<br>Days | Total<br>Number of<br>Discharges | Average<br>Number of<br>Days per<br>Discharge | Total Cost |                      | Average Cost<br>per Discharge |             |
|------------------------|----------------------------|----------------------------------|---|------------|----------------------|-------------------------------|-------------|
| All Causes*            | 7,664,127                  | 1,675,166                        | 4.6   | \$         | 32,444,352,642.51    | \$                            | 19,367.84   |
| CVD                    | 1,122,087                  | 238,518                          | 4.7   | \$         | 7,543,232,864.56     | \$                            | 31,625.42   |
| Stroke                 | 206, 139                   | 40,600                           | 5.1   | \$         | 997,068,507.41       | \$                            | 24, 558. 34 |
| Heart Disease          | 795,445                    | 174,610                          | 4.6   | \$         | 5, 750, 036, 828. 83 | \$                            | 32,930.74   |
| Atherosclerosis        | 120,503                    | 23, 308                          | 5.2   | \$         | 796, 127, 528. 32    | \$                            | 34, 156. 84 |
| *Primary diagnosis onl | y                          |                                  |   |            |                      |                               |             |

The cost of cardiovascular diseases in the United States for 2006 is estimated at \$403 billion (direct and indirect costs). By comparison, in 2004, the estimated cost of all cancers was \$190 billion, and in 1999, the estimated cost of HIV infections was \$28 billion.<sup>8</sup>

In 2004, in Illinois, there were 238,518 inpatient primary discharges for CVD, with more than \$7.5 billion in charges (Figure 28). While CVD accounts for 14 percent of all discharges, 23 percent of all hospital charges are due to CVD. The average cost per discharge for CVD was approximately \$32,000, compared to only little more than \$17,000 for all discharges except CVD.

However, it should be noted that Illinois discharge data in this report represents a lower estimate because only primary discharges coded as CVD are included. Individuals with non-primary CVD discharge hospitalizations (such as those with a primary discharge of diabetes and a secondary discharge of CVD) also are excluded.



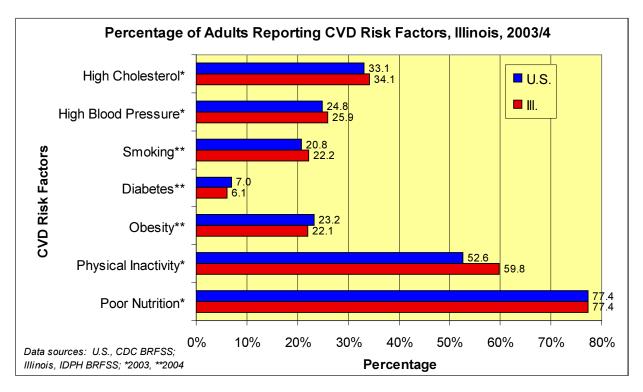
### **Risk Factors**

Risk factors for heart disease and stroke are classified as nonmodifiable or modifiable. Nonmodifiable risk factors cannot be controlled. These include gender, race, family history and advancing age. Risk factors that can be controlled, or changed, are called modifiable. The more risk factors a person has, the greater the chance of heart disease and stroke. Major modifiable risk factors are:

- High cholesterol
- High blood pressure
- Smoking
- Diabetes
- Obesity
- Physical inactivity
- Poor nutrition

Data on risk factors are collected through the Behavioral Risk Factor Surveillance System (BRFSS). The BRFSS is a state-based, random-digit-dialed telephone survey. According to results from the 2003/4 BRFSS surveys, Illinois and the United States had similar rates for all risk factors (Figure 29).

### Figure 29. CVD Risk Factors among Adults, Illinois and United States



The most common risk factors for heart disease and stroke among adults in Illinois are poor nutrition and physical inactivity. More than 77 percent of the adult population does not get the recommended five servings of fruits and vegetables a day, and 60 percent do not get the recommended amount of physical activity. These two risk factors have a synergistic effect on other risk factors including obesity, high cholesterol and high blood pressure. More than one-third (34.1 percent) of adults in Illinois have high cholesterol, and one in four has high blood pressure. Many adults (22.2 percent) in Illinois are current smokers, another factor that increases a person's chances for developing heart disease and/or having a stroke.<sup>1</sup>



### **High Cholesterol**

As blood cholesterol levels rise, so does the risk for cardiovascular disease. Too much LDL cholesterol clogs arteries, increasing the risk of heart attack and stroke.<sup>9</sup>

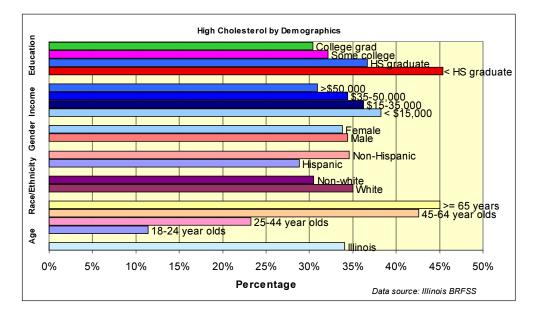


Figure 30. High Cholesterol among Adults in Illinois, 2003

According to the 2003 Illinois BRFSS results, more than 2.3 million adults in Illinois have high cholesterol levels. As educational level increases, the proportion of adults with high cholesterol decreases (Figure 30). Almost 46 percent of all adults with less than a high school education have high cholesterol levels compared to 30 percent of college graduates. Likewise, as the income level increases, the proportion of those with high cholesterol decreases. For adults with an annual household income of less than

\$15,000, approximately 38.2 percent reported high cholesterol, compared to 30.9 percent of those with annual household incomes greater than \$50,000. Younger age groups (18-24 years and 25-44 years) have lower rates of high cholesterol (11.4 percent and 23.3 percent, respectively) compared to those in the 45-64 age group (42.6 percent) and those 54 years of age and older (45.0 percent). Whites (35.0 percent) and non-Hispanics (34.6 percent) have higher rates of high cholesterol compared to non-whites (30.5 percent) and Hispanics (29.8 percent).

The percentage of adults with high cholesterol varies from 30.6 percent in Chicago to 37.5 percent in urban counties (Figure 31). Champaign, Chicago, Hancock, Jackson and Whiteside counties had the lowest high cholesterol rates (20 percent-23 percent) compared to Brown, Lake, Moultrie, Pope, Rock Island and Saline counties, which had the highest rates of adults with high cholesterol (36 percent - 43 percent) (Figure 32).

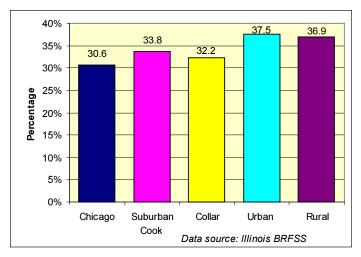
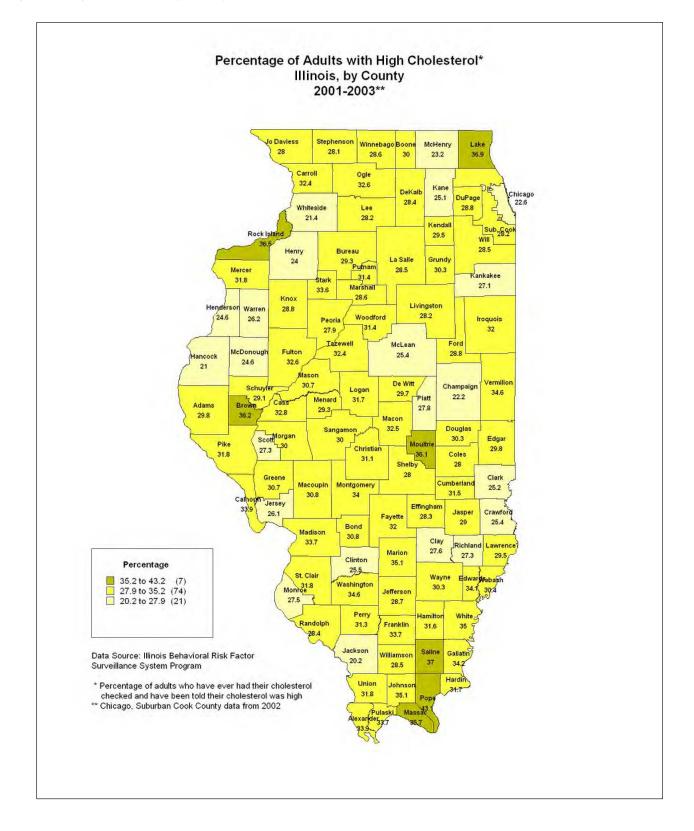


Figure 31. High Cholesterol among Adults by County Groups, 2003

### Figure 32. High Cholesterol, by County





### **Trends in High Cholesterol**

Both Illinois and the United States have similar high cholesterol prevalence trends, with the percentage of adults with high cholesterol increasing from approximately 30 percent in 1999 to 34 percent in 2003 (Figure 33). Older age groups (45-64, 65+) consistently have higher rates of high cholesterol compared to younger age groups (Figure 34).

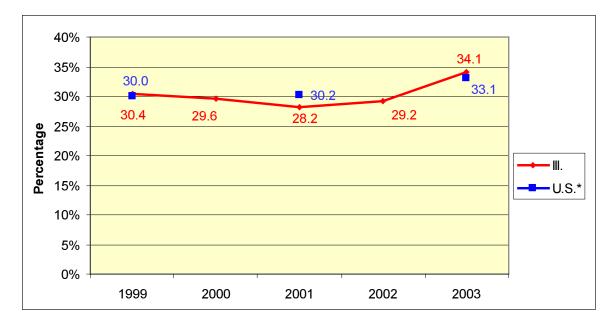
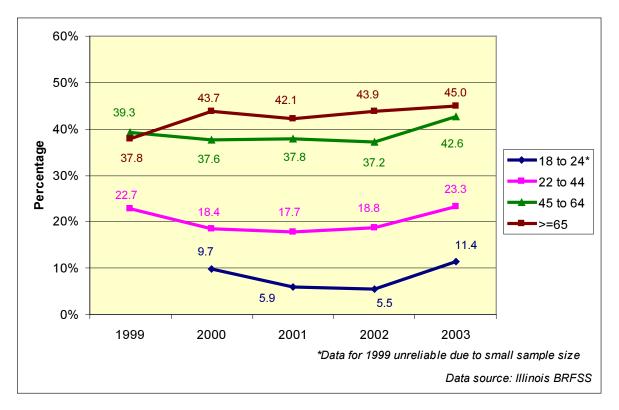




Figure 34. Trends in High Cholesterol, by Age, Illinois

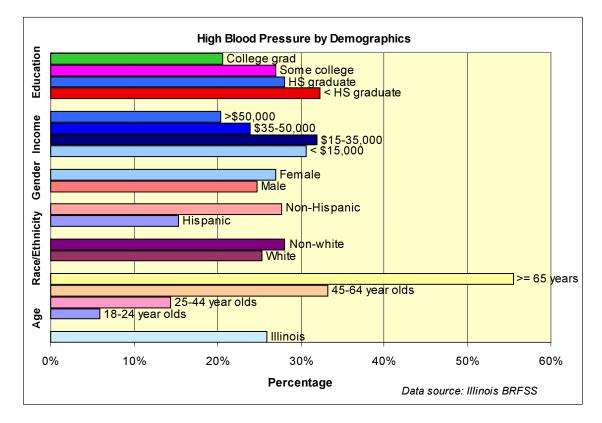




### **High Blood Pressure**

Hypertension, or high blood pressure, is the chronic state of elevated pressure in the arteries. High blood pressure is a major risk factor for heart disease, congestive heart failure, stroke, impaired vision and kidney disease. Generally, the higher the blood pressure, the greater the risk.<sup>10</sup>



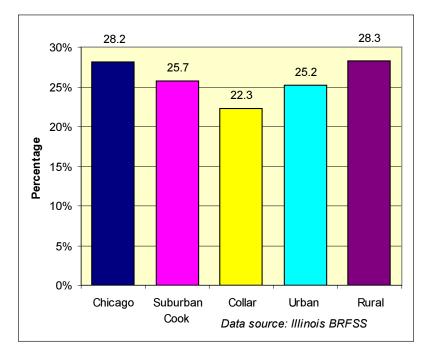


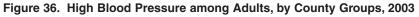
Results from the 2003 Illinois BRFSS indicate that approximately 2.4 million adults in the state have high blood pressure. Rates of high blood pressure increase with age (Figure 35). Only 6 percent of those between the ages of 18 and 24 years have high blood pressure compared to 14 percent of those between 25 and 44, 33 percent of those 45-64, and 56 percent of those 65 and older. While there is little difference by race, the prevalence of high blood pressure rates among non-Hispanics is 81 percent higher than among Hispanics. A larger proportion of adults in households with lower incomes (<\$35,000) have high blood pressure compared to those in higher income brackets (≥\$35,000). As education decreases, the percentage of those with high blood pressure increases. Prevalence of high blood pressure is 35 percent higher in adults with less than a high school education compared to adults with a college degree.



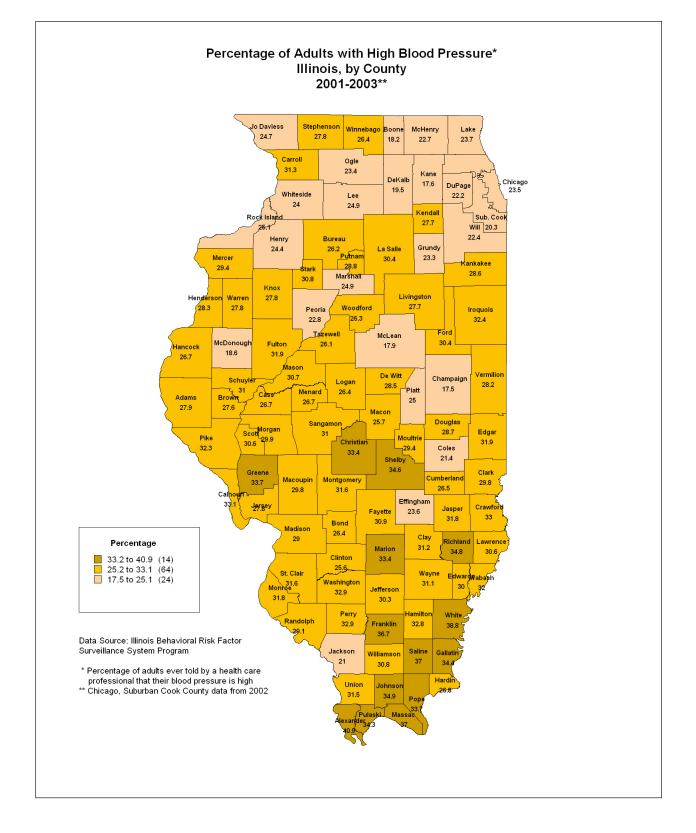
Very little difference in blood pressure prevalence is observed by county groups (Figure 36). Approximately 28 percent of adults in rural areas and in Chicago have high blood pressure. In urban and suburban Cook areas, approximately 25 percent of adults have high blood pressure.

Boone, Champaign, Kane, McDonough and McLean counties have the lowest rates of high blood pressure ranging from 17 percent to 19 percent. Prevalence of high blood pressure in Alexander, Franklin, Massac, Saline and White counties is higher – ranging from 36 percent to 41 percent. Several of these counties are along the Illinois-Kentucky border (Figure 37).





### Figure 37. High Blood Pressure, by County

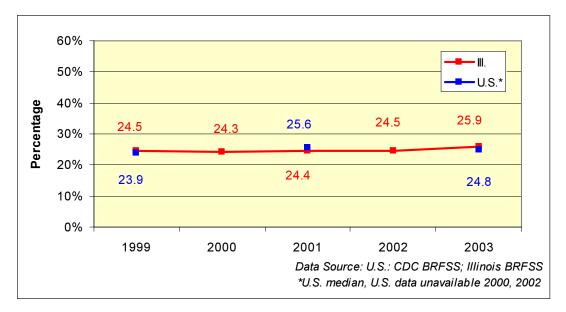




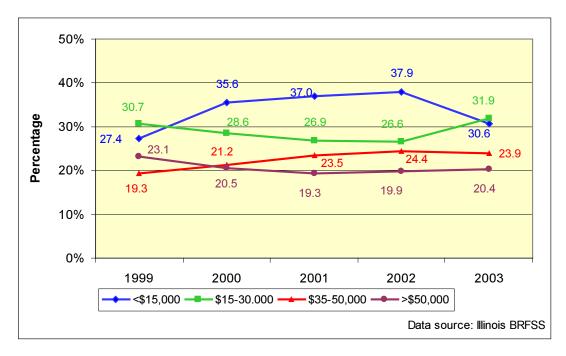
### **Trends in High Blood Pressure**

Prevalence of high blood pressure among adults in Illinois and the United States has remained virtually unchanged since 1999 (Figure 38). No differences exist between the United States and Illinois, as well. While there has been some variability in the percentage of adults with high blood pressure in various income groups, the percentage of high blood pressure among those with household incomes of less than \$15,000 increased from 1999 to 2002, and decreased in 2003 (Figure 39).





### Figure 39: Trends in High Blood Pressure, by Income, Illinois

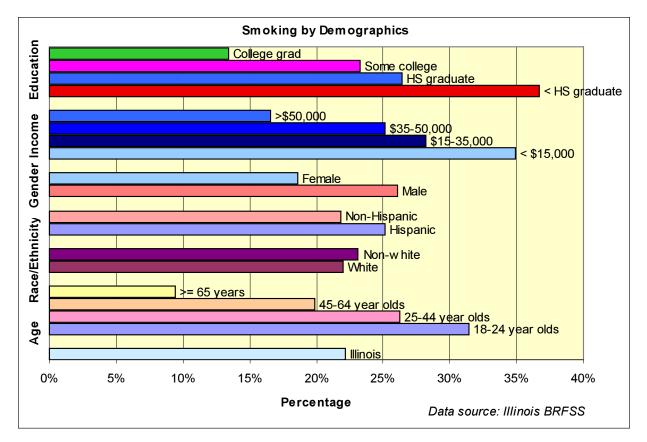


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### Smoking

Cigarette smoking is a major cause of coronary heart disease and is a major risk factor for sudden death from heart attack.<sup>11</sup> Cigarette smoking also almost doubles a person's risk for stroke.<sup>12</sup> According to results from the 2004 Illinois BRFSS, two million adults in Illinois currently smoke cigarettes. As age increases, smoking rates decrease (Figure 40). While 31 percent of adults ages 18-24 years are current smokers, this decreases to 26 percent for adults ages 25-44 years, 20 percent for those 45-64 years of age, and 9 percent for adults 65 years and older. A larger proportion of males (26.2 percent) are current smokers compared to females (18.6 percent). As income or education increases, the prevalence of smoking decreases. Cigarette smoking among adults in lower income households (less than \$15,000) is higher than among more affluent households ( $\geq$ \$50,000). The prevalence of cigarette smoking is 36.7 percent for those who did not graduate from high school, compared to only 13.4 percent for college graduates.

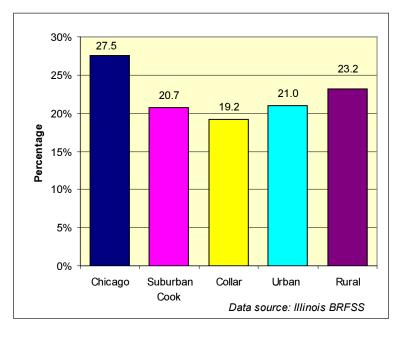
### Figure 40. Current Smoking among Adults in Illinois, 2004



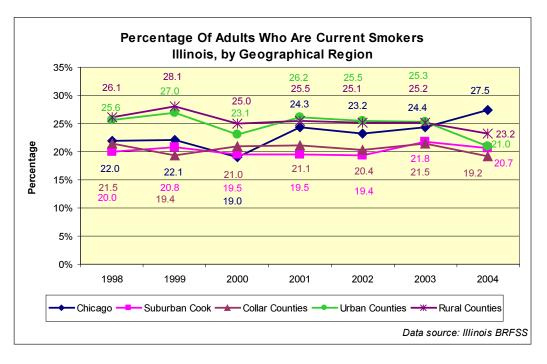
In 2004, Chicago had the highest smoking prevalence rate (27.5 percent) compared to other geographical regions in the state (Figure 41). In 2004, the prevalence rate among rural communities was 23.2 percent, and approximately 20 percent for suburban Cook, collar, and urban communities. However, from 1992-2003, urban and rural counties had the highest prevalence rate for smoking (Figure 42). The five counties with the lowest prevalence of smoking are Lake (13.7 percent), Champaign (16.6 percent), Washington (16.8 percent), Monroe (17.3 percent) and DuPage (17.8 percent) (Figure 43). The five counties with the highest smoking prevalence rates are Franklin (32.3 percent), White (32.3 percent), Mason (33.5 percent), Pulaski (34.5 percent) and Hardin (36.1 percent).



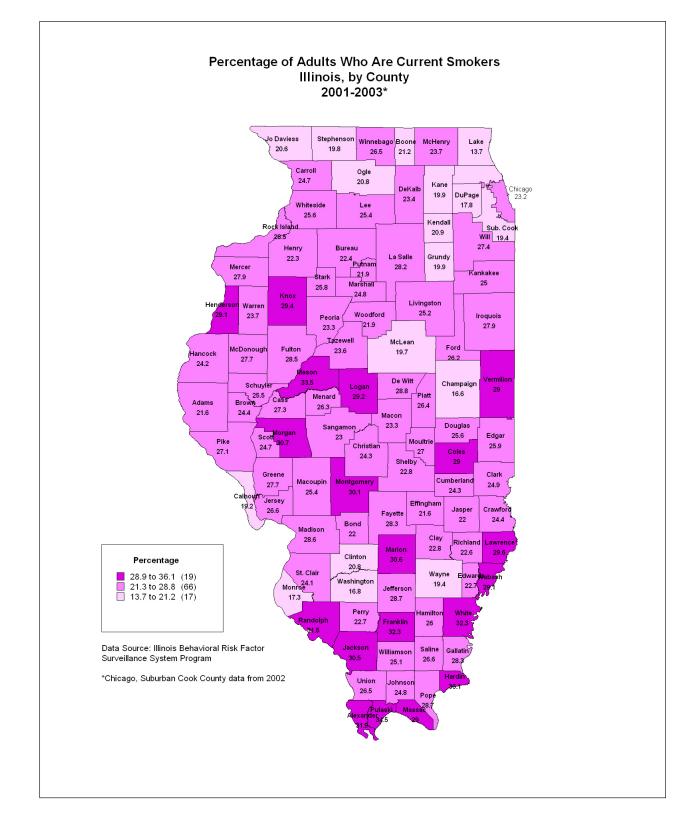
### Figure 41. Current Smoking among Adults, by County Groups, 2004



### Figure 42: Geographical Trends in Smoking



### Figure 43. Current Smoking, by County





### **Trends in Smoking**

In 2004, Illinois ranked 32nd among all the states for prevalence of cigarette smoking.<sup>2</sup> Illinois and the United States have similar smoking rates, with the percentage of cigarette smoking among adults remaining unchanged since 1998 (Figure 44). In 1998, the prevalence of smoking among men was 25.7 percent higher than among women. In 2004, this gap increased, with the prevalence of smoking among men 40 percent higher than among women (Figure 45).

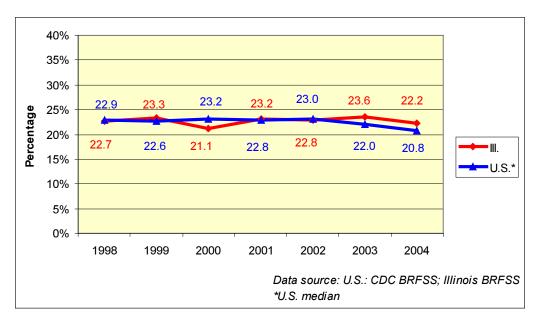
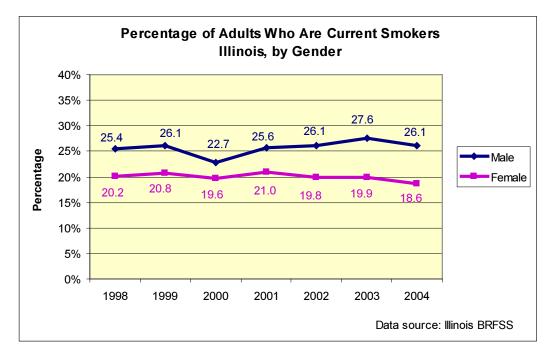




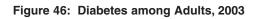
Figure 45. Trends in Smoking, by Gender, Illinois

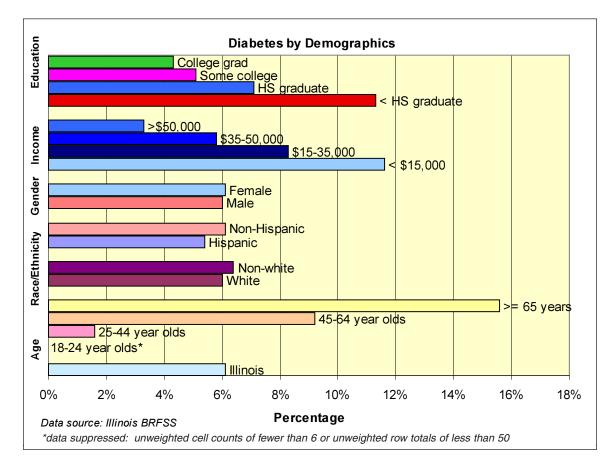


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### Diabetes

People with diabetes, due to the many complications caused by this disease, suffer greater morbidity and mortality than the general population.<sup>13</sup> Heart disease and stroke are the most common causes of morbidity and mortality among people with diabetes.<sup>14</sup>

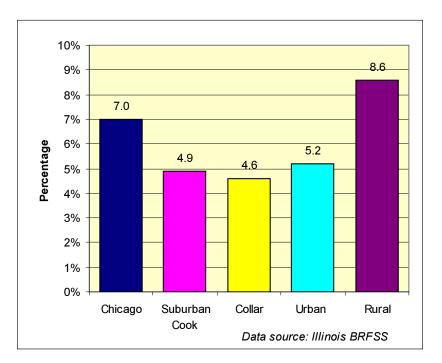




The 2003 Illinois BRFSS estimates that more than half a million people in Illinois have diabetes. Prevalence of diabetes is highest among those 45 years and older, those in lower income groups, and those with low education levels (Figure 46). The prevalence of diabetes among those ages 25-44 years is only 1.6 percent compared to 9.2 percent for ages 45-64 years and 15.6 percent for those 65 years of age and older. Little difference in diabetes prevalence rates exists between race and ethnic groups. As with many other risk factors, when income and education levels improve, the prevalence of diabetes decreases dramatically. The prevalence of diabetes among those without a high school education (11.3 percent) is 59 percent higher than among those with a high school education only (7.1 percent). This trend continues with a diabetes prevalence rate of 5.1 percent for those with some college, and 4.3 percent for college graduates.

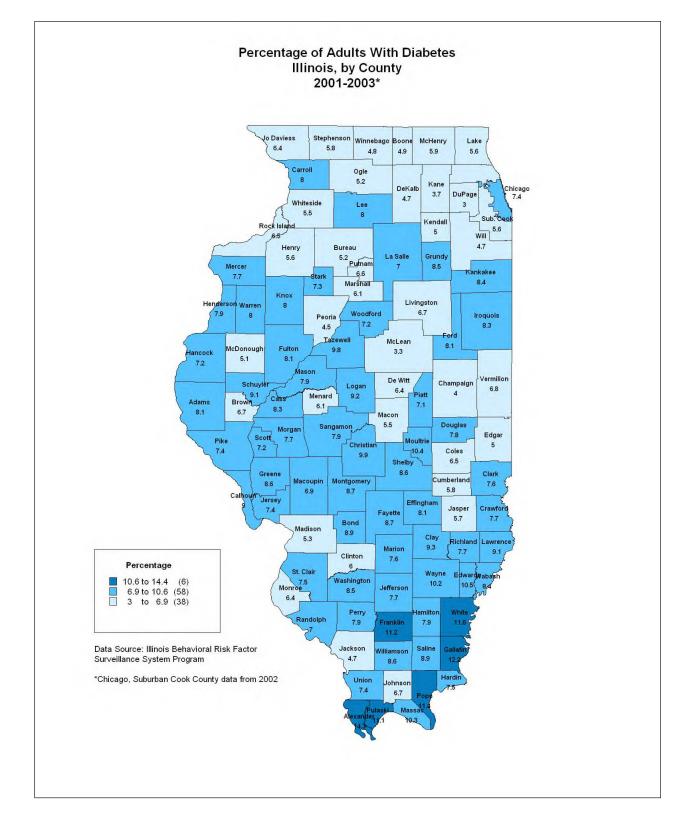


The prevalence of diabetes is highest in rural communities (8.6 percent) and Chicago (7.0 percent) compared to urban (5.2 percent), suburban Cook (4.9 percent) and collar communities (4.6 percent) (Figure 47). DuPage (3.0 percent), McLean (3.3 percent), Kane (3.7 percent), Champaign (4.0 percent) and Peoria (4.5 percent) counties have the lowest diabetes prevalence rates (Figure 48), with the highest rates found in Pulaski (11.1 percent), Franklin (11.2 percent), Pope (11.4 percent), White (11.6 percent), Gallatin (12.2 percent) and Alexander (14.3 percent) counties.





### Figure 48. Diabetes, by County





### **Trends in Diabetes**

The prevalence rate for diabetes in Illinois closely parallels that of the United States over the last seven years (Figure 49). A slight increase in the prevalence of diabetes occurred from 1998 to 2003, with a decrease in both Illinois and the United States in 2004. This decrease was seen among all age groups (Figure 50).

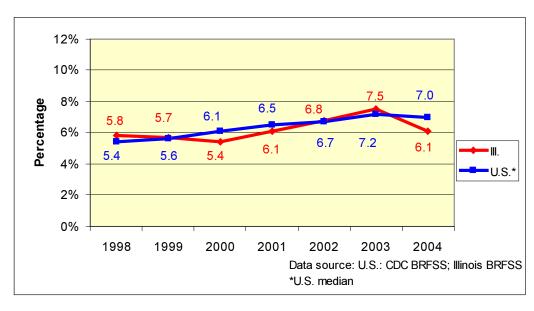
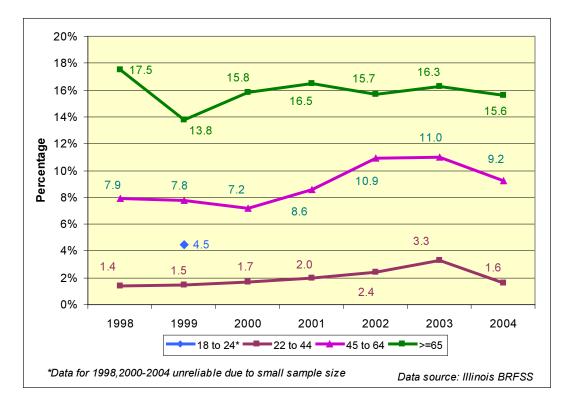




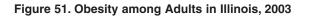
Figure 50. Trends in Diabetes, by Age, Illinois

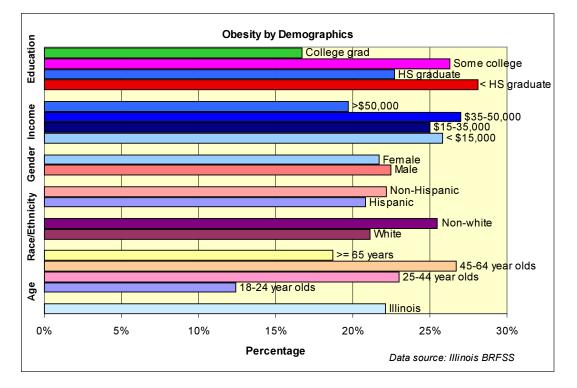




### Obesity

Obesity, a major risk factor for heart disease and stroke, is associated with many other risk factors including high blood pressure, diabetes and high cholesterol, and is usually the result or poor nutrition and lack of adequate physical activity. Obesity is a figure calculated by using weight and height to determine a number called the "body mass index" (BMI). Adults with a BMI of 30 or greater are considered obese.<sup>19</sup>



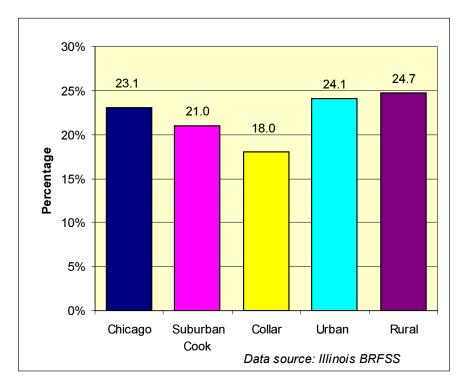


According to the 2003 Illinois BRFSS, almost two million Illinois adults are obese. The prevalence of obesity increases from 12.4 percent among ages 18-24 to 23.0 percent for those ages 25-44 years and reaches the highest prevalence rate of 26.7 percent for the 45-64 year age group before declining to 18.7 percent for those persons 65 years of age and older (Figure 51). Obesity rates for non-whites are 20.8 percent higher than those for whites. No large difference in obesity prevalence is found between genders or ethnicities (Hispanic vs. non-Hispanic). For those adults with a household income less than \$50,000, approximately 26 percent are obese, compared to 19.7 percent for those with household incomes greater than \$50,000. Obesity rates vary with educational level. The prevalence rate of obesity for those without a high school degree is the highest, at 28.1 percent followed by those with some college (26.3 percent), high school graduates (22.7 percent), and, finally, those with a college degree (16.7 percent).

## **BURDEN OF HEART DISEASE AND STROKE**

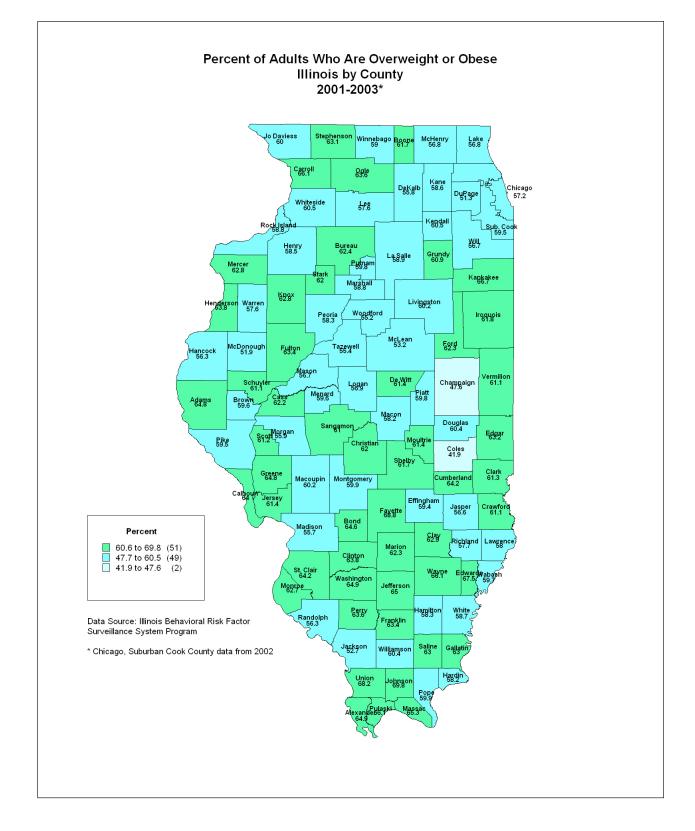


Chicago, urban, and rural communities have the highest obesity rates, ranging from 23.1 percent to 24.7 percent (Figure 52). The prevalence of obesity in collar communities is 18.0 percent and in suburban Cook communities 21.0 percent. In Figure 53, the five counties with the lowest obesity rates are Coles (41.9 percent), Champaign (47.6 percent), DuPage (51.3 percent), McDonough (51.9 percent) and Jackson (52.7 percent). The five counties with the highest obesity rates are Kankakee (66.7 percent), Edwards (67.5 percent), Union (68.2 percent), Fayette (68.8 percent) and Johnson (69.8 percent).



### Figure 52. Obesity among Adults, by County Groups, 2003

### Figure 53. Obesity, by County

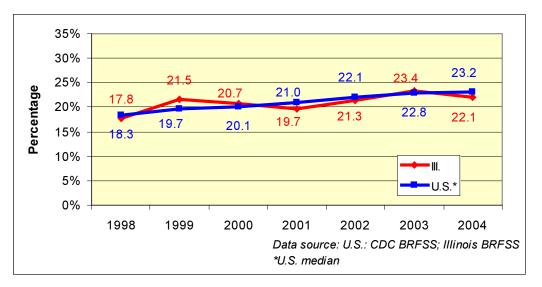




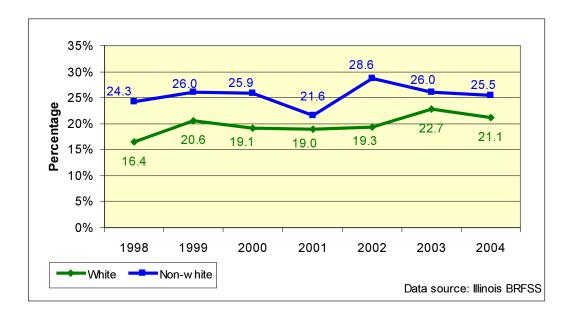
### **Trends in Obesity**

The rate of obesity is increasing both in Illinois and the United States. Since 1998, obesity has increased 24 percent in Illinois (Figure 54). Although obesity rates in Illinois have remained close to the national median since 1998, according to the United Health Foundation, Illinois ranked 17th among all the states in 1990 for obesity and is currently ranked 27th.<sup>2</sup> Obesity rates among whites have increased 16.4 percent since 1998, while the rates for non-whites have remained stable at approximately 25 percent (Figure 55).





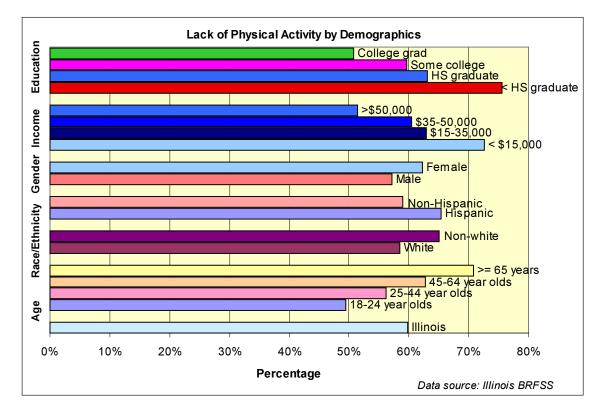
### Figure 55. Trends in Obesity, by Race, Illinois



### **Physical Inactivity**

Physical inactivity (not engaging in the recommended levels of physical activity) is a major risk factor for developing heart disease. It also contributes to other risk factors, including obesity, high blood pressure, high triglycerides, a low level of HDL ("good") cholesterol and diabetes.<sup>15</sup>

The recommended level of physical activity for adults is at least 30 minutes of moderate activity on five or more days of the week or 20 or more minutes of vigorous-intensity physical activity three or more days per week.<sup>16</sup>



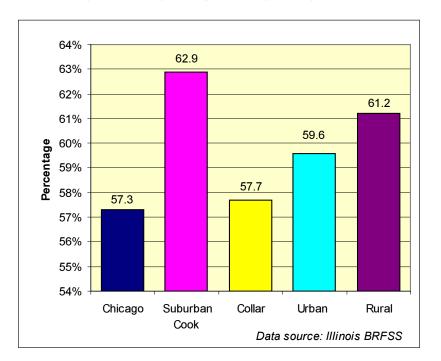


Nearly 60 percent of all adults in Illinois do not meet the recommended levels of physical activity. Almost half (49.4 percent) of those between the ages of 18 and 24 are already physically inactive (Figure 56). This trend continues with age. For those ages 25-44 years, 56.2 percent are physically inactive; among those 45-64 years of age, 62.7 percent are physically inactive; and for those 65 years or older, 70.8 percent are physically inactive. The prevalence of physical inactivity is higher in non-whites (65.0 percent) than whites (58.5 percent). As income and education increase, levels of physically inactivity decrease. For those living in households with less than \$15,000 in annual income, the prevalence of physical inactivity is 72.6 percent compared to those with household incomes greater than \$50,000, which is at 51.4 percent. The prevalence of physical inactivity is 48.9 percent higher in those with less than a high school education (75.5 percent) than those with a college education (50.7 percent).

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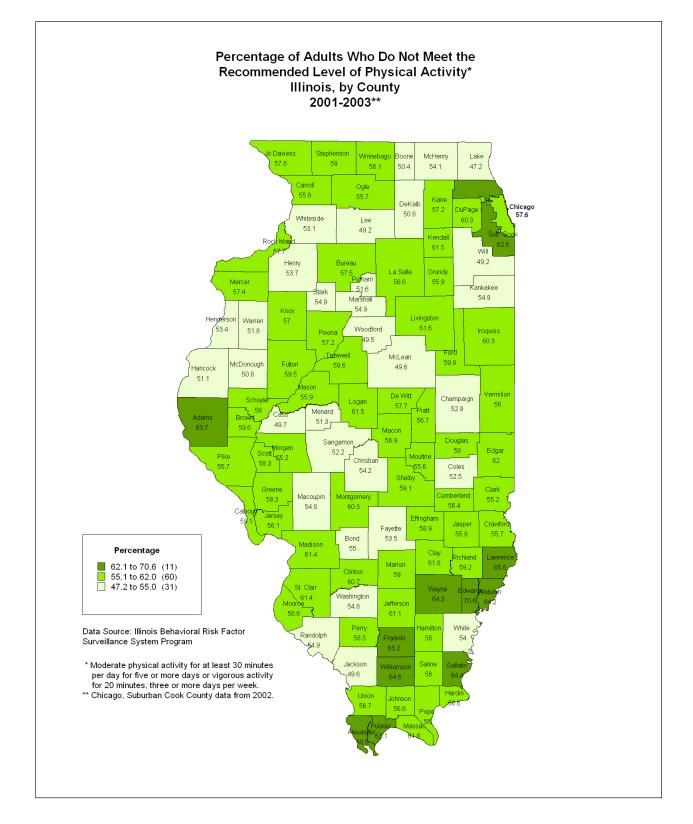


Approximately 63 percent of adults in suburban Cook and 61 percent in rural communities are physically inactive (Figure 57). In urban, collar and Chicago communities, the level of physical inactivity ranges from 57.3 percent to 59.6 percent. Counties with lowest prevalence of physical inactivity (range: 47.2 percent - 49.7 percent) are Cass, Jackson, Lake, Lee, McLean, Will and Woodford. Edwards County has the highest prevalence of physical inactivity (70.6 percent) followed by Alexander (68.6 percent) and Lawrence (65.6 percent) counties (Figure 58).





### Figure 58. Physical Inactivity, by County





### **Trends in Physical Inactivity**

Due to lack of data at the national level, physical inactivity trends in the United States and Illinois cannot be compared. However, for the past three years in Illinois, there has been no improvement in the percentage of adults meeting the recommended level of physical activity (Figure 59). Data from the last two years suggest that the prevalence of physical inactivity is higher in Hispanic populations than among non-Hispanics (Figure 60). Data will need to be collected for a few more years before any conclusions about trends can be made.



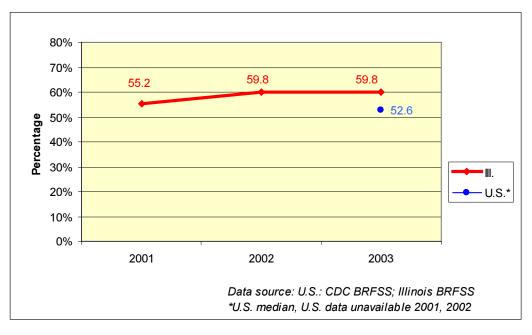
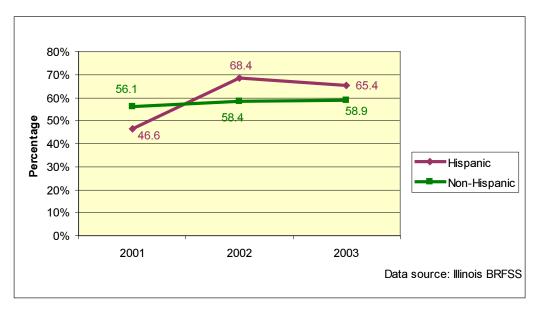


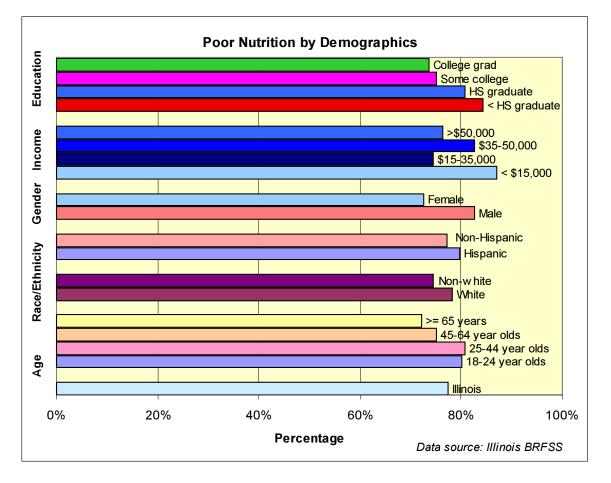
Figure 60. Trends in Low Physical Activity, by Ethnicity, Illinois



### **Poor Nutrition**

Poor nutrition is defined here as not getting the recommended five servings of fruits and vegetables per day. Eating fruits and vegetables reduces stroke risk, <sup>17</sup> and may help to reduce the risk of heart disease and diabetes, as well as lower high blood pressure.<sup>18</sup> Results from the 2003 Illinois BRFSS indicate that more than 7.2 million adults in Illinois (77.4 percent) do not eat the recommended five servings of fruits and vegetables per day. Approximately 80 percent of adults ages 18-44 do not eat the recommended number of servings (Figure 61). This slightly improves with age, with 75.0 percent of those between the ages of 45-64 and 72.1 percent of those 65 years and older not meeting the recommended daily allowance. While there is no major difference between race or ethnicity groups, the percentage of males who do not consume five servings of fruits and vegetables per day is 14 percent higher than females. Rates of poor nutrition vary with income level. The prevalence of poor nutrition in the lower income bracket (less than \$15,000) is 87.0 percent, compared to those in the \$15,000-\$35,000 bracket (74.5 percent), the \$35,000-\$50,000 income bracket (82.7 percent) and the highest income bracket – more than \$50,000 (76.4 percent). As education level increases, the rate of poor nutrition decreases. Prevalence of poor nutrition is 12.7 percent less in college graduates compared to those with less than a high school education.

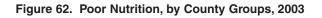


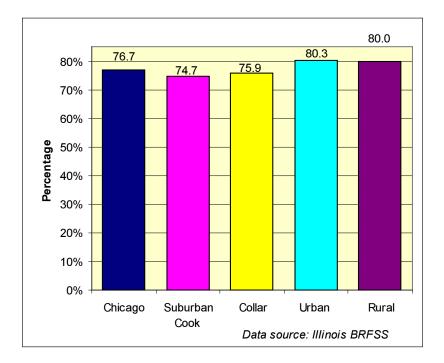


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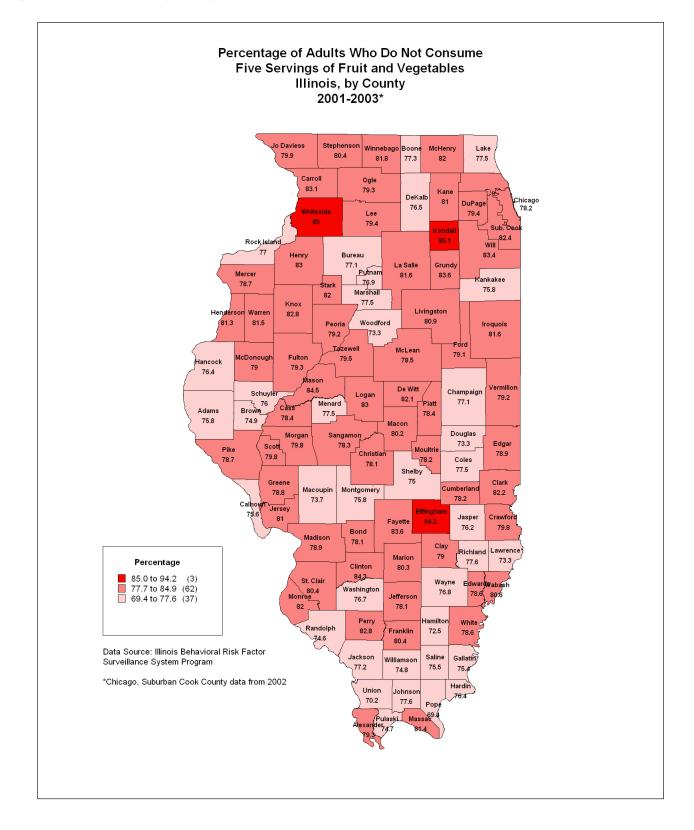


The prevalence of poor nutrition ranges from a low of 74.7 percent in suburban Cook to 80.3 percent in urban communities (Figure 62). Pope, Union and Hamilton counties had the lowest prevalence of poor nutrition at 69.4 percent, 70.2 percent, and 72.5 percent, respectively. Effingham County had the highest poor nutrition prevalence rate at 94.2 percent, followed by Kendall (85.1 percent) and Whiteside (85.0 percent) counties (Figure 63).





### Figure 63. Poor Nutrition, by County





### **Trends in Poor Nutrition**

Rates of poor nutrition have not changed for Illinois or the United States since 1998 (Figure 64). Changes in poor nutrition rates also have not been observed by race groups since 1998 (Figure 65).



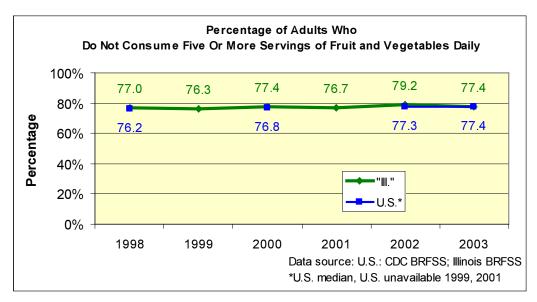
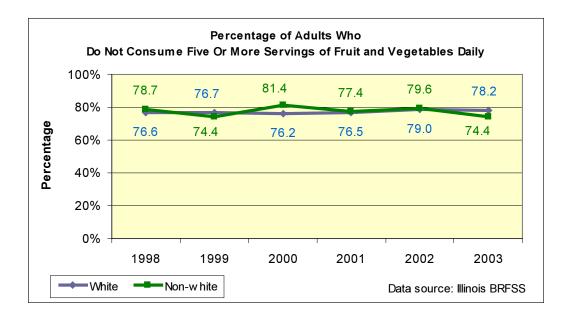


Figure 65. Trends in Poor Nutrition, by Race, Illinois





### Signs and Symptoms of a Heart Attack or Stroke

One of the factors known to adversely influence the outcome of an acute heart disease and stroke event is the time between the onset of symptoms and receiving treatment. The three stages at which time delays can occur are between the onset of symptoms and the call for help, during pre-hospital care and during transportation.

One of the factors demonstrated to play an important role in reducing the time delay between the onset of a heart attack or stroke and accessing emergency care is the public awareness of the signs and symptoms of heart attack and stroke.<sup>19,20</sup>

A point-in-time survey conducted by IDPH in 2005 was used to assess public awareness of the signs and symptoms of heart attack and stroke. Knowledge was assessed through a set of 12 questions, six each on heart attack and stroke. Two items were included in the survey to test for the validity of the responses provided by respondents.

The five signs and symptoms of a heart attack or stroke used in the survey are noted below.

### Signs/Symptoms of a Heart Attack

- Pain/discomfort in jaw, neck or back
- · Feeling weak, lightheaded, faint
- Chest pain or discomfort
- · Shortness of breath
- Pain/discomfort in arms/shoulders

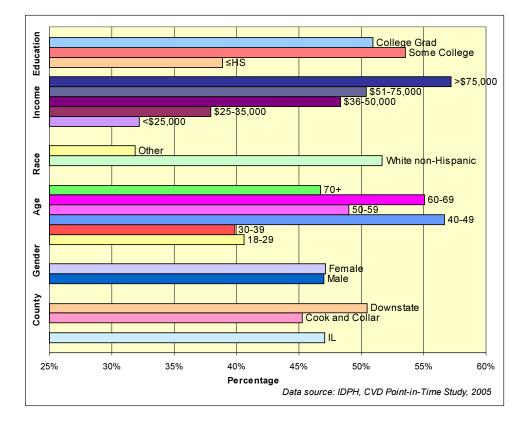
- Signs/Symptoms of a Stroke
- Sudden numbness or weakness of face, arm or leg
- Sudden confusion or trouble speaking
- Sudden trouble seeing in one of both eyes
- Sudden trouble walking, dizziness or loss of balance
- Sudden severe headache with no known cause

Results of the survey are detailed next.



### Awareness of Signs and Symptoms of a Heart Attack

Less than half of all adults in Illinois can recognize all the signs and symptoms of a heart attack (Figure 66). The percentage of adults in Cook and the surrounding collar counties who recognize the symptoms of a heart attack is 45.3 percent compared to 50.5 percent downstate. Men and women are equally likely to recognize the signs and symptoms of a heart attack (approximately 47 percent). Recognizing the signs and symptoms of a heart attack varied by age groups with only 39.9 percent of those between the ages of 30 and 39 years, and 56.7 percent of those between 40 and 49 years of age recognizing the signs and symptoms of a heart attack.



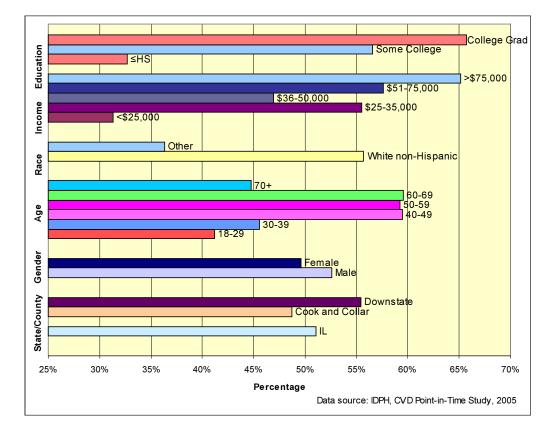
### Figure 66. Percent of Adults Who Can Correctly Recognize Five to Six Symptoms of a Heart Attack

Nearly half of white non-Hispanics (51.6 percent) were able to recognize the signs and symptoms of a heart attack; only 31.9 percent of other race/ethnicities were able to do this. As income increases, the proportion of adults who can correctly identify the signs and symptoms of a heart attack increases, with a range of 32.2 percent for those in the low income bracket (less than \$25,000) and 57.2 percent for those in the highest income bracket (more than \$75,000). Approximately 39 percent of those with a high school or less than a high school education were able to recognize the signs and symptoms of a heart attack compared to approximately 52 percent of those with some college or a college education.



### Awareness of Signs and Symptoms of a Stroke

Approximately 51 percent of adults in Illinois can correctly recognize five to six signs and symptoms of a stroke (Figure 67). A larger percentage of adults in the downstate area (55.4 percent) compared to Cook and the surrounding collar counties (48.7 percent) can correctly identify the five signs and symptoms of a stroke. Men (52.6 percent) and women (49.6 percent) are similar in their abilities to recognize the signs and symptoms of a stroke. Approximately 41 percent of adults ages 18-29 recognize the signs and symptoms of a stroke 70 years and older, and approximately 60 percent of those between the ages of 40 and 69 years.



### Figure 67. Percentage of Adults Who Can Correctly Identify Five to Six Signs and Symptoms of a Stroke

# Conclusion



Even though heart disease and stroke are largely preventable, they continue to be the leading causes of death in Illinois. Although deaths due to heart disease and stroke have been decreasing since the late 1970s, partly due to advances in medical treatment, the rate of decline has slowed over the past 10 years. While the majority of deaths due to heart disease and stroke are among whites (which reflects the population demographics), African Americans and in particular, African American men, have the highest mortality rates. Non-white, non-African-American individuals have the lowest heart disease and stroke mortality rates.

Heart disease and stroke also cause a heavy burden in terms of economics, years of potential life lost and quality of life issues. In 2004, billing charges for heart disease and stroke exceeded \$7.5 billion in Illinois, accounting for 14 percent of all hospital charges that year. Heart disease and stroke taxes the state's health care system, accounting for more than 1.1 million days spent in hospitals, 14 percent of the total days spent in the hospital for any cause in 2004. Although quantitative and qualitative data are not readily available to describe the impact of heart disease and stroke, numerous national studies indicate a large proportion of heart attack and stroke survivors experience a diminished quality of life. In 2003, more than 400,000 years of potential life was lost due to heart disease and stroke in Illinois.

Much of the burden of heart disease and stroke could be prevented through the reduction of risk factors, recognizing the signs and symptoms of a heart attack or stroke, and seeking immediate medical attention at the onset of signs and symptoms.

A large majority of adults in Illinois continue to be at risk of heart disease and stroke due to modifiable risk factors. More than 75 percent of adults do not consume at least five servings of fruits and vegetables daily and 60 percent do not meet the minimal recommended levels of physical activity. Individuals in low income groups and/or those with lower educational status have higher proportions of heart disease and stroke risk factors – including high cholesterol, high blood pressure, diabetes and physical inactivity.

These very same risk groups (low income and/or education status) are unlikely to recognize the signs and symptoms of a heart attack or stroke. Nearly 70 percent of individuals with household incomes of less than \$25,000 cannot recognize all the signs and symptoms of a heart attack or stroke. The same is true for those with less than a high school education.

While great strides have been made in reducing deaths due to heart attack and stroke, the decline in mortality rates is slowing. This trend can be reversed by focusing prevention efforts on several specific goals:

- reducing a person's risk factors;
- increasing public awareness of the warning signs of heart attack and stroke; and
- decreasing the time between when a person experiences any of these warning signs and when he/she receives appropriate medical attention.

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### Mortality

From 1990 to 1998, coding of mortality data was based on the International Classification of Diseases, Ninth Revision (ICD-9). Codes for mortality data from 1999 to present are based on the International Classification of Diseases, Tenth Revision (ICD-10).

ICD-10 codes for leading causes of death in Illinois from 2003 are given below:

| Cause of Death                              | ICD-10 CODES   |
|---|--|
| Cardiovascular Disease                      | 100-109, 111, 113, 120-151, 110, 112, 115, 152, 170-178, 160-169 |
| Malignant neoplasms                         | C00-C97  |
| Chronic lower respiratory diseases          | J40-J47  |
| Accidents                                   | V01-X59,Y85-Y86  |
| Diabetes melliltus                          | E10-E14  |
| Influenza and pneumonia                     | J10-J18  |
| Alzheimer's disease                         | G30  |
| Nephritis, nephrotic syndrome and nephrosis | N00-N07, N17-N19,N25-N27   |
| Septicemia                                  | A40-A41  |

In this report, CVD mortality is categorized into three broad categories: stroke, heart disease, and atherosclerosis and other (including hypertension, hypertensive renal disease, aortic and other aneurysm, other peripheral vascular disease and diseases of capillaries). Heart disease is further categorized into three major areas: ischemic heart disease, coronary heart failure, and other heart diseases. Specific ICD codes used for defining the underlying cause of death for CVD and CVD-related mortality are given in the chart below.

| Disease                   |                        | ICD-9                           | ICD-10                         |
|---------------------------|------------------------|---------------------------------|--------------------------------|
| CVD                       |                        | 390-398, 401-438, 440-448       | 100-113, 115, 120-152, 160-178 |
| Stroke                    |                        | 430-438                         | 160-169                        |
| Heart Disease             |                        | 390-398, 402, 404-429           | 100-109, 111, 113, 120-151     |
|                           | Ischemic HD            | 410-414, 429.2                  | 120-125                        |
|                           | Coronary Heart Failure | 428                             | 150                            |
|                           | Other Heart Diseases   | 390-398, 402, 404-409, 415-427, | 10-19, 111, 113, 126-149, 151  |
|                           |                        | 429.0-429.1, 429.3-429.9        |                                |
| Atherosclerosis and Other |                        | 401, 403, 440-448               | 110, 112, 115, 152, 170-178    |

Age-adjusted (2000 population) mortality rates for Illinois and the United States were obtained from the National Center for Health Statistics through the CDC WONDER Web site (http://wonder.cdc.gov). Mortality rates are suppressed when the number of deaths is fewer than 21 for the given time period. Mortality events (or number of deaths) and place of death data for Illinois were obtained from the Illinois Center for Health Statistics, IDPH.

### Morbidity

Hospital discharge data (also known as facility discharge data) is reported by hospitals using a uniform billing form and is based on ICD-9 codes. This billing data is reported by the Illinois Department of Public Health, Office of Policy, Planning and Statistics. The data include all persons who are admitted to a hospital – including admissions through the emergency department (emergency department visits that do not result in hospitalization are excluded). The data do not reflect individual patients. An individual may have multiple hospitalizations, thus multiple discharges, a year. The data contained in this report use only primary diagnosis codes, which results in a lower estimate. These data include discharges for individuals who died while in the hospital.

### **Risk Factors**

Risk factor data for the United States were obtained from the National Center for Chronic Disease Prevention and Health Promotion, BRFSS through the CDC BRFSS Web site (www.cdc.gov/brfss/). Availability of national data for selected risk factors is dependent on the number of states that included questions regarding the respective risk factor in their state survey, thus, national risk factor data may not be available for any given year; in these cases the unavailability of data is stated in this document. Prevalence of risk factors in the United States is calculated as a median of the prevalence rate for all states participating.

Risk factor data for Illinois were obtained from the Illinois Department of Public Health, (Illinois Center for Health Statistics) through its Web site (http://app.idph.state.il.us/brfss/). Where data are indicated as unreliable, it is due to small sample size, either an unweighted cell count of five or less and/or confidence intervals of 12.5 percent or greater.

### Definitions for risk factors are given below:

High blood pressure: From 1999-2001, high blood pressure was calculated as having said "yes" to the following two questions "Have you every had your blood pressure taken by a doctor, nurse, or other health care professional?" and "Have you ever been told by a doctor, nurse or other health care professional that you have high blood pressure?" From 2002-2003, high blood pressure was calculated as having said yes to the question "Have you ever had your blood pressure taken by a doctor, nurse, or other health care professional?"

High cholesterol: Respondents who answered "yes" to the question "Have you ever been told by a doctor, nurse, or other health care professional that you have high blood cholesterol?" with the denominator as those who reported ever having their blood cholesterol tested.

Diabetes: Respondents who answered "yes" to the question "Have you ever been told by a doctor that you have diabetes?" Those who answered "yes, during pregnancy" were not classified as having diabetes.

Poor nutrition: Respondents who ate less than five servings of fruits and vegetables per day. This data is derived from a sequence of questions regarding eating habits.

Physical inactivity: Respondents who did not meet the recommended level of physical activity for adults (at least 30 minutes on five or more days of the week of moderate activity or vigorous-intensity physical activity three or more days per week for 20 or more minutes per occasion). The data are derived from a sequence of questions regarding physical activity.

Smoking: Respondents who answered "yes" to the questions "Have you smoked at least 100 cigarettes in your life?" and "Do you now smoke every day or some days?"

Obesity: Respondents with a body mass index (BMI) of 30kg/m<sup>2</sup> derived from self-reported weight and height.



### County groups are categorized as follows:

Chicago - Illinois residents that reside within the boundaries of Chicago and excludes all other Illinois residents.

**Cook County** – Illinois residents that reside within the boundaries of Cook County but not within the City of Chicago and excludes all other Illinois residents.

**Collar Counties** – Illinois residents that reside within the five counties that surround and are contiguous with Cook County. The five collar counties are DuPage, Kane, Lake, McHenry, and Will.

**Urban Counties** – Urban counties include residents of counties outside the immediate Chicago metropolitan area. Urban counties contain their own large city and include Champaign, DeKalb, Kankakee, Kendall, McLean, Macon, Madison, Peoria, Rock Island, Sangamon, St. Clair, Tazewell, and Winnebago counties.

**Rural Counties** – Rural counties include residents of counties outside the immediate Chicago metropolitan area. Rural counties do not contain a large city and include Adams, Alexander, Bond, Boone, Brown, Bureau, Calhoun, Carroll, Cass, Christian, Clark, Clay, Clinton, Coles, Crawford, Cumberland, DeWitt, Douglas, Edgar, Edwards, Effingham, Fayette, Ford, Franklin, Fulton, Gallatin, Greene, Grundy, Hamilton, Hancock, Hardin, Henderson, Henry, Iroquois, Jackson, Jasper, Jefferson, Jersey, JoDaviess, Johnson, Knox, LaSalle, Lawrence, Lee, Livingston, Logan, McDonough, Macoupin, Marion, Marshall, Mason, Massac, Menard, Mercer, Monroe, Montgomery, Morgan, Moultrie, Ogle, Perry, Piatt, Pike, Pope, Pulaski, Putnam, Randolph, Richland, Saline, Schuyler, Scott, Shelby, Stark, Stephenson, Union, Vermillion, Wabash, Warren, Washington, Wayne, White, Whiteside, Williamson, and Woodford Counties.

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