

# ***Alabama Chartbook of Regional Disparities In Mortality***



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Alabama Department of Public Health  
Center for Health Statistics  
Division of Statistical Analysis

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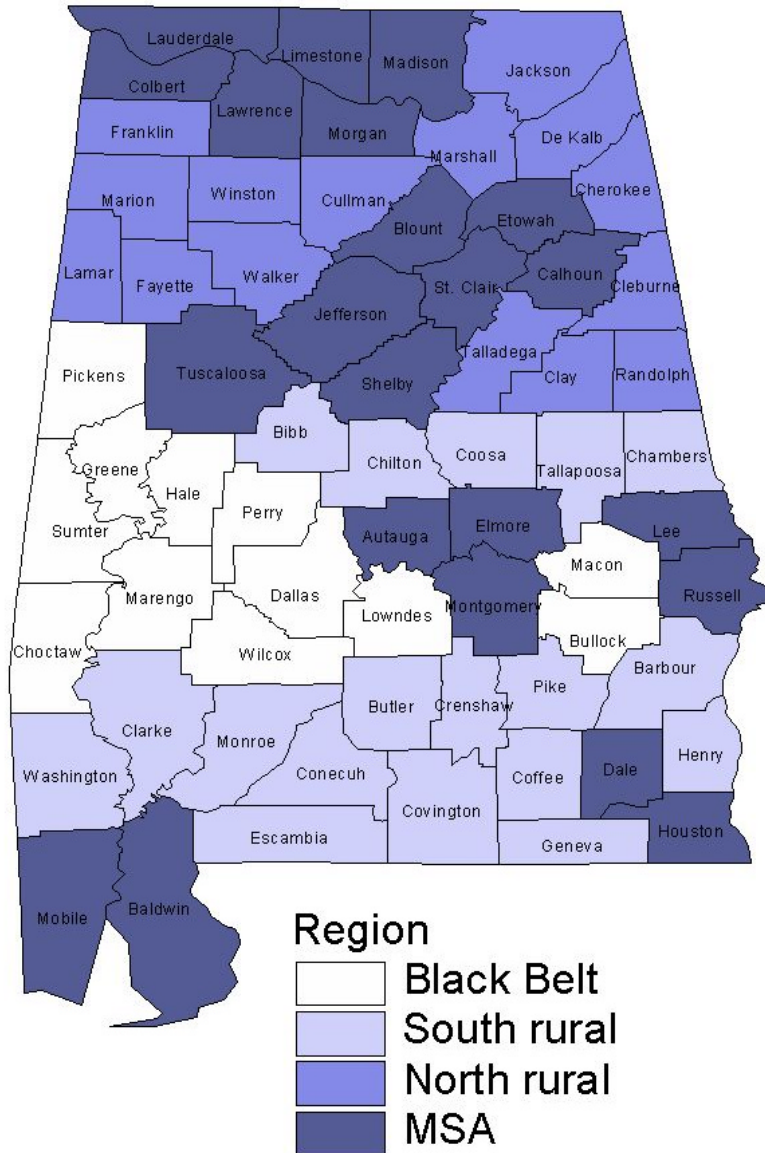
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## Regions of Alabama by County



MSA COUNTIES		NORTH RURAL COUNTIES		SOUTH RURAL COUNTIES		BLACK BELT COUNTIES
AUTAUGA	LEE	CHEROKEE	TALLADEGA	BARBOUR	GENEVA	BULLOCK
BALDWIN	LIMESTONE	CLAY	WALKER	BIBB	HENRY	CHOCTAW
BLOUNT	MADISON	CLEBURNE	WINSTON	BUTLER	MONROE	DALLAS
CALHOUN	MOBILE	CULLMAN		CHAMBERS	PIKE	GREENE
COLBERT	MONTGOMERY	DEKALB		CHILTON	TALLAPOOSA	HALE
DALE	MORGAN	FAYETTE		CLARKE	WASHINGTON	LOWNDES
ELMORE	RUSSELL	FRANKLIN		COFFEE		MACON
ETOWAH	ST. CLAIR	JACKSON		CONECUH		MARENGO
HOUSTON	SHELBY	LAMAR		COOSA		PERRY
JEFFERSON	TUSCALOOSA	MARION		COVINGTON		PICKENS
LAUDERDALE		MARSHALL		CRENSHAW		SUMTER
LAWRENCE		RANDOLPH		ESCAMBIA		WILCOX

## Introduction

This Alabama Chartbook of Regional Disparities in Mortality addresses the increasing interest in health disparities and rural regions of Alabama. Eliminating disparities in health outcomes is a serious public health concern in Alabama. The US Dept of Health and Human Services defines a health disparity as a population-specific difference in the presence of disease, health outcome, or access to care.<sup>1</sup> Mortality disparities can be defined/illustrated by age, race, sex, region or other factors. This chartbook examines differences in age-adjusted death rates among blacks and whites and men and women for four regions of the state: the Black Belt, the south rural region, the north rural region, and urban regions called metropolitan statistical areas (MSA). Of Alabama's 67 counties, 22 comprise the MSA region for this study as designated by the US Office of Management and Budget. The remaining 45 counties are rural. See the Methodology section on page 25 for additional discussion.

### Rural and urban comparisons

Rural and urban areas differ in ways that affect health outcomes. Health insurance coverage differs depending on the amount of industry and employment located in a region. The placement of health care facilities and providers also affects urban and rural death rates. Medical specialists, hospitals, trauma centers, kidney dialysis centers, and mental health in-patient facilities, for example, are less likely to be located in rural regions. Certain causes of death such as human immunodeficiency virus (HIV) disease or homicide are associated with urban areas. Other causes of death such as motor vehicle accidents (MVA) plague rural counties. An example of a critical problem in rural areas is the amount of time an emergency response team requires to reach a serious MVA. The longer response times lead, in part, to higher MVA death rates in rural areas.<sup>2</sup>

### The Black Belt

Alabama has both urban and rural regions. One of the rural regions of Alabama being studied in various ways nationally and locally is the Black Belt, a vast stretch of farmland extending from Georgia through Alabama and Mississippi. Varying definitions of the specific counties in Alabama that make up the Black Belt exist. For this study, the Black Belt is defined as Bullock, Choctaw, Dallas, Greene, Hale, Lowndes, Macon, Marengo, Perry, Pickens, Sumter and Wilcox counties, excluding the MSA counties of Montgomery, Autauga, Elmore, Lee and Russell. This designation maintains the integrity of the classical definitions, without the MSA counties. See the Methodology section on page 25 for additional discussion.

### Race

A factor that confounds an analysis of region is race. In Alabama, northern rural areas are predominantly white. Other areas, particularly the Black Belt, have higher percentages of black Alabamians. The percentages of black Alabamians for each study

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<sup>1</sup> U. S. Department of Health and Human Services. Health Resources and Services Administration. Office of Minority Health. Bureau of Primary Health Care. *Eliminating Health Disparities in the United States*. November 2000

<sup>2</sup> Chapman, K. *Motor Vehicle Deaths in Alabama. Part 2. Rural Alabama: A Danger Zone*. Montgomery, Alabama: Alabama Department of Public Health. February 1999.

region are 8.7 percent, north rural; 29.4 percent, south rural; 68.0 percent, Black Belt; and 26.7 percent, MSA. Race is often a predictor of mortality. Black Alabamians have a higher infant mortality rate and a lower life expectancy. Compared to whites, black Alabamians experience higher age-adjusted death rates by homicide, prostate cancer, diabetes, kidney diseases and human immunodeficiency virus (HIV) disease.<sup>3</sup>

Mortality analyses have shown higher death rates for some regions when compared to the rest of the state. For instance, the Black Belt's age-adjusted prostate cancer death rate is 58.4 as compared to 38.0 for the remainder of the state. However, the age-adjusted prostate cancer death rate in Alabama for blacks is 81.5 compared to a rate of 29.6 for whites. Thus, the higher prostate cancer death rate for the Black Belt may be due to the higher proportion of the Black Belt population that is black. To understand mortality disparities, it is necessary to examine regions of the state while holding race constant.

## Age-adjustment

Regional populations often have large differences in age distribution. Such differences confound comparisons between regions. When the population size and number of deaths are large enough, a mathematical technique called "age-adjusting" can be used to eliminate age in the comparison populations as a confounding factor. In this study, age adjusting has been used to eliminate age as a cause for differences in the death rates.

## Causes of death

The charts in this document display age-adjusted death rates by race, sex and region for selected causes of death, particularly chronic diseases and other leading causes. The causes from illness are heart disease, cancer, cerebrovascular disease (stroke), chronic lower respiratory disease (CLRD), diabetes and human immunodeficiency virus (HIV) disease. Specific cancer mortality analyses included are prostate, breast, lung (including trachea and bronchus), and colorectal cancer. External causes of death included are homicide, suicide and accidents, including a separate analysis for motor vehicle accidents (MVA). Very few deaths occur in some regions for specific race and sex groupings over the three-year study period. The number of deaths for each grouping is listed along with the charts. Make conclusions with caution when the deaths number 20 or less.

## Conclusions

Region is an important predictor of mortality for some causes of death. For instance, MVA deaths are less likely in metropolitan regions. For some race/sex groups, the accident and MVA death rates are higher in the Black Belt than other regions. Rates for homicide, suicide and HIV tend to be higher in the MSA region. Death rates in the north rural region are lower than other regions, in most analyses. However, with a few exceptions, region is far less important than race or sex when studying death disparities in Alabama. When holding race and sex constant, region fails to predict mortality for most of the causes of death studied.

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<sup>3</sup> Chapman, K. *Alabama Atlas of Racial Disparities in Mortality*. Montgomery, Alabama: Alabama Department of Public Health, June 2002.

# Findings

## REGION

- Region as a predictor of mortality, though important, is often less important than either race or sex. **No region** consistently predicts higher cause-specific mortality for every race/sex grouping.
- Region is **not** a significant predictor of mortality for black males or black females for cerebrovascular disease (stroke), all cancer, lung cancer, colorectal cancer, breast cancer, prostate cancer or chronic lower respiratory disease (CLRD).
- Additionally, for black females, region is **not** a significant predictor for accidents, homicide, or diabetes.
- Region is **not** a significant predictor of mortality for white males for diabetes, homicide or suicide and, for white females, for homicide.

## Black Belt

- Black males in the Black Belt have a significantly higher accident rate than white males in the Black Belt and males of either race in the MSA region.
- The Black Belt rate is significantly higher than the MSA rate for females for motor vehicle accidents (MVA).
- The Black Belt rate is significantly higher than the MSA rate for heart disease for blacks.
- The Black Belt cerebrovascular disease and prostate cancer death rates are significantly higher than the north rural rates for white males.
- The Black Belt cancer death rate is significantly higher than the north rural rate for white males.
- The Black Belt death rates are **not** significantly higher than any other region for all race/sex groupings for breast cancer, lung cancer, colorectal cancer, CLRD, diabetes, human immunodeficiency virus (HIV) disease, homicide or suicide.

## Metropolitan (MSA)

- The metropolitan black male homicide rate is significantly higher than all rural regions, but region fails to predict homicide risk for white males or females of either race.
- The metropolitan rate is higher than the north rural rate for whites of either sex for colorectal cancer, all cancer, CLRD and cerebrovascular disease.
- Additionally, the metropolitan rate is higher than the north rural rate for white females for suicide and breast cancer and for white males for prostate and lung cancer and heart disease.
- The MSA death rate is significantly higher than the north and south rural regions for white females for lung cancer.
- The MSA death rate is significantly higher than the Black Belt rate for white females for diabetes.
- The MSA death rate is significantly higher than the south rural region for black males for HIV disease. Regional significance tests were not possible for black females and whites.
- The MSA death rate is significantly higher than the south rural region for black males for diabetes.
- Metropolitan death rates are **not** significantly higher than any other region for all race/sex groupings for accidents and MVA.

## North Rural

- The north rural rate is significantly higher than the MSA rate for whites for accidents and MVA and for black males for MVA.
- The north rural rate is significantly higher than the MSA rate for black males for heart disease.
- North rural death rates are **not** significantly higher than any other region for all race/sex groupings for all cancer, prostate, breast, lung and colorectal cancer, cerebrovascular disease, CLRD, diabetes, HIV, homicide or suicide.



## South Rural

- The south rural region is significantly higher than the MSA region for blacks of either sex and for white males for MVA.
- The south rural region is significantly higher than the north rural region for whites for CLRD and stroke.
- The south rural region is significantly higher than the north rural region for white males for all cancer and prostate and lung cancer.
- The south rural region heart disease death rate is significantly higher than the north rural and MSA regions for whites and higher than the MSA region for black males.
- South rural death rates are **not** significantly higher than any other region for all race/sex groupings for breast cancer, colorectal cancer, diabetes, HIV, homicide or suicide.

## RACE

### Black

- Blacks have a significantly higher heart disease rate than whites in all regions.
- The black female diabetes rate is significantly higher than the white female rate in all regions.
- The black male diabetes death rate is higher than the white male rate in the Black Belt and MSA regions.
- Black males have a higher prostate cancer and overall cancer rate than white males in all regions.
- Cerebrovascular death rates for black males and females in the north rural, south rural and MSA regions are higher than rates for white males and females, respectively.
- In the MSA region, black males and females have a significantly higher HIV disease death rate than white males and females, respectively.
- Black females have a significantly higher homicide, breast cancer and overall cancer rate than white females in the MSA region.
- The black male colorectal cancer rate is significantly higher than the white male rate in the MSA region.
- The black male MVA rate is significantly higher than the white male rate in the Black Belt.
- The black male homicide rate is significantly higher than the white male rate in the south rural and MSA regions.

### White

- The white rate is significantly higher than the black rate for CLRD for males in the south rural and MSA regions and for females in the south rural, MSA and Black Belt regions.
- White females have a significantly higher MVA rate than black females in the MSA region.
- Whites have a higher death rate than blacks for suicide in all regions, though small numbers limit significance testing.

## SEX

- In the south rural region, black females have a significantly higher diabetes death rate than black males, but sex fails to predict diabetes risk for blacks in other regions or for whites. In fact, diabetes is the only cause where females have a significantly higher death rate than males for any race/region grouping.
- Regardless of race or region, males have significantly higher death rates than females for heart disease, cancer, lung cancer and accidents.
- Though significance tests often were not possible, males have higher rates than females across all regions for suicide, CLRD, and HIV disease.
- Males have significantly higher MVA death rates than females for every race/region grouping except white Alabamians in the Black Belt.
- Males have a significantly higher colorectal cancer and homicide death rate than females in the MSA region.
- The cerebrovascular disease death rate is significantly higher for males than females only among metropolitan blacks.



# *Charts*



**Median Age at Death by Race, Sex, Region and Cause  
Alabama 1998 to 2000**

	White Male				White Female				Black Male				Black Female			
	BB	NR	SR	MSA	BB	NR	SR	MSA	BB	NR	SR	MSA	BB	NR	SR	MSA
Heart Disease	75	73	75	75	84	83	84	83	70	68	72	70	80	77	78	78
Cancer	72	70	71	71	73	72	73	73	72	71	71	70	69	69	70	70
Lung Cancer	72	69	71	69	72	69	71	71	69	65	67	67	68	63	70	69
Colorectal Cancer	65	74	74	72	77	78	78	78	70	*	74	72	78	78	73	76
Prostate Cancer	79	78	80	79					80	80	80	77				
Breast Cancer					70	66	65	68					58	*	59	61
Cerebrovascular Disease	79	77	78	78	83	83	85	83	70	73	73	72	81	81	80	79
Accidents	43	41	43	42	60	50	66	57	38	39	40	39	48	50	35	48
MVA	37	37	36	37	40	37	45	34	36	34	38	35	39	*	22	38
CLRD	77	76	76	76	75	74	78	77	76	72	78	74	69	*	80	72
Diabetes	70	71	70	72	81	81	82	77	73	*	70	68	74	73	75	74
HIV Disease	*	*	*	39	*	*	*	42	38	*	41	39	*	*	*	38
Homicide	*	39	36	38	*	36	36	36	29	*	32	27	31	*	28	34
Suicide	52	45	42	44	*	55	41	43	*	*	26	33	*	*	*	*

\* Fewer than 10 deaths; unreliable

Note: Infants under age one are omitted from median age calculations.

**Infant Mortality Rate by Region and Race  
Alabama 1998 to 2000**

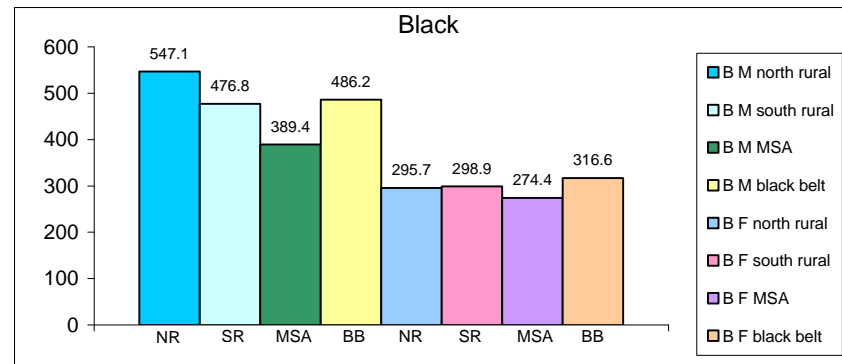
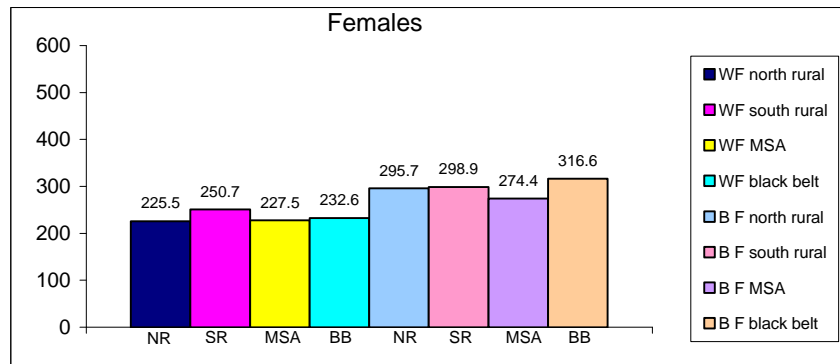
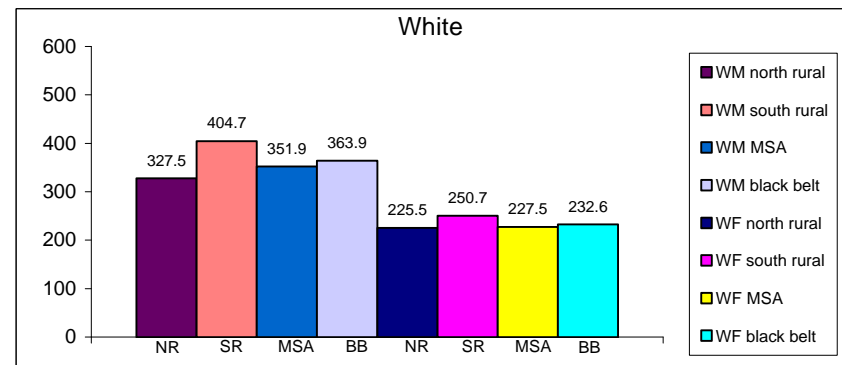
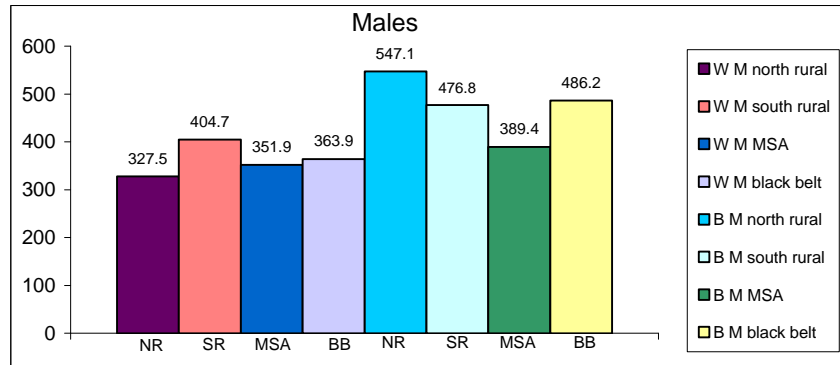
Race	Region			
	BB	NR	SR	MSA
White	4.0	7.7	6.5	7.0
Black	12.9	16.5	15.2	16.2
Rate is per 1,000 births				

- For both black and white Alabamians, the infant mortality rate is lowest in the Black Belt.
- White females die from accidents at a younger median age in the MSA region than the other regions.
- Black males die at a younger age from suicide than whites in any region.
- The youngest median age at death for MVA is for black females in the south rural region.

# Heart Disease

Age-adjusted Death Rates by Region, Race and Sex  
Alabama 1998 to 2000  
Rate per 100,000 2000 standard million

Deaths	BF	WF	BM	WM	Total
NR	226	3,297	263	3,246	7,032
MSA	3,104	9,934	2,615	9,438	25,091
SR	673	2,045	634	1,986	5,338
BB	799	502	696	467	2,464
<b>Total</b>	<b>4,802</b>	<b>15,778</b>	<b>4,208</b>	<b>15,137</b>	<b>39,925</b>



## Heart disease

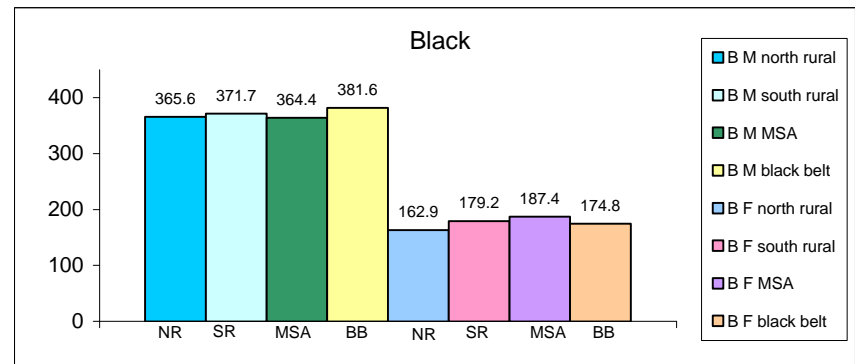
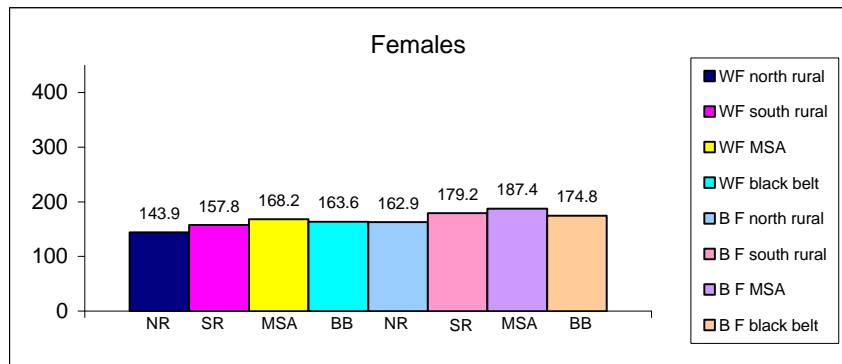
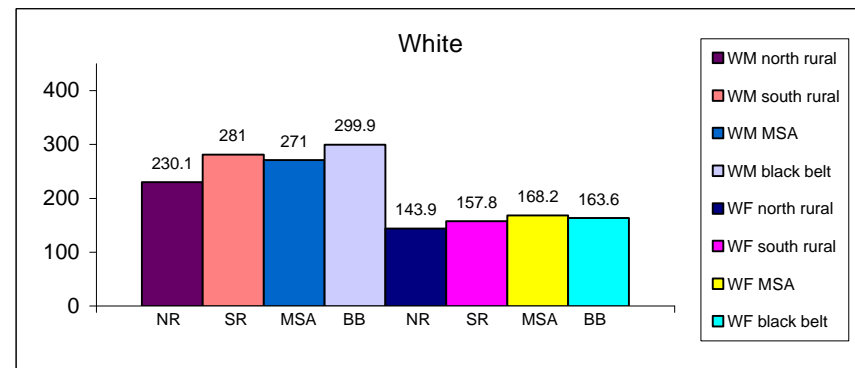
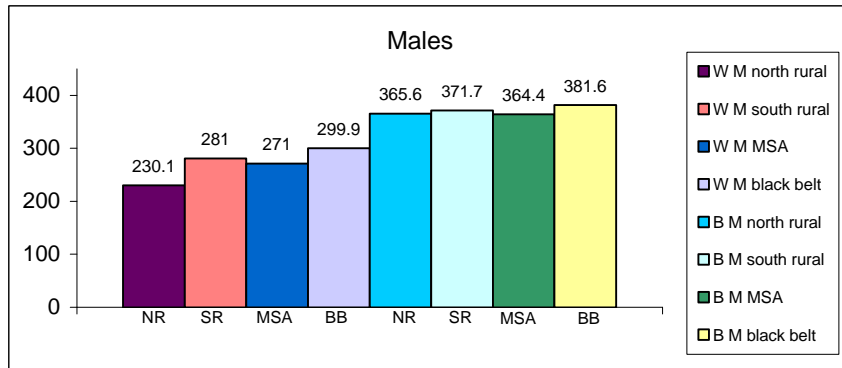
**Race-sex-region-specific age-adjusted death rates; significance tests are at the 95% confidence level**

- For black males, the rate is significantly lower in the MSA region compared to all other regions.
- For black females, the rate is significantly lower in the MSA region compared to the Black Belt.
- For black Alabamians, rural regions (NR, SR, and BB) do not differ significantly.
- The rate for white males is significantly higher in the south rural region than the north rural region.
- Males have significantly higher rates than females for every region.
- Regardless of region, the rate for black males and females is significantly higher than for white males and females, respectively.

# Cancer

**Age-adjusted Death Rates by Region, Race and Sex**  
**Alabama 1998 to 2000**  
**Rate per 100,000 2000 standard million**

Deaths	BF	WF	BM	WM	Total
NR	119	1,777	172	2,293	4,361
MSA	2,078	6,974	2,465	7,931	19,448
SR	377	1,152	494	1,462	3,485
BB	399	306	543	402	1,650
<b>Total</b>	<b>2,973</b>	<b>10,209</b>	<b>3,674</b>	<b>12,088</b>	<b>28,944</b>



## Cancer

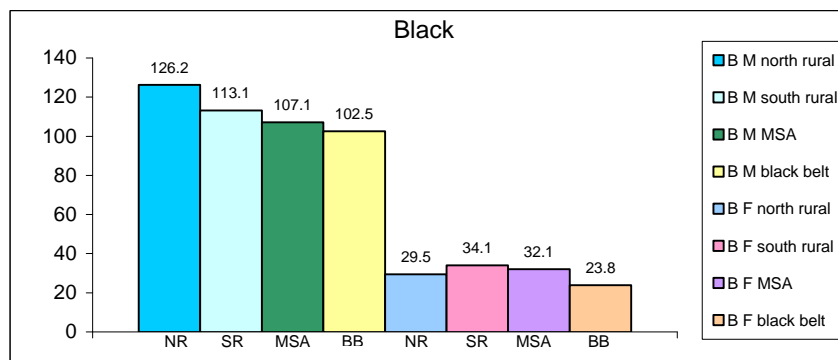
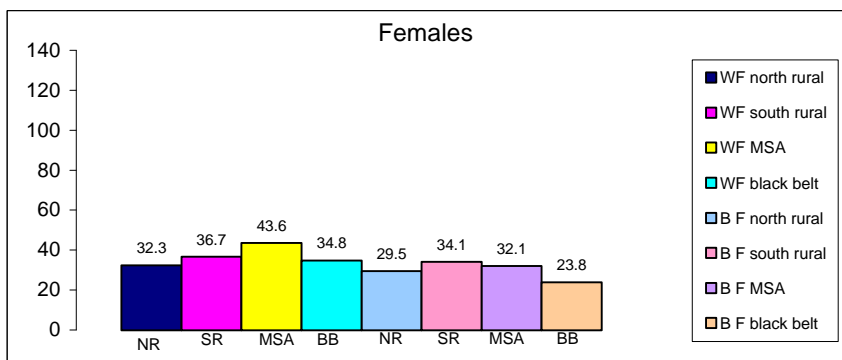
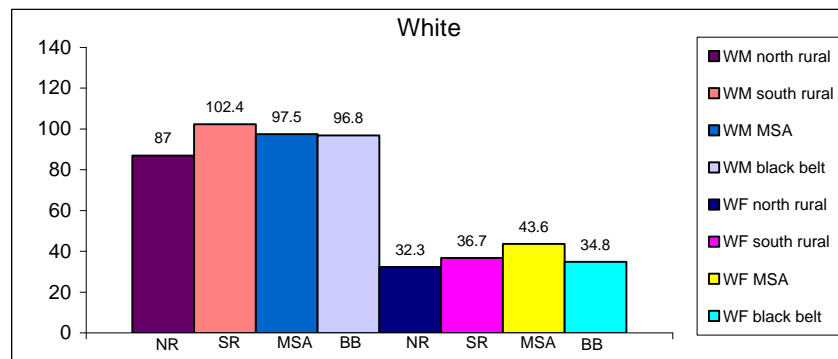
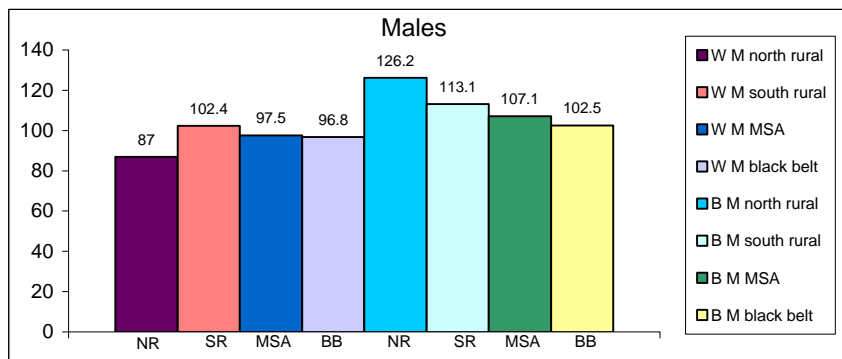
### Race-sex-region-specific age-adjusted death rates; significance tests are at the 95% confidence level

- Region is not a significant predictor of cancer mortality for either black males or black females.
- The rate for north rural white males is significantly lower than all other regions.
- North rural white females have a significantly lower rate than MSA white females.
- Males have significantly higher race-specific rates than females in every region.
- Black males have a significantly higher rate than white males in all regions.
- The rate for black females is significantly higher than for white females in the MSA region.

# Lung Cancer

Age-adjusted Death Rates by Region, Race and Sex  
Alabama 1998 to 2000  
Rate per 100,000 2000 standard million

Deaths	BF	WF	BM	WM	Total
NR	21	396	62	881	1,360
MSA	351	1,811	742	2,966	5,870
SR	70	267	155	553	1,045
BB	53	65	145	132	395
<b>Total</b>	<b>495</b>	<b>2,539</b>	<b>1,104</b>	<b>4,532</b>	<b>8,670</b>



## Lung cancer

**Race-sex-region-specific age-adjusted death rates; significance tests are at the 95% confidence level**

- Region is not a significant predictor of mortality for black males or black females.
- South rural and metropolitan white males have a significantly higher rate than north rural white males.
- White metropolitan females have a significantly higher rate than those in the north rural region.
- The rate for black males is significantly higher than for white males in the north rural region.
- In the MSA region, white females have a significantly higher rate than black females.
- Males have a significantly higher rate than females for every region.

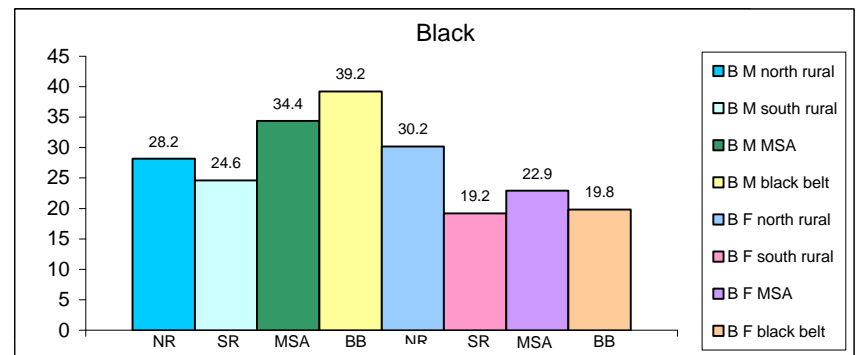
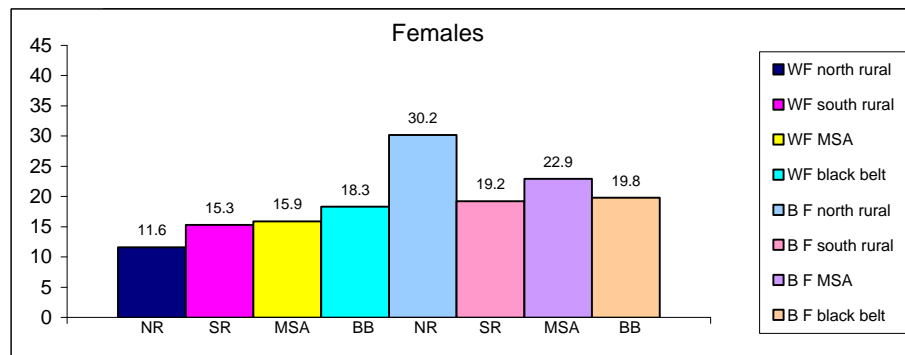
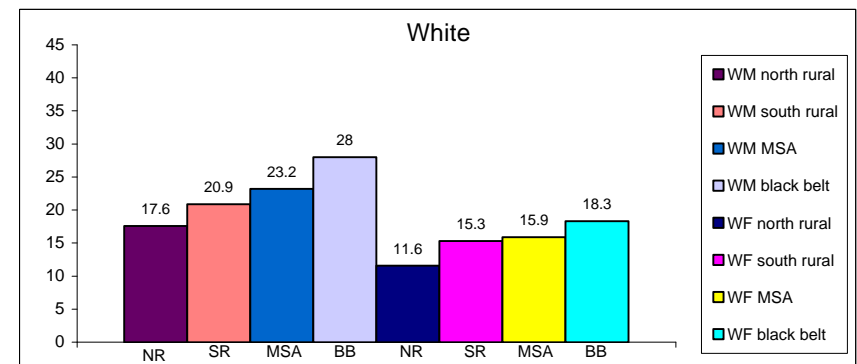
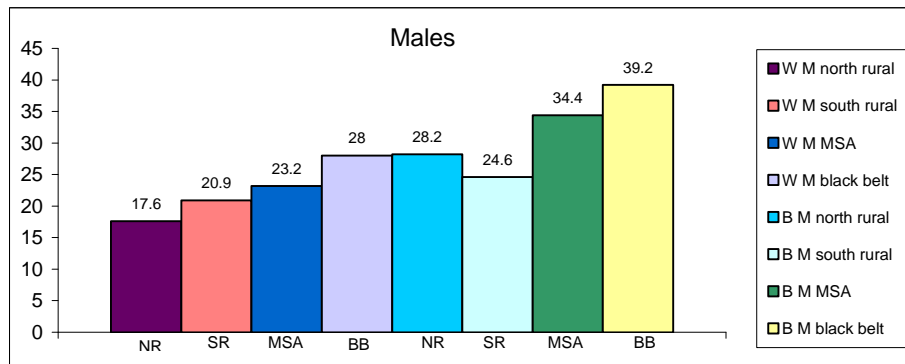
# Colorectal Cancer

Age-adjusted Death Rates by Region, Race and Sex  
Alabama 1998 to 2000

Rate per 100,000 2000 standard million

Shaded cells show fewer than 20 deaths. Rates are unreliable.

Deaths	BF	WF	BM	WM	Total
NR	23	154	13	175	365
MSA	252	676	227	672	1,827
SR	42	115	32	106	295
BB	48	36	56	37	177
<b>Total</b>	<b>365</b>	<b>981</b>	<b>328</b>	<b>990</b>	<b>2,664</b>



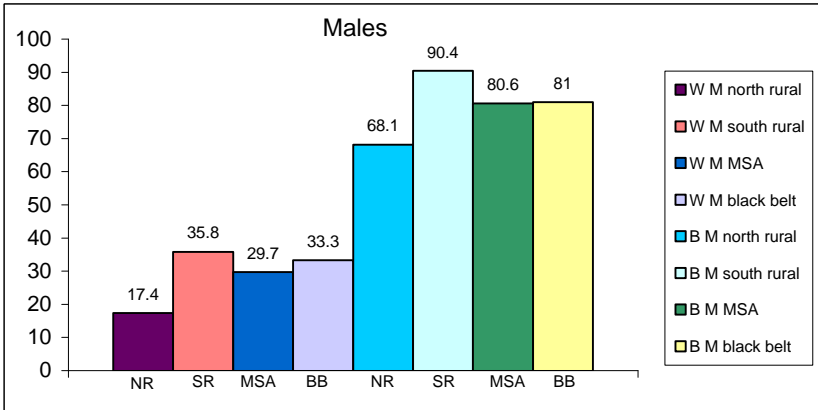
## Colorectal cancer

Race-sex-region-specific age-adjusted death rates; significance tests are at the 95% confidence level

- For both black males and black females, region is not a significant predictor of mortality.
- For whites, MSA rates are significantly higher than north rural rates.
- The rate for black females is significantly higher than for white females in the north rural and MSA regions.
- The rate for black males is significantly higher than for white males in the MSA region.
- Metropolitan females have a significantly lower rate than metropolitan males.

# Prostate Cancer

**Age-adjusted Death Rates by Region, Race and Sex**  
**Alabama 1998 to 2000**  
**Rate per 100,000 2000 standard million**



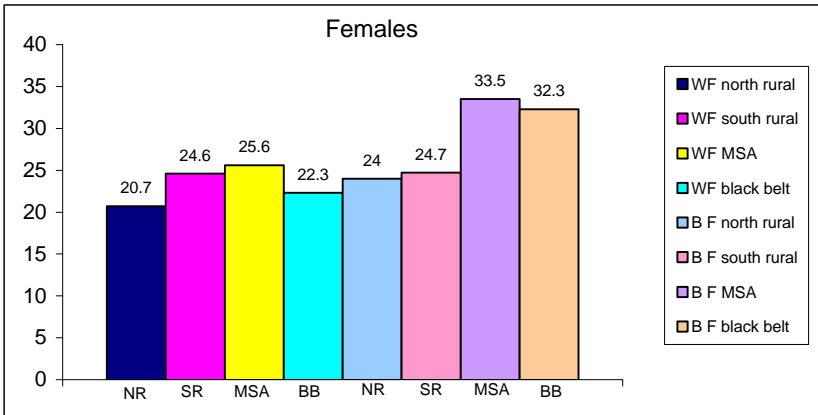
Deaths	BM	WM	Total
NR	29	175	204
MSA	485	727	1,212
SR	110	168	278
BB	115	41	156
<b>Total</b>	<b>739</b>	<b>1,111</b>	<b>1,850</b>

**Prostate cancer**  
**Race-sex-region-specific age-adjusted death rates;**  
**significance tests are at the 95% confidence level**

- Among white males the rate for the north rural region is significantly lower than any other region in Alabama.
- Region is not a significant predictor of mortality for black males.
- For every region, the rate for black males is significantly higher than white males.

# Breast Cancer

**Age-adjusted Death Rates by Region, Race and Sex**  
**Alabama 1998 to 2000**  
**Rate per 100,000 2000 standard million**  
 Shaded cells show fewer than 20 deaths. Rates are unreliable.



Deaths	BF	WF	Total
NR	18	238	256
MSA	378	1,031	1409
SR	52	163	215
BB	69	39	108
<b>Total</b>	<b>517</b>	<b>1,471</b>	<b>1988</b>

**Breast cancer**  
**Race-sex-region-specific age-adjusted death rates;**  
**significance tests are at the 95% confidence level**

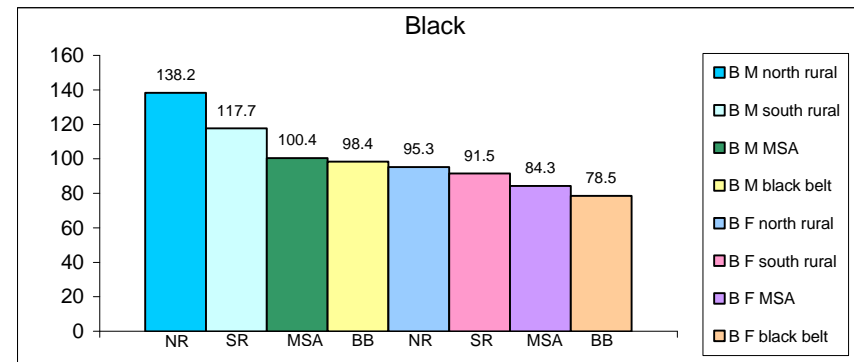
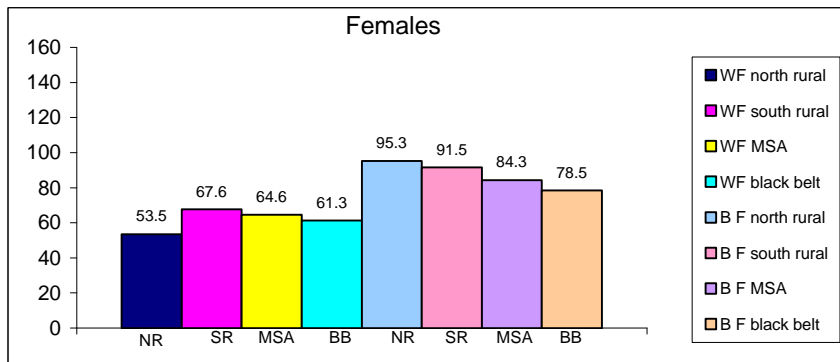
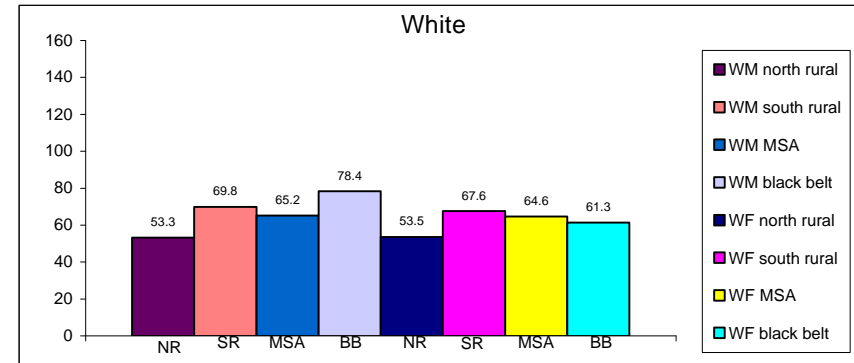
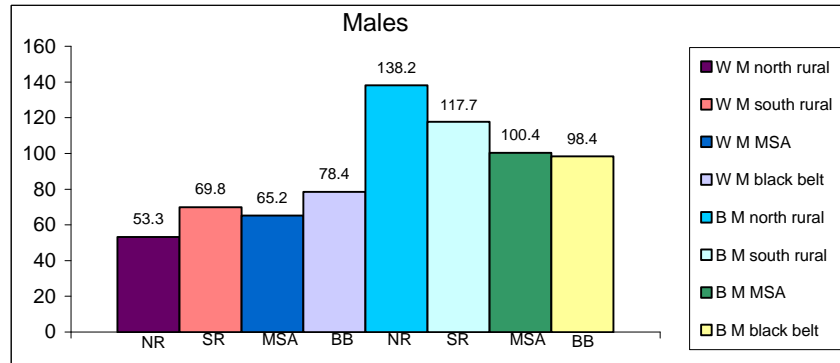
- Black females have no significant differences among any of the regions in Alabama.
- White females have a significantly higher risk of mortality in the MSA compared to the north rural region.
- For metropolitan females, the black rate is significantly higher than the white rate.



# Cerebrovascular Disease

Age-adjusted Death Rates by Region, Race and Sex  
Alabama 1998 to 2000  
Rate per 100,000 2000 standard million

Deaths	BF	WF	BM	WM	Total
NR	74	801	63	530	1,468
MSA	948	2,837	664	1,654	6,103
SR	209	559	154	334	1,256
BB	201	132	141	96	570
<b>Total</b>	<b>1,432</b>	<b>4,329</b>	<b>1,022</b>	<b>2,614</b>	<b>9,397</b>



## Cerebrovascular disease

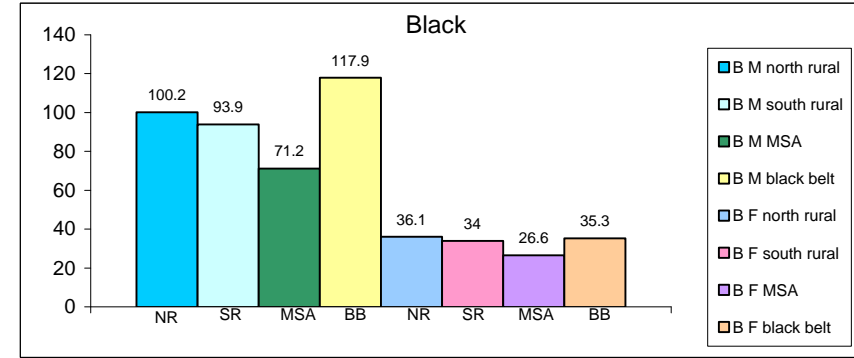
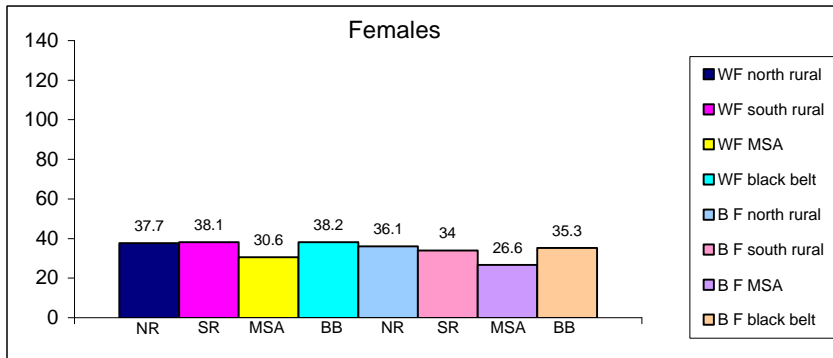
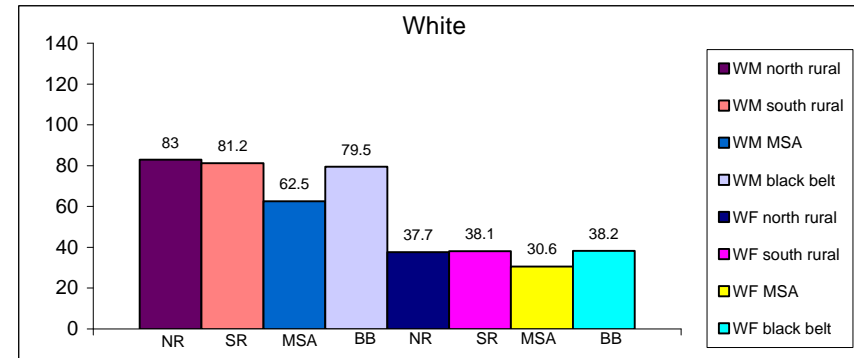
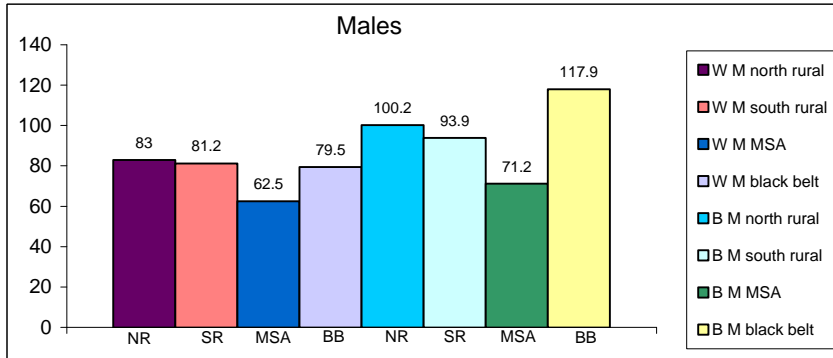
**Race-sex-region-specific age-adjusted death rates; significance tests are at the 95% confidence level**

- Region is not a significant predictor of mortality for black Alabamians.
- White males have a significantly lower death rate in the north rural region compared to all other regions.
- White females have a significantly lower death rate in the north rural region compared to the south rural and MSA regions.
- Rates do not differ significantly in any region for white males compared to white females.
- In the north rural, south rural and MSA regions, the rates for black males and black females are significantly higher than white males and white females, respectively.

# Accidents

Age-adjusted Death Rates by Region, Race and Sex  
Alabama 1998 to 2000  
Rate per 100,000 2000 standard million

Deaths	BF	WF	BM	WM	Total
NR	29	367	67	700	1,163
MSA	324	1,147	685	1,915	4,071
SR	79	233	168	396	876
BB	83	53	202	94	432
<b>Total</b>	<b>515</b>	<b>1,800</b>	<b>1,122</b>	<b>3,105</b>	<b>6,542</b>



## Accidents

**Race-sex-region-specific age-adjusted death rates; significance tests are at the 95% confidence level**

- For black males, the rate for the Black Belt is significantly higher than for the MSA region.
- For white males, the rates for the north rural and south rural regions are significantly higher than the MSA region.
- Males have significantly higher race-specific rates than females for every region.
- No region has a significantly different rate between black females and white females.
- The rate for black males is significantly higher than for white males in the Black Belt and MSA regions.

# Motor Vehicle Accidents

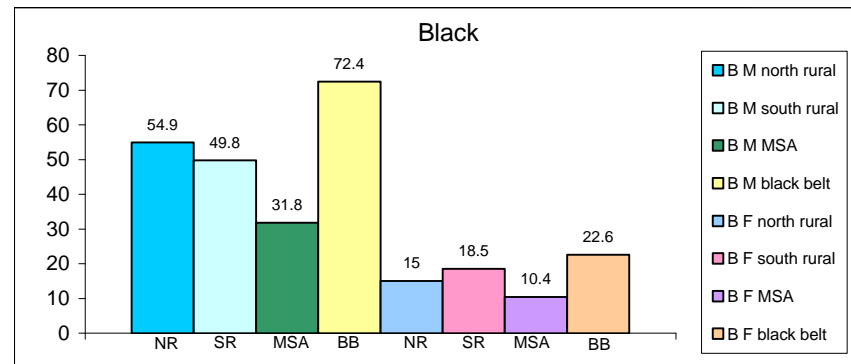
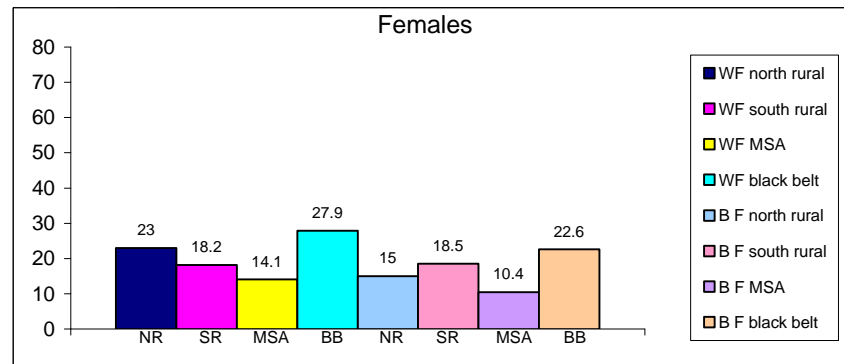
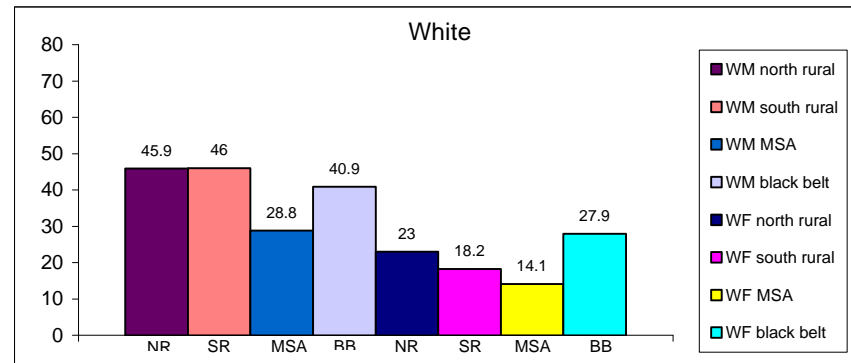
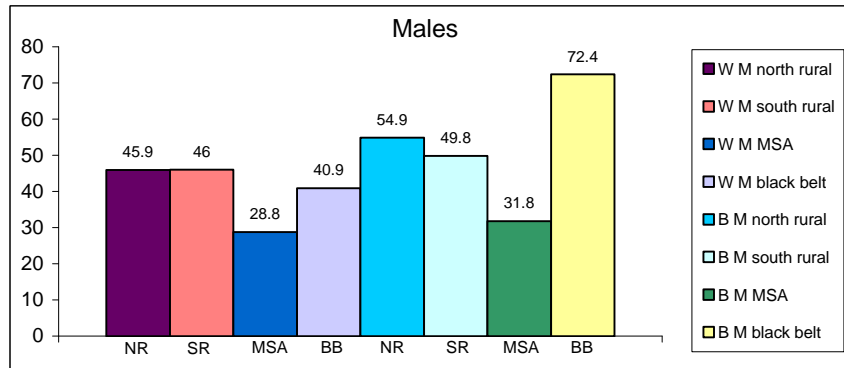
## Age-adjusted Death Rates by Region, Race and Sex

Alabama 1998 to 2000

Rate per 100,000 2000 standard million

Shaded cells show fewer than 20 deaths. Rates are unreliable.

Deaths	BF	WF	BM	WM	Total
NR	12	198	40	381	631
MSA	131	494	330	926	1,881
SR	44	97	92	224	457
BB	51	34	125	48	258
<b>Total</b>	238	823	587	1,579	3,227



### Motor vehicle accidents

#### Race-sex-region-specific age-adjusted death rates; significance tests are at the 95% confidence level

- Metropolitan Alabamians have a lower MVA death rate than rural Alabamians, often significantly lower.
- Males have significantly higher rates than females for every region where there were at least 20 deaths.
- In the Black Belt, black males have a rate significantly higher than white males.
- In the MSA region, white females have a significantly higher rate than black females.

# Chronic Lower Respiratory Disease

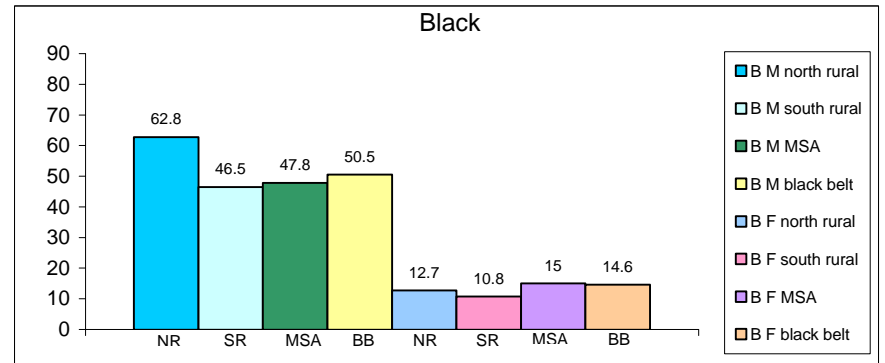
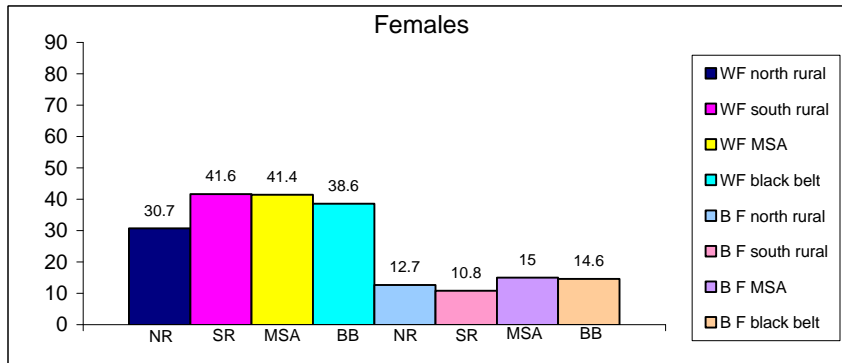
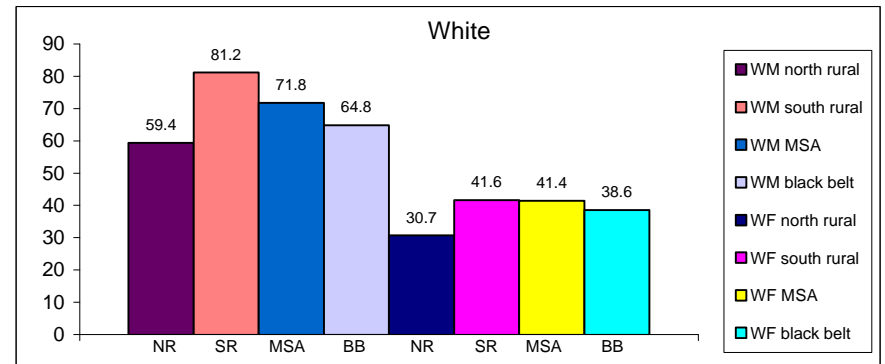
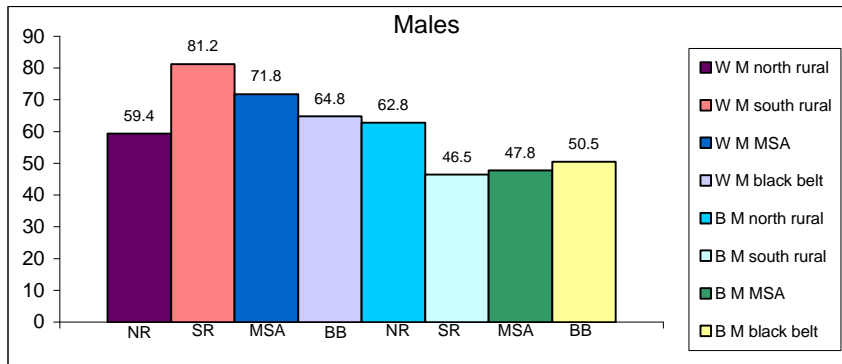
Age-adjusted Death Rates by Region, Race and Sex

Alabama 1998 to 2000

Rate per 100,000 2000 standard million

Shaded cells show fewer than 20 deaths. Rates are unreliable.

Deaths	BF	WF	BM	WM	Total
NR	9	401	30	598	1,038
MSA	165	1,773	304	1,939	4,181
SR	24	324	59	405	812
BB	33	78	71	83	265
<b>Total</b>	<b>231</b>	<b>2,576</b>	<b>464</b>	<b>3,025</b>	<b>6,296</b>



## Chronic Lower Respiratory Disease

Race-sex-region-specific age-adjusted death rates; significance tests are at the 95% confidence level

- Region is not a statistically significant predictor of mortality for black Alabamians .
- White Alabamians have a significantly lower rate in the north rural compared to the MSA and south rural regions.
- Males have a significantly higher rate than females for every region where there were at least 20 deaths.
- White males have a significantly higher rate than black males in the MSA and south rural regions.
- White females have a significantly higher rate than black females in the MSA, south rural and Black Belt regions.

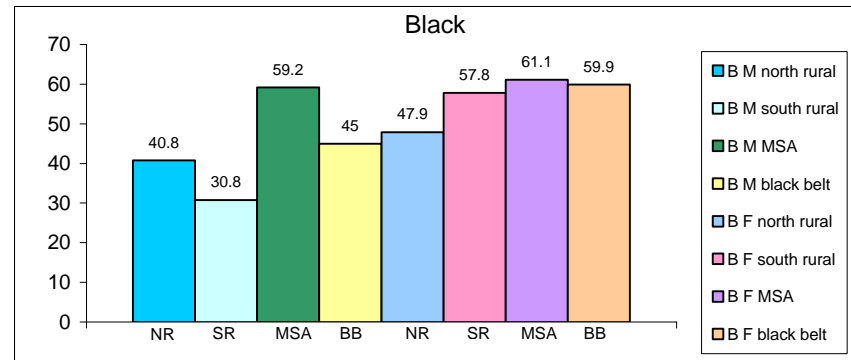
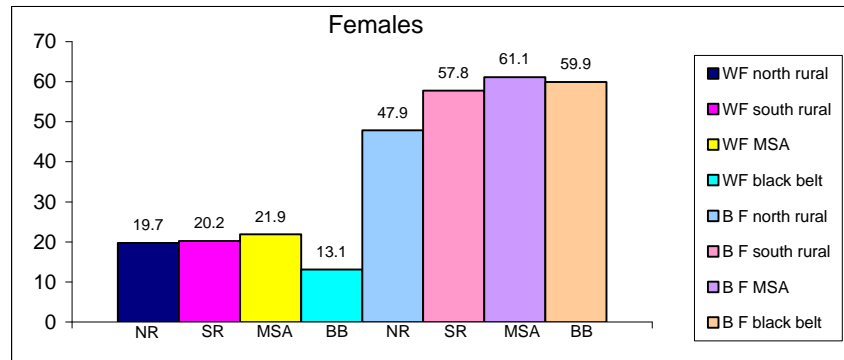
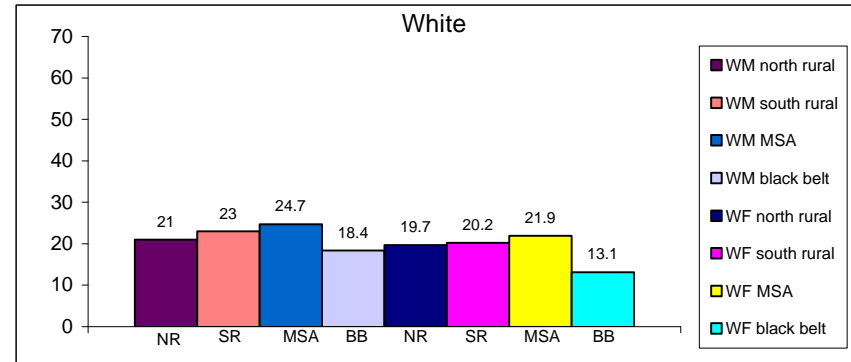
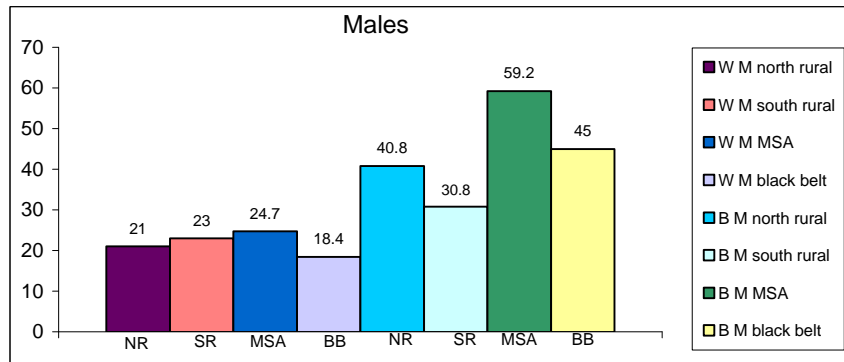
# Diabetes

## Age-adjusted Death Rates by Region, Race and Sex Alabama 1998 to 2000

Rate per 100,000 2000 standard million

Shaded cells show fewer than 20 deaths. Rates are unreliable.

Deaths	BF	WF	BM	WM	Total
NR	36	276	18	206	536
MSA	671	928	415	704	2,718
SR	126	157	41	118	442
BB	140	27	64	24	255
<b>Total</b>	<b>973</b>	<b>1,388</b>	<b>538</b>	<b>1,052</b>	<b>3,951</b>



## Diabetes

### Race-sex-region-specific age-adjusted death rates; significance tests are at the 95% confidence level

- For black females and white males, region is not a significant predictor of mortality.
- For white females, the Black Belt rate is significantly lower than for any other comparison region.
- The rate for black males is significantly higher in the MSA compared to the south rural region.
- Black females have a significantly higher rate than black males only in the south rural region.
- Black females have a significantly higher rate than white females for every region.
- Black males have a significantly higher rate than white males in the Black Belt and MSA regions.

# HIV Disease

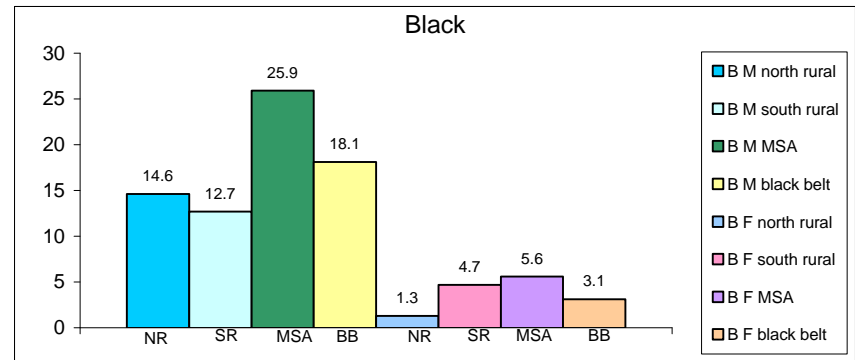
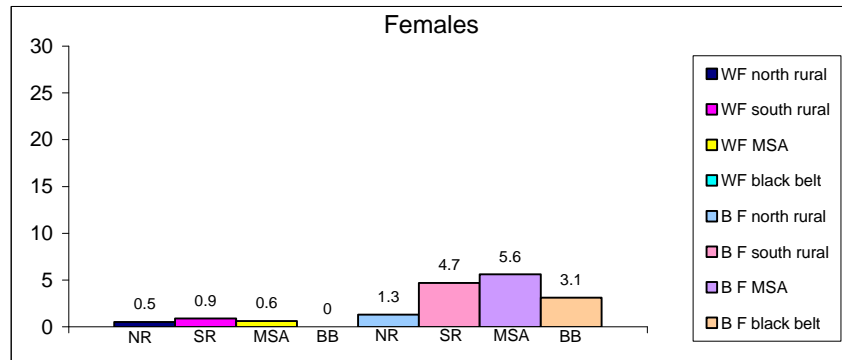
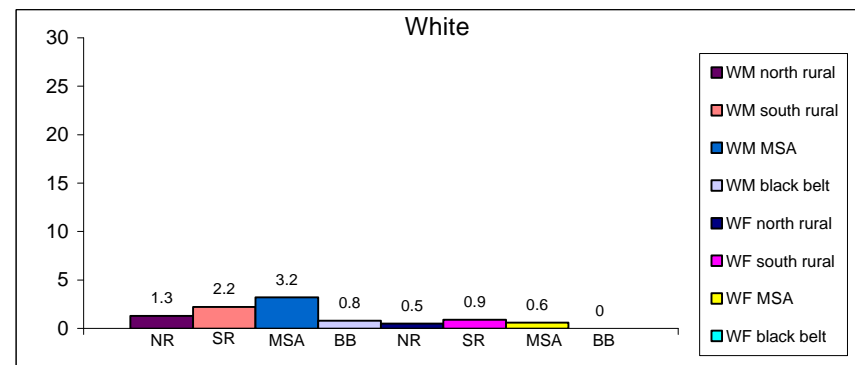
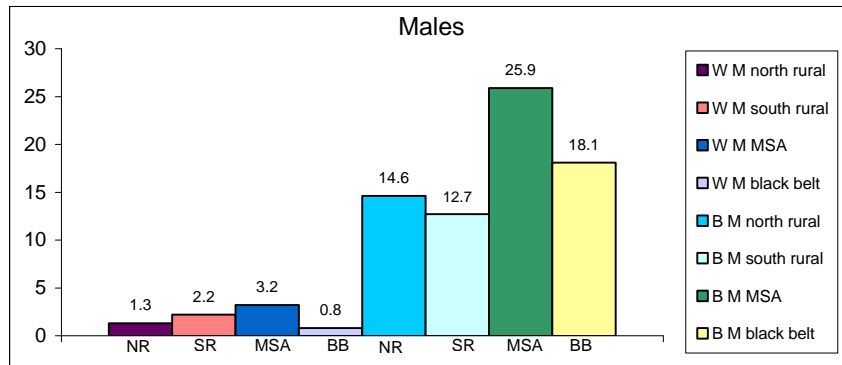
## Age-adjusted Death Rates by Region, Race and Sex

### Alabama 1998 to 2000

Rate per 100,000 2000 standard million

Shaded cells show fewer than 20 deaths. Rates are unreliable.

Deaths	BF	WF	BM	WM	Total
NR	1	4	10	11	26
MSA	72	21	262	107	462
SR	10	4	22	11	47
BB	6	0	27	1	34
<b>Total</b>	<b>89</b>	<b>29</b>	<b>321</b>	<b>130</b>	<b>569</b>



## Human Immunodeficiency Virus (HIV) Disease

Race-sex-region-specific age-adjusted death rates; significance tests are at the 95% confidence level

- The small number of deaths makes regional significance tests meaningless for black and white females and white males.
- Black males of the south rural region have a significantly lower rate than metropolitan black males.
- Regardless of race, metropolitan males have a significantly higher rate than females.
- Metropolitan black males and females have significantly higher rates than white males and females, respectively.

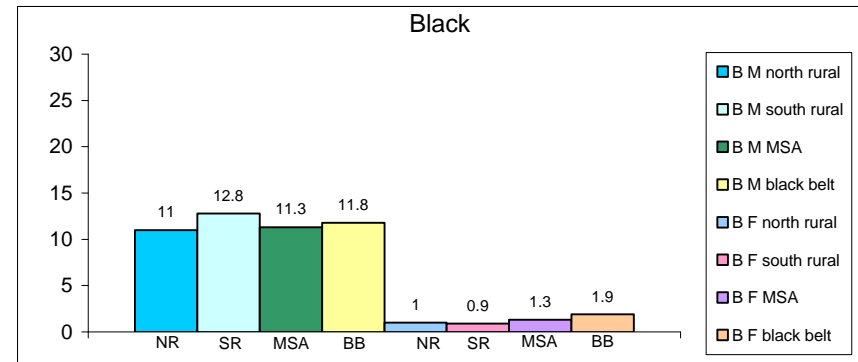
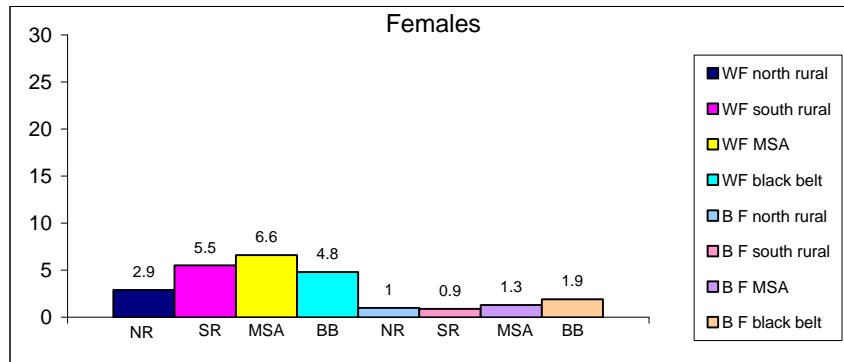
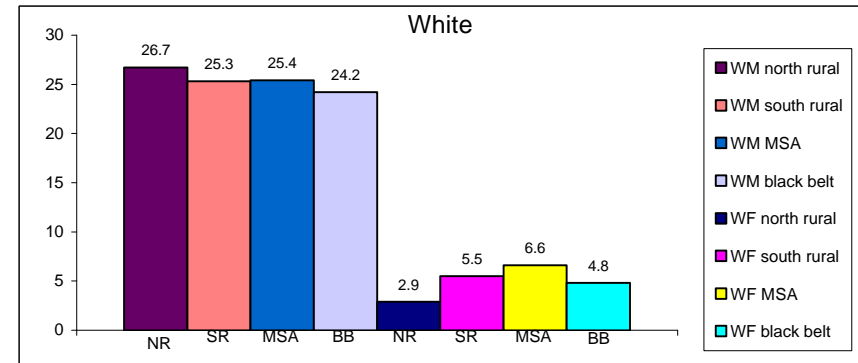
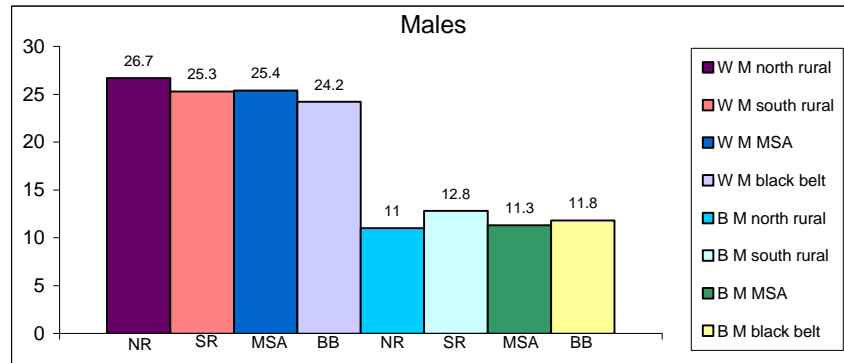
# Suicide

## Age-adjusted Death Rates by Region, Race and Sex Alabama 1998 to 2000

Rate per 100,000 2000 standard million

Shaded cells show fewer than 20 deaths. Rates are unreliable.

Deaths	BF	WF	BM	WM	Total
NR	1	28	6	230	265
MSA	16	235	119	828	1,198
SR	2	28	26	125	181
BB	4	6	19	29	58
<b>Total</b>	<b>23</b>	<b>297</b>	<b>170</b>	<b>1,212</b>	<b>1,702</b>



## Suicide

### Race-sex-region-specific age-adjusted death rates; significance tests are at the 95% confidence level

- Race-sex specific rates vary little by region, and no region has consistently higher rates.
- For white females, the death rate in the MSA region is significantly higher than the north rural region.
- Rates for white males are significantly higher than black males in the MSA and south rural regions.
- The small number of deaths makes regional significance tests meaningless for black females.
- While significance tests often were not possible, males have strikingly higher rates than females across both races and all regions.



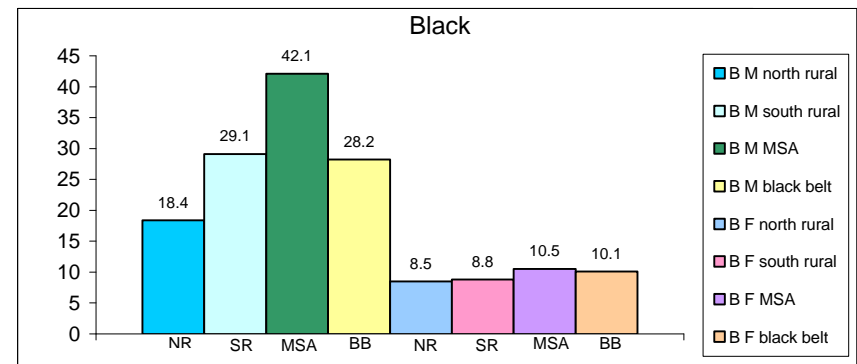
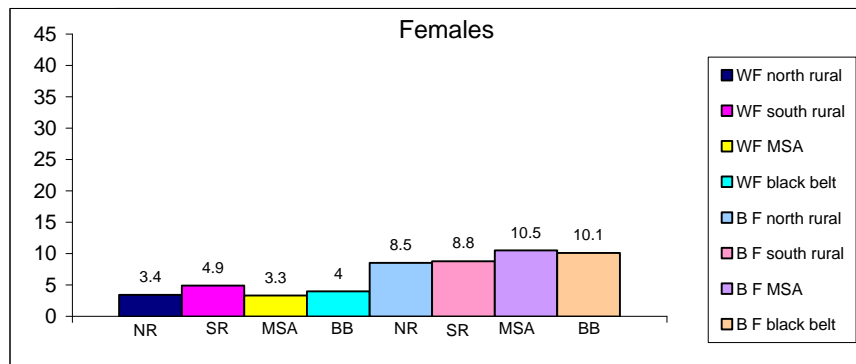
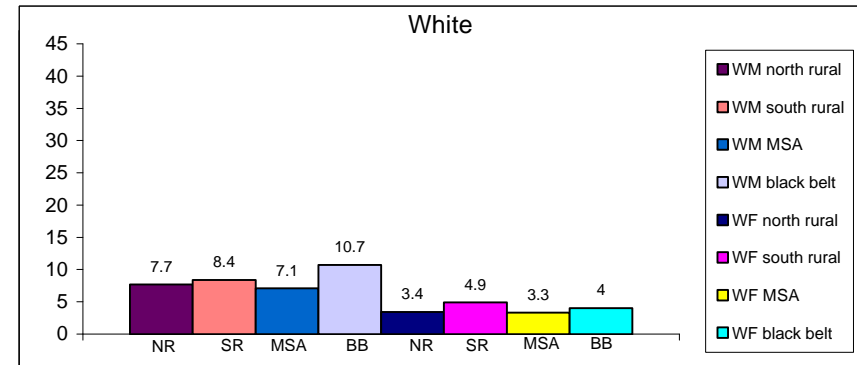
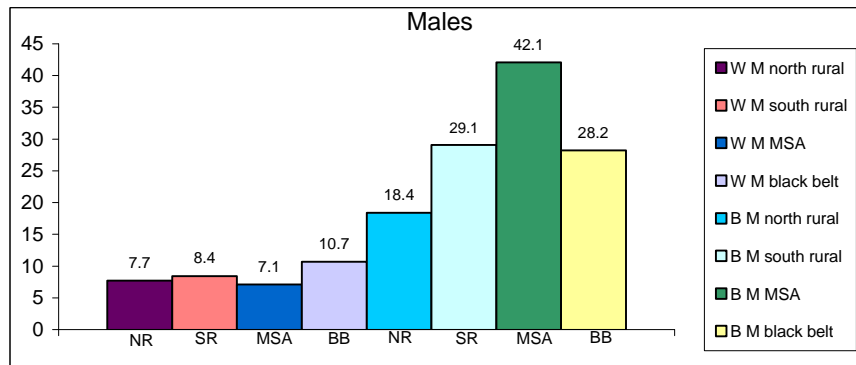
# Homicide

## Age-adjusted Death Rates by Region, Race and Sex Alabama 1998 to 2000

Rate per 100,000 2000 standard million

Shaded cells show fewer than 20 deaths. Rates are unreliable.

Deaths	BF	WF	BM	WM	Total
NR	7	28	13	63	111
MSA	140	114	495	234	983
SR	20	24	57	40	141
BB	23	5	50	14	92
<b>Total</b>	<b>190</b>	<b>171</b>	<b>615</b>	<b>351</b>	<b>1,327</b>

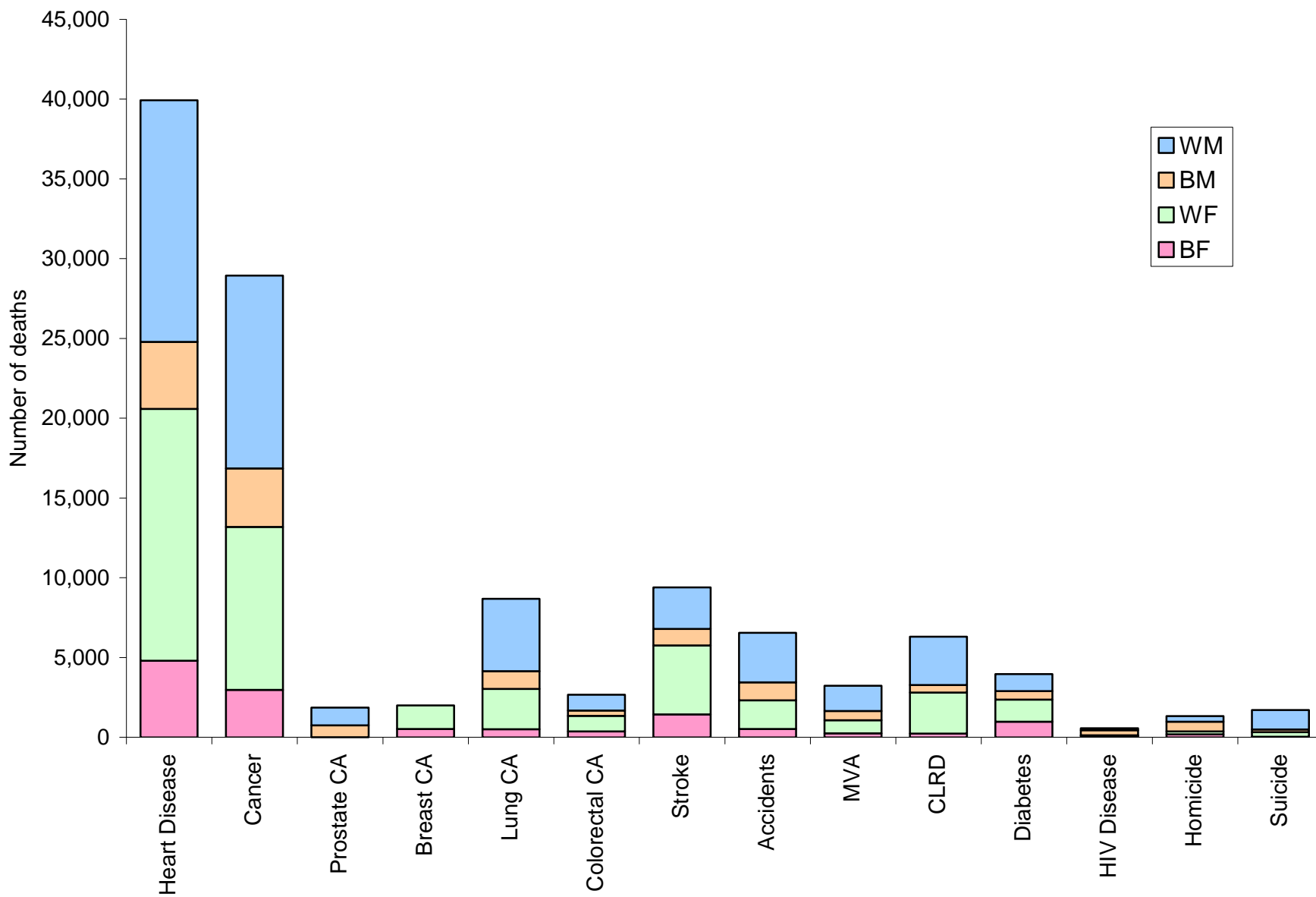


## Homicide

### Race-sex-region-specific age-adjusted death rates; significance tests are at the 95% confidence level

- Region is not a statistically significant predictor of mortality for females or white males.
- Metropolitan black males have a significantly higher rate than black males in the three rural regions.
- Black females have a significantly higher rate than white females in the MSA region.
- Black males have a significantly higher rate than white males in the MSA and south rural regions.
- Metropolitan males have a significantly higher rate than females.

## Deaths by Cause, Race and Sex, Alabama 1998 to 2000



# *Appendix*





# Methodology

The study period for this *Alabama Chartbook of Regional Disparities in Mortality* is 1998 to 2000. The age-adjusted cause-specific death rates are calculated using three years of death data and the combined populations for the same three years.

## Population

The analyses are for white and black Alabamians. The populations for 1998 and 1999 are based on Census estimates. The Census uses birth and death data, migration, institutional, and military data to make population estimates. For 2000, the actual Census figures are used. For Alabama, the Census 2000 population percentages are 71.1 percent white, 26.0 percent black or African American, 0.5 percent American Indian and Alaskan Native, 0.7 percent Asian, 0.0 percent Native Hawaiian and Other Pacific Islander, and 1.7 percent other or multiple races. Races other than black and white are not used in these analyses. Four counties in Alabama have less than 1,000 Alabamians who are of the black race: Winston, Cullman, Blount and Cleburne. Population bases used to calculate the three-year rates are listed on page 29.

## Regions

### Metropolitan Statistical Areas

The US Office of Management and Budget (OMB) designates MSA counties. MSAs are comprised of counties with a city of 50,000 or more population and surrounding counties that meet certain criteria, such as 50% of the employed population commuting to an adjoining qualified MSA county. In 2003 the OMB revised the MSA designations. For instance, Lowndes County was recently designated as part of the Montgomery MSA region because at least 25 percent of the county's workforce commutes to Montgomery. These analyses precede that designation and include Lowndes in the Black Belt.

### North and South rural

No widely accepted designations of rural counties exist in Alabama. Often counties that are not MSA-designated counties are classified as rural. However, a great deal of area in MSA counties can be very rural territory. For instance, Lowndes County, recently designated as a MSA county, has more than 60 percent of the population living in rural areas.<sup>1</sup> Being designated as a rural or urban county allows the use of different funding and grant sources. Some counties prefer a rural or urban designation depending on the type of money being sought for improvements. For the purposes of this study, counties not MSA-designated in 2000 were classified as rural.

### Black Belt

Traditionally, the phrase Black Belt referred to a vast stretch of fertile, dark soil farmland conducive to cotton farming extending from Georgia through Alabama and Mississippi. While the soil color gave the region its name, historically, African Americans have predominantly populated the counties that make up the Black Belt. Definitions of the specific counties in Alabama that make up the Black Belt vary greatly.<sup>2</sup> Based strictly on soil composition, Montgomery County is included in the Black Belt; however, many other definitions treat Montgomery as an urban county and place it outside the Black Belt. In 1949, V.O. Key, a Southern political scientist included those counties where blacks totaled 50 percent or more of the population in 1940.<sup>3</sup> Fourteen counties in south Alabama met this definition. In 1982, Bogie and Harrison<sup>4</sup> defined the Black Belt according to three criteria in place from 1880 to 1910- black soil coloration, majority black and plantation agriculture. Their criteria include 11

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<sup>1</sup> Rural counties of Alabama. Center for Business and Economic Research. Found July 29, 2003 <http://cber.cba.ua.edu/edata/maps/rural2000.jpg>

<sup>2</sup> See Hollingsworth JS. Population changes in Alabama's Black Belt: 1880 to 1990. Auburn University at Montgomery. Center for Demographic and Cultural Research, January 1993.

<sup>3</sup> Key, VO Jr. *Southern Politics*. New York: Vintage Press. 1949.

<sup>4</sup> Bogie, DW and Harrison DE. An examination of population changes in Alabama's Black Belt counties: 1960-1970 and 1970-1980. *Sociological Spectrum*, 2: 351-65, 1982.

counties. Today, the Rural Business and Economic Development Program located at Tuskegee University defines 13 counties as Black Belt but only targets 5 of the counties.<sup>5</sup> For this study, the Black Belt is defined as Bullock, Choctaw, Dallas, Greene, Hale, Lowndes, Macon, Marengo, Perry, Pickens, Sumter and Wilcox excluding the MSA counties of Montgomery, Autauga, Elmore, Lee and Russell. With two exceptions, the ADPH Children's Health Insurance Program's (CHIP) Regions of Interest definition of north rural, south rural, metropolitan statistical areas and the Black Belt was followed. In this CHS study, Pickens and Choctaw counties were included in the Black Belt while the CHIP definition designated them as north rural and south rural counties, respectively. These counties, frequently included in many Black Belt definitions, were included in the Black Belt region to produce a sufficient sample size to allow valid comparisons among the four regions.

## **Cause of Death**

Mortality data for this chart book are from death certificates filed with the Center for Health Statistics of the Alabama Department of Public Health for residents of Alabama. Data reflect the underlying cause of death, defined as the disease or injury initiating the sequence of events that leads directly to death. For this study, deaths are classified using the International Classification of Diseases (ICD), Versions 9 and 10. Data for 1998 are coded according to the ICD-9, and data for 1999 and 2000 are classified using the ICD-10. Comparability ratios from the National Center for Health Statistics (NCHS) are applied to deaths for 1998 to account for the differences in the two classification versions. The ICD codes are listed on page 27. Data are presented according to the usual residence of the decedent rather than the geographic location where a death occurred.

## **Mortality Data Limitations**

Death certificate data are inadequate for estimating the prevalence of a disease. Death certificates are not intended to provide information on all of the medical conditions of a decedent, but instead, to provide information relating to the cause of death. Physicians vary in the way they interpret causal sequences, and they may have difficulty selecting a single underlying cause of death for a person with multiple chronic diseases. For this regional study, the focus is the difference in the death rates, though such rates do not reflect the entire burden of a disease in a particular population.

## **Age-adjusted Rates**

Age-adjustment is a mathematical technique for removing the effects of age from crude rates to allow meaningful comparisons across populations with different underlying age structures. Comparing the heart disease death rate in Shelby County to that of Greene County may be misleading if Greene County has an older population that leads to a higher crude death rate. Age-adjusted rates are calculated by applying the age-specific rates of various populations to a single standard population. In this publication, the 2000 Standard Million is the standard population chosen. The age-adjusted rate does not provide a genuine death rate, but rather affords a picture of what the death rates might be if the two comparison populations had exactly the same age-structured population.

## **Small Number Limitations**

When using vital events data for studying small geographic areas or for examining specific medical or social factors, the number of events reported in a given year may be very small. Understanding the statistical limitations of small numbers is important in conducting analyses. Any time something is measured, error is almost inevitable. Error can be based on the accuracy of the reports, or alternately, on the number of the events or the size of the population. Some error is random; and when the numbers are very large, random error does not affect the usefulness of the data. However, when the number of vital events is very small or the population of the area is very low, random errors in data collection, or even randomly occurring events, can cause drastic fluctuations in rates.

Additionally, for cause-specific data, the number of deaths in the age groupings used to calculate age-adjusted rates is often extremely small. Small numbers can cause rates to fluctuate drastically making

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<sup>5</sup> Rural Business and Economic Development Program. Found January 17, 2003 [http://agriculture.tusk.edu/rural\\_dev.htm](http://agriculture.tusk.edu/rural_dev.htm).

the rates unreliable. Age-adjusting adds uncertainty to any set of estimates because age-adjustment requires not just a single estimate for the entire population but also several estimates, one for each age subgroup. Subgroup estimates are less certain because they are based on smaller numbers than the whole.<sup>6</sup>

One way to counteract random error is to increase the number of years or to enlarge the area being studied. Otherwise, calculations may be correct but have very limited practical value. To stabilize rates in this publication, three years of mortality data were combined and multi-county regions were constructed. Even with these data combinations, some of the age-adjusted rates are based on fewer than 20 deaths. Consult page 28 for the death frequencies and confidence intervals accompanying the age-adjusted rates.

## Significance Tests

When comparing two age-adjusted death rates to determine whether a statistically significant difference exists, data analysts often examine the overlap between the two confidence intervals. If the intervals overlap, there is no significant difference. The number of deaths affects the width of the confidence interval, creating a wider variability for rates based on smaller numbers. Age-adjusted rates based on less than 20 events are considered unstable and should not be used for comparison purposes.<sup>7</sup> The method of examining overlap between confidence intervals is considered a conservative test of significance.<sup>8</sup> In this study, using the 95% confidence level, many death rates were close to being significantly different. With a less conservative significance test, a few more of the comparison death rates may have been significantly different.

## ICD-9 and ICD-10 Codes

CAUSE OF DEATH	ICD 9 CODE	ICD 10 CODE
Human Immunodeficiency Virus Disease	042-044	B20-B24
Malignant Neoplasms	140-208	C00-C97
Colon, Rectum and Anus	153-154	C18-C21
Trachea, Bronchus and Lung	162	C33-C34
Breast	174-175	C50
Prostate	185	C61
Diabetes Mellitus	250	E10-E14
Diseases of the Heart	390-398, 402, 404, 410-429	I00-I09, I11, I13, I20-I51
Cerebrovascular Diseases	430-434, 436-438	I60-I69
Chronic Lower Respiratory Dis.	490-494, 496	J40-J47
Accidents	E800-E869, E880-E929	V01-X59, Y85-Y86
Motor Vehicle Accidents	E800-E848, E929.0, E929.1	V02-V04, V09.0, V09.2, V12-V14, V19.0-V19.2, V19.4-V19.6, V20-V79, V80.3-V80.5, V81.0-V81.1, V82.0-V82.1, V83-V86, V87.0-V87.8, V88.0-V88.8, V89.0, V89.2
Intentional Self-Harm (Suicide)	E950-E959	X60-X84, Y87.0
Assault (Homicide)	E960-E969	X85-Y09, Y87.1

<sup>6</sup> Gerzoff, R. and Williamson, GD. Who's number one? The impact of variability on rankings based on public health indicators. *Public Health Reports*. March-April 2001 16: 158-164.

<sup>7</sup> Pennsylvania Department of Health. Health Statistics—Technical Assistance. Tools of the Trade. Comparing age-adjusted rates. Found July 29, 2003 <http://www.health.state.pa.us/stats/techassist/compareadj.htm>

<sup>8</sup> Schenker, N. and Gentleman J. On judging the significance of differences by examining the overlap between confidence intervals. *The American Statistician*. August 2001. 55(3).





**County Populations**  
**Three-Year Total and One-Year Average**  
**By Race, Alabama 1998 to 2000**

COUNTY	1998-2000 COMBINED		ONE YEAR AVERAGE	
	WHITE	BLACK	WHITE	BLACK
<b>Total</b>	<b>9,467,393</b>	<b>3,365,844</b>	<b>3,155,798</b>	<b>1,121,948</b>
<b>MSA</b>				
Autauga	101,735	25,744	33,912	8,581
Baldwin	351,915	51,387	117,305	17,129
Blount	140,411	2,027	46,804	676
Calhoun	273,737	66,581	91,246	22,194
Colbert	130,903	28,095	43,634	9,365
Dale	114,028	28,357	38,009	9,452
Elmore	145,551	43,515	48,517	14,505
Etowah	260,870	46,095	86,957	15,365
Houston	192,017	64,659	64,006	21,553
Jefferson	1,204,359	749,185	401,453	249,728
Lauderdale	227,778	25,325	75,926	8,442
Lawrence	79,656	16,002	26,552	5,334
Lee	231,289	78,220	77,096	26,073
Limestone	161,394	26,898	53,798	8,966
Madison	623,126	183,074	207,709	61,025
Mobile	775,435	396,985	258,478	132,328
Montgomery	348,467	297,968	116,156	99,323
Morgan	287,904	36,373	95,968	12,124
Russell	87,173	61,330	29,058	20,443
Shelby	388,824	34,958	129,608	11,653
St. Clair	171,169	17,704	57,056	5,901
Tuscaloosa	340,927	138,381	113,642	46,127
<b>NORTH RURAL</b>				
Cherokee	62,640	4,514	20,880	1,505
Clay	34,706	7,210	11,569	2,403
Cleburne	40,540	2,019	13,513	673
Cullman	223,533	2,174	74,511	725
DeKalb	173,318	3,583	57,773	1,194
Fayette	47,424	6,995	15,808	2,332
Franklin	84,220	4,293	28,073	1,431
Jackson	145,791	6,748	48,597	2,249
Lamar	41,696	6,010	13,899	2,003
Marion	88,396	3,440	29,465	1,147
Marshall	234,016	3,917	78,005	1,306
Randolph	47,157	15,107	15,719	5,036
Talladega	157,582	75,535	52,527	25,178
Walker	196,907	14,460	65,636	4,820
Winston	72,390	286	24,130	95
<b>BLACK BELT</b>				
Bullock	9,013	21,492	3,004	7,164
Dallas	53,982	84,966	17,994	28,322
Greene	5,551	23,947	1,850	7,982
Hale	19,817	30,717	6,606	10,239
Lowndes	9,697	29,661	3,232	9,887
Macon	9,244	60,441	3,081	20,147
Marengo	32,584	36,212	10,861	12,071
Perry	12,164	24,854	4,055	8,285
Sumter	12,595	33,359	4,198	11,120
Wilcox	11,584	28,364	3,861	9,455
<b>SOUTH RURAL</b>				
Barbour	43,152	38,629	14,384	12,876
Bibb	45,760	8,698	15,253	2,899
Butler	37,417	26,910	12,472	8,970
Chambers	67,520	41,671	22,507	13,890
Chilton	99,450	13,364	33,150	4,455
Clarke	47,154	37,549	15,718	12,516
Coffee	101,307	23,628	33,769	7,876
Conecuh	23,163	17,766	7,721	5,922
Coosa	22,546	12,721	7,515	4,240
Covington	96,651	15,233	32,217	5,078
Crenshaw	29,709	10,948	9,903	3,649
Escambia	73,832	34,219	24,611	11,406
Geneva	65,614	9,178	21,871	3,059
Henry	30,503	16,989	10,168	5,663
Monroe	41,863	29,425	13,954	9,808
Pike	53,581	31,928	17,860	10,643
Tallapoosa	88,204	32,378	29,401	10,793
Washington	34,752	15,443	11,584	5,148