Georgia 2002

# CARDIOVASCULAR DISEASE REPORT


THE NUMBERS BEHIND GEORGIA'S LEADING CAUSE OF DEATH AND DISABILITY

# contents

## THE NUMBERS BEHIND GEORGIA'S LEADING CAUSE OF DEATH A

# acknowledgments

**THIS REPORT WAS PREPARED JOINTLY BY THE GEORGIA DEPARTMENT OF HUMAN RESOURCES, DIVISION OF PUBLIC HEALTH AND THE AMERICAN HEART ASSOCIATION, SOUTHEAST AFFILIATE**

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# executive summary

- Cardiovascular disease (CVD), including heart disease and stroke, was the number one killer of Georgians in 1999, accounting for 39% of all deaths.
- More than 24,000 Georgians died from CVD in 1999.
- The CVD death rate in Georgia was 14% higher than the national rate in 1999.
- CVD kills more women than men in Georgia; although the age-adjusted CVD mortality rate is higher for men, the actual number of deaths is higher for women because there are more elderly women than men.
- For both men and women in Georgia, age-adjusted CVD death rates are higher for blacks than whites.
- The majority of CVD deaths in Georgia were classified as ischemic heart disease (43%) or stroke (18%).
- Georgia had the tenth highest CVD mortality rate among the 50 states in 1999; for stroke in particular, Georgia had the sixth highest mortality rate among the 50 states.
- CVD caused more than 128,000 hospitalizations in 1999 and more than $1.9 *billion* in hospital charges.
- The high CVD death rates in Georgia may be caused by the high prevalence of preventable risk factors for heart attacks and stroke, such as smoking, high blood pressure, overweight, a lack of regular physical activity, and poor diet.
- In the late 1990s, smoking rates increased among adults in Georgia; in 1999, 24% reported that they currently smoked.
- In 1999, three fourths (74%) of adults in Georgia reported not being physically active on a regular basis.
- Over half (58%) of all adults in Georgia were overweight or obese in 1999.
- The high CVD death rates should alert Georgians to the importance of working together to facilitate regular physical activity, healthy eating, and smoke-free lifestyles.

# introduction

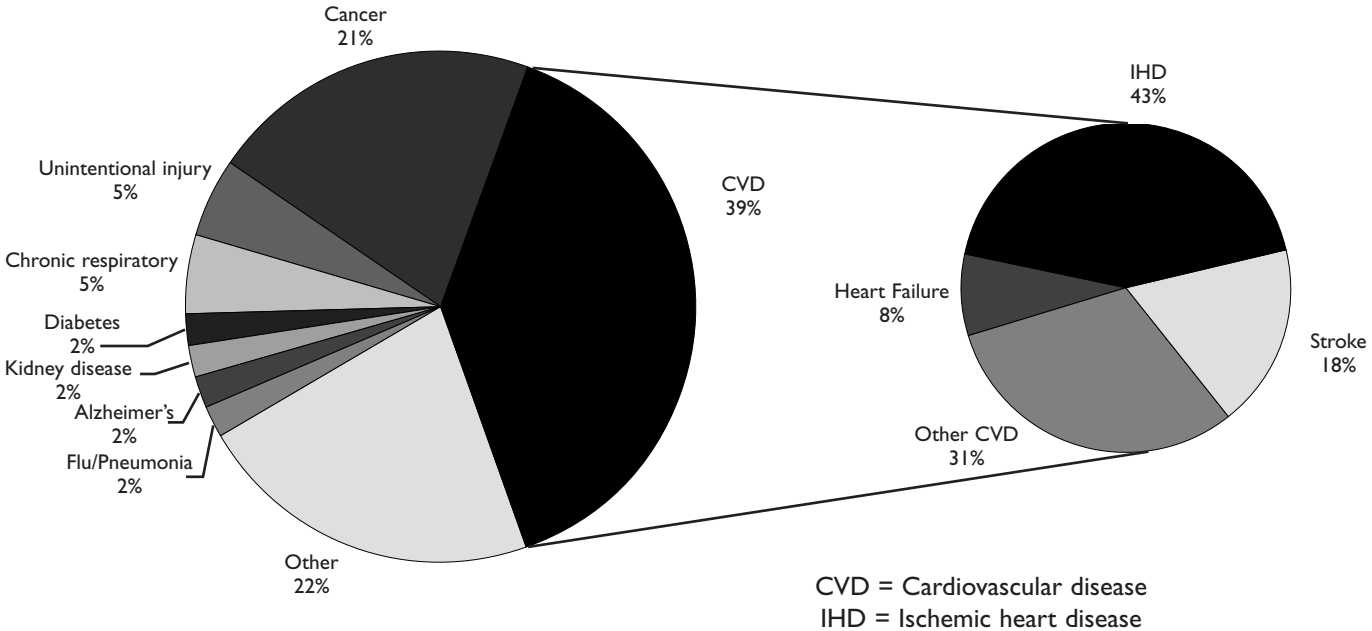
## *CVD is the leading cause of death in Georgia and the United States*

Cardiovascular disease (CVD) includes all diseases of the heart and blood vessels, including ischemic heart disease (caused by narrowing of the coronary arteries, which reduces blood flow and oxygen to the heart), stroke, congestive heart failure, hypertensive disease, and atherosclerosis. CVD is the nation's leading killer of both men and women in all racial and ethnic groups. Each year in the United States, about 950,000 people die from CVD, which accounts for approximately 41% of all deaths.[1,2] Almost 6 million hospitalizations each year are due to CVD.[1] According to the American Heart Association, CVD is a leading cause of disability in the nation.

In Georgia, CVD caused 24,274 deaths in 1999, 39% of all deaths that year (Figure 1). Ischemic heart disease and stroke accounted for about 61% of CVD deaths. Death and disability from CVD are related to a number of risk factors, including smoking, high blood pressure, high blood cholesterol, a lack of regular physical activity, overweight, and poor nutrition. The adoption of a healthier lifestyle can lower the risk for developing CVD or reduce the severity of existing disease.

This report describes the burden of CVD in Georgia. Its purpose is to present a brief overview of CVD death rates during the past two decades, including rates of ischemic heart disease and stroke; to report county-specific death rates; to report the number of CVD, ischemic heart disease, and stroke hospitalizations for Georgia residents; and to describe the prevalence of CVD risk factors in Georgia.

**Figure 1. Leading causes of death in Georgia, 1999**



# CARDIOVASCULAR DISEASE MORTALITY IN GEORGIA

Cardiovascular disease death rates have declined in both Georgia and the U.S. during the past 20 years (Figure 2). The causes of the decline are debated but presumably are related to the decline in cigarette smoking during the 1980s, improved blood pressure control, and improvements in medical care. Among the 50 states in 1999, Georgia had the tenth highest CVD death rate.

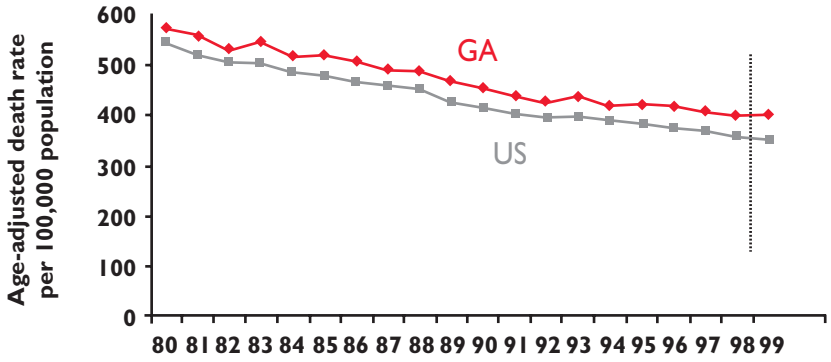
Although the Georgia CVD death rate continues to decline, the rate of decline is slowing. From 1980 through 1992, the CVD death rate declined by an average of 2.4% per year. In contrast, from 1992 through 1998, the average annual decrease slowed to only 1.0% per year (Figure 3). Over the entire time period, 1980 through 1999, Georgia's CVD death rate was consistently above the U.S. rate and the gap is widening; Georgia's rate was 5% above the U.S. rate in 1980 and 14% above the U.S. rate in 1999.

CVD death rates differ by sex and race; blacks have higher rates than whites and men have higher rates than women. In 1999, the CVD death rate in Georgia was 23% higher for black males than white males and 26% higher for black females than white females (Figure 4). The reasons for higher rates among blacks are not well understood, but they may be a result of a higher percentage of blacks with high blood pressure, or a higher percentage living in poverty with associated factors of poor diet or decreased access to health care.

As stated above, males have a higher risk than females for dying from CVD. In 1999, the age-adjusted CVD death rate was 475 per 100,000 standard population for men and 343 per 100,000 standard population for women. However, 11,223 males and 13,050 females in Georgia died from CVD. More women die from CVD because women live to older ages when CVD is more common.

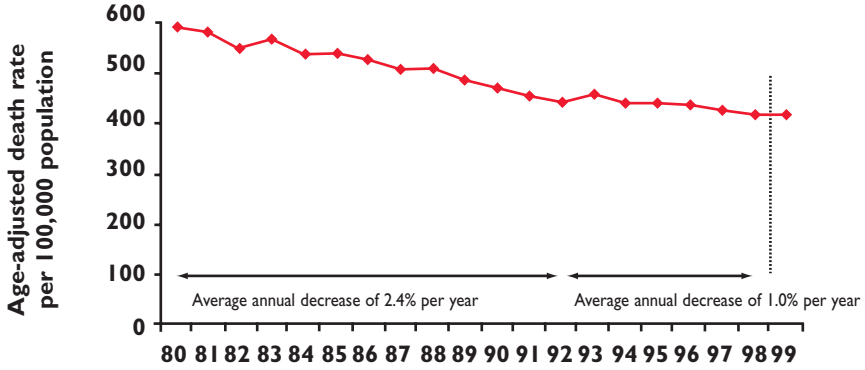
CVD, however, is not just a disease of old age. The process of arterial narrowing, which causes heart attacks and strokes, may begin in the teenage years.[3,4] The age at which blocked arteries actually kill varies greatly, and death can occur before old age. Of persons in Georgia who died from CVD in 1999, 22% were younger than 65 years of age (Figure 5). A greater percentage of blacks than whites die from CVD at ages less than 65 years (Table 1). Almost one half (42%) of black men who died of CVD in 1999 were younger than 65 years, whereas only 26% of white men who died of CVD were less than 65 years.

**Figure 2. Cardiovascular disease death rates in Georgia and the United States, 1980-1999**

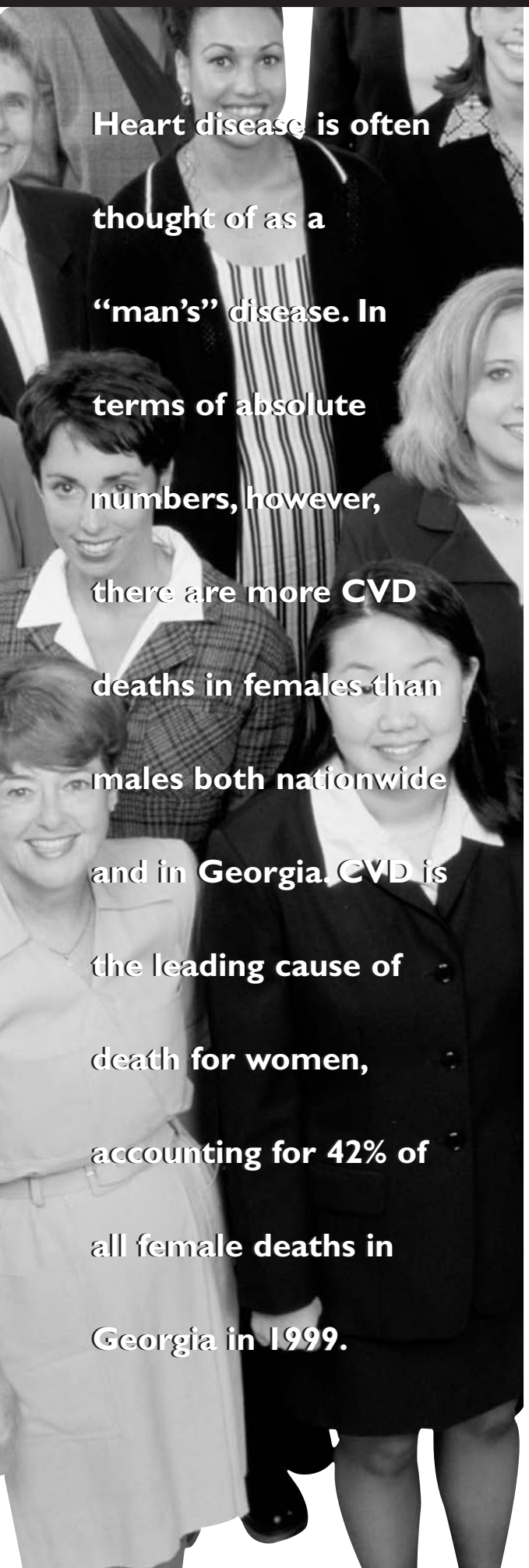



*NOTE. The vertical dotted line indicates a change in coding systems used for cause of death. ICD-9 codes were used for 1980-1998; ICD-10 codes were used for 1999 deaths.*

**Figure 3. Cardiovascular disease death rates in Georgia, 1980-1999**




*NOTE. The vertical dotted line indicates a change in coding systems used for cause of death. ICD-9 codes were used for 1980-1998; ICD-10 codes were used for 1999 deaths.*



Heart disease is often thought of as a "man's" disease. In terms of absolute numbers, however, there are more CVD deaths in females than males both nationwide and in Georgia. CVD is the leading cause of death for women, accounting for 42% of all female deaths in Georgia in 1999.

**Figure 4. Cardiovascular disease death rates in Georgia by race and sex, 1999**

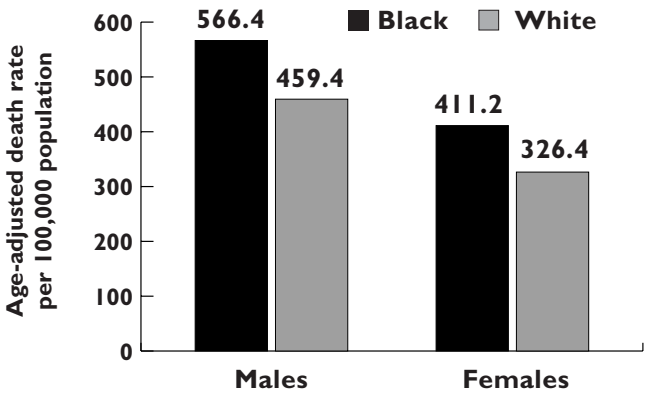



**Figure 5. Cardiovascular disease deaths in Georgia by age group, 1999**

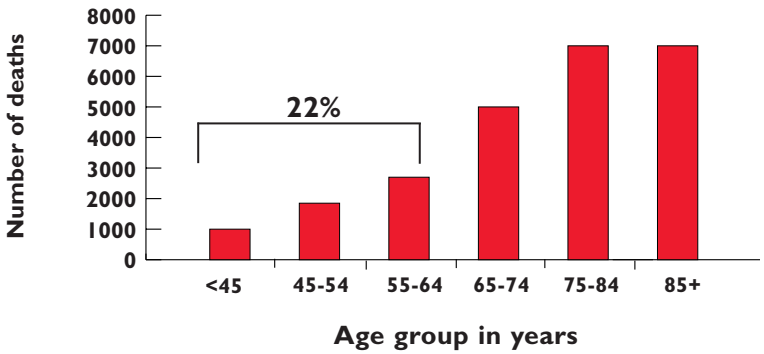



**Table 1. Premature cardiovascular disease deaths by race and sex, Georgia 1999**

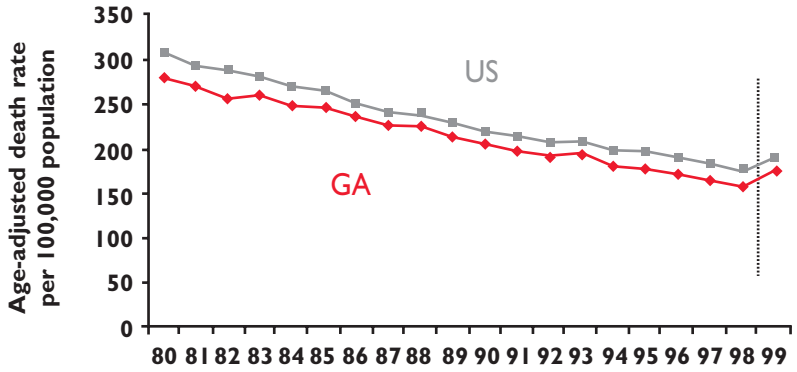
| | Total CVD deaths | No. (%) CVD deaths <65 yrs |
|---|---|---|
| **Black males** | 2,842 | 1,199 (42.2%) |
| **White males** | 8,361 | 2,202 (26.3%) |
| **Black females** | 3,402 | 828 (24.3%) |
| **White females** | 9,618 | 997 (10.4%) |

# *Ischemic heart disease*
# MORTALITY IN GEORGIA

Ischemic heart disease, also known as coronary heart disease, refers to narrowing of the coronary arteries, which reduces blood flow and oxygen to the heart. Ischemic heart disease includes acute myocardial infarctions ("heart attacks") and complications resulting from previous myocardial infarctions. Of the 24,274 cardiovascular deaths in Georgia in 1999, 10,502 (43%) were from ischemic heart disease. The death rate from ischemic heart disease has decreased during the past 20 years (Figure 6), and unlike CVD overall, the average annual rate of decrease has continued at a steady pace. Also unlike total cardiovascular disease, Georgia's death rate from ischemic heart disease is below the national rate, ranging from 5% to 12% below the US rate each year (Figure 6).

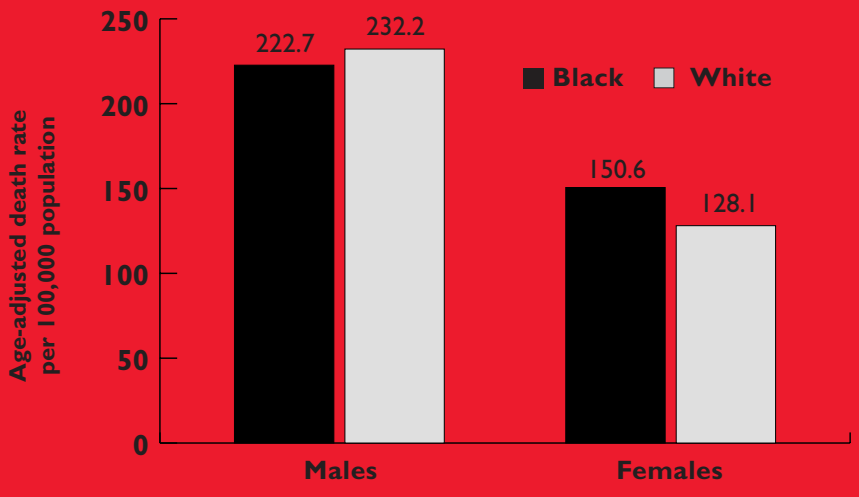
In Georgia, the age-adjusted death rate from ischemic heart disease was 1.7 times higher for men (227.5 per 100,000 standard population) than for women (132.0 per 100,000 standard population) in 1999. Among men, blacks and whites had a similar age-adjusted death rate in 1999 (Figure 7). Death rates for blacks tend to be higher than for whites in younger men (25 to 74 years) but higher for whites than blacks in the elderly (>75 years). Similar to overall CVD, the death rate from ischemic heart disease increases with age, but 23% of deaths are in persons less than 65 years.

**Figure 6. Ischemic heart disease death rates in Georgia and the United States, 1980-1999**



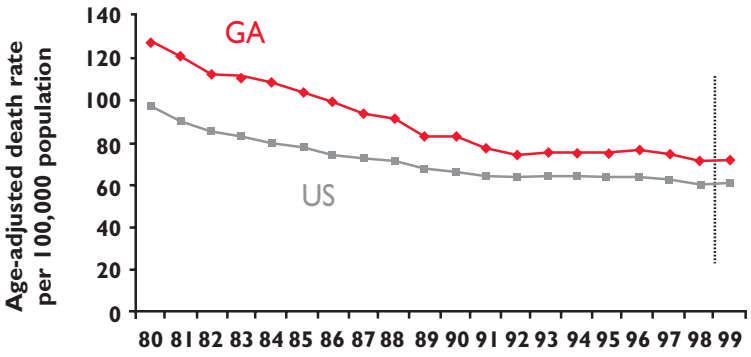

*NOTE. The vertical dotted line indicates a change in coding systems used for cause of death. ICD-9 codes were used for 1980-1998; ICD-10 codes were used for 1999 deaths.*

**Figure 7. Ischemic heart disease death rates in Georgia by race and sex, 1999**



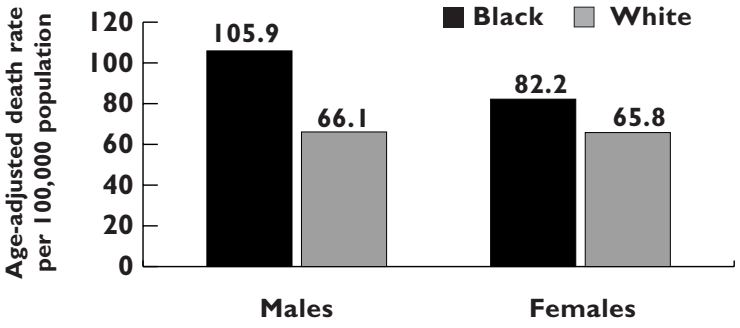
# STROKE MORTALITY IN GEORGIA

## Figure 8. Stroke death rates in Georgia and the United States by year, 1980-1999

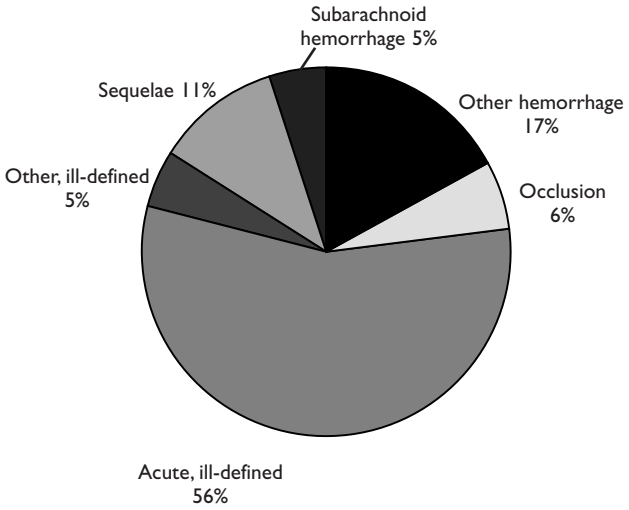



*NOTE. The vertical dotted line indicates a change in coding systems used for cause of death. ICD-9 codes were used for 1980-1998; ICD-10 codes were used for 1999 deaths.*

## Figure 9. Stroke death rates in Georgia by race and sex, 1999




## Figure 10. Stroke deaths by type, Georgia, 1999



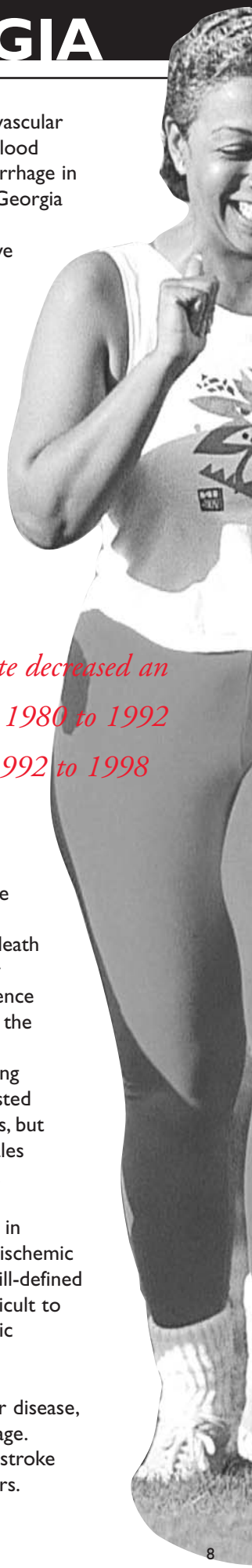

Stroke, technically known as a cerebrovascular accident, refers to an infarct (loss of blood supply due to a blocked artery) or hemorrhage in the brain. Of the 24,274 CVD deaths in Georgia in 1999, 4,277 (18%) were due to stroke. Age-adjusted death rates from stroke have decreased during the past two decades in both Georgia and the U.S. (Figure 8); however, since 1992, the rate of decline has slowed. In Georgia, the stroke death rate decreased an average of 4.4% per year from 1980 to 1992 but only 0.7% per year from 1992 to 1998. Age-adjusted stroke death rates in Georgia are consistently above the U.S. rate although the gap is narrowing, with Georgia's rate 32% above the U.S. rate in 1980 but only 16% above the U.S. rate in 1999.

*In Georgia, the stroke death rate decreased an average of 4.4% per year from 1980 to 1992 but only 0.7% per year from 1992 to 1998*

Unlike ischemic heart disease deaths, for which sex differences are more striking than racial differences, age-adjusted stroke deaths are much higher for blacks than whites. In 1999, the age-adjusted stroke death rate for blacks was 1.4 times the rate for whites in Georgia. Reasons for the difference are not well understood but may include the higher prevalence of high blood pressure and decreased access to health care among blacks. Black males had a higher age-adjusted death rate from stroke than black females, but the rates for white males and white females were almost the same in 1999 (Figure 9).

Only a small percentage of stroke deaths in Georgia are classified as hemorrhagic or ischemic on death certificates. Most are coded to ill-defined forms of stroke (Figure 10), making it difficult to quantify or monitor trends in hemorrhagic stroke and ischemic stroke.

As for most other types of cardiovascular disease, the stroke mortality rate increases with age. Nonetheless, 18% of persons dying from stroke in Georgia in 1999 were less than 65 years.



# *hospitalizations*
## for cardiovascular disease in Georgia

In addition to the more than 24,000 Georgians dying from CVD each year, many more Georgians experience a heart attack, stroke, or other cardiovascular disease that is not fatal. For most of these CVD survivors, their lives are forever changed. Most will need to take medications for the rest of their lives, and some are left with permanent, severe disabilities such as the loss of speech or the inability to move an arm or leg. We can estimate part of the burden of non-fatal CVD in Georgia by examining hospitalizations.

In 1999, of almost one million hospitalizations in Georgia, 14.1% were for CVD. There were 128,386 hospitalizations for CVD among Georgia residents, an average of five hospitalizations for every CVD death. Georgia residents spent a total of 635,927 days in the hospital because of CVD, and the charges for these admissions totaled more than $1.9 billion (Table 3). The average charge per CVD hospitalization was $15,394, and the average length of stay was five days.

The major primary diagnoses for CVD hospitalizations were ischemic heart disease, stroke, and heart failure (Figure 11). Ischemic heart disease accounted for 46,566 hospitalizations with an average length of stay of four days and average hospital charges of $18,277 per stay. There were 23,513 hospitalizations for stroke with an average length of stay of six days and average hospital charges of $13,808 per stay. Heart failure accounted for 22,390 hospitalizations with an average length of stay of five days and average hospital charges of $10,276 per stay.

Hospital charges are only part of the direct medical costs of CVD. Other direct costs include physician fees, office visit costs, and medications. Indirect costs associated with CVD include long-term care and rehabilitation, lost productivity and lost family resources, particularly for individuals who suffer permanent disability. These additional costs are greater than the hospital charges. The health and economic burden that CVD places on the health care system is profound, and it will continue to grow as our population ages.

## MEDICAL PROCEDURES FOR CARDIOVASCULAR DISEASE IN GEORGIA

According to an annual survey by the Georgia Department of Community Health, there were 83,439 cardiac catheterizations performed in non-federal facilities in Georgia in 1999.[5] Of these, 77% were for diagnostic purposes only and 23% were therapeutic in nature.[5] The total number of cardiac catheterizations in Georgia increased 25% from 1995 to 1999 (Table 2). In 1999, there were 10,449 open heart surgeries performed in Georgia.[5] The number of open heart surgeries performed has been relatively stable since 1995 (Table 2).

**Figure 11. Cardiovascular disease hospitalizations, Georgia residents, 1999**

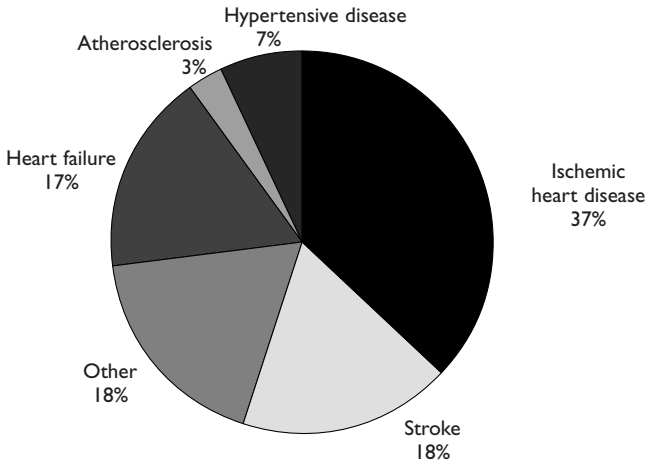



**Table 2. Number of cardiac catheterizations and open heart surgeries in Georgia, 1995-1999**

| Year | Cardiac catheterizations | Open heart surgeries |
|---|---|---|
| **1995** | 66,752 | 10,223 |
| **1996** | 72,071 | 10,762 |
| **1997** | 74,150 | 10,990 |
| **1998** | 79,644 | 10,256 |
| **1999** | 83,439 | 10,449 |

Source: Georgia Department of Community Health, Division of Health Planning

# CARDIOVASCULAR DISEASE STATISTICS BY COUNTY

Tables 3 and 4 (pages 11-14) show for each county and public health district in Georgia the number of CVD deaths in 1999, the average annual age-adjusted mortality rate for CVD from 1995 to 1999, the number of ischemic heart disease deaths and the corresponding age-adjusted rate, and the number of stroke deaths and the corresponding age-adjusted rate. Average annual age-adjusted mortality rates were calculated for a 5-year period because counties with small populations had too few deaths to calculate a rate accurately for a shorter time period. Caution should be used when making comparisons among age-adjusted county death rates because counties with small populations are more likely to have wide variations in rates from year to year simply due to chance.

The right-hand set of columns in Tables 3 and 4 shows the total charges for CVD hospitalizations in 1999, the number of hospitalizations for CVD in 1999, and the number of hospitalizations for ischemic heart disease, stroke, and congestive heart failure. Hospitalization data are based on county of residence, not location of hospital. Caution should be used when making comparisons among counties because Georgia residents hospitalized outside of Georgia are not included in the tables. This may lead to an underestimation of hospitalizations for residents of counties near large cities in neighboring states (e.g., counties bordering Chattanooga, TN, or Jacksonville, FL).

Figure 12 (map) shows average annual age-adjusted CVD deaths rates by county during the period 1995 through 1999. Counties with the highest CVD death rates are clustered in the southeast region and along the state's western border. Figure 13 (map) shows average annual age-adjusted stroke death rates by county, with the highest rates in the southwest corner and in other counties scattered throughout the state.

**Figure 12. Cardiovascular disease death rates by county, Georgia, 1995-1999**

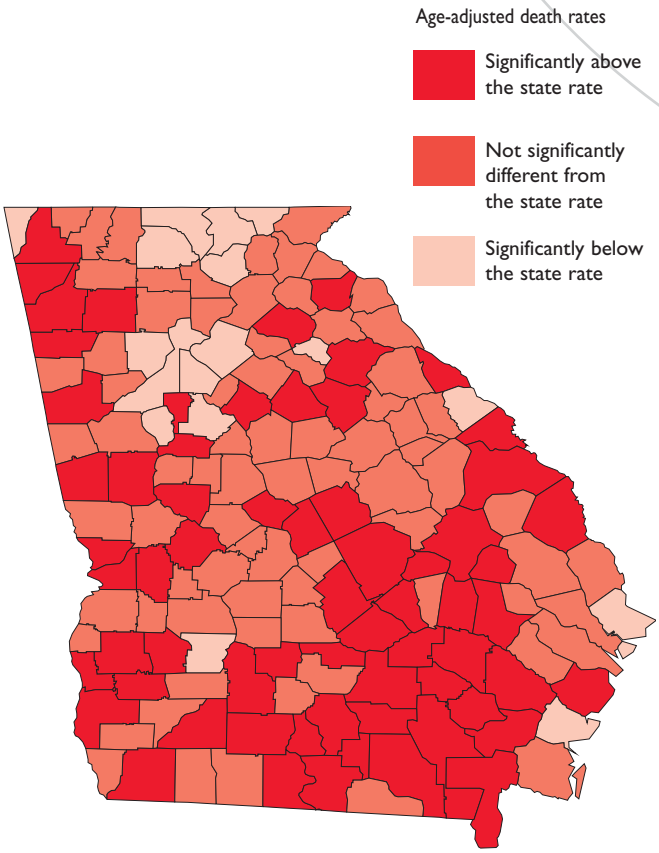
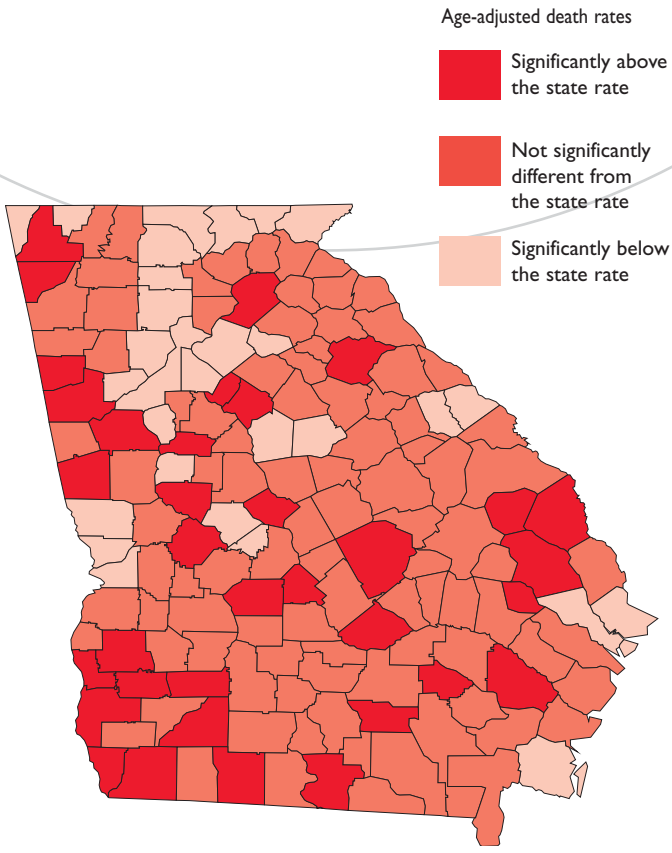



**Figure 13. Stroke death rates by county, Georgia, 1995-1999**



# TABLE 3. Cardiovascular disease deaths, age-adjusted mortality rates, and hospitalizations by county, Georgia, 1995-1999

| | DEATHS | | | | | | HOSPITALIZATIONS | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | CVD No. 1999 | AAMR 1995-99 | IHD No. 1999 | AAMR 1995-99 | Stroke No. 1999 | AAMR 1995-99 | CVD Total Charges 1999 | CVD No. 1999 | IHD No. 1999 | Stroke No. 1999 | CHF No. 1999 |
| **Georgia** | **24,274** | **406.4** | **10,502** | **185.4** | **4,277** | **76.8** | **$1,976,409,081** | **128,386** | **46,566** | **23,513** | **22,390** |
| Appling | 69 | 471.5 | 25 | 182.4 | 7 | 94.6 | $6,210,746 | 372 | 151 | 60 | 46 |
| Atkinson | 27 | 678.7 | 7 | 196.4 | 4 | 124.5 | $1,467,757 | 130 | 28 | 24 | 27 |
| Bacon | 53 | 585.7 | 30 | 339.5 | 13 | 113.8 | $2,180,489 | 221 | 84 | 35 | 56 |
| Baker | 22 | 425.1 | 10 | 162.1 | 3 | 82.1 | $1,021,017 | 63 | 15 | 17 | 13 |
| Baldwin | 157 | 421.7 | 81 | 236.7 | 37 | 80.0 | $14,723,124 | 876 | 359 | 150 | 156 |
| Banks | 39 | 452.1 | 20 | 229.3 | 4 | 105.1 | $3,702,479 | 270 | 119 | 51 | 37 |
| Barrow | 114 | 380.6 | 43 | 161.5 | 19 | 58.7 | $13,240,698 | 838 | 370 | 126 | 119 |
| Bartow | 229 | 436.9 | 98 | 182.2 | 34 | 80.8 | $26,577,980 | 1,458 | 664 | 203 | 163 |
| Ben Hill | 97 | 478.3 | 50 | 231.0 | 9 | 66.9 | $6,517,328 | 510 | 189 | 71 | 107 |
| Berrien | 80 | 456.0 | 38 | 227.0 | 16 | 65.0 | $4,230,990 | 432 | 154 | 90 | 62 |
| Bibb | 662 | 456.2 | 306 | 219.3 | 118 | 83.8 | $77,566,013 | 4,228 | 1,769 | 690 | 783 |
| Bleckley | 51 | 408.0 | 20 | 148.5 | 7 | 62.2 | $4,111,736 | 321 | 154 | 54 | 49 |
| Brantley | 44 | 470.6 | 16 | 202.2 | 7 | 98.3 | $3,594,423 | 274 | 110 | 40 | 43 |
| Brooks | 79 | 454.7 | 30 | 184.6 | 16 | 82.6 | $3,056,424 | 349 | 103 | 75 | 91 |
| Bryan | 51 | 394.6 | 26 | 172.8 | 7 | 51.7 | $8,014,315 | 349 | 130 | 61 | 67 |
| Bulloch | 176 | 427.5 | 42 | 120.8 | 39 | 100.3 | $17,440,536 | 952 | 347 | 188 | 134 |
| Burke | 83 | 529.3 | 30 | 246.1 | 12 | 94.0 | $5,772,425 | 361 | 87 | 89 | 82 |
| Butts | 69 | 418.5 | 35 | 212.2 | 17 | 80.5 | $6,445,054 | 427 | 163 | 90 | 56 |
| Calhoun | 31 | 593.3 | 20 | 208.3 | 3 | 221.4 | $1,671,405 | 157 | 24 | 37 | 51 |
| Camden | 73 | 415.2 | 31 | 192.6 | 5 | 54.4 | $1,990,615 | 227 | 71 | 27 | 36 |
| Candler | 50 | 478.6 | 25 | 213.8 | 4 | 90.6 | $3,810,100 | 254 | 80 | 47 | 44 |
| Carroll | 287 | 433.9 | 141 | 212.8 | 59 | 101.4 | $25,546,242 | 1,782 | 672 | 391 | 249 |
| Catoosa | 172 | 387.6 | 105 | 221.6 | 19 | 51.9 | $4,337,817 | 292 | 97 | 61 | 55 |
| Charlton | 37 | 513.6 | 21 | 260.9 | 6 | 78.9 | $1,006,050 | 115 | 27 | 16 | 32 |
| Chatham | 838 | 384.7 | 371 | 196.6 | 137 | 64.3 | $71,876,888 | 3,882 | 1,079 | 812 | 772 |
| Chattahoochee | 14 | 655.8 | 9 | 299.7 | 0 | 39.7 | $699,291 | 43 | 16 | 5 | 11 |
| Chattooga | 116 | 489.4 | 70 | 260.8 | 16 | 111.4 | $13,827,188 | 707 | 299 | 113 | 120 |
| Cherokee | 311 | 418.9 | 115 | 170.1 | 41 | 59.3 | $23,995,833 | 1,550 | 733 | 260 | 193 |
| Clarke | 270 | 374.8 | 110 | 164.9 | 56 | 74.9 | $21,452,529 | 1,291 | 416 | 268 | 182 |
| Clay | 29 | 515.5 | 9 | 210.7 | 9 | 151.3 | $450,700 | 36 | 12 | 7 | 8 |
| Clayton | 483 | 432.3 | 222 | 201.8 | 81 | 70.3 | $45,787,512 | 2,868 | 1,180 | 455 | 487 |
| Clinch | 32 | 537.5 | 10 | 188.6 | 1 | 89.1 | $1,246,799 | 120 | 33 | 19 | 22 |
| Cobb | 1,125 | 376.5 | 435 | 164.1 | 176 | 68.5 | $103,208,283 | 6,341 | 2,726 | 1,067 | 641 |
| Coffee | 133 | 453.4 | 65 | 222.3 | 16 | 84.0 | $7,485,792 | 707 | 201 | 127 | 145 |
| Colquitt | 185 | 458.4 | 83 | 212.5 | 36 | 81.0 | $7,848,568 | 711 | 189 | 160 | 148 |
| Columbia | 171 | 346.8 | 83 | 186.7 | 29 | 56..6 | $12,680,575 | 669 | 269 | 127 | 91 |
| Cook | 78 | 485.0 | 40 | 282.6 | 21 | 95.0 | $3,930,834 | 442 | 129 | 88 | 89 |
| Coweta | 214 | 406.2 | 80 | 170.8 | 50 | 89.6 | $19,050,850 | 1,213 | 453 | 247 | 198 |
| Crawford | 39 | 366.1 | 24 | 216.1 | 5 | 42.7 | $2,348,115 | 136 | 66 | 24 | 16 |
| Crisp | 87 | 415.4 | 30 | 147.6 | 15 | 86.6 | $6,390,291 | 586 | 189 | 128 | 99 |
| Dade | 47 | 356.0 | 27 | 177.0 | 4 | 54.9 | $796,295 | 73 | 26 | 12 | 16 |
| Dawson | 32 | 356.6 | 13 | 178.8 | 4 | 62.7 | $5,386,667 | 315 | 132 | 50 | 62 |
| Decatur | 142 | 495.5 | 45 | 151.5 | 25 | 115.9 | $3,266,229 | 440 | 108 | 89 | 105 |
| DeKalb | 1,356 | 342.1 | 506 | 136.5 | 267 | 71.0 | $100,889,718 | 6,379 | 1,897 | 1,320 | 1,142 |
| Dodge | 95 | 483.8 | 53 | 233.7 | 18 | 85.2 | $8,200,677 | 651 | 284 | 89 | 115 |
| Dooly | 40 | 445.1 | 18 | 222.8 | 6 | 106.3 | $6,624,470 | 506 | 190 | 92 | 102 |
| Dougherty | 360 | 394.8 | 144 | 155.7 | 66 | 86.9 | $28,743,477 | 1,766 | 458 | 343 | 368 |

| | DEATHS | | | | | | HOSPITALIZATIONS | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | CVD No. 1999 | AAMR 1995-99 | IHD No. 1999 | AAMR 1995-99 | Stroke No. 1999 | AAMR 1995-99 | CVD Total Charges 1999 | CVD No. 1999 | IHD No. 1999 | Stroke No. 1999 | CHF No. 1999 |
| Douglas | 209 | 392.0 | 88 | 220.0 | 32 | 56.8 | $19,984,506 | 1,253 | 556 | 224 | 162 |
| Early | 68 | 496.9 | 38 | 269.6 | 12 | 103.6 | $1,016,531 | 109 | 14 | 23 | 33 |
| Echols | 12 | 539.7 | 3 | 249.4 | 3 | 92.7 | $266,377 | 24 | 11 | 5 | 2 |
| Effingham | 81 | 402.8 | 39 | 211.3 | 15 | 70.2 | $7,818,013 | 404 | 138 | 85 | 70 |
| Elbert | 105 | 421.1 | 50 | 228.2 | 25 | 82.1 | $7,098,664 | 531 | 203 | 102 | 110 |
| Emanuel | 99 | 471.5 | 43 | 211.4 | 15 | 85.6 | $9,332,419 | 648 | 215 | 109 | 135 |
| Evans | 43 | 433.1 | 13 | 181.0 | 19 | 145.3 | $4,677,918 | 322 | 82 | 83 | 74 |
| Fannin | 74 | 299.8 | 39 | 136.8 | 11 | 54.7 | $7,595,775 | 526 | 227 | 94 | 72 |
| Fayette | 200 | 353.8 | 89 | 167.0 | 36 | 60.6 | $16,388,008 | 1,028 | 449 | 171 | 130 |
| Floyd | 457 | 446.3 | 204 | 217.1 | 61 | 76.8 | $49,431,519 | 2,417 | 912 | 392 | 442 |
| Forsyth | 209 | 397.4 | 97 | 195.3 | 31 | 66.2 | $14,636,654 | 973 | 408 | 160 | 169 |
| Franklin | 84 | 458.0 | 46 | 253.8 | 9 | 78.6 | $8,207,081 | 634 | 248 | 113 | 117 |
| Fulton | 2,172 | 393.9 | 941 | 175.6 | 379 | 72.3 | $179,385,334 | 11,849 | 3,256 | 2,051 | 2,797 |
| Gilmer | 98 | 347.9 | 52 | 198.0 | 10 | 47.0 | $7,049,209 | 522 | 214 | 89 | 85 |
| Glascock | 15 | 342.1 | 2 | 96.3 | 2 | 92.8 | $1,538,489 | 84 | 21 | 19 | 23 |
| Glynn | 243 | 345.2 | 102 | 142.1 | 52 | 72.0 | $17,023,591 | 1,473 | 383 | 234 | 237 |
| Gordon | 155 | 438.4 | 72 | 220.0 | 33 | 86.1 | $19,471,133 | 1,093 | 464 | 187 | 183 |
| Grady | 98 | 439.9 | 53 | 218.0 | 12 | 84.3 | $2,873,354 | 345 | 93 | 67 | 97 |
| Greene | 67 | 468.8 | 27 | 180.6 | 7 | 83.4 | $3,960,147 | 268 | 82 | 58 | 41 |
| Gwinnett | 695 | 306.7 | 282 | 131.5 | 125 | 61.5 | $81,863,140 | 4,892 | 2,261 | 788 | 648 |
| Habersham | 132 | 394.3 | 63 | 194.3 | 22 | 76.2 | $9,677,293 | 737 | 371 | 118 | 88 |
| Hall | 396 | 393.7 | 175 | 186.5 | 91 | 89.2 | $32,562,731 | 2,187 | 855 | 402 | 382 |
| Hancock | 45 | 441.7 | 5 | 93.7 | 11 | 75.6 | $3,099,741 | 219 | 51 | 40 | 42 |
| Haralson | 117 | 431.9 | 63 | 213.0 | 16 | 95.0 | $11,417,550 | 632 | 241 | 134 | 95 |
| Harris | 71 | 377.8 | 25 | 146.7 | 13 | 58.8 | $3,421,891 | 202 | 81 | 45 | 22 |
| Hart | 117 | 379.2 | 61 | 219.4 | 24 | 72.0 | $6,368,886 | 509 | 202 | 83 | 103 |
| Heard | 35 | 435.0 | 10 | 138.5 | 7 | 97.1 | $2,114,297 | 176 | 58 | 45 | 20 |
| Henry | 255 | 375.4 | 109 | 182.0 | 53 | 67.9 | $26,901,493 | 1,655 | 743 | 285 | 284 |
| Houston | 279 | 408.0 | 104 | 185.3 | 48 | 69.0 | $33,398,956 | 2,251 | 1,058 | 339 | 353 |
| Irwin | 33 | 423.3 | 21 | 237.6 | 2 | 58.7 | $2,041,983 | 206 | 60 | 34 | 58 |
| Jackson | 155 | 462.6 | 89 | 214.5 | 25 | 87.0 | $14,069,821 | 891 | 394 | 151 | 161 |
| Jasper | 53 | 419.6 | 36 | 239.6 | 5 | 36.6 | $3,769,601 | 258 | 87 | 46 | 45 |
| Jeff Davis | 66 | 513.5 | 37 | 261.3 | 5 | 62.5 | $5,810,549 | 312 | 133 | 48 | 47 |
| Jefferson | 76 | 435.8 | 17 | 205.2 | 15 | 74.0 | $7,377,671 | 421 | 106 | 104 | 81 |
| Jenkins | 46 | 450.4 | 27 | 234.8 | 13 | 128.6 | $3,281,755 | 235 | 48 | 57 | 44 |
| Johnson | 40 | 418.2 | 11 | 172.5 | 10 | 74.1 | $2,233,237 | 165 | 59 | 29 | 23 |
| Jones | 81 | 399.2 | 42 | 192.4 | 15 | 67.2 | $5,534,789 | 276 | 141 | 54 | 34 |
| Lamar | 60 | 406.6 | 22 | 140.6 | 11 | 85.1 | $4,922,430 | 356 | 144 | 70 | 49 |
| Lanier | 12 | 519.9 | 6 | 205.1 | 3 | 79.0 | $1,294,426 | 159 | 32 | 20 | 51 |
| Laurens | 209 | 487.2 | 95 | 249.9 | 44 | 97.5 | $16,681,786 | 1,075 | 443 | 161 | 177 |
| Lee | 33 | 301.7 | 10 | 131.3 | 6 | 76.6 | $3,672,357 | 258 | 89 | 43 | 46 |
| Liberty | 110 | 414.6 | 37 | 172.5 | 24 | 80.2 | $8,733,711 | 440 | 146 | 77 | 74 |
| Lincoln | 29 | 500.0 | 11 | 236.9 | 5 | 106.2 | $4,198,364 | 228 | 113 | 35 | 29 |
| Long | 21 | 389.8 | 8 | 125.4 | 3 | 58.0 | $1,903,787 | 109 | 33 | 15 | 22 |
| Lowndes | 315 | 431.8 | 120 | 194.2 | 61 | 89.3 | $15,163,719 | 1,450 | 376 | 303 | 271 |
| Lumpkin | 50 | 361.5 | 20 | 194.2 | 8 | 61.5 | $3,983,426 | 349 | 151 | 62 | 72 |
| Macon | 59 | 429.2 | 19 | 127.2 | 15 | 88.7 | $2,918,165 | 222 | 86 | 47 | 53 |
| Madison | 94 | 405.5 | 47 | 194.7 | 13 | 57.8 | $10,329,323 | 628 | 227 | 119 | 106 |
| Marion | 28 | 496.8 | 12 | 218.8 | 2 | 91.4 | $1,632,800 | 79 | 22 | 16 | 14 |
| McDuffie | 97 | 391.4 | 26 | 214.4 | 15 | 54.5 | $9,141,692 | 489 | 190 | 99 | 75 |
| McIntosh | 43 | 563.9 | 19 | 239.1 | 4 | 96.3 | $2,791,237 | 197 | 48 | 35 | 34 |
| Meriwether | 118 | 486.9 | 51 | 244.8 | 17 | 88.6 | $5,944,104 | 447 | 141 | 95 | 84 |
| Miller | 39 | 437.0 | 16 | 206.4 | 2 | 70.1 | $953,640 | 105 | 27 | 18 | 24 |
| Mitchell | 91 | 449.9 | 40 | 222.7 | 19 | 96.6 | $4,650,226 | 384 | 111 | 73 | 103 |
| Monroe | 74 | 445.5 | 47 | 258.6 | 11 | 70.9 | $4,292,454 | 336 | 120 | 74 | 46 |
| Montgomery | 34 | 458.1 | 9 | 132.8 | 2 | 54.6 | $2,265,477 | 154 | 62 | 23 | 24 |

| | DEATHS | | | | | | HOSPITALIZATIONS | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | CVD No. 1999 | AAMR 1995-99 | IHD No. 1999 | AAMR 1995-99 | Stroke No. 1999 | AAMR 1995-99 | CVD Total Charges 1999 | CVD No. 1999 | IHD No. 1999 | Stroke No. 1999 | CHF No. 1999 |
| Morgan | 78 | 461.8 | 43 | 267.6 | 12 | 70.8 | $4,789,737 | 290 | 107 | 59 | 37 |
| Murray | 81 | 411.9 | 41 | 193.6 | 14 | 92.9 | $6,773,255 | 521 | 219 | 88 | 83 |
| Muscogee | 683 | 436.8 | 339 | 212.2 | 93 | 69.4 | $50,658,462 | 3,191 | 972 | 666 | 688 |
| Newton | 184 | 447.4 | 79 | 189.6 | 51 | 130.6 | $17,464,119 | 1,294 | 483 | 262 | 225 |
| Oconee | 69 | 374.1 | 34 | 180.6 | 12 | 71.0 | $5,974,725 | 376 | 116 | 83 | 70 |
| Oglethorpe | 55 | 499.8 | 15 | 176.1 | 10 | 115.7 | $2,418,756 | 173 | 66 | 34 | 24 |
| Paulding | 143 | 408.3 | 54 | 184.9 | 13 | 70.6 | $10,442,821 | 645 | 282 | 114 | 75 |
| Peach | 86 | 395.0 | 42 | 186.5 | 8 | 60.3 | $9,611,814 | 653 | 257 | 90 | 117 |
| Pickens | 88 | 426.9 | 19 | 139.5 | 8 | 57.3 | $6,856,913 | 380 | 179 | 48 | 44 |
| Pierce | 86 | 475.0 | 35 | 184.4 | 8 | 62.7 | $4,041,315 | 372 | 131 | 72 | 62 |
| Pike | 45 | 409.1 | 19 | 185.7 | 6 | 49.3 | $3,977,278 | 285 | 102 | 63 | 52 |
| Polk | 203 | 509.5 | 96 | 232.3 | 27 | 86.4 | $23,024,681 | 1,204 | 481 | 232 | 190 |
| Pulaski | 44 | 464.5 | 25 | 275.8 | 12 | 109.0 | $4,342,234 | 333 | 154 | 67 | 44 |
| Putnam | 76 | 395.3 | 38 | 216.5 | 9 | 52.7 | $6,786,298 | 448 | 224 | 71 | 57 |
| Quitman | 11 | 545.2 | 3 | 91.5 | 4 | 102.7 | $349,652 | 26 | 9 | 4 | 3 |
| Rabun | 63 | 371.0 | 27 | 146.2 | 7 | 48.8 | $4,179,714 | 345 | 103 | 80 | 60 |
| Randolph | 52 | 522.8 | 19 | 180.5 | 7 | 124.4 | $1,920,150 | 153 | 28 | 36 | 39 |
| Richmond | 672 | 460.9 | 334 | 233.0 | 118 | 77.4 | $66,760,031 | 3,572 | 1,186 | 711 | 540 |
| Rockdale | 209 | 383.1 | 94 | 161.2 | 53 | 95.6 | $15,492,970 | 958 | 383 | 185 | 144 |
| Schley | 12 | 456.8 | 6 | 226.3 | 4 | 88.4 | $1,055,014 | 86 | 14 | 19 | 21 |
| Screven | 76 | 489.0 | 29 | 236.1 | 23 | 114.8 | $6,968,170 | 415 | 141 | 97 | 66 |
| Seminole | 45 | 453.3 | 14 | 186.3 | 13 | 120.0 | $775,500 | 147 | 31 | 23 | 37 |
| Spalding | 252 | 482.6 | 91 | 204.0 | 52 | 94.9 | $19,311,458 | 1,307 | 470 | 277 | 200 |
| Stephens | 139 | 397.9 | 49 | 134.6 | 23 | 76.2 | $10,747,277 | 789 | 357 | 110 | 107 |
| Stewart | 24 | 436.8 | 7 | 199.9 | 6 | 89.0 | $1,717,670 | 132 | 17 | 43 | 36 |
| Sumter | 144 | 433.2 | 62 | 193.7 | 33 | 84.3 | $8,973,808 | 706 | 182 | 179 | 143 |
| Talbot | 33 | 461.1 | 14 | 206.1 | 4 | 70.4 | $3,151,974 | 149 | 45 | 29 | 28 |
| Taliaferro | 13 | 498.2 | 5 | 165.0 | 3 | 128.4 | $1,065,880 | 57 | 18 | 11 | 12 |
| Tattnall | 88 | 486.0 | 37 | 250.4 | 18 | 91.5 | $6,990,447 | 428 | 130 | 85 | 86 |
| Taylor | 39 | 554.7 | 24 | 268.0 | 8 | 111.2 | $3,022,867 | 217 | 63 | 55 | 41 |
| Telfair | 69 | 527.2 | 34 | 248.6 | 17 | 123.2 | $7,559,067 | 550 | 228 | 75 | 114 |
| Terrell | 61 | 472.9 | 24 | 207.5 | 12 | 76.4 | $3,762,554 | 250 | 60 | 48 | 61 |
| Thomas | 181 | 415.2 | 61 | 153.8 | 51 | 115.2 | $7,928,631 | 848 | 257 | 190 | 190 |
| Tift | 122 | 429.2 | 48 | 215.7 | 28 | 76.7 | $8,130,939 | 654 | 175 | 130 | 139 |
| Toombs | 132 | 480.6 | 31 | 103.5 | 23 | 89.8 | $9,680,149 | 611 | 211 | 117 | 137 |
| Towns | 60 | 306.5 | 24 | 135.2 | 15 | 54.9 | $4,891,936 | 330 | 151 | 48 | 54 |
| Treutlen | 38 | 532.9 | 6 | 115.7 | 6 | 95.6 | $2,736,337 | 156 | 61 | 23 | 20 |
| Troup | 301 | 499.0 | 102 | 211.6 | 67 | 100.5 | $16,914,088 | 1,477 | 479 | 382 | 225 |
| Turner | 43 | 498.8 | 25 | 240.8 | 6 | 98.3 | $2,572,745 | 193 | 84 | 26 | 21 |
| Twiggs | 48 | 478.7 | 20 | 194.5 | 9 | 85.6 | $3,905,171 | 210 | 81 | 30 | 48 |
| Union | 88 | 338.9 | 40 | 174.3 | 10 | 54.6 | $6,536,733 | 507 | 231 | 75 | 84 |
| Upson | 154 | 527.7 | 63 | 217.5 | 37 | 132.7 | $10,756,127 | 840 | 361 | 156 | 145 |
| Walker | 315 | 459.4 | 163 | 242.9 | 41 | 87.7 | $10,722,991 | 807 | 255 | 171 | 169 |
| Walton | 180 | 414.1 | 107 | 250.4 | 31 | 69.4 | $11,815,213 | 882 | 348 | 153 | 139 |
| Ware | 188 | 467.9 | 70 | 192.9 | 29 | 70.5 | $1,267,701 | 989 | 341 | 154 | 184 |
| Warren | 38 | 444.1 | 12 | 88.3 | 4 | 55.3 | $2,360,365 | 149 | 44 | 30 | 31 |
| Washington | 104 | 398.4 | 33 | 160.2 | 18 | 86.5 | $6,964,189 | 423 | 169 | 63 | 53 |
| Wayne | 102 | 495.1 | 47 | 193.8 | 25 | 152.8 | $9,068,760 | 663 | 239 | 120 | 115 |
| Webster | 15 | 417.3 | 7 | 169.6 | 3 | 69.9 | $710,419 | 46 | 12 | 16 | 7 |
| Wheeler | 32 | 509.2 | 15 | 175.3 | 5 | 107.2 | $2,526,263 | 186 | 83 | 31 | 22 |
| White | 82 | 376.4 | 41 | 181.9 | 13 | 80.0 | $7,373,867 | 502 | 214 | 72 | 91 |
| Whitfield | 260 | 394.3 | 125 | 171.8 | 57 | 85.3 | $18,849,174 | 1,326 | 509 | 257 | 227 |
| Wilcox | 35 | 412.5 | 12 | 185.1 | 3 | 78.7 | $3,729,448 | 247 | 99 | 38 | 45 |
| Wilkes | 48 | 407.8 | 24 | 192.2 | 8 | 87.6 | $5,324,733 | 314 | 125 | 47 | 61 |
| Wilkinson | 50 | 490.5 | 24 | 234.8 | 10 | 81.4 | $5,526,675 | 298 | 144 | 46 | 37 |
| Worth | 89 | 469.0 | 48 | 228.9 | 17 | 74.0 | $4,939,954 | 379 | 111 | 71 | 85 |

# TABLE 4. Cardiovascular disease deaths, age-adjusted mortality rates, and hospitalizations by health district, Georgia, 1995-1999

| | DEATHS | | | | | | HOSPITALIZATIONS | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | CVD No. 1999 | AAMR 1995-99 | IHD No. 1999 | AAMR 1995-99 | Stroke No. 1999 | AAMR 1995-99 | CVD Total Charges 1999 | CVD No. 1999 | IHD No. 1999 | Stroke No. 1999 | CHF No. 1999 |
| **Georgia** | **24,274** | **406.4** | **10,502** | **185.4** | **4,277** | **76.8** | **$1,976,409,081** | **128,386** | **46,566** | **23,513** | **22,390** |
| District 1-1: Northwest (Rome) | 1,954 | 440.0 | 952 | 216.5 | 264 | 80.0 | $170,049,975 | 9,328 | 3,721 | 1,619 | 1,508 |
| District 1-2: North Georgia (Dalton) | 912 | 388.5 | 391 | 168.8 | 141 | 67.9 | $71,120,159 | 4,825 | 2,081 | 836 | 704 |
| District 2: North (Gainesville) | 1,491 | 382.3 | 676 | 185.2 | 261 | 73.2 | $118,254,744 | 8,447 | 3,542 | 1,424 | 1,426 |
| District 3-1: Cobb-Douglas | 1,334 | 377.8 | 523 | 171.7 | 208 | 66.5 | $123,192,789 | 7,594 | 3,282 | 1,291 | 803 |
| District 3-2: Fulton | 2,172 | 393.9 | 941 | 175.6 | 379 | 72.3 | $179,385,334 | 11,849 | 3,256 | 2,051 | 2,797 |
| District 3-3: Clayton | 483 | 432.3 | 222 | 201.8 | 81 | 70.3 | $45,787,512 | 2,868 | 1,180 | 455 | 487 |
| District 3-4: East Metro (Lawrenceville) | 1,088 | 337.1 | 455 | 143.8 | 229 | 76.1 | $114,820,229 | 7,144 | 3,127 | 1,235 | 1,017 |
| District 3-5: DeKalb | 1,356 | 342.1 | 506 | 136.5 | 267 | 71.0 | $100,889,718 | 6,379 | 1,897 | 1,320 | 1,142 |
| District 4: LaGrange | 1,990 | 426.8 | 812 | 191.5 | 412 | 87.9 | $158,271,429 | 10,993 | 4,235 | 2,272 | 1,692 |
| District 5-1: South Central (Dublin) | 804 | 473.7 | 361 | 214.9 | 161 | 91.0 | $69,109,386 | 4,714 | 1,986 | 740 | 789 |
| District 5-2: North Central (Macon) | 1,597 | 426.9 | 721 | 205.9 | 267 | 74.1 | $162,803,816 | 9,736 | 4,167 | 1,567 | 1,631 |
| District 6: East Central (Augusta) | 1,463 | 437.8 | 643 | 209.4 | 262 | 79.4 | $135,802,569 | 7,642 | 2,563 | 1,535 | 1,270 |
| District 7: West Central (Columbus) | 1,341 | 441.6 | 603 | 200.2 | 222 | 79.1 | $93,697,624 | 6,380 | 1,938 | 1,387 | 1,315 |
| District 8-1: South (Valdosta) | 871 | 448.7 | 381 | 214.9 | 165 | 81.0 | $47,205,765 | 4,419 | 1,313 | 842 | 891 |
| District 8-2: Southwest (Albany) | 1,445 | 434.6 | 606 | 184.1 | 277 | 95.9 | $73,123,443 | 5,962 | 1,587 | 1,202 | 1,361 |
| District 9-1: East (Savannah) | 919 | 385.1 | 410 | 197.5 | 152 | 64.9 | $79,694,901 | 4,286 | 1,217 | 897 | 842 |
| District 9-2: Southeast (Waycross) | 1,326 | 476.9 | 511 | 190.4 | 224 | 94.2 | $85,979,531 | 6,842 | 2,328 | 1,295 | 1,254 |
| District 9-3: Coastal (Brunswick) | 541 | 370.2 | 223 | 157.6 | 95 | 67.4 | $40,457,256 | 2,795 | 811 | 449 | 470 |
| District 10: Northeast (Athens) | 1,187 | 409.5 | 565 | 202.7 | 210 | 73.8 | $95,149,613 | 6,168 | 2,329 | 1,153 | 989 |

## ABBREVIATIONS

**AAMR** = Age-adjusted mortality rate

**CHF** = Congestive heart failure

**CVD** = Cardiovascular disease

**IHD** = Ischemic heart disease

*Additional abbreviations can be found on page 20.*

# Cardiovascular disease

## RISK FACTORS

Some CVD risk factors are "modifiable," meaning that individuals can change their behavior to slow, or even reverse, the process of arterial blockage and decrease their risk of having a heart attack or stroke. Modifiable risk factors include smoking, high blood pressure, high blood cholesterol level, overweight or obesity, lack of regular physical activity, and poor diet.

Some CVD risk factors cannot be changed, such as old age, male sex, and a family history of heart attacks at a young age. Individuals with unmodifiable risk factors should be particularly diligent in eliminating modifiable risk factors. The leveling off of the Georgia CVD death rate may be related to a recent increase in prevalence in CVD risk factors in Georgia.

### SMOKING

The percentage of Georgians who currently smoke declined from 31% in 1984 to 19% in 1992. Since then, the percentage of adults who smoke has been consistently higher than 20% (Figure 14). In 1999, 24 percent of Georgia adults reported that they currently smoke cigarettes.

Lowering smoking rates is a public health priority. In addition to its well-known association with cancer, smoking is a major CVD risk factor. In fact, each year smoking causes more deaths from heart attacks than from cancer.[6] The good news is that giving up smoking quickly reduces the chance of developing CVD.[7] It is also important to prevent people, especially young people, from starting to smoke. Most smokers begin using tobacco before their eighteenth birthday, suggesting that if adolescents are kept tobacco-free, most will never start smoking.[8]

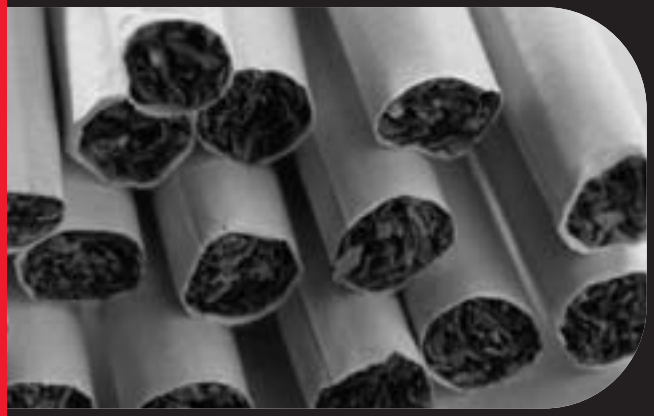
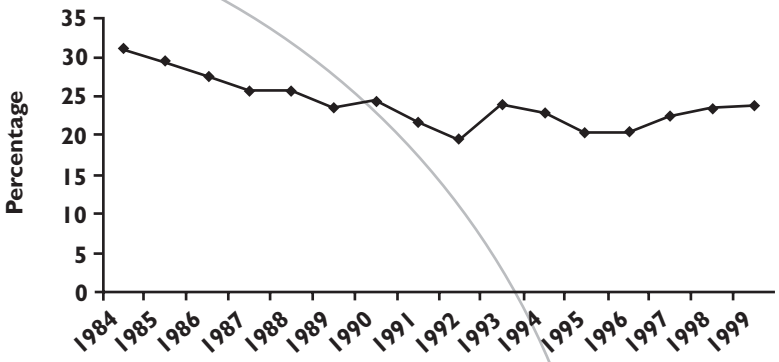


**Figure 14. Percentage of Georgians reporting current smoking, 1984-1999**




***One of every four adults in Georgia currently smokes, over half are overweight or obese, and three of every four do not get regular physical activity.***

**Figure 15. Percentage of Georgians reporting high blood pressure and percentage reporting high blood cholesterol, 1984-1999**

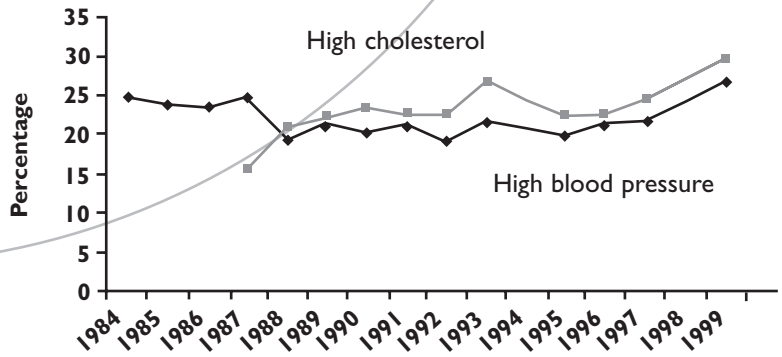


**Figure 16. Percentage of Georgians reporting no regular physical activity and percentage overweight or obese, 1984-1999**

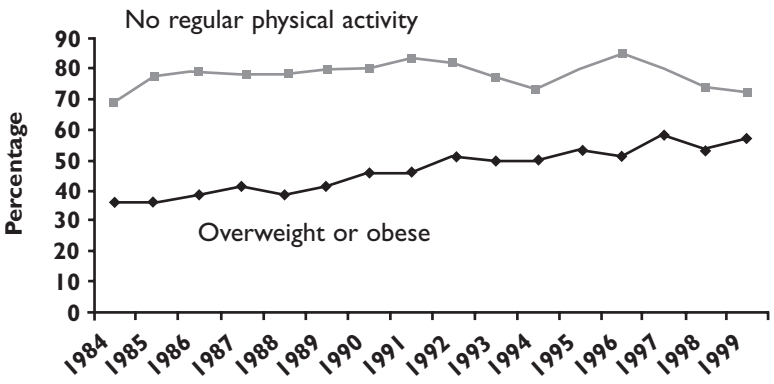
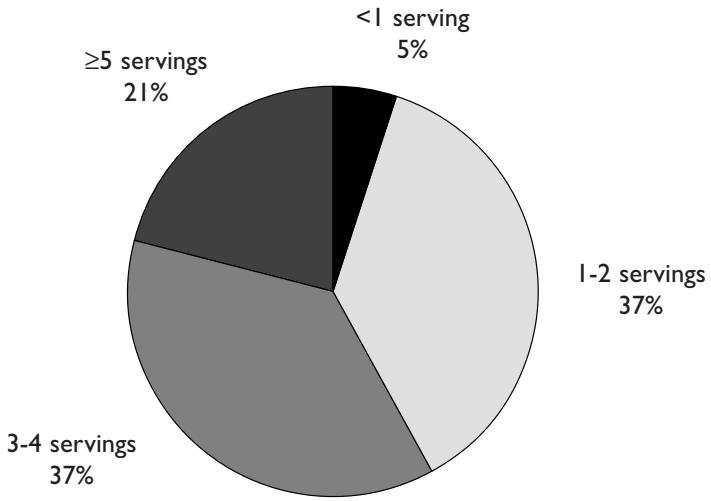



**Figure 17. Daily servings of fruits and vegetables consumed by Georgians, 1998**




*Excess body fat increases risk for heart disease and stroke. Excess weight can lead to high blood pressure, high cholesterol, or diabetes, all of which increase the risk for CVD.*

## HIGH BLOOD PRESSURE

High blood pressure is a major risk factor for both heart disease and stroke. The percentage of Georgians who report having been told they have high blood pressure has remained between 19% and 26% since 1984 (Figure 15). The percentage of Georgians with high blood pressure whose blood pressure is under control is not known. Nationally, about three quarters of people with high blood pressure know they have it, just over half are being treated, and just over one fourth are under control.[9] Some people can control their high blood pressure by losing weight and engaging in regular physical activity. For those who are unable to decrease their blood pressure by lifestyle modification alone, medications prescribed by a physician can often control high blood pressure successfully.

## HIGH CHOLESTEROL

When there is too much cholesterol in blood, the excess can become trapped in the artery walls. Cholesterol buildup happens very slowly, but over time causes most heart attacks. Cholesterol is transported to and from cells by lipoproteins. Low-density lipoprotein (LDL), the "bad cholesterol," clogs the arteries to the heart; a high level of LDL increases the risk for heart disease. High-density lipoprotein (HDL), the "good cholesterol," carries cholesterol away from the heart and other parts of the body; a high level of HDL decreases the risk for heart disease. A high total cholesterol level increases the risk for heart disease. Lowering high total blood cholesterol levels can decrease the likelihood of death from heart disease.[10]

The percentage of Georgia adults who report ever having had their blood cholesterol level checked increased from 53% in 1987 to 78% in 1999. Of persons who had been checked, the percentage told they have high cholesterol increased from 15% in 1987 to 29% in 1999 (Figure 16). It is not known if the increase in the percentage of persons reporting high cholesterol represents a true increase in cholesterol levels among Georgians. Nationally, mean cholesterol levels decreased during the period 1972 to 1990.[11]

Many people can control their cholesterol level by modifying their diet. For those who cannot, medication can lower blood cholesterol levels. In adults, a total cholesterol level of 200 mg/dL or higher is considered high risk; LDL levels >130 mg/dL or HDL levels <40mg/dL are also considered high risk.[9] The National Institutes of Health recommend that all adults get a fasting lipoprotein profile (total cholesterol, LDL cholesterol, HDL cholesterol, triglycerides) every five years.[10]

## PHYSICAL INACTIVITY AND BEING OVERWEIGHT

Regular moderate or vigorous physical activity can reduce the risk for CVD.[12] Many Georgians are not physically active on a regular basis (Figure 16). Approximately 76% of Georgia adults do not get regular physical activity (at least 30 minutes per day of moderate-intensity activity, such as walking at a brisk pace, on five or more days a week). Additional information about the physical activity patterns of Georgians, the costs of inactivity, and suggestions for future actions can be found in the 2001 *Georgia Physical Activity Report*, published by the Georgia Department of Human Resources and the American Heart Association.

Overweight and obese adults are at increased risk for CVD.[13] In both Georgia and the U.S., there has been a steady increase in the percentage of overweight (body mass index 25.0 – 29.9) and obese adults (body mass index ≥ 30.0; see appendix for details). From 1984 to 1999, the percentage of overweight and obese Georgians increased from 37% to 58%. The prevalence of overweight or obese adults in Georgia is higher than the median of 56% for the U.S. See Table 5 for body mass index corresponding to normal weight, overweight, and obese.

In 1998, only 19% of overweight and obese adults in Georgia reported that a health care professional had advised them to lose weight within the past 12 months. Losing weight and being physically active on a regular basis can improve blood pressure and cholesterol levels and can decrease the chance of developing diabetes, another risk factor for heart disease.[12, 13]

## DIET

Eating five or more servings of fruits and vegetables per day can help to prevent heart disease, cancer, and other chronic conditions. In 1998, only 21% of Georgians reported that they ate at least five servings of fruits and vegetables per day (Figure 17, page 16).

## DIABETES

Persons with diabetes have two to three times the risk for death from cardiovascular disease as persons who do not have diabetes.[14] The prevalence of diabetes has increased nationwide during the past decade in adults.[15] Among children, prevalence of diabetes has increased, most likely because of an increase in type 2 diabetes, which is associated with obesity.[16] In Georgia, the prevalence of diabetes among adults increased from 4% in 1993 to 6% in 1999; no data are available for children. Type 2 diabetes can be prevented by maintaining normal body weight and staying physically active. Persons with diabetes can prevent complications by keeping their blood sugar as close to normal as possible, refraining from smoking, eating a healthy diet, getting regular physical activity, and maintaining normal blood pressure.

## PREVIOUS CARDIOVASCULAR DISEASE

In 1998 and 1999, approximately 8% of Georgia adults reported having had a heart attack, ischemic heart disease, or a stroke. Although these persons cannot change the past, they can take steps to prevent recurrences. The American Heart Association recommends consideration of the use of aspirin for persons who have had a heart attack, unstable angina, ischemic stroke, or transient ischemic attack. Of Georgians reporting a history of heart attack, ischemic heart disease, or stroke, 54% reported taking aspirin every day. For certain types of heart conditions, other medications may be needed to reduce the risk of recurrence.

*From 1984 to 1999, the percentage of overweight and obese Georgians increased from 37% to 58%.*

## TABLE 5. Body Mass Index Table

| | NORMAL | | | | | | OVERWEIGHT | | | | | OBESE | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **BMI** | **19** | **20** | **21** | **22** | **23** | **24** | **25** | **26** | **27** | **28** | **29** | **30** | **31** | **32** | **33** | **34** | **35** |
| **HEIGHT (inches)** | **BODY WEIGHT (pounds)** | | | | | | | | | | | | | | | | |
| **4'10"** | 91 | 96 | 100 | 105 | 110 | 115 | 119 | 124 | 129 | 134 | 138 | 143 | 148 | 153 | 158 | 162 | 167 |
| **4'11"** | 94 | 99 | 104 | 109 | 114 | 119 | 124 | 128 | 133 | 138 | 143 | 148 | 153 | 158 | 163 | 168 | 173 |
| **5'** | 97 | 102 | 107 | 112 | 118 | 123 | 128 | 133 | 138 | 142 | 148 | 153 | 158 | 163 | 168 | 174 | 179 |
| **5'1"** | 100 | 106 | 111 | 116 | 122 | 127 | 132 | 137 | 143 | 148 | 153 | 158 | 164 | 169 | 174 | 180 | 185 |
| **5'2"** | 104 | 109 | 115 | 120 | 126 | 131 | 136 | 142 | 147 | 153 | 158 | 164 | 169 | 175 | 180 | 186 | 191 |
| **5'3"** | 107 | 113 | 118 | 124 | 130 | 135 | 141 | 146 | 152 | 158 | 163 | 169 | 175 | 180 | 186 | 191 | 197 |
| **5'4"** | 110 | 116 | 122 | 128 | 134 | 140 | 145 | 151 | 157 | 163 | 169 | 174 | 180 | 186 | 192 | 197 | 204 |
| **5'5"** | 114 | 120 | 126 | 132 | 138 | 144 | 150 | 156 | 162 | 168 | 174 | 180 | 186 | 192 | 198 | 204 | 210 |
| **5'6"** | 118 | 124 | 130 | 136 | 142 | 148 | 155 | 161 | 167 | 173 | 179 | 186 | 192 | 198 | 204 | 210 | 216 |
| **5'7"** | 121 | 127 | 134 | 140 | 146 | 153 | 159 | 166 | 172 | 178 | 185 | 191 | 198 | 204 | 211 | 217 | 223 |
| **5'8"** | 125 | 131 | 138 | 144 | 151 | 158 | 164 | 171 | 177 | 184 | 190 | 197 | 203 | 210 | 216 | 223 | 230 |
| **5'9"** | 128 | 135 | 142 | 149 | 155 | 162 | 169 | 176 | 182 | 189 | 196 | 203 | 209 | 216 | 223 | 230 | 236 |
| **5'10"** | 132 | 139 | 146 | 153 | 160 | 167 | 174 | 181 | 188 | 195 | 202 | 209 | 216 | 222 | 229 | 236 | 243 |
| **5'11"** | 136 | 143 | 150 | 157 | 165 | 172 | 179 | 186 | 193 | 200 | 208 | 215 | 222 | 229 | 236 | 243 | 250 |
| **6'** | 140 | 147 | 154 | 162 | 169 | 177 | 184 | 191 | 199 | 206 | 213 | 221 | 228 | 235 | 242 | 250 | 258 |
| **6'1"** | 144 | 151 | 159 | 166 | 174 | 182 | 189 | 197 | 204 | 212 | 219 | 227 | 235 | 242 | 250 | 257 | 265 |
| **6'2"** | 148 | 155 | 163 | 171 | 179 | 186 | 194 | 202 | 210 | 218 | 225 | 233 | 241 | 249 | 256 | 264 | 272 |
| **6'3"** | 152 | 160 | 168 | 176 | 184 | 192 | 200 | 208 | 216 | 224 | 232 | 240 | 248 | 256 | 264 | 272 | 279 |
| **6'4"** | 156 | 164 | 172 | 180 | 189 | 197 | 205 | 213 | 221 | 230 | 238 | 246 | 254 | 263 | 271 | 279 | 287 |

Source: Adapted from *Clinical Guidelines on the Identification, Evaluation, and Treatment of Overweight and Obesity in Adults: The Evidence Report. NIH Publication No. 98-4083*

To calculate your Body Mass Index (BMI) find your height in the first column and scan across to find your weight. The number at top of the column is your BMI. Normal ranges from 19 to 24, overweight from 25 to 29, and obese 30 or above.

# Conclusion

This report summarizes the most recent information available on cardiovascular disease deaths and hospitalizations in Georgia. The most important finding of this report is the slowing of the decline in CVD death rates during the 1990s. It is not possible to explain conclusively the reasons for the change in CVD death rate trends, but two factors are probably important. First, there has been an increase in the prevalence of risk factors for CVD, such as smoking and overweight, that put Georgians at risk for a heart attack or stroke. Second, owing to advances in medical care, the number of Georgians who have already had a heart attack or stroke is growing. These cardiovascular disease survivors are at particularly high risk for dying from CVD, and thus contribute to a growing number of CVD deaths.

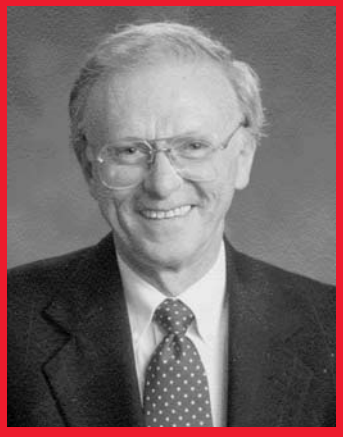
The practical implications of these findings are clear. Because most heart attacks and strokes result from a process of arterial blockage that begins at an early age, a greater effort should be made to reduce the prevalence of risk factors among all Georgians, including children and adolescents. Reducing CVD risk factors involves not smoking, controlling high blood pressure, reducing blood cholesterol, engaging in regular physical activity, and eating a healthy diet.

Sustained behavioral changes are often difficult to make, even for highly motivated individuals. Therefore, it is critical that entire communities make policy and environmental changes that make it easier for individuals to change their behavior. Community leaders and parents can act as role models. Additionally, local environments, such as schools and workplaces, can be changed to facilitate healthy behaviors. Environmental changes include creation of more walkable communities and replacement of soda vending machines with those offering juice and water.

***It is crucial to involve entire communities in changing societal norms of behavior. Community leaders and parents can act as role models. Local environments, such as schools, neighborhoods, and workplaces, can be changed to facilitate healthy behaviors.***

Much of the death and disability from CVD in Georgia is preventable. If we focus attention on realistic ways of reducing risk, we can renew the decline in CVD death rates that Georgia has experienced in much of the past two decades. Georgians can work together to reduce the number of individuals who suffer and die from cardiovascular disease by advocating for healthier communities and following treatment recommendations.

## THE PAUL COVERDELL NATIONAL ACUTE STROKE REGISTRY



Senator Paul C. Coverdell (1939-2000)

Emory University, in collaboration with the Georgia Medical Care Foundation, received a one-year grant from CDC to participate in "The Paul Coverdell National Acute Stroke Registry." Georgia is one of four states participating in the project. The objective of the stroke registry is to improve the quality of care for patients with acute stroke. The project involves collecting information on all persons admitted to participating hospitals with a diagnosis of stroke. The data will be used to identify strengths in patient management and opportunities for improved care so as to provide education for clinicians and multidisciplinary teams. The registry gives Georgia the opportunity to impact national health care policy and at the same time improve stroke management in our communities. Over 40 acute care hospitals in the state will be participating in the project. Dr. Michael Frankel of the Emory University School of Medicine is the principal investigator for the project. Senator Paul C. Coverdell faithfully served the citizens of Georgia as a soldier, legislator, Peace Corps Director, and United States Senator, until a massive stroke took his life on July 18, 2000.

# *Reduce Your Risk*
## FOR HEART DISEASE AND STROKE

*To reduce your risk of heart disease, we recommend that you do the following:*

**Don't smoke cigarettes.** Tobacco use is the number one preventable cause of heart disease in the U.S. Tobacco makes your blood clot more easily, stiffens the walls of your arteries, and deprives your heart of needed oxygen. The message is simple: if you use tobacco, stop; if you don't use tobacco, don't start.

**Stay active.** Moderate physical activity (such as walking or yard work) for a total of 30 minutes a day on most days of the week helps keep your weight down, allows your body to get rid of "bad" cholesterol, and can help keep your blood pressure under control. Recent research shows that you don't have to do your daily allotment of physical activity all at once. Ten or fifteen minutes at a time will be enough, as long as it adds up to at least 30 minutes most days of the week. Just make physical activity a regular part of your life.

**Eat less fat.** Dietary fats, especially animal fats, pose another big threat to your heart. The National Institutes of Health recommend that you keep your fat intake to 25% to 35% of total calories and consume no more than 7% of your total calories from animal or saturated fats. Use the FDA "Nutrition Facts" on the label of all processed foods to help you cut down on your fat intake. The American Heart Association also has free dietary recommendations.

**Check your blood pressure.** Uncontrolled high blood pressure is a leading risk factor for stroke, which is like a heart attack, only in the brain. Stroke is a leading cause of disability among adults and the third leading cause of death in Georgia. If your blood pressure is normal, get it checked at least every two years. If your blood pressure is 130/85 or over, consult a physician. He or she can help you get it under control.

**Check your cholesterol level.** If your cholesterol is normal (total cholesterol less than 200), get it checked every five years. If it is high, see your doctor about getting it under control. Eating foods low in saturated fat and cholesterol, such as most fruits and vegetables, and staying physically active are two easy ways to keep your cholesterol low.

**Recognize and treat diabetes.** Having diabetes (high blood sugar) can seriously increase your risk of stroke and heart disease. If you have diabetes, you can prevent or delay heart and blood vessel disease by controlling your weight, cholesterol, and blood pressure. In addition, never stop taking your diabetes medications without consulting your doctor first. Always consult your doctor if you have questions about your medications for diabetes and high blood pressure.

**Know your family's heart history.** Heart disease often runs in families. If your family has a history of early heart disease, you may be at increased risk. If so, do not despair. You can readily reduce that risk by following the above steps. Your family will thank you for it.

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# Appendix:

## METHODS, GLOSSARY, AND ABBREVIATIONS

### METHODS

Age-adjusted mortality rates for the U.S. and Georgia from 1980 through 1998 were obtained via WONDER at http://wonder.cdc.gov from the compressed mortality file compiled by the National Center for Health Statistics, CDC. The following ICD-9 codes were used: CVD, 390-448; ischemic heart disease, 410-414; and stroke, 430-438. The year 2000 projected population was used as the standard population.

Age-adjusted mortality rates for Georgia in 1999 were based on death certificate data provided by the Vital Statistics Branch and Office of Health Information and Policy of the Georgia Division of Public Health. The following ICD-10 codes were used for CVD: CVD, I00-78; ischemic heart disease, I20-25; stroke, I60-69; hypertensive disease, I11, I13; other CVD, CVD codes not already categorized. ICD-10 codes for stroke included subarachnoid hemorrhage, I60; other intracerebral and intracranial hemorrhage, I61-62; occlusion, I63; acute ill-defined, I64; other ill-defined, I67; sequelae, I69. ICD-10 codes for non-CVD causes of death included cancer, C00-C97; chronic respiratory disease, J40-J47; injuries, V01-X59, Y85-86; diabetes, E10-14; kidney disease, N00-07, N17-19, N25-27; influenza and pneumonia, J10-18; other, all disease codes not already categorized. Age-adjusted death rates for Georgia were calculated using the direct method with population estimates from the U.S. Bureau of the Census (release date: August 30, 2000) and the U.S. 2000 projected population as the standard. Age-adjusted death rates for the U.S. in 1999 were obtained from the National Vital Statistics Report, Vol 49, No. 8, September 21, 2001.

The average annual percentage change in age-adjusted death rates represents the average of the relative change between each pair of consecutive years.

Data on hospitalizations at acute care hospitals in Georgia were provided by the Office of Health Information and Policy after compilation by the Georgia Hospital Association. Analyses were restricted to Georgia residents. The following ICD-9 codes were used for principal diagnosis: CVD, 390-448; ischemic heart disease, 410-414; stroke, 430-438; heart failure, 428; hypertensive disease, 401-404; atherosclerosis, 440.

Data on cardiac catheterizations and open heart surgeries were obtained from annual surveys of Georgia hospitals conducted by the Division of Health Planning of the Georgia Department of Community Health.

Age-adjusted mortality rates for counties and districts were calculated using data from death certificates provided by Vital Statistics Branch and Office of Health Information and Policy. The number of deaths for 1999 was determined using the ICD-10 codes above (CVD, I00-78; ischemic heart disease, I20-25; stroke, I60-69). The number of deaths for 1995-1998 was determined using ICD-9 codes that correspond to the new ICD-10 codes (CVD, 390-434,436-448; ischemic heart disease 410-414,429.2; stroke, 430-434,436-438). The number of

deaths for 1995-1998 was multiplied by the "comparability ratio" provided by NCHS (National Vital Statistics Reports, Vol 49, No. 3) for CVD (0.9981), ischemic heart disease (0.9990), and stroke (1.0588), respectively, before calculating age-adjusted mortality rates. The "comparability ratio" compensates for the change in coding systems. Age-adjusted mortality rates were calculated using county population estimates from the U.S. Bureau of Census (release date: August 30, 2000) and the year 2000 projected population as the standard. The z-test was used to compare county rates to the state rate with significance at $p<0.05$. The source of the formula for the z-test and the standard error for an age-adjusted rate was the National Center for Health Statistics, National Vital Statistics Report, volume 48, number 11, July 24, 2000, page 104. This formula was not adjusted to reflect the use of comparability ratios for four years (1995-1998) of the five-year period of observation (1995-1999), given that no published formulas exist for such a situation; we assume that the increase in variability from use of comparability ratios is negligible given the small values of the relative standard errors of the comparability ratios.

Data on risk factors were obtained from the Georgia Behavioral Risk Factor Surveillance System, a telephone survey conducted annually with a sample of adults aged 18 years and older. The sample is weighted so that it reflects the total adult population of the state. CVD risk factors assessed by the BRFSS include the following:

Current smoker: defined as someone who has smoked at least 100 cigarettes his/her lifetime and smokes now

High blood pressure: defined as ever having been told by a doctor, nurse, or health professional that your blood pressure was high

High cholesterol: defined as ever having been told by a doctor or health professional that your blood cholesterol level was high

Regular physical activity: defined as at least 30 minutes of moderate intensity physical activity five or more days a week or at least 20 minutes of vigorous physical activity three or more days a week

Overweight: defined as a body mass index [BMI] from 25.0 - 29.9 kilograms per meters squared. BMI equals weight in kilograms divided by height in meters squared. Using weight in pounds and height in inches, BMI equals 705 times weight divided by height squared

Obese: defined as a body mass index [BMI] $\geq$ 30.0 kilograms per meter squared

Daily servings of fruits and vegetables: number of servings of fruit, fruit juice, green salad, potatoes, carrots, and other vegetables consumed per day based on reports of consumption during the past day, week, month, or year

Diabetes: defined as ever having been told by a doctor that you have diabetes

Previous cardiovascular disease: defined as ever having been told by a doctor that you had a heart attack or myocardial infarction, angina or coronary heart disease, or a stroke

## GLOSSARY

*Age-adjusted death rate*: a rate calculated based on a standard age distribution to enable comparison of rates in populations with different age structures

*Angina*: pain or discomfort in the chest that occurs when the heart does not receive enough blood

*Atherosclerosis*: deposits of cholesterol and other substances in the walls of arteries

*Cardiovascular disease*: includes a wide variety of diseases of the heart and blood vessels, including ischemic heart disease (heart attacks), high blood pressure, stroke, and hypertensive heart disease

*Cholesterol*: fatty substance in blood that gets deposited in blood vessel walls, causing atherosclerosis, when blood cholesterol levels are high

*Diabetes:* a chronic disorder of metabolism affecting the way the body uses digested food for growth and energy

*HDL* (high-density lipoprotein): carries cholesterol away from other parts of the body back to the liver for removal from the body

*Heart attack* (also known as myocardial infarction): death or damage to the heart muscle caused by an insufficient supply of blood due to blockage of one or more coronary arteries

*Heart failure*: condition in which the heart cannot pump enough blood to meet the body's needs

*Hospital charges*: a hospital's full established rates, which do not necessarily reflect costs or reimbursement

*Ischemic heart disease (also known as coronary heart disease)*: includes heart attacks and related problems caused by a narrowing of the coronary arteries

*LDL (low-density lipoprotein)*: contains most of the cholesterol in the blood and carries it to tissues and organs via arteries; it is the main source of damaging buildup and blockage in the arteries

*Prevalence*: the percentage of a population that has a disease or a risk factor at a given time

*Risk factor*: a habit, characteristic, or finding on clinical examination that is associated with an increased probability of a disease

*Stroke*: occurs when blood vessels to the brain burst or become clogged by a blood clot or some other particle resulting in lack of blood flow and oxygen to the brain and death of nerve cells

## ABBREVIATIONS

**AAMR** = Age-adjusted mortality rate
**BMI** = Body Mass Index
**CDC** = Centers for Disease Control and Prevention
**CHF** = Congestive heart failure
**CVD** = Cardiovascular disease
**HDL** = High-density lipoprotein
**IHD** = Ischemic heart disease
**ICD-9** = The International Classification of Diseases, 9th Revision
**ICD-10** = The International Classification of Diseases, 10th Revision
**LDL** = Low-density lipoprotein

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