



Cardiovascular Disease in Georgia, 2005



Acknowledgments

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Highlights

- Cardiovascular disease (CVD), including heart disease and stroke, was the number one killer of Georgians in 2003, accounting for 23,295 deaths, or 35% of all deaths.
- The CVD death rate in Georgia was 12% higher than the national rate in 2003.
- For both men and women in Georgia, age-adjusted CVD death rates are higher for blacks than whites.
- In 2003, most CVD deaths in Georgia were classified as ischemic heart disease (41%) or stroke (18%).
- Georgia had the tenth highest CVD mortality rate among the 50 states in 2002; for stroke in particular, Georgia had the ninth highest mortality rate among the 50 states.
- CVD caused more than 142,000 hospitalizations and \$3.3 billion in hospital charges in 2003.
- 3 in 4 (74%) of Georgia adults have at least two modifiable risk factors for CVD. One in ten (9%) of Georgia adults have 5 or more modifiable risk factors for CVD.
- The smoking rate among adults in Georgia has remained stable for the past decade; in 2003, one in four (23%) reported that they currently smoked.
- CVD risk factors are frequently acquired before becoming adults. Data from youth surveys show high prevalence of physical inactivity, poor diet, obesity, and smoking.
- The high CVD death rates should alert Georgians to the importance of working together to facilitate regular physical activity, healthy eating, and not smoking.



Introduction

Cardiovascular disease (CVD) includes all diseases of the heart and blood vessels, including ischemic heart disease, stroke, congestive heart failure, hypertensive disease, and atherosclerosis. CVD is the nation's leading killer of both men and women across all racial and ethnic groups. Each year in the United States, about 900,000 people die from CVD, which accounts for approximately 37% of all deaths.^{1,2} Over 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 23,295 deaths in 2003, 35% of all deaths that year (Figure 1, Table 1). Heart disease (all forms) and stroke are the first and third most common causes of death in Georgia (Figure 1). Ischemic heart disease - the most common form of heart disease - and stroke account for about 20% of deaths in Georgia (Table 1).

Death and disability from CVD are related to a number of risk factors, including smoking, inadequate physical activity, poor diet, obesity, high blood pressure, high cholesterol, and diabetes. The adoption of a healthier lifestyle can lower the risk of developing CVD or reduce the severity of existing disease.

This report describes the burden of CVD in Georgia and has the following purposes:

- 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
- To describe the prevalence of CVD risk factors in Georgia and to describe the prevalence of secondary prevention measures in Georgia.

Figure 1. Leading causes of death, Georgia, 2003 (N=66,337)

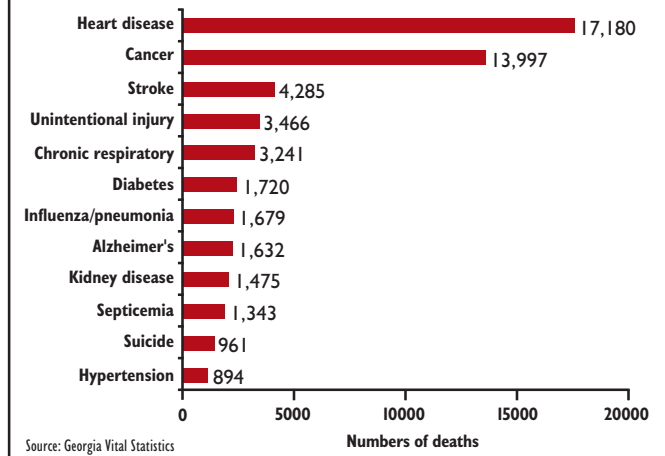
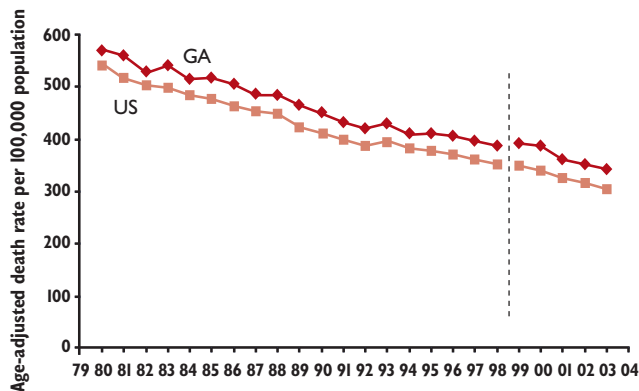


Table 1. Cardiovascular disease deaths in Georgia, 2003

CAUSES	# DEATHS 2003
Cardiovascular Disease Total	23,295
Heart Disease	17,180
Ischemic Heart Disease	9,579
Hypertensive Heart Disease	855
Other Heart Disease	6,746
Stroke	4,285
Hypertension	894
Atherosclerosis	305
Other	631

Cardiovascular Disease in Georgia

Figure 2. Cardiovascular disease death rates in Georgia and the United States, 1980-2003



NOTE: The dotted line indicates a change in coding system for cause of death. ICD-9 codes were used for 1980-1998 deaths; ICD-10 codes were used for 1999-2003 deaths.

Figure 3. Cardiovascular disease death rates in Georgia by race and sex, 2003

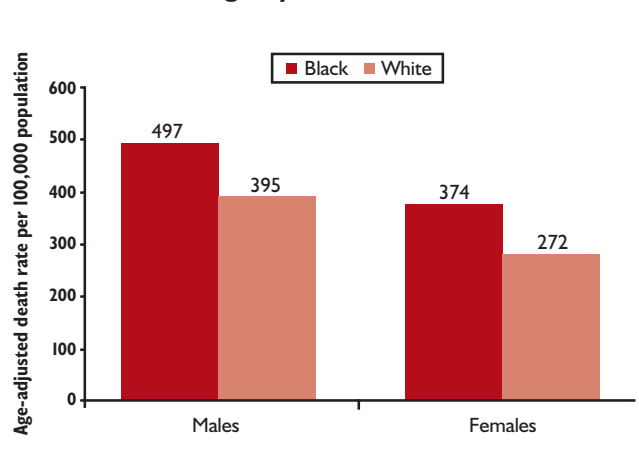


Table 2. Premature* cardiovascular disease deaths by race and sex, Georgia, 2003

	Total CVD deaths (No.)	Premature* CVD deaths (No. (%))
Black males	2,823	1,336 (47%)
White males	8,132	2,248 (28%)
Black females	3,392	935 (28%)
White females	8,806	1,065 (12%)

*Premature death is death <65 years of age

Cardiovascular disease death rates have declined in both Georgia and the U.S. during the past 23 years (Figure 2). The causes of the decline are presumably related to the decline in cigarette smoking during the 1980s, improved blood pressure control, population-wide reduction in blood cholesterol, and improvements in medical care.

From 1980 through 2003, the CVD death rate in Georgia declined by an average of 2.4% per year (Figure 2). Through the entire time period, Georgia's CVD death rate was consistently above the U.S. rate. Among the 50 states in 2002, Georgia had the tenth highest CVD death rate.

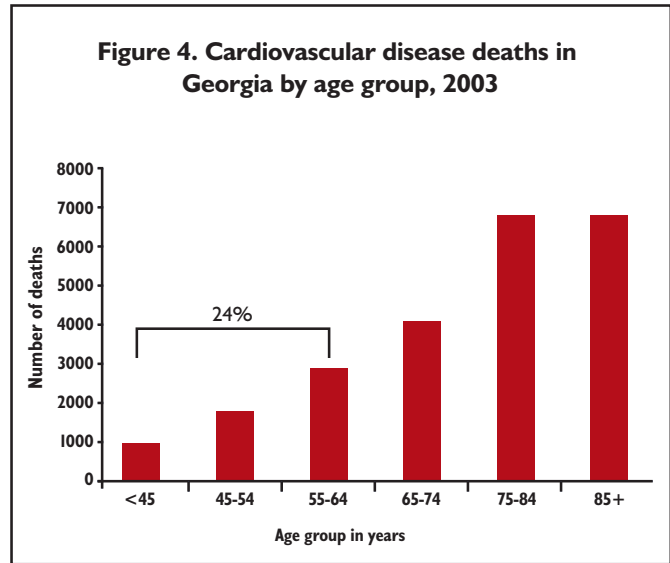
CVD death rates in Georgia differ by sex and race. The age-adjusted death rate from CVD was 1.4 times higher for males (411 per 100,000) than for females (292 per 100,000) in 2003. The age-adjusted death rate from CVD was 1.4 times higher for blacks (426 per 100,000) than for whites (325 per 100,000) in 2003. In 2003, the CVD death rate in Georgia was 1.3 times higher for black males than white males and 1.4 times higher for black females than white females (Figure 3). 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. However, 11,038 males and 12,257 females in Georgia died from CVD in 2003. Since men experience CVD at a higher rate earlier in life, many people consider heart disease a "man's disease." Current health promotion campaigns are promoting awareness and education of the severity of CVD among women, the leading killer of women in Georgia.

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 Georgians who died from CVD in 2003, 24% were younger than 65 years of age (Figure 4). A greater percentage of blacks than whites die from CVD at ages less than 65 years (Table 2). Almost one half (47%) of black men who died of CVD in 2003 were less than 65 years, whereas only 28% of white men who died of CVD were less than 65 years.

Georgia also has a large financial burden due to CVD. In 2003, CVD caused 142,000 hospitalizations resulting in \$3.3 billion in hospital charges at acute care facilities.

Figure 4. Cardiovascular disease deaths in Georgia by age group, 2003

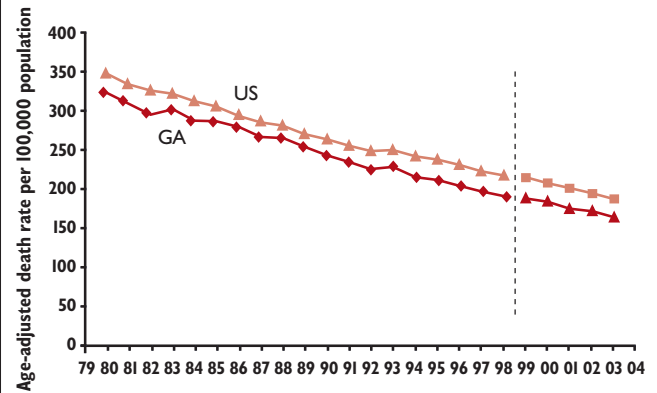


Ischemic Heart Disease in Georgia

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 23,295 cardiovascular deaths in Georgia in 2003, 9,579 (41%) were from ischemic heart disease. The death rate from ischemic heart disease has decreased during the past 23 years at an average decline of 3.5% per year (Figure 5). Unlike total cardiovascular disease, Georgia's death rate from ischemic heart disease is below the national rate, ranging from 5% to 14% below the US rate each year (Figure 5).

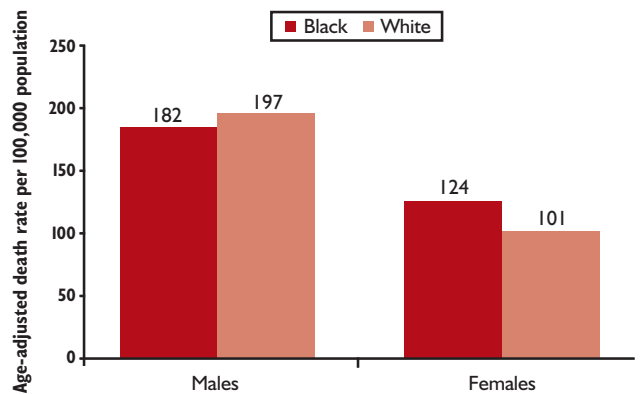
In Georgia, the age-adjusted death rate from ischemic heart disease was 1.8 times higher for men (192 per 100,000) than for women (105 per 100,000) in 2003. The age-adjusted death rate from ischemic heart disease was similar for blacks (147 per 100,000) and whites (141 per 100,000) in 2003. Among men, whites had a slightly higher age-adjusted death rate than blacks; whereas among women, blacks had a slightly higher age-adjusted death rate than whites (Figure 6). Similar to overall CVD, the death rate from ischemic heart disease increases with age, but 26% of deaths in 2003 occurred in persons less than 65 years old.

Figure 5. Ischemic heart disease death rates in Georgia and the United States, 1980-2003



NOTE: The dotted line indicates a change in coding system for cause of death. ICD-9 codes were used for 1980-1998 deaths; ICD-10 codes were used for 1999-2003 deaths.

Figure 6. Ischemic heart disease death rates in Georgia by race and sex, 2003



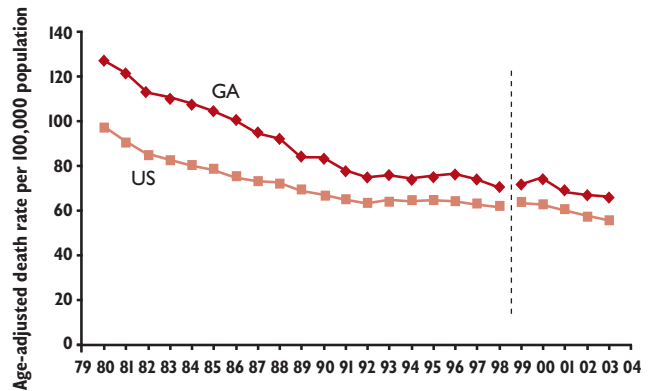
Stroke in Georgia

Stroke, sometimes called cerebrovascular disease, refers to an infarct (loss of blood supply due to a blocked artery) or hemorrhage in the brain. Of the 23,295 CVD deaths in Georgia in 2003, 4,285 (18%) were due to stroke. Age-adjusted death rates from stroke have decreased during the past 23 years in both Georgia and the US (Figure 7); 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 decreased 1.2% per year from 1992 to 2003. Age-adjusted stroke death rates in Georgia are consistently above the US rate although the gap is narrowing, with Georgia's rate 32% above the US rate in 1980 but only 20% above the US rate in 2003.

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 Georgia, the age-adjusted death rates from stroke were similar for men (65 per 100,000) and women (63 per 100,000) in 2003. The age-adjusted death rate from stroke was 1.5 times higher for blacks (88 per 100,000) than for whites (58 per 100,000) in 2003. 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 2003 (Figure 8).

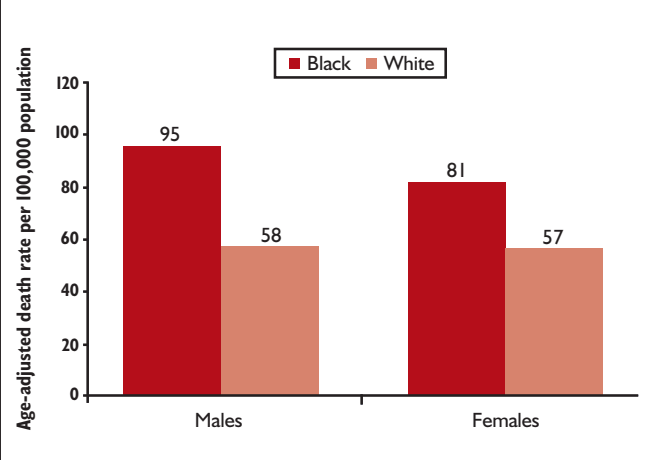
As for most other types of cardiovascular disease, the stroke mortality rate increases with age. Nonetheless, 19% of persons dying from stroke in Georgia in 2003 were less than 65 years old.

Figure 7. Stroke death rates in Georgia and the United States, 1980-2003



NOTE: The dotted line indicates a change in coding system for cause of death. ICD-9 codes were used for 1980-1998 deaths; ICD-10 codes were used for 1999-2003 deaths.

Figure 8. Stroke death rates in Georgia by race and sex, 2003



Cardiovascular Disease Statistics by County

Figure 9 (map) shows average annual age-adjusted CVD deaths rates by county during the period 1999 through 2003. Counties with the highest CVD death rates are clustered in the southeast region and along the state's western border. Figure 10 (map) shows average annual age-adjusted stroke death rates by county during 1999-2003, with the lowest rates in the counties surrounding Atlanta.

Tables 3 and 4 (pages 10-17) show the following data for Georgia counties and public health districts respectively: the number of CVD deaths in 2003, the average annual age-adjusted mortality rate for CVD from 1999 to 2003, the number of stroke deaths and the corresponding age-adjusted rate, and the number of ischemic heart disease 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 stable 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 because of chance.

The right-hand set of columns in Tables 3 and 4 shows the total charges for CVD hospitalizations in 2003, the 2003 CVD hospitalization rate, the number of hospitalizations for CVD in 2003, and the number of hospitalizations for stroke, ischemic heart disease, and congestive heart failure. Hospitalization data are based on county of residence, not location of hospital. Furthermore, the data are restricted to acute care, non-federal facilities, which excludes patients seen at Veteran's Administration and military facilities. 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 9. Cardiovascular disease death rates by county, Georgia, 1999-2003

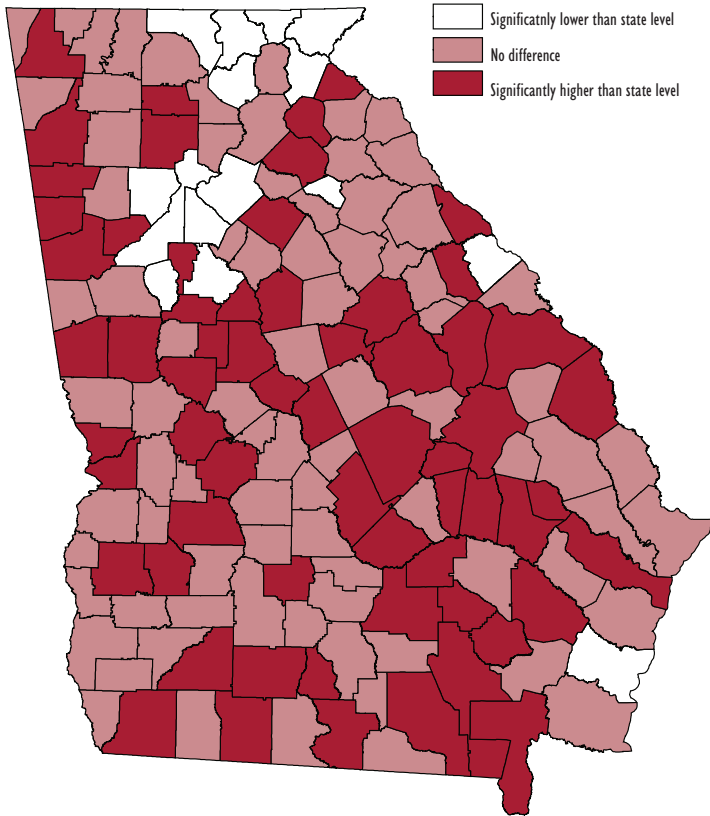


Figure 10. Stroke death rates by county, Georgia, 1999-2003

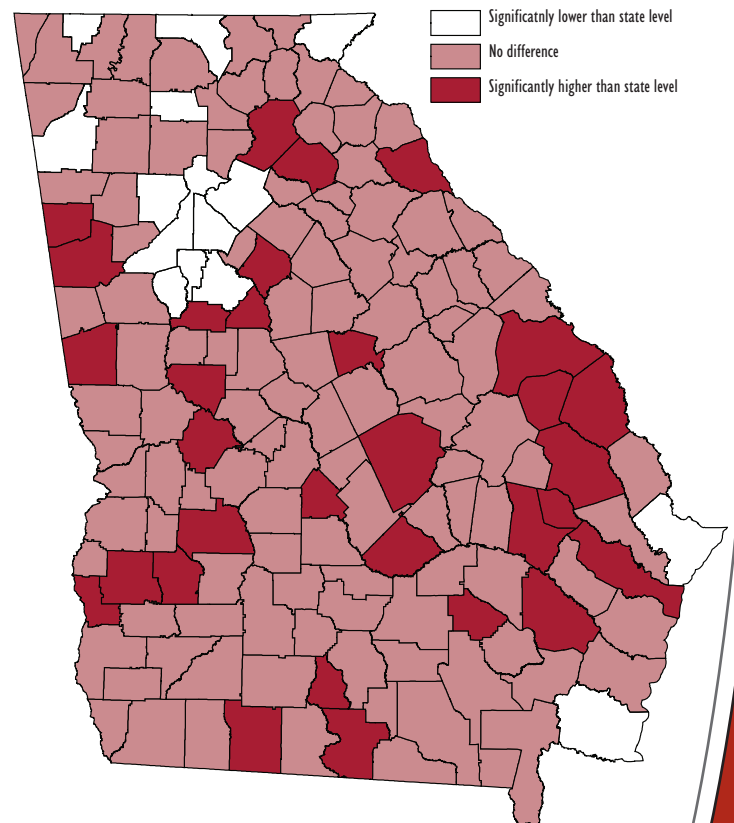


Table 3. Cardiovascular disease deaths, age-adjusted mortality rates, and hospitalizations by county, Georgia, 1999-2003

COUNTY	DEATHS					
	CVD DEATHS 2003	CVD ANNUAL AAMR 1999-2003	STROKE DEATHS 2003	STROKE ANNUAL AAMR 1999-2003	IHD DEATHS 2003	IHD ANNUAL AAMR 1999-2003
Georgia	23,295	367	4,285	68	9,579	154
APPLING	56	404	12	78	17	121
ATKINSON	21	423	3	56	7	157
BACON	42	470	7	98	25	259
BAKER	14	400	2	94	6	144
BALDWIN	148	402	28	90	73	199
BANKS	43	424	10	78	19	209
BARROW	149	397	24	73	69	157
BARTOW	214	365	33	59	112	168
BEN HILL	64	395	11	60	28	182
BERRIEN	66	364	14	70	30	161
BIBB	553	405	132	74	189	170
BLECKLEY	43	365	9	65	14	131
BRANTLEY	54	401	15	63	19	178
BROOKS	68	407	12	71	19	113
BRYAN	60	348	13	73	18	140
BULLOCH	148	373	27	81	48	103
BURKE	98	471	14	88	39	187
BUTTS	74	438	14	106	21	153
CALHOUN	39	428	6	95	23	210
CAMDEN	67	340	5	44	32	134
CANDLER	36	374	4	60	18	155
CARROLL	305	423	65	99	125	191
CATOOSA	194	388	32	55	111	225
CHARLTON	43	450	8	71	12	192
CHATHAM	806	358	137	58	277	142
CHATTAHOOCHE	11	788	1	-	4	352
CHATTOOGA	103	398	17	64	63	235
CHEROKEE	329	398	60	62	138	145
CLARKE	228	341	48	71	98	146
CLAY	16	424	3	114	7	169
CLAYTON	443	390	66	57	199	181
CLINCH	30	504	4	57	13	228
COBB	1,155	321	177	56	425	121
COFFEE	139	440	26	71	74	204
COLQUITT	181	404	36	69	70	171
COLUMBIA	185	311	33	62	76	144
COOK	61	477	16	119	19	217
COWETA	243	351	47	76	98	137
CRAWFORD	31	374	3	73	18	187
CRISP	82	387	23	78	32	140
DADE	65	407	8	63	40	233
DAWSON	47	380	8	66	19	168
DECATUR	114	430	17	68	28	116
DEKALB	1,293	291	262	60	463	113
DODGE	86	444	10	69	37	210
DOOLY	49	408	10	72	31	211
DOUGHERTY	301	366	69	77	113	141
DOUGLAS	246	402	39	65	95	165
EARLY	59	395	13	79	26	187
ECHOLS	7	388	2	95	3	127
EFFINGHAM	124	394	18	63	54	208
ELBERT	80	396	16	91	34	191
EMANUEL	105	435	18	85	43	169
EVANS	45	461	8	161	24	166
FANNIN	94	300	15	50	46	149

AAMR = Age-adjusted mortality rate
 CHF = Congestive heart failure
 CVD = Cardiovascular disease
 IHD = Ischemic heart disease

HOSPITALIZATIONS

CVD Total Charges 2003	CVD Rate 2003	Total CVD 2003	Stroke 2003	IHD 2003	CHF 2003
\$3,347,000,000	1946	142,336	23,164	50,098	28,394
\$8,300,000	2298	399	71	150	80
\$2,400,000	2171	136	23	49	32
\$3,700,000	3178	323	67	111	79
\$1,200,000	1526	66	10	16	18
\$21,900,000	2120	884	128	349	173
\$7,000,000	2026	290	64	107	42
\$22,400,000	2275	930	139	329	190
\$47,200,000	2401	1,712	237	755	222
\$9,500,000	2557	449	53	185	87
\$7,800,000	2250	387	73	119	84
\$110,500,000	2608	4,061	599	1,457	1,000
\$7,300,000	2301	295	45	103	56
\$5,400,000	2273	315	55	116	59
\$5,400,000	2298	414	74	127	93
\$10,700,000	1822	338	61	125	73
\$24,100,000	2042	904	153	328	167
\$10,400,000	2427	484	81	144	126
\$9,700,000	2335	441	80	180	82
\$2,000,000	2463	148	26	37	45
\$3,900,000	1005	268	36	60	89
\$6,300,000	2512	277	39	111	50
\$50,000,000	2639	2,127	330	907	283
\$5,300,000	642	367	66	83	107
\$1,300,000	1140	103	14	26	32
\$113,600,000	1704	4,033	760	989	924
\$1,500,000	2075	56	7	21	19
\$18,900,000	2215	631	93	255	122
\$62,300,000	2159	2,376	351	1,129	355
\$30,100,000	1856	1,321	252	338	261
\$600,000	523	24	5	5	5
\$87,800,000	2029	3,448	449	1,262	807
\$2,600,000	2096	136	17	53	12
\$210,600,000	1734	8,101	1,253	3,494	1,169
\$15,400,000	2567	861	140	244	199
\$12,200,000	2110	903	147	297	251
\$32,700,000	1520	1,185	192	456	200
\$7,000,000	2723	434	95	126	107
\$28,400,000	1324	1,085	173	471	178
\$8,000,000	2741	301	33	143	59
\$9,500,000	2622	590	102	209	119
\$800,000	332	55	<5	21	13
\$8,500,000	2145	339	52	132	60
\$5,800,000	1923	532	115	142	100
\$199,100,000	1582	8,247	1,355	2,400	1,767
\$12,200,000	3369	673	101	292	128
\$5,000,000	2643	291	54	120	51
\$41,300,000	1921	1,749	380	420	395
\$41,700,000	2404	1,821	282	834	269
\$1,700,000	644	92	20	17	36
\$1,400,000	2371	65	9	16	13
\$17,600,000	1744	567	119	204	93
\$9,900,000	2225	518	106	144	119
\$13,600,000	3131	700	129	203	197
\$4,800,000	1865	203540	28	73	48
\$13,500,000	1830		98	228	72

Table 3 continued . . .

COUNTY	DEATHS					
	CVD DEATHS 2003	CVD ANNUAL AAMR 1999-2003	STROKE DEATHS 2003	STROKE ANNUAL AAMR 1999-2003	IHD DEATHS 2003	IHD ANNUAL AAMR 1999-2003
FAYETTE	210	299	38	51	85	133
FLOYD	352	410	50	59	153	184
FORSYTH	234	383	40	63	97	153
FRANKLIN	89	386	14	54	48	226
FULTON	1,850	333	335	59	697	136
GILMER	75	359	12	60	40	172
GLASCOCK	15	370	3	70	4	108
GLYNN	265	326	58	65	99	133
GORDON	123	386	20	82	57	176
GRADY	116	382	16	60	47	179
GREENE	64	409	10	72	27	167
GWINNETT	833	282	161	55	321	107
HABERSHAM	119	319	26	59	55	158
HALL	405	364	76	80	165	152
HANCOCK	42	495	3	83	10	100
HARALSON	114	434	31	93	55	212
HARRIS	66	357	15	61	26	151
HART	92	389	18	65	42	194
HEARD	39	377	7	77	8	97
HENRY	255	344	38	58	117	152
HOUSTON	285	369	52	65	106	140
IRWIN	53	376	10	58	22	182
JACKSON	162	413	26	87	75	195
JASPER	47	429	6	54	23	264
JEFF DAVIS	63	537	10	62	25	227
JEFFERSON	70	442	12	81	27	153
JENKINS	40	423	4	115	21	217
JOHNSON	36	384	6	75	6	113
JONES	79	368	24	82	33	158
LAMAR	69	414	12	74	27	144
LANIER	21	388	2	90	6	118
LAURENS	216	435	44	86	118	222
LEE	45	352	9	78	19	151
LIBERTY	92	443	13	88	32	162
LINCOLN	46	476	8	79	19	213
LONG	28	453	3	64	14	165
LOWNDES	262	412	63	85	78	144
LUMPKIN	57	320	10	56	30	151
MCDUFFIE	97	453	19	79	43	158
MCINTOSH	34	403	10	85	9	128
MACON	56	397	13	72	25	163
MADISON	92	420	17	75	47	205
MARION	39	442	7	64	20	223
MERIWETHER	126	485	13	72	82	283
MILLER	28	373	2	50	14	157
MITCHELL	91	425	13	75	39	209
MONROE	77	445	7	59	51	276
MONTGOMERY	25	511	9	82	3	103
MORGAN	55	399	9	60	29	234
MURRAY	81	344	20	72	37	151
MUSCOGEE	661	415	110	67	308	192
NEWTON	172	370	36	83	85	178

HOSPITALIZATIONS

CVD Total Charges 2003	CVD Rate 2003	Total CVD 2003	Stroke 2003	IHD 2003	CHF 2003
\$33,400,000	1517	1,339	181	562	184
\$74,000,000	2407	2,367	345	945	418
\$42,500,000	2101	1,659	234	689	265
\$11,100,000	2388	583	112	216	112
\$300,900,000	1848	11,596	1,829	3,294	2,696
\$11,300,000	2175	587	89	232	113
\$1,800,000	2029	69	12	27	9
\$28,500,000	1686	1,340	204	357	370
\$34,600,000	2687	1,166	169	568	158
\$4,700,000	1644	412	90	114	93
\$7,300,000	1692	299	50	97	55
\$155,200,000	1545	5,985	886	2,395	981
\$17,500,000	1763	725	127	314	107
\$58,100,000	1730	2,123	459	684	389
\$5,800,000	2312	224	32	81	45
\$20,600,000	2806	794	111	354	127
\$8,000,000	1378	356	70	116	65
\$8,900,000	1969	558	87	204	112
\$5,100,000	2302	243	38	98	39
\$56,500,000	2184	2,277	357	943	460
\$53,500,000	2700	2,681	333	1,253	465
\$4,900,000	2655	285	40	78	51
\$24,200,000	2379	981	151	360	172
\$7,700,000	3097	357	54	152	54
\$7,400,000	2795	347	48	142	75
\$7,900,000	2535	448	70	110	123
\$4,600,000	2441	220	29	66	52
\$3,900,000	2211	224	39	89	42
\$14,500,000	2157	525	85	245	84
\$10,400,000	2439	396	59	149	92
\$3,600,000	3495	231	26	85	49
\$27,600,000	2703	1,283	211	520	223
\$7,700,000	1429	292	43	109	57
\$13,800,000	1854	528	99	171	107
\$4,500,000	2152	207	32	72	42
\$2,700,000	1844	111	17	34	25
\$30,600,000	2199	1,651	314	483	265
\$8,300,000	2411	461	91	174	76
\$11,000,000	2347	494	102	166	89
\$5,500,000	1918	222	29	67	56
\$5,700,000	1941	267	41	107	53
\$12,900,000	2116	540	97	179	102
\$3,000,000	2098	137	22	43	35
\$10,100,000	2087	513	99	119	130
\$2,100,000	1652	135	23	29	48
\$8,300,000	1932	441	81	117	109
\$12,500,000	2271	490	70	192	113
\$5,000,000	2934	219	36	73	41
\$7,800,000	1875	321	67	108	62
\$11,700,000	1937	601	101	211	123
\$63,900,000	1726	3,012	587	848	621
\$29,600,000	2526	1,517	255	508	343

Table 3 continued . . .

COUNTY	DEATHS					
	CVD DEATHS 2003	CVD ANNUAL AAMR 1999-2003	STROKE DEATHS 2003	STROKE ANNUAL AAMR 1999-2003	IHD DEATHS 2003	IHD ANNUAL AAMR 1999-2003
OCONEE	67	337	13	67	29	149
OGLETHORPE	56	412	12	89	21	172
PAULDING	172	381	40	65	68	144
PEACH	76	406	13	59	25	185
PICKENS	108	420	9	43	18	80
PIERCE	69	477	11	68	26	190
PIKE	54	384	9	66	29	156
POLK	193	448	20	60	97	213
PULASKI	47	415	15	104	18	213
PUTNAM	67	388	10	67	28	178
QUITMAN	12	330	2	66	6	122
RABUN	69	321	11	44	32	135
RANDOLPH	38	549	7	136	9	184
RICHMOND	676	381	117	70	309	172
ROCKDALE	172	361	30	78	80	150
SCHLEY	12	418	3	92	8	227
SCREVEN	67	441	17	124	27	159
SEMINOLE	40	395	6	85	13	137
SPALDING	223	456	41	87	92	170
STEPHENS	112	404	25	74	35	131
STEWART	21	359	3	82	8	124
SUMTER	140	411	29	105	62	182
TALBOT	25	434	1	58	11	163
TALIAFERRO	8	324	2	73	0	81
TATTNALL	96	415	19	99	35	178
TAYLOR	33	454	6	106	14	215
TELFAIR	69	506	15	104	31	221
TERRELL	63	457	11	100	22	179
THOMAS	163	399	39	91	56	145
TIFT	126	348	18	69	68	167
TOOMBS	125	449	27	84	34	101
TOWNS	47	287	11	54	12	108
TREUTLEN	32	458	3	62	7	105
TROUP	231	460	56	86	77	168
TURNER	42	448	8	74	20	231
TWIGGS	38	456	6	71	19	225
UNION	85	290	18	56	37	121
UPSON	156	466	41	129	61	165
WALKER	275	439	46	68	158	247
WALTON	213	405	43	79	110	224
WARE	186	427	36	74	85	175
WARREN	23	383	6	57	3	96
WASHINGTON	91	423	16	67	28	143
WAYNE	103	454	20	125	58	214
WEBSTER	8	352	4	86	3	160
WHEELER	16	403	3	58	5	167
WHITE	71	362	10	58	31	164
WHITFIELD	250	369	48	71	107	153
WILCOX	38	394	8	63	24	197
WILKES	53	388	13	67	15	173
WILKINSON	44	421	13	93	12	184
WORTH	74	383	15	59	29	192

HOSPITALIZATIONS

CVD Total Charges 2003	CVD Rate 2003	Total CVD 2003	Stroke 2003	IHD 2003	CHF 2003
\$10,500,000	1,786	412	71	126	76
\$5,300,000	1,799	236	45	76	34
\$35,400,000	2,463	1,446	188	695	209
\$15,500,000	2,983	642	84	249	154
\$12,700,000	1,910	550	90	242	86
\$6,700,000	2,645	440	64	170	101
\$7,800,000	2,239	311	46	131	63
\$31,500,000	2,413	984	134	408	174
\$6,400,000	3,048	319	38	133	60
\$12,700,000	2,363	540	71	250	90
\$400,000	390	15	<5	<5	<5
\$7,800,000	1,694	359	61	115	84
\$3,300,000	2,077	166	37	36	48
\$84,900,000	1,801	3,247	533	992	658
\$28,100,000	2,014	1,232	222	420	240
\$1,600,000	1,697	64	14	33	7
\$9,200,000	2,185	364	69	111	80
\$1,800,000	1,350	148	34	17	50
\$39,700,000	2,517	1,468	243	472	349
\$11,900,000	1,988	609	109	197	125
\$1,900,000	1,720	117	23	18	36
\$12,700,000	1,929	622	121	177	133
\$2,700,000	1,582	116	28	34	22
\$1,200,000	1,611	51	6	16	13
\$10,800,000	2,331	473	71	170	102
\$5,400,000	2,360	218	37	79	44
\$8,300,000	3,449	445	54	164	107
\$6,400,000	2,596	292	41	73	88
\$9,700,000	1,544	728	147	191	178
\$16,200,000	1,941	734	122	273	127
\$12,600,000	2,247	585	84	198	165
\$4,600,000	1,486	246	47	100	43
\$4,300,000	2,658	188	25	82	23
\$23,000,000	2,772	1,636	339	462	382
\$3,600,000	1,978	183	38	53	34
\$6,400,000	2,316	231	43	88	40
\$10,900,000	1,842	544	79	229	84
\$15,800,000	2,659	835	125	281	226
\$11,100,000	1,068	719	119	184	220
\$28,700,000	2,294	1,371	236	470	264
\$16,600,000	2,851	1,127	157	330	321
\$3,400,000	1,930	137	24	44	22
\$8,400,000	2,100	437	75	154	79
\$15,500,000	3,141	814	133	268	145
\$1,100,000	1,445	36	10	9	6
\$3,900,000	3,296	202	24	100	35
\$12,800,000	1,766	446	85	170	74
\$20,700,000	1,551	1,194	248	309	241
\$3,800,000	2,309	214	33	86	30
\$7,200,000	2,547	335	50	107	93
\$8,400,000	2,683	288	51	121	47
\$8,400,000	1,724	386	57	121	84

Table 4. Cardiovascular disease deaths, age-adjusted mortality rates, and hospitalizations by health district, Georgia, 1999-2003

DISTRICT	DEATHS					
	CVD DEATHS 2003	CVD ANNUAL AAMR 1999-2003	STROKE DEATHS 2003	STROKE ANNUAL AAMR 1999-2003	IHD DEATHS 2003	IHD ANNUAL AAMR 1999-2003
Georgia	23,295	367	4,285	68	9,579	154
Northwest (Rome)	1,805	404	297	64	914	199
North Georgia (Dalton)	937	368	164	62	386	143
North (Gainesville)	1,470	354	277	65	622	155
Cobb/Douglas	1,401	332	216	57	520	127
Fulton	1,850	333	335	59	697	136
Clayton (Morrow)	443	390	66	57	199	181
East Metro (Lawrenceville)	1,177	303	227	61	486	122
Dekalb	1,293	291	262	60	463	113
LaGrange	1,985	392	381	79	822	161
South Central (Dublin)	608	432	122	80	263	188
North Central (Macon)	1,578	399	313	71	615	173
East Central (August)	1,483	386	266	74	626	163
West Central (Columbus)	1,269	409	237	75	574	181
South (Valdosta)	770	396	156	78	293	160
Southwest (Albany)	1,328	391	254	75	505	158
Coastal (Savannah & Brunswick)	1,476	358	257	62	535	145
Southeast (Waycross)	1,256	431	237	83	520	167
Northeast (Athens)	1,166	385	218	76	539	181

AAMR = Age-adjusted mortality rate
 CHF = Congestive heart failure
 CVD = Cardiovascular disease
 IHD = Ischemic heart disease



HOSPITALIZATIONS

CVD Total Charges 2003	CVD Rate 2003	Total CVD 2003	Stroke 2003	IHD 2003	CHF 2003
\$3,347,000,000	1946	142,336	23,164	50,098	28,394
\$279,200,000	2000	10,241	1,466	4,268	1,770
\$132,000,000	1915	5,848	977	2,351	990
\$209,400,000	1878	8,942	1,607	3,331	1,573
\$252,200,000	1825	9,922	1,535	4,328	1,438
\$300,900,000	1848	11,596	1,829	3,294	2,696
\$87,800,000	2029	3,448	449	1,262	807
\$212,900,000	1710	8,734	1,363	3,323	1,564
\$199,100,000	1582	8,247	1,355	2,400	1,767
\$289,200,000	2140	12,671	2,070	4,775	2,468
\$82,200,000	2828	4,062	606	1,642	745
\$285,400,000	2518	11,661	1,658	4,734	2,403
\$192,000,000	1960	7,941	1,329	2,514	1,704
\$125,700,000	1801	6,087	1,159	1,858	1,268
\$89,500,000	2281	4,833	844	1,545	910
\$112,800,000	1784	6,324	1,214	1,700	1,552
\$195,900,000	1670	7,407	1,325	2,007	1,737
\$143,100,000	2437	7,443	1,164	2,539	1,667
\$158,500,000	2067	6,929	1,214	2,227	1,335

Cardiovascular Disease Risk Factors

Some CVD risk factors are modifiable, meaning that individuals can change their behavior to prevent, slow, or even reverse, the process of arterial blockage and decrease their risk of having a heart attack or stroke. Modifiable risk factors among adults include smoking, inadequate physical activity, poor diet, obesity, high blood pressure, high blood cholesterol level, and diabetes (Figure 11). Risk factors for CVD are not present exclusively among adults; many youth in Georgia adopt unhealthy habits early in life which contribute to the risk of heart disease (Figure 12).

Some CVD risk factors cannot be changed, such as old age, male sex, and family history of heart attacks at a young age. Individuals with non-modifiable risk factors should be particularly diligent in eliminating modifiable risk factors.



SMOKING

The percentage of Georgia adults 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 13). In 2003, 23% of Georgia adults reported that they currently smoke cigarettes (Figure 11).

Lowering smoking rates is a public health priority. In addition to its well-known association with cancer, smoking is a major risk factor for CVD. Each year in Georgia smoking causes almost the same number of deaths from CVD as cancer, 4,226 and 4,235 deaths, respectively.⁵ The good news is that giving up smoking quickly reduces the risk for CVD.⁶ It is also important to prevent people, especially young people, from initiating smoking. Eighty percent of tobacco-users begin before their eighteenth birthday. If adolescents are kept tobacco-free, most will never start smoking.⁷ In 2003, 21% of Georgia high school students were current smokers. This rate is similar to the rate in adults (Figure 12).

As of July 2005, the Georgia Smoke Free Air Act prohibits smoking in workplaces and public establishments. The new restrictions will reduce exposure to second-hand smoke and limit public venues for current smokers.

PHYSICAL INACTIVITY, DIET AND OBESITY

Regular, moderate, or vigorous physical activity can reduce the risk for CVD.⁸ CDC recommendations are 30 minutes, 5 days a week of moderate physical activity or 20 minutes, 3 days a week of vigorous physical activity. Fifty-eight percent of Georgia adults and 37% of Georgia high school students do not meet the CDC's recommended level of physical activity (Figures 11, 12). Forty-two percent of Georgia high school students reported watching at least 3 hours of TV per day in 2003 (Figure 12).

Eating five or more servings of fruits or vegetables per day can help prevent heart disease, cancer, and other chronic conditions. In 2003, only 23% of Georgia adults reported that they ate at least five servings of fruits and vegetables per day (Figure 11). Only 17% of Georgia high school students report eating at least 5 daily servings of fruits and vegetables (Figure 12).

Obese adults are at increased risk for CVD.⁹ In both Georgia and the US, there has been a steady increase in the percentage of obese adults (body mass index greater than 30.0; see appendix for details). The percent of obese adults in Georgia was 25% in 2003 (Figure 11). Eleven percent of Georgia high school students were obese in 2003 (Figure 12).

HIGH BLOOD PRESSURE

High blood pressure is a major risk factor for both heart disease and stroke. The percentage of Georgians who reported having been told they had high blood pressure was 28% in 2003 (Figure 11). The percentage of Georgians with high blood pressure whose blood pressure is currently under control is not known. Nationally, only 69% of people with high blood pressure know it. Of those, 58% are treated with medications, and of those, 53% are controlled on medications. Only 31% of people with high blood pressure have it adequately controlled.¹⁰ For some people, high blood pressure can be controlled by losing weight and engaging in regular physical activity. Those who are unable to decrease their blood pressure by lifestyle modification alone require medications prescribed by a physician to successfully control high blood pressure.

Figure 11. Prevalence of CVD risk factors among adults, Georgia, 2003

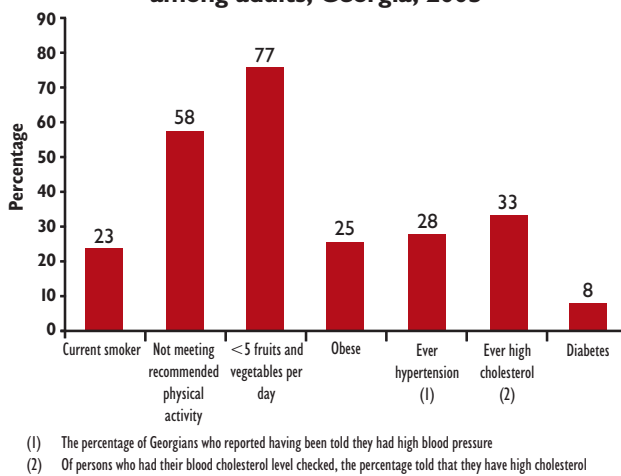


Figure 12. Prevalence of CVD risk factors among high school students, Georgia, 2003

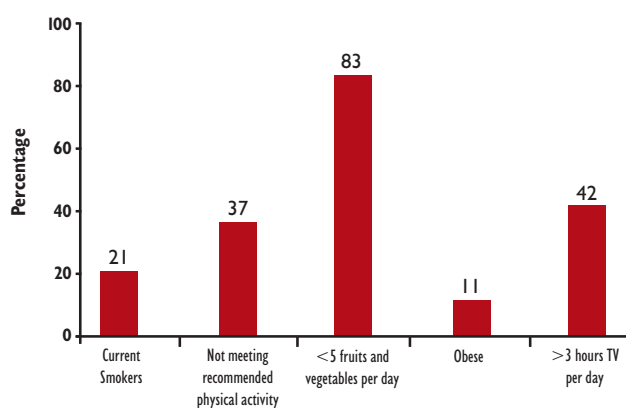
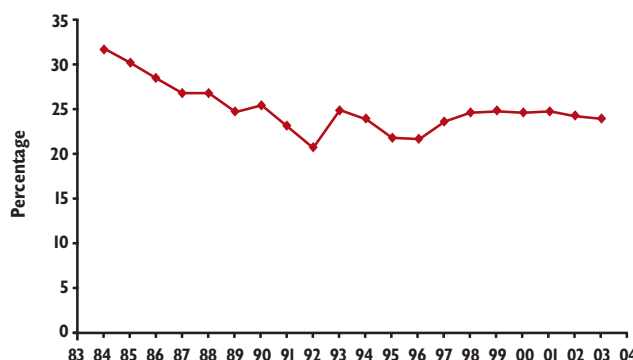


Figure 13. Percentage of adults reporting current smoking, Georgia, 1984-2003



HIGH CHOLESTEROL

When there is too much cholesterol in blood, the excess can become trapped in the artery walls, gradually narrowing and damaging the arteries and increasing the risk of heart attack or stroke. Cholesterol is transported to and from cells by lipoproteins. Low-density lipoprotein (LDL), the "bad cholesterol," clogs the arteries; a high level of LDL increases the risk for heart disease. High-density lipoprotein (HDL), the "good cholesterol," removes cholesterol from the arteries; 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 risk of death from heart disease.¹¹

The percentage of Georgian adults who report ever having had their blood cholesterol level checked increased from 53% in 1987 to 75% in 2003. Of persons who had

been checked, the percentage told that they have high cholesterol increased from 15% in 1987 to 33% in 2003 (Figure 11). It is not known if the increase in the percentage of persons reporting high cholesterol represents a true increase in cholesterol levels among Georgians. Other explanations for the increase may include increased screening among high risk populations.

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 elevated; LDL levels > 130 mg/dL or HDL levels < 40mg/dL also increases a person's risk of CVD.¹⁰ The National Institutes of Health recommend that all adults get a fasting lipoprotein profile (total cholesterol, LDL cholesterol, HDL cholesterol, triglycerides) every 5 years.¹¹



DIABETES

Persons with diabetes have two to three times the risk of death from cardiovascular disease as persons who do not have diabetes.¹² The prevalence of diabetes among adults has increased nationwide during the past decade.¹³ Among children, the prevalence of diabetes has increased, due to an increase in type 2 diabetes, which is associated with obesity.¹⁴ In Georgia, the prevalence of diabetes among adults increased from 4% in 1993 to 8% in 2003 (Figure 11). Similar data are not available for children. Maintaining healthy body weight and staying physically active can prevent type 2 diabetes. 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.

MULTIPLE RISK FACTORS

Since risk factors work in combination to increase risk, it is important to consider multiple risk factors. Of the seven major modifiable risk factors, 74% of Georgia adults have at least two. Approximately 9% of Georgians have 5 or more risk factors. Only 6% of Georgia adults live with no major modifiable CVD risk factors (Table 5).

The majority of individuals in high risk groups do not discuss appropriate behavior modifications with medical professionals. In high-risk populations, fewer than half received medical advice regarding adopting healthier lifestyles (Table 6). In addition to conducting a personalized risk assessment, a medical professional can provide counseling or direct individuals to resources to aid in the modification of risk factors.

Table 5. Adults by number of modifiable risk factors*, Georgia, 2003

Number of Risk Factors	Number of Adults	Percent of Adults
0	346,000	6%
1	1,146,000	20%
2	1,620,000	29%
3	1,350,000	24%
4	722,000	13%
5	334,000	6%
6	119,000	2%
7	17,000	<1%

*Modifiable Risk Factors include being obese, not meeting recommended physical activity recommendations, current smoker, ever having high blood pressure, ever having high cholesterol, consuming <5 daily fruits and vegetables, and diabetes

Table 6. Percentage of adults with selected risk factors reporting that a doctor or health professional talked with them about healthy lifestyles, Georgia, 2003

High Risk Group	Lifestyle Issue	Discussed issue with health professional
Obese adults	Lose weight	38%
Obese adults	Eat fewer high fat or high cholesterol foods	35%
Obese adults	Eat more fruits and vegetables	43%
Obese adults	Increased physical activity	48%
Adults reporting ever having high cholesterol	Eat fewer high fat and high cholesterol foods	48%
Adults consuming fewer than 5 fruits and vegetables per day	Eat more fruits and vegetables	30%
Adults not meeting recommended level of physical activity	Be more physically active	37%

Secondary Prevention of CVD

Secondary prevention involves efforts to further reduce risk among individuals who have already experienced a CVD event. In 2003, approximately 8% of Georgia adults reported a previous heart attack, ischemic heart disease, or a stroke (Figure 14). For individuals with a history of a previous CVD event, the risk for a subsequent event is substantial.¹⁵ It is important for these individuals to take steps to prevent a recurrence.

There is a strong association between modifiable risk factors and a history of CVD event. The percentage of persons experiencing a CVD event was higher among people who had several modifiable risk factors. Three quarters of persons reporting 7 modifiable risk factors had a history of CVD, whereas only 2% of persons with no modifiable risk factors had a history of CVD (Figure 15).

Cardiac rehabilitation was utilized by 26% of Georgia adults who had reported past heart attack or stroke during 2003. The American Heart Association defines cardiac rehabilitation as coordinated, multifaceted interventions designed to optimize a cardiac patient's physical, psychological, and social functioning, in addition to stabilizing, slowing, or even reversing the progression of the underlying atherosclerotic processes, thereby reducing morbidity and mortality. These comprehensive and long-term programs often involve baseline patient assessment, nutritional counseling, aggressive risk factor management, counseling, and exercise training. Exercise-based cardiac rehabilitation is associated with lower total and cardiac mortality rates when compared to usual medical care.¹⁶

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.¹⁷ For certain types of heart conditions, other medications may be useful in reducing the risk of recurrence.

The majority of Georgia adults were able to correctly identify the major symptoms of heart attack and stroke (Table 7). Early recognition of CVD events can expedite treatment and reduce complications and severity. The CDC estimates that 60% of cardiac deaths occur either before reaching a hospital or in the emergency room.¹⁸

The Georgia Coverdell Stroke Registry (GCSR) was established in 2005 to improve the care of acute stroke patients in hospital settings. This program addresses quality improvement in multiple areas of stroke care, from rapid screening, diagnosis, and intervention for patients experiencing an acute stroke, to secondary prevention measures such as blood pressure control, smoking cessation, and treatment of elevated cholesterol in order to reduce the incidence of recurrent stroke after hospital discharge. In addition, the program will also help improve the utilization of rehabilitation services for those who have experienced an acute stroke in the an effort to reduce long-term disability due to stroke. The GCSR is a component of the state of Georgia Cardiovascular Health Initiative, which is a part of a national effort funded by the CDC to reduce heart disease and stroke related morbidity and mortality.

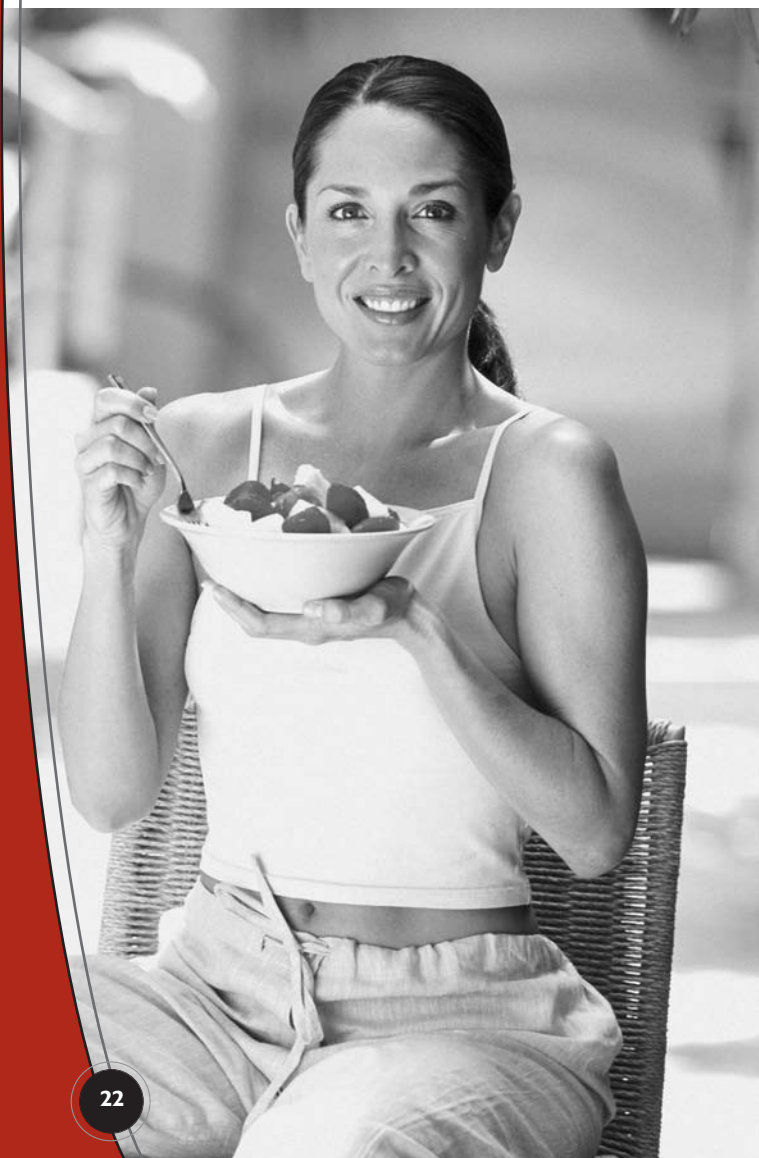


Figure 14. Percentage of adults reporting a previous heart attack, angina, or stroke, Georgia, 2003

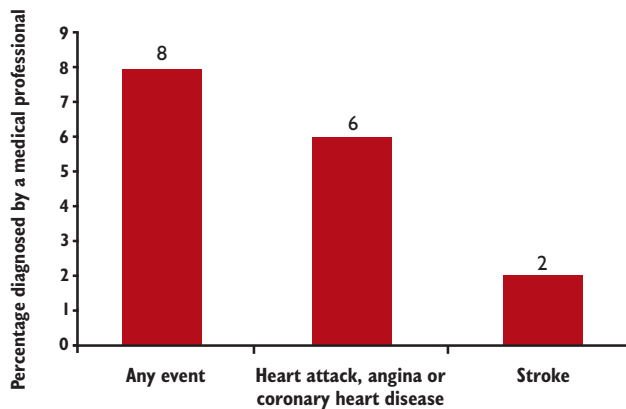


Figure 15. Age-adjusted percentage of adults reporting history of heart attack, stroke or coronary heart disease by number of modifiable risk factors*, Georgia, 2003

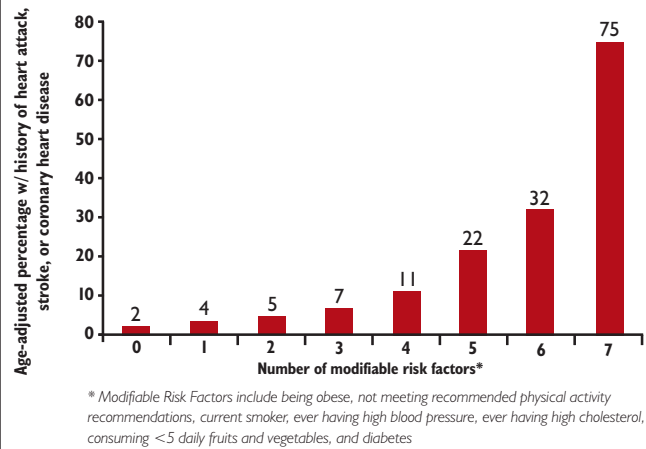


Table 7. Awareness of heart attack and stroke symptoms among adults, Georgia, 2003

Heart Attack		Stroke	
Symptoms	Correctly identified	Symptoms	Correctly identified
Chest pain or discomfort	94%	Body numbness or weakness, especially on one side	93%
Shortness of breath	86%	Sudden confusion or trouble speaking	87%
Pain or discomfort in arm/shoulders	85%	Sudden dizziness, trouble walking, or loss of balance	85%
Feeling weak, lightheaded or faint	66%	Sudden vision trouble	64%
Pain or discomfort in jaw, neck or back	45%	Severe unexplained headache	62%

Conclusions

This report summarizes the most recent information available on cardiovascular disease deaths and hospitalizations in Georgia. The burden of cardiovascular disease in Georgia is immense. CVD is the leading cause of death in Georgia, resulting in over 142,000 hospitalizations and charges of \$3.3 billion in 2003. Annual CVD medical charges have increased over time and will likely continue to increase with rising healthcare costs, advances in medical care, aging population, and escalating risk factor prevalence.

The burden of CVD is greater among particular populations. Blacks have higher rates of CVD than whites, especially for stroke. Furthermore, men have higher rates of CVD than women.

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, engaging in regular physical activity, eating a healthy diet, maintaining a healthy weight, controlling high blood pressure, reducing blood cholesterol, and preventing diabetes.

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 implement policies that facilitate healthy behaviors. Some changes in the environment include 100% tobacco-free policies, opportunity for physical activity during the work day, and healthy vending machine and cafeteria choices.

Much of the death and disability from CVD in Georgia is preventable. If we focus attention on realistic ways of reducing risk, we can continue 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. As we move forward it is imperative that we encourage everyone in our state to “Live Healthy.”



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Appendix: methods, definitions, and abbreviations

METHODS

Age-adjusted mortality rates for the US from 1980 through 1998 and for Georgia from 1980 through 1993 were obtained via WONDER at <http://wonder.cdc.gov> from the compressed mortality file compiled by the National Center for Health Statistics, CDC. Age-adjusted mortality rates for Georgia from 1994 through 1998 were obtained from OASIS at <http://oasis.state.ga.us>. The following ICD-9 codes were used: CVD, 390-434, 436-448; ischemic heart disease, 410-414, 429.2; and stroke, 430-434, 436-438. The 2000 U.S. standard population was used as the standard population.

Age-adjusted mortality rates for the US from 1999 through 2002 were obtained via WONDER at <http://wonder.cdc.gov> from the compressed mortality file compiled by the National Center for Health Statistics, CDC. Age-adjusted mortality rates for Georgia from 1999 through 2003 were obtained from OASIS at <http://oasis.state.ga.us>. The following ICD-10 codes were used for CVD: CVD, I00-78; ischemic heart disease, I20-25; stroke, I60-69; heart failure, I50; other CVD, CVD codes not already categorized. ICD-10 codes for stroke included subarachnoid hemorrhage, I60; other cerebral 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; unintentional injuries, V01-X59, Y85-86; diabetes, E10-14; Alzheimers, G30; kidney disease, N00-07, N17-19, N25-27; influenza and pneumonia, J10-18. 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 2000 U.S. standard population as the standard. Age-adjusted death rates for the US in 2003 were obtained from the National Vital Statistics Report, Vol 53, No. 15, February 28, 2005.

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-CM 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.

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 through 2003 was determined using the ICD-10 codes above (CVD, I00-78; ischemic heart disease, I20-25; stroke, I60-69). Age-adjusted mortality rates were calculated using county population estimates from the US Bureau of Census and the year 2000 U.S. standard 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.

Data on behaviors, health history, and health knowledge among adults were obtained from the 2003 Georgia Behavioral Risk Factor Surveillance System, a telephone survey conducted annually with a sample of adults aged 18 years and older.¹⁹ The sample is weighted so that it reflects the total adult population of the state. Data for Table 6 were obtained from module 9, "Cardiovascular Disease." Data for heart attack and stroke symptoms were obtained from module 8, "Heart Attack and Stroke." CVD risk factors assessed by the BRFSS include the following:

Current smoker: Defined as someone who has smoked at least 100 cigarettes in his 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.

Physical activity recommendations: 30 minutes, 5 days a week (moderate physical activity) or 20 minutes, 3 days a week (vigorous physical activity).

Obese: Defined as a body mass index [BMI] > 30.0 kilograms per meter squared, based on self-reported height and weight. 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.

Daily servings of fruits and vegetables: Number of servings of fruits or vegetables per day based on self-reporting 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 and/or myocardial infarction, angina and/or coronary heart disease, or a stroke.

Prevalence data on CVD risk factors among high school students were obtained from the 2003 Georgia Student Health Survey (GSHS) conducted by the Georgia Department of Human Resources, Division of Public Health, in collaboration with the Georgia Department of Education.²⁰ The questionnaire was modeled after the core Youth Risk Behavior Survey, developed by the Centers for Disease Control. Each student record is weighted so that it reflects the likelihood of sampling each student. CVD risk factors assessed by the GSHS are defined according to the above BRFSS terms, except:

Current Smoker: Defined as smoking cigarettes on one or more of the past 30 days.

Daily servings of fruits and vegetables: Number of servings of fruits or vegetables per day in the past 7 days.

Obese: Body mass index for age 95th percentile, based on self-reported height and weight.

TV Watching: Hours of TV watched per day on an average school day.

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

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 oxygen 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

Modifiable Risk Factor: a risk factor that can be changed in order to slow, or reverse, the disease process and decrease the risk of disease

Prevalence: the percentage of a population that has a disease or a risk factor at a specific point in 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 brain 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-9-CM= The International Classification of Diseases, 9th Revision, Clinical Modification

ICD-10 = The International Classification of Diseases, 10th Revision

LDL = Low-density lipoprotein



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