

Alabama Rural Health Report

Vol. 1 No. 1

December 2001

Unintentional Injury Mortality in Alabama, 1994 - 1998



Alabama Rural Health Association
Post Office Box 4509
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Dear Readers:

Alabama has the Nation's third highest death rate from unintentional injuries! And, unintentional injury deaths in our state's rural communities are 43 per cent higher than in our urban communities! These statistics alone should get the attention of every Alabamian because of the high risk of dying from unintentional injuries.

This is a publication on Alabama deaths resulting from unintentional injuries and is presented by the Alabama Rural Health Association through its inaugural edition of *Alabama Rural Health Report*. It documents the significant impact of unintentional injuries in the everyday lives of our citizens, especially those who live or travel in rural Alabama. Many of you can remember when this information was described as "accidental" injuries. The terminology change to "unintentional" injuries was made largely to alter perceptions that such injuries and subsequent deaths were subject simply to chance and unavoidable. From a public health perspective we know that these deaths **are** avoidable and **can be prevented** through a prescription of both individual and community level adherence to effective safety measures. This report hopefully will stimulate reflection, discussion, and action in implementing safety measures which significantly reduce these troubling statistics.

The Alabama Rural Health Association is a non-profit organization devoted to bringing rural health issues before policy makers and the general public. Association dues are minimal and membership is open to anyone interested in improving rural Alabama's access to health care and its health status. Its mission of communication, education and advocacy provides a common forum for a great diversity of organizations and individuals. We invite you to join us in these efforts by completing and submitting a membership application which can found on the inside of the last page of this report.

Sincerely,

Clyde Barganier, President

UNINTENTIONAL INJURY MORTALITY IN ALABAMA, 1994-1998

- ! Alabama - 3rd highest unintentional injury death rate in nation
- ! Alabama - 2nd highest motor vehicle death rate in nation - significantly higher in rural counties
- ! Alabama - 2nd highest suffocation death rate in nation - significantly higher in rural counties
- ! Alabama - 5th highest fire death rate in nation - rural South Alabama 2½ time U.S. rate
- ! Machinery accident deaths significantly higher in rural North Alabama

Experiencing the devastation of losing a friend or relative when the death was preventable is a destructive and punishing reality for many Alabamians. The large number of crosses lining Alabama's highways provides physical evidence of the personal hurt and suffering that motor vehicle accidents have inflicted. However, there are a number of types of accidents other than those involving motor vehicles and Alabama's record is not good for several other types of accidents. This study analyzes deaths from unintentional injuries (also called accidental deaths) for several major types of accidents during the years 1994 through 1998.

A special comparison of death rates by type of accident is made between Alabama's rural and urban counties. Differences in behavior and exposures for residents of rural and urban counties produce a natural expectation that deaths by type of accident may vary in these areas. Urban counties are the 21 counties which were parts of Metropolitan Statistical Areas, as designated by the federal Office of Management and Budget, during the years covered by of this study. Urban counties are Autauga, Baldwin, Blount, Calhoun, Colbert, Dale, Elmore, Etowah, Houston, Jefferson, Lauderdale, Lawrence, Limestone, Madison, Mobile, Montgomery, Morgan, Russell, St. Clair, Shelby, and Tuscaloosa. The remaining 46 counties were considered rural. The Auburn-Opelika Metropolitan Statistical Area, which includes Lee County, was established on June 30, 1999 which follows the years covered in this study. This county was considered rural in this study.

Information presented in this study is by the county where the decedents resided rather than the county where the death occurred. Information recorded on Alabama Certificates of Death was used in this study. This information was obtained through the Centers for Disease Control and Prevention's WONDER System. The Internet address for this system is <http://wonder.cdc.gov>. Death rates are extensively used in this study. These are calculated as the number of deaths per 100,000 population per year for the specific population being described.

Unintentional injuries claimed 11,083 Alabamians during the years 1994 through 1998. The death rate was 51.59 deaths per 100,000 residents per year which was the third highest among all 50 states. This loss of 11,083 Alabamians is similar in number to losing everyone currently living in Bullock County to accidents over only a 5-year period of time. Only Mississippi and New Mexico recorded unintentional injury death rates higher than that for Alabama during these five years. Table 1 presents the number of unintentional deaths and

STATE	DEATHS	RATE
Mississippi	7,941	58.59
New Mexico	4,712	55.37
ALABAMA	11,083	51.59
Arkansas	6,220	49.75
Wyoming	1,184	49.44
Alaska	1,497	49.36
United States	472,029	35.58

rates for the five states with the highest rates and the United States during the study period. Alabama's death rate from unintentional accidents is nearly 45 percent higher than that for the nation.

Table 2 presents deaths and death rates for selected types of accidents to residents of Alabama's rural and urban counties during the years 1994-1998. The number of deaths by county of residence and type of accident appears in the Appendix at the end of this publication.

<p style="text-align: center;">TABLE 2 UNINTENTIONAL INJURY DEATHS AND DEATH RATES BY TYPE OF ACCIDENT RESIDENTS OF ALABAMA'S RURAL AND URBAN COUNTIES, 1994-1998</p>						
TYPE OF ACCIDENT (International Classification of Diseases, Ninth Revision codes)	RURAL COUNTY RESIDENTS		URBAN COUNTY RESIDENTS		ALABAMA RESIDENTS	
	DEATHS	RATE	DEATHS	RATE	DEATHS	RATE
Motor Vehicle Accidents E(810 - E825)	2,507	36.14	3,288	22.6	5,795	26.97
Accidental Falls (E880 - E888)	348	5.02	710	4.88	1,058	4.92
Accidental Suffocation (E911, E912, E913)	246	3.55	367	2.52	613	2.85
Fire, Flames, and Hot Substances (E890 - E899, E924)	204	2.94	346	2.38	550	2.56
Accidental Drowning (E830, E832, E910)	176	2.54	305	2.1	481	2.24
Accidental Poisoning (E850 - E869)	127	1.83	303	2.08	430	2.00
Natural and Environmental Factors (E900 - E909)	69	0.99	150	1.03	219	1.02
Machinery Accidents (E919)	64	0.92	68	0.47	132	0.61
All Other Types of Accidents	754	10.87	1,051	7.22	1,805	8.40
All Unintentional Injury Deaths (E800 - E929)	4,495	64.79	6,588	45.29	11,083	51.59

NOTE: Rates are per 100,000 population per year in specified area.

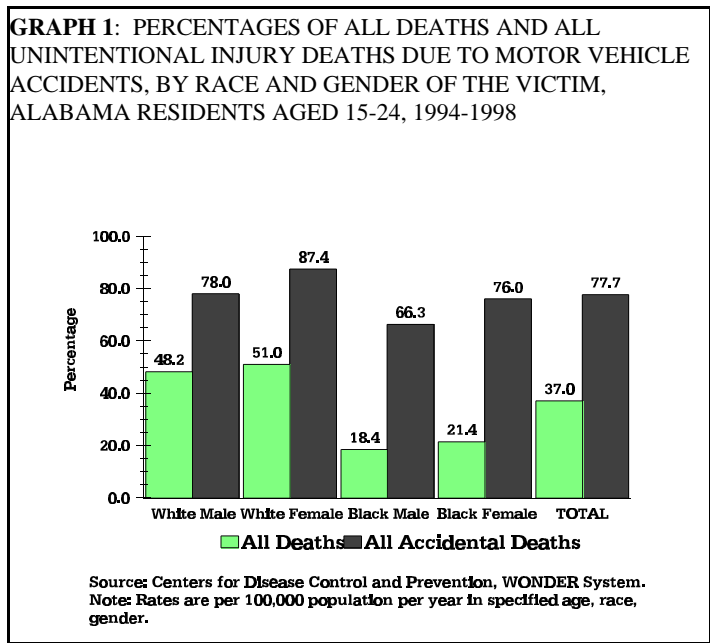
MOTOR VEHICLE ACCIDENTS

Alabama lost 5,795 residents to motor vehicle accidents during 1994 through 1998. This was slightly more than one half of all unintentional injury deaths during this time period. Alabama's

motor vehicle death rate of 26.97 deaths per 100,000 population per year was the second highest among all 50 states during the study period. Only Mississippi (32.88) experienced a higher rate. Alabama's motor vehicle death rate was over 65 percent higher than the national rate of 16.32 during this time period. The number of deaths to Alabama residents from motor vehicle accidents has remained rather constant during the decade of 1989-1998.

Age is one of the most recognized risk factors for motor vehicle fatalities. Younger and older persons are at greater risk of becoming motor vehicle fatalities than are persons in other age groups. Motor vehicle accidents claimed the lives of more Alabamians aged 15-24 years than any other cause of death. Motor vehicle accidents were responsible for 37.0 percent of all deaths and 77.7 percent of all unintentional injury deaths to Alabamians aged 15-24 years. Graph 1 presents the percentage of all deaths and all unintentional injury deaths comprised by victims of motor vehicle accidents for all Alabamians aged 15-24 years during the study period. These figures reveal the high risk for Alabama's children, especially for white females where 51.0 percent of all deaths and 87.4 percent of all accidental deaths were the result of motor vehicle accidents. There were 1,402 motor vehicle accident deaths to Alabamians aged 15-24 consisting of the following: 783 white males, 326 white females, 214 black males, 73 black females, and six males of other races. There were no motor vehicle accident deaths to females of other races in this age group.

The risk of becoming a motor vehicle fatality is even greater for Alabama's children aged 15-19 years. Motor vehicle accidents were responsible for nearly 42 percent of all deaths to Alabama's children aged 15-19. Over 52 percent of all deaths to Alabama's white males, over 65 percent of all deaths to white females, over 18 percent of all deaths to black males, and over 21 percent of all deaths to black females aged 15-19 years were the result of motor vehicle accidents. In addition to great personal suffering, there is an enormous economic cost associated with these accidents. Nationally, the National Highway Traffic Safety Administration estimated that the economic cost of police-reported fatal and nonfatal crashes involving drivers aged 15-20 years was about \$32 billion in 1997.¹

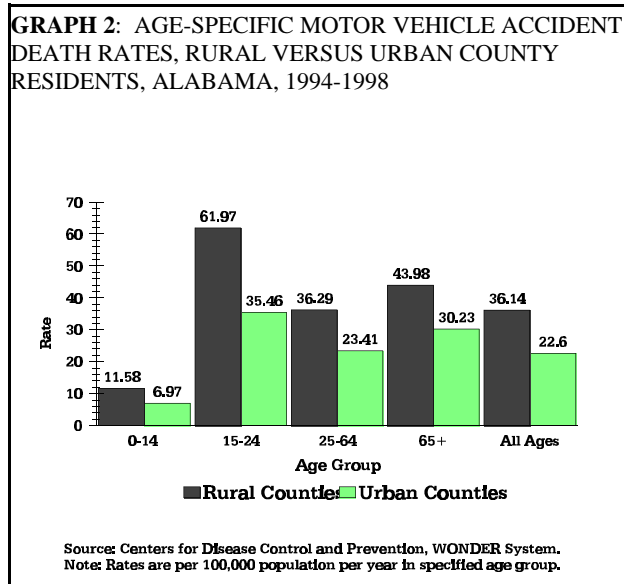


Nationally, the number of licensed drivers aged 70 years or older has increased by nearly 50 percent during the past decade.² With the aging of America and the Baby Boomers starting to turn 70 in 2016, this growing presence of older drivers will continue. This trend will be of greater interest in many of Alabama's rural counties which already have older populations than is found in most urban counties. This increasing number of older drivers raises concern since age-related declines in sensory and cognitive functions, and physical impairments due to medical conditions may affect some older people's driving ability.³ In addition, older drivers tend to be physically less capable of surviving motor vehicle crashes and more likely to die of their injuries than are people in other age

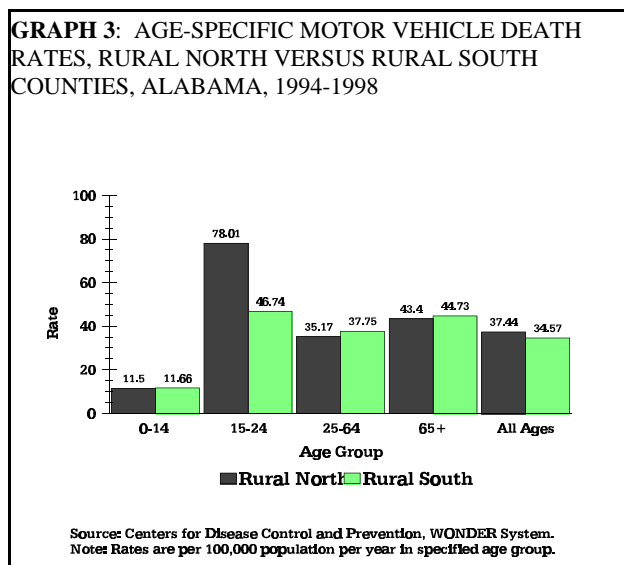
groups.⁴

Graph 2 presents motor vehicle death rates by age group for residents of Alabama's rural and urban counties during the study period. All rates were considerably higher for rural counties. Tests were performed to determine whether the differences between the rates for rural and urban counties were statistically significant and all were found to be highly significant.

An earlier study of selected health status indicators was presented in the *Health Status of Rural Alabamians*, published by the Alabama Rural Health Association in January 1998. This earlier study subdivided Alabama's 46 rural counties into those in the Appalachian region of North Alabama and those in South Alabama. Health-related outcomes were analyzed for these two areas separately in that publication. Numerous variations between health-related outcomes for residents of these two different rural areas were identified in that publication. The motor vehicle accident deaths to rural county residents in this current study were classified by age and residence using the same subdivision for North or South Alabama that was used in the earlier study. Age-specific rates for this analysis are presented in Graph 3. A listing of the counties comprising rural North Alabama and rural South Alabama areas can be found in the Appendix at the end of this publication.



The age-specific rates for all age groups were very similar for residents of the Rural South and Rural North counties except for the 15-24 year age group. The motor vehicle death rates for this age group were 78.01 in the rural counties of North Alabama compared to only 46.74 in the rural counties of South Alabama. This rate for the rural counties in North Alabama was more than double the rate for persons aged 15-24 residing in Alabama's urban counties (35.46). This high rate in the rural counties of North Alabama resulted from fatalities which appeared to be distributed throughout that area rather than being in clusters.



To decrease the greater risk of becoming a motor vehicle fatality for rural Alabama residents, the many risk factors must be individually considered and possible solutions or preventative measures identified and implemented. One preventative action which was recently enacted appears to be saving lives. Legislation making failure to use a seat belt a primary offense was passed in 1999 and went into enforcement in December 1999. Prior to this time, failure to use a seat belt was a

secondary offense and a motorist could not be pulled over for this violation, alone. A citation for failure to use a seat belt could be issued only when a motorist had been pulled over for a primary offense and a citation had been given for another offense. Failing to use a seat belt is now a primary offense. Motorists can be pulled over and issued a citation for this violation alone. According to Alabama Department of Public Safety information, the number of traffic fatalities documented by that agency decreased from 1,142 in 1999 to 986 during 2000, the first full year of having this important legislation. Enforcement of this promising legislation holds even greater promise for lowering motor vehicle accident fatalities in rural counties since seat belt usage surveys conducted by the Alabama Department of Public Health have consistently revealed that rural residents are less likely to use seat belts than are urban residents.

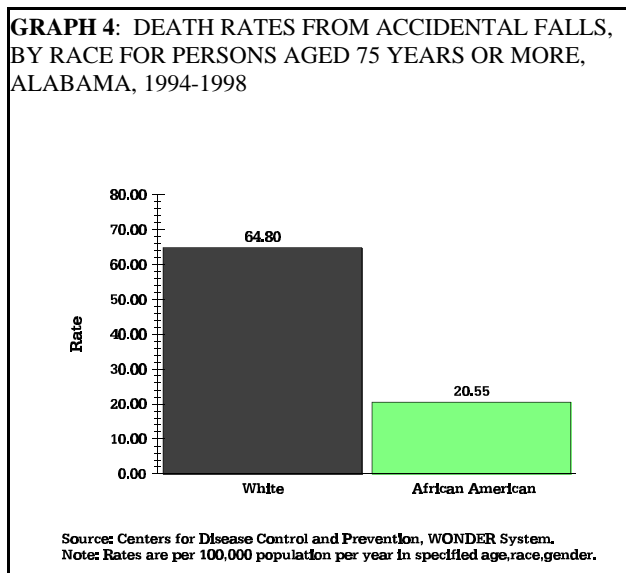
ACCIDENTAL FALLS

Alabama lost 1,058 residents during 1994 through 1998 due to accidental falls. The number of deaths from accidental falls has remained rather constant during this past decade. Alabama's death rate from accidental falls (4.92) was below the national rate (5.59).

The death rate from accidental falls for residents of rural Alabama counties (5.02) was slightly higher than that for urban counties (4.88). This difference was not found to be statistically significant. The death rate from accidental falls was higher for rural counties in North Alabama (5.65) than for rural counties in South Alabama (4.25). This difference in rates was found to be statistically significant.

Accidental falls is the leading cause of accidental death to Alabamians aged 75 or more years. During the study period, 688 Alabamians aged 75 or more died from accidental falls. A notable fact about these decedents is that 637 or 92.6 percent were White and only 51 or 7.4 percent were African Americans. There were no deaths to persons of other races. The death rate for Whites aged 75 or more was approximately three times higher than that for African Americans as can be seen in Graph 4. This accounts for the significant difference between the rates found in the rural counties of North Alabama versus the rural counties in South Alabama. The population in the rural counties in North Alabama is comprised of a higher percentage of Whites than those in South Alabama. Variation by gender was not found to be significant.

These figures cover only deaths from accidental falls without considering the suffering caused by the loss in quality of life caused by falls and the economic cost associated with these injuries. Alabama's elderly population will increase in number tremendously during the first half of the 21st century. The incidents of suffering and even death from accidental falls must be expected to increase with this population. It has been estimated that the cost of fall injuries could reach \$32.4 billion in the United States by 2020⁵.



ACCIDENTAL SUFFOCATION

Alabama lost 613 residents during 1994 through 1998 due to accidental suffocation. Alabama's death rate from accidental suffocation (2.85) exceeded the national rate (1.64) and was the second highest among all 50 states. Only Mississippi (3.00) had an accidental suffocation death rate higher than Alabama's. The number of deaths from accidental suffocation have remained rather constant during this past decade. In this study, suffocation included the inhaling of food or other objects as well as mechanical suffocation (falling earth, in a crib, etc.). The majority of all suffocation deaths (534 or 87.1 percent) involved the inhaling of food or other objects.

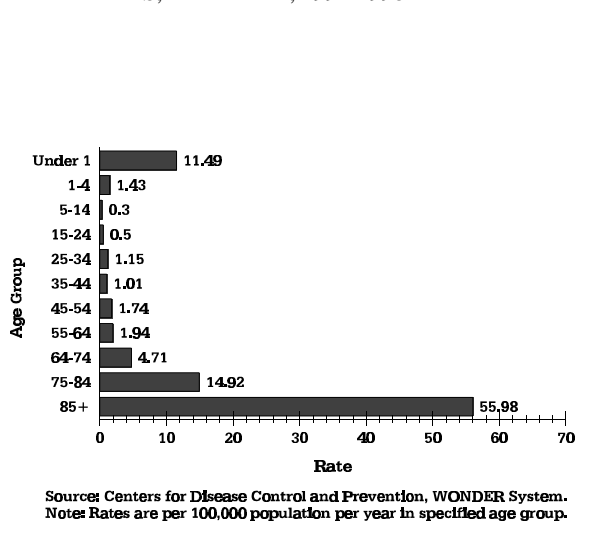
The death rate from accidental suffocation for residents of rural Alabama counties (3.55) was higher than that for urban counties (2.52). When tested for significance, the difference between these rates for rural and urban counties was found to be statistically significant. The death rate from accidental suffocation was slightly higher for rural counties in North Alabama (3.57) than for rural counties in South Alabama (3.52). This rate difference was not statistically significant.

As with accidental falls, the elderly population is at greater risk from accidental suffocation. Alabama residents aged 75 or more years recorded the second highest accidental suffocation death rate (25.02) for that age group in all 50 states. Alabama lost 309 residents aged 75 or more to accidental suffocation during the study period. This was more than one half (50.4 percent) of all accidental suffocation deaths to persons of all ages.

The figures on accidental suffocation deaths to Alabamians aged 85 years or more were even more alarming. Alabama lost 170 residents aged 85 or more to accidental suffocation during the study period. The death rate was 55.98 deaths per 100,000 population aged 85 or more per year. This was the highest accidental suffocation death rate for persons aged 85 or more among all 50 states. Mississippi recorded the second highest rate at 50.25 with the national rate being 26.59. Considering all types of accidents, only falls claimed more Alabama residents in this age group than did suffocation.

Infants are another population that is at higher risk for accidental suffocation. During the study period, Alabama lost 91 infants to accidents with suffocation responsible for 35 or over 38 percent of these deaths. Accidental suffocation was the leading cause of accidental death to Alabama infants.

GRAPH 5: AGE-SPECIFIC ACCIDENTAL SUFFOCATION DEATH RATES, ALABAMA, 1994-1998

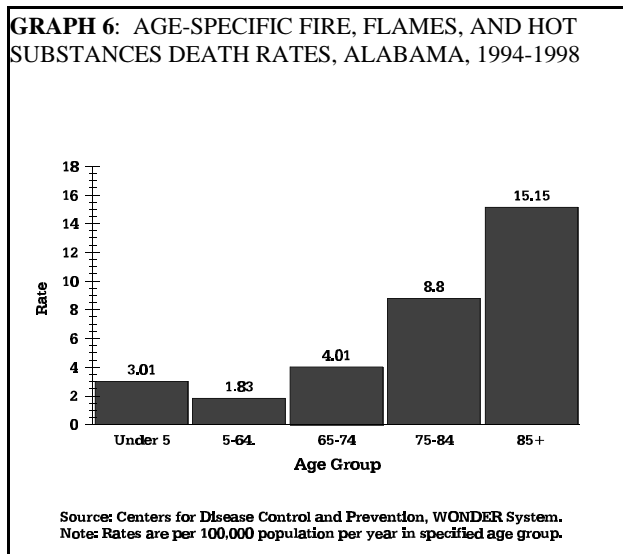


FIRE, FLAMES, AND HOT SUBSTANCES

Alabama lost 550 residents to fire, flames, and hot substances during 1994 through 1998. Deaths from these related causes have been steadily decreasing during this past decade. However, Alabama's death rate from fire, flames, and hot substances (2.56) exceeded the national rate (1.41) and was the fifth highest among all 50 states. Only Mississippi (4.07), Alaska (3.30), Arkansas

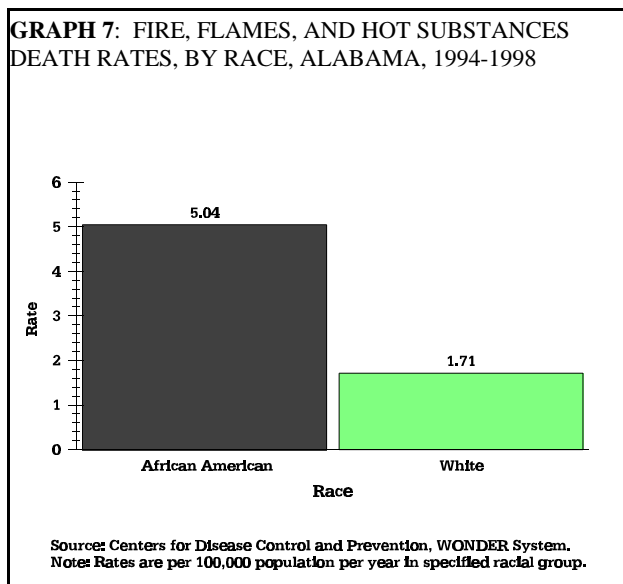
(2.80), and South Carolina (2.67) had death rates from fire, flames, and hot substances higher than Alabama's.

The death rate from fire, flames, and hot substances for residents of rural Alabama counties (2.94) was higher than that for urban counties (2.38). This difference was found to be statistically significant, though the degree of this significance has decreased since a similar study was published in the *Health Status of Rural Alabamians* in 1998. The death rate from fire, flames, and hot substances was highest for residents of the rural counties in South Alabama (3.58). Residents of the rural counties in South Alabama were at approximately two and one half times greater risk of becoming fire, flame, or hot substance fatalities when compared to the nation as a whole. The rate for residents of the rural counties in North Alabama was 2.4. While the difference between the rates for rural South Alabama and rural North Alabama was highly significant, the degree of significance has decreased since the 1998 study.



Preschool children under age five and older adults aged 65 and over are at greater risk of becoming fatalities from fire, flames, and hot substances. Nearly 43 percent of all fatalities were from these age groups. Graph 6 presents age-specific fire, flames, and hot substance death rates which clearly reveal this greater risk to the very young and older population.

African Americans are also at considerably greater risk from fire, flames and hot substances. Nearly 51 percent (280) of the 550 fatalities during the study period were African Americans, even though African Americans comprised just under 26 percent of Alabama's total population. The death rate for African Americans (5.04) was nearly three times greater than the rate for Whites (1.71). There was only one death involving an Alabamian of an other race. Alabama's African Americans were at approximately three and one half times greater risk of becoming fire, flame, or hot substance fatalities when compared to the nation as a whole.



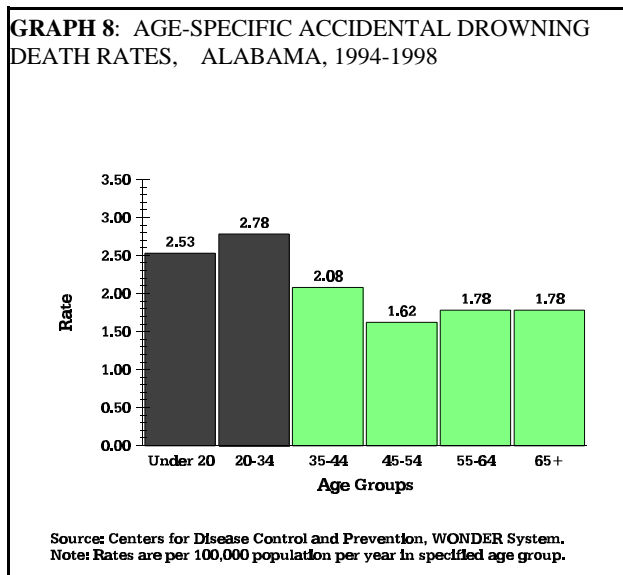
ACCIDENTAL DROWNING

Alabama lost 481 residents to accidental drowning during 1994 through 1998. Deaths from

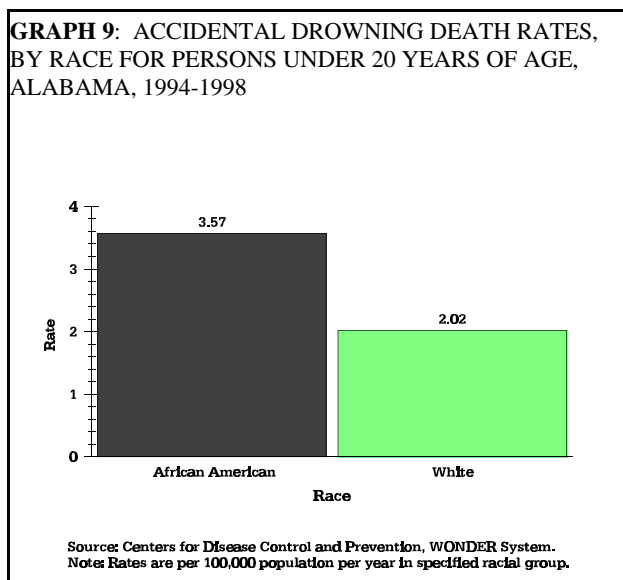
accidental drowning have remained rather constant during this past decade. Alabama's death rate from accidental drowning (2.24) exceeded the national rate (1.56) and was the eleventh highest among all 50 states.

The death rate from accidental drowning for residents of rural Alabama counties (2.54) was higher than that for urban counties (2.10); however, this difference was not found to be statistically significant. The death rate from accidental drowning was higher for rural counties in South Alabama (2.70) than for rural counties in North Alabama (2.4). This difference was not found to be statistically significant.

While Alabama's accidental drowning death rates exceeded those for the nation in most age groups; children, youth, and young adults appeared to be at greater risk. Nearly one third (153) of all accidental drowning victims during the study period were under 20 years of age. Nearly 60 percent (284) of all victims were under 35 years of age. This higher risk for Alabamians under age 35 can be seen in the age-specific rates presented in Graph 8.



Of Alabama's 481 accidental drowning victims during 1994-1998, 325 were White, 151 were African American, and 5 were other races. The greatest accidental drowning risk involved African American children under 20 years of age. Over 46 percent (71) of all African American victims were under 20 years of age. African American children under 20 years of age were at nearly twice the risk of accidental drowning than were White children in this age group. This risk can be seen in the rates presented in Graph 9.



ACCIDENTAL POISONING

Alabama lost 430 residents to accidental poisoning during 1994 through 1998. Deaths from accidental poisoning have been gradually increasing over this past decade. Alabama's death rate from accidental poisoning (2.00) was well below the national rate (3.66).

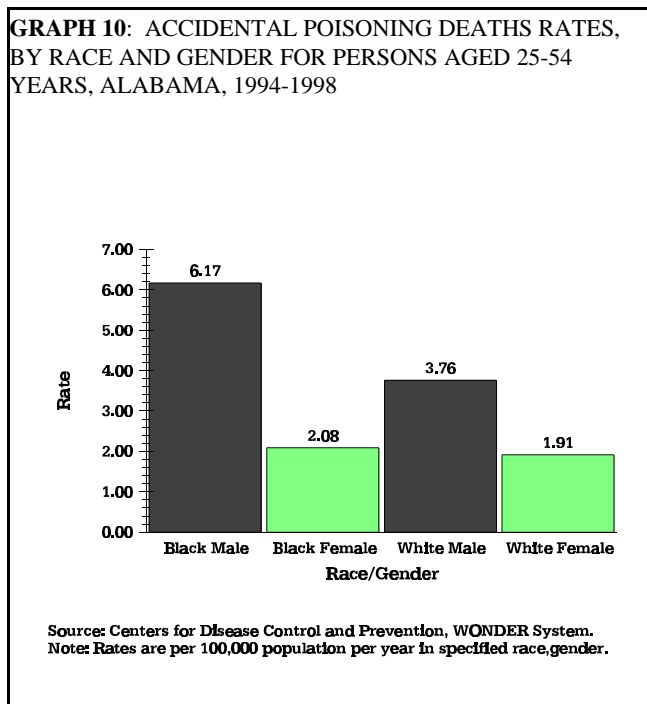
The death rate from accidental poisoning for residents of rural Alabama counties (1.83) was lower than the rate for urban counties (2.08). This rate difference was not found to be statistically significant. The death rate from accidental poisoning was higher for rural counties in North Alabama (1.88) than for rural counties in South Alabama (1.78). This difference was not statistically

significant.

An analysis of Alabama’s accidental poisoning data was complicated by the fact that over 40 percent of the 430 deaths were classified with “other” or “unspecified” sources of the poisoning. The data did indicate distinct age groups where the risk from accidental poisoning was greater.

Among children and youth, children aged one through four years of age were at a higher risk for poisoning. There were 16 accidental poisoning deaths involving children in this age group during the study period. Accidental poisoning by gas and vapors was a greater source of poisoning with carbon monoxide being of special danger.

Another higher risk age group included persons aged 25 through 54 years. There were 311 accidental poisoning deaths to Alabamians in this age group. This total accounted for over 72 percent of all accidental poisoning deaths. Among persons 25-54 years of age, males were at greater risk, especially Black or African American males. 189 of the 311 deaths to Alabamians in this age group, or nearly 61 percent, were males. Graph 10 clearly reveals the greater risk for males (especially African American males) in this age group. Accidental poisoning by drugs, medications, and biologicals was a much greater concern than gas and vapors with local anesthetics being of special concern.



The highest risk age group was comprised of Alabamians aged 75 or more years. There were 55 deaths from accidental poisoning involving Alabamians aged 75 or more years for a rate of 4.45. Rates were rather consistent by race and gender in this age group. While Alabama has one of the lower accidental poisoning death rates among all states when all ages are considered, Alabama’s rate for the 75 or more years age group is the third highest among all 50 states. Accidental poisoning by drugs, medications, and biologicals was a greater concern than gas and vapors with agents primarily affecting the cardiovascular system being of special concern.

NATURAL AND ENVIRONMENTAL FACTORS

Alabama lost 219 residents to natural and environmental factors during 1994 through 1998. This is a grouping of several types of events such as excessive heat, excessive cold,

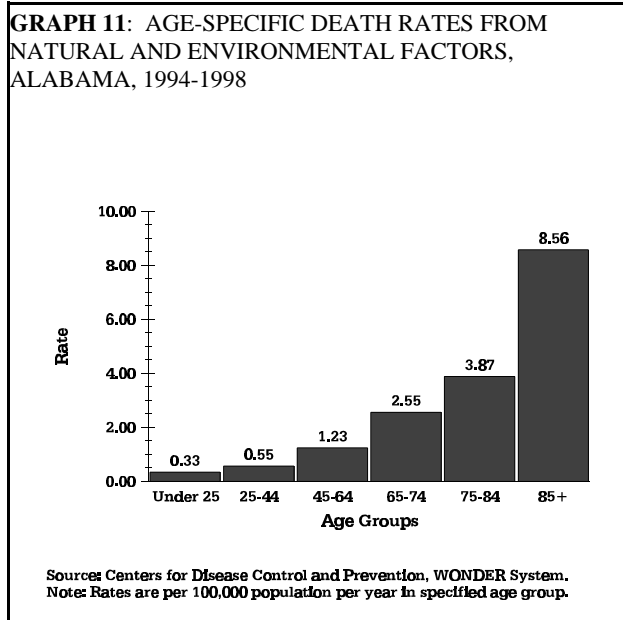
**TABLE 3
DEATHS FROM NATURAL AND ENVIRONMENTAL FACTORS
BY TYPE OF EVENT
ALABAMA, 1994-1998**

Excessive Heat	33	Excessive Cold	68
Exposure/Abandonment	22	Contact With Venomous Plants/Animals	7
Injuries Caused by Animals	5		
Cataclysmic Storms/Floods	71	Lightning	13
TOTAL		219	

abandonment or exposure, contacts with venomous animals or plants, injury by animals, lightning, and cataclysmic storms and floods. Deaths from several natural and environmental factors vary according to the actions of nature. Alabama's death rate from natural and environmental factors during 1994-1998 (1.02) was nearly double the national rate (0.58) and was the tenth highest among all 50 states.

The death rate from natural and environmental factors for residents of rural Alabama counties (0.99) was lower than the rate for urban counties (1.03); however, this difference was not statistically significant. This rate was higher for rural counties in North Alabama (1.03) than for rural counties in South Alabama (0.95). This rate difference was not statistically significant.

Alabama's elderly population is at greater risk for death from natural and environmental factors. Nearly 47 percent (102) of the 219 deaths involved persons aged 65 years or more. Graph 11 presents age-specific death rates which clearly reflect the increasing risk as age increases. Older residents were especially at risk from excessive heat or cold and exposure. Of the 123 deaths from these causes, 78 or over 63 percent of all victims were aged 65 or more. Cataclysmic storms and floods were responsible for 10 of the 17 deaths to children under 15 years of age.



MACHINERY ACCIDENTS

Alabama lost 132 residents to machinery accidents during 1994 through 1998. Nearly 86 percent of all machinery accident fatalities (113) were White males with 17 being African American males and two females. Alabama's death rate from machinery accidents (0.61) was higher than the national rate (0.37). The number of deaths from machinery accidents have remained rather constant over this past decade.

The death rate from machinery accidents for residents of rural Alabama counties (0.92) was higher than the rate for urban counties (0.47). This difference was found to be statistically significant. The death rate from machinery accidents was higher for rural counties in North Alabama (1.14) than for rural counties in South Alabama (0.67). This difference was statistically significant.

Agricultural machines were responsible for 74, or over 56 percent, of the 132 machinery accident deaths. This accounts for the difference between the rates for rural versus urban counties. This also accounts for a large portion of the difference between the rates in northern versus southern rural counties. Death rates were slightly higher for persons aged 45 through 84 years

OTHER TYPES OF ACCIDENTS

Several other types of accidents were not studied because of small numbers of deaths or concern over possible inaccuracy of classification. Types of accidents which were not included are railway accidents, boating accidents, air transport accidents, abnormal reactions to surgical or medical procedures, accidents involving falling objects, striking against or being struck by objects or persons, being caught between two objects, accidents caused by cutting or piercing objects, firearm accidents, explosions, electrocution, and late effects of accidental injuries.

According to the information reported on Certificates of Death, 324 Alabamians lost their lives in firearms accidents during the years 1994 through 1998. This would give Alabama an accidental firearm death rate of 1.51 which would be the second highest among all 50 states with only Alaska having a higher rate. However, there is a concern that several of these 324 deaths may have actually been suicides or instances where the intent of the injury could not be determined. Cause of death classification rules default the cause to accidental in many cases when adequate intent information is not provided. Because of this perceived reporting concern, deaths from firearms accidents were not studied separately.

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APPENDIX

DEFINITIONS OF RESIDENCY

Counties identified as “rural” in this study include the 46 Alabama counties which were not included as parts of Metropolitan Statistical Areas, as designated by the federal Office of Management and Budget, during the years 1994-1998. These 46 rural counties were further divided into those within the Appalachian Region of North Alabama which includes 21 counties and those within South Alabama which includes 25 counties.

Rural includes Barbour, Bibb, Bullock, Butler, Chambers, Cherokee, Chilton, Choctaw, Clarke, Clay, Cleburne, Coffee, Conecuh, Coosa, Covington, Crenshaw, Cullman, Dallas, DeKalb, Escambia, Fayette, Franklin, Geneva, Greene, Hale, Henry, Jackson, Lamar, Lee, Lowndes, Macon, Marengo, Marion, Marshall, Monroe, Perry, Pickens, Pike, Randolph, Sumter, Talladega, Tallapoosa, Walker, Washington, Wilcox, and Winston counties.

Rural North Alabama includes Bibb, Chambers, Cherokee, Chilton, Clay, Cleburne, Coosa, Cullman, DeKalb, Fayette, Franklin, Jackson, Lamar, Marion, Marshall, Pickens, Randolph, Talladega, Tallapoosa, Walker, and Winston counties.

Rural South Alabama includes Barbour, Bullock, Butler, Choctaw, Clarke, Coffee, Conecuh, Covington, Crenshaw, Dallas, Escambia, Geneva, Greene, Hale, Henry, Lee, Lowndes, Macon, Marengo, Monroe, Perry, Pike, Sumter, Washington, and Wilcox counties.

Urban includes Autauga, Baldwin, Blount, Calhoun, Colbert, Dale, Elmore, Etowah, Houston, Jefferson, Lauderdale, Lawrence, Limestone, Madison, Mobile, Montgomery, Morgan, Russell, St. Clair, Shelby, and Tuscaloosa counties.

RATE CALCULATION

Crude death rates were used in this study. These rates are calculated and expressed per 100,000 persons in the population during each year for which the rate applies. For example, the crude death rate of 26.97 for motor vehicle accidents during 1994-1998 means that during each of these years, 26.97 out of every 100,000 Alabamians lost their lives in motor vehicle accidents.

Age-adjusted death rates are used in many studies, especially where different populations are being compared and there is concern that differences between the ages of the populations may contribute to much of the rate variation. For example, one area being studied may have a significantly higher percentage of elderly persons in its population than another area being studied. It is possible that much of the difference between crude death rates for some causes of death in these two areas could be due to one area having a larger elderly population. Age-adjusted rates are also commonly used

when the same population is compared over a time period which is long enough for the age structure of the population to change. Age-adjusted death rates remove age of the population as a concern.

Specific causes of death which have a large proportion of younger aged decedents such as motor vehicle accidents, will have crude and age-adjusted death rates which are close in value. This can be seen in Table 4 for motor vehicle accidents where the median age of all decedents was only 35.21 years. The crude death rate was 26.97 and the age-adjusted rate was 26.3. Causes of death which have a large proportion of older aged decedents will usually have crude death rates which are higher in value than age-adjusted death rates. This can be seen in Table 4 for accidental suffocation where the median age for all decedents was 80.18 years. The crude death rate was 2.85 and the age-adjusted death rate was only 1.7.

Crude death rates were used in this study instead of age-adjusted rates for two reasons. First, the ages of decedents was rather young for most types of accidents. Thus, age would not be the major contributor to mortality and would not be likely to confound the study findings. The exceptions would be accidental falls and accidental suffocation where a greater proportion of decedents are older in age. Age-adjusted rates would be better for analyzing rate variation involving influences other than age for these causes of death. The second reason for using crude death rates is that crude rates have a meaning as was described above. The values of age-adjusted death rates only have relative meanings. Age-adjusted rates can only be used to compare the relative magnitudes when age difference is removed as a factor. For example, the age-adjusted rate of 26.3 for motor vehicle accidents during 1994-1998 does not mean that 26.3 out of every 100,000 Alabamians died each year in motor vehicle accidents. The value, 26.3, can only be compared to other age-adjusted rates to determine the relative magnitude of motor vehicle fatalities in Alabama during those years.

Table 4 presents the median age at death along with crude and age-adjusted death rates for all types of accidents included in this study. The 1940 U.S. Standard Million Population was used in calculating age-adjusted rates.

TABLE 4
UNINTENTIONAL INJURY CRUDE AND AGE-ADJUSTED DEATH RATES,
NATIONAL RANKING AMONG ALL 50 STATES, AND MEDIAN AGE AT DEATH
BY TYPE OF ACCIDENT
ALABAMA, 1994-1998

TYPE OF ACCIDENT (International Classification of Diseases, Ninth Revision codes)	CRUDE RATES		AGE-ADJUSTED RATES		MEDIAN AGE (years)
	RATE	RANK	RATE	RANK	
Motor Vehicle Accidents E(810 - E825)	26.97	2	26.3	4	35.21
Accidental Falls (E880 - E888)	4.92	41	2.4	43	77.35
Accidental Suffocation (E911, E912, E913)	2.85	2	1.7	4	80.18
Fire, Flames, and Hot Sub- stances (E890 - E899, E924)	2.56	5	2.1	5	51.88
Accidental Drowning (E830, E832, E910)	2.24	11	2.3	10	30.42
Accidental Poisoning (E850 - E869)	2.00	31	1.8	32	41.69
Natural and Environmental Factors (E900 - E909)	1.02	10	0.8	10	61.74
Machinery Accidents (E919)	0.61	17	0.5	17	52.92
All Other Types of Accidents	8.40	2	6.7	2	51.91
All Unintentional Injury Deaths (E800 - E929)	51.59	3	44.7	5	43.44
All Causes of Death	996.55	8	573.0	3	74.88

NOTE: Crude death rates are per 100,000 population per year. Age-adjusted death rates are per 100,000 standardized population per year. Ranking among states is from highest rate to lowest rate.

TABLE 5
ACCIDENTAL DEATHS BY TYPE OF ACCIDENT AND COUNTY OF RESIDENCE
ALABAMA, 1994-1998

County	All Accidents	Type of Accident								
		Motor	Drownin	Poisonin	Falls	Fire, Flames, and Hot	Machinery	Natural/ Environmental	Suffocation	All Other Accidents
Autauga	86	52	5	4	4	3	0	3	1	14
Baldwin	321	175	38	14	12	25	14	5	4	34
Barbour	74	41	3	5	6	3	4	0	3	9
Bibb	63	31	7	7	3	1	1	2	1	10
Blount	146	86	15	6	4	8	3	2	2	20
Bullock	57	33	2	3	5	5	1	0	0	8
Butler	87	42	6	4	1	3	2	1	0	28
Calhoun	273	154	25	9	13	9	6	13	1	43
Chambers	106	49	11	9	5	3	5	2	2	20
Cherokee	86	48	5	2	4	3	1	12	3	8
Chilton	121	61	10	8	2	7	6	1	2	24
Choctaw	54	39	3	0	2	3	1	0	0	6
Clarke	122	78	6	5	2	8	2	1	1	19
Clay	52	26	8	1	2	2	1	0	1	11
Cleburne	45	30	5	1	2	0	0	1	2	4
Coffee	119	65	14	11	4	4	3	3	1	14
Colbert	131	69	10	6	6	5	4	2	2	27
Conecuh	60	29	6	3	2	4	3	2	1	10
Coosa	42	27	1	2	2	2	0	2	1	5
Covington	125	74	13	9	6	3	1	3	1	15
Crenshaw	56	29	2	9	3	3	2	0	1	7
Cullman	196	100	12	18	7	9	5	1	3	41
Dale	113	59	9	6	5	2	4	1	1	26
Dallas	159	72	11	7	11	8	4	4	4	38
DeKalb	194	88	22	14	4	6	9	4	4	43
Elmore	161	90	14	5	4	8	7	0	4	29
Escambia	102	69	6	5	3	0	7	1	2	9
Etowah	284	128	36	13	14	12	14	5	3	59
Fayette	65	40	7	4	1	1	0	0	3	9
Franklin	102	61	13	6	4	2	2	1	0	13
Geneva	77	45	5	3	3	3	1	1	1	15
Greene	40	27	0	1	4	1	0	1	0	6
Hale	57	32	1	3	8	2	0	1	0	10
Henry	43	28	1	2	4	1	0	2	0	5
Houston	179	101	16	3	9	9	7	2	2	30
Jackson	161	96	10	4	4	9	6	2	4	26
Jefferson	1,522	697	172	121	93	58	106	56	13	206
Lamar	62	40	3	1	1	1	2	0	1	13
Lauderdale	246	129	25	9	6	8	11	2	3	53
Lawrence	138	76	16	9	10	3	2	0	0	22
Lee	163	89	11	6	6	8	8	2	0	33
Limestone	141	77	17	7	8	2	3	3	1	23
Lowndes	45	28	3	3	1	3	0	0	0	7
Macon	68	26	4	3	8	4	1	1	1	20
Madison	439	217	46	20	28	19	12	7	6	84
Marengo	85	47	7	7	7	5	1	2	1	8
Marion	119	71	14	6	3	6	2	0	1	16
Marshall	249	141	17	15	11	13	7	4	2	39
Mobile	901	409	108	52	55	60	57	26	7	127
Monroe	59	30	6	3	3	1	2	0	2	12
Montgomery	386	186	60	17	19	20	19	7	1	57
Morgan	274	136	22	18	6	14	12	2	4	60
Perry	50	26	5	2	3	2	2	1	0	9
Pickens	72	47	0	2	1	2	0	0	1	19
Pike	100	53	9	7	1	6	3	0	0	21
Randolph	85	53	4	9	4	2	2	0	0	11
Russell	134	75	14	7	7	10	3	4	0	14
St. Clair	150	74	12	7	9	10	6	2	3	27
Shelby	244	138	24	11	16	5	7	2	6	35
Sumter	51	25	3	5	8	1	0	2	1	6
Talladega	217	121	22	9	9	5	6	1	2	42
Tallapoosa	131	68	13	8	7	7	3	4	2	19
Tuscaloosa	319	160	26	23	18	15	6	6	4	61
Walker	272	164	22	9	15	7	12	2	4	37
Washington	50	27	4	4	5	2	1	1	1	5
Wilcox	62	36	3	1	7	2	7	1	0	5
Winston	90	55	8	0	0	3	1	0	4	19
ALABAMA	11,083	5,795	1,058	613	550	481	430	219	132	1,805

Publication of *Alabama Rural Health Report* is made possible through a grant provided by the National Rural Health Association.

Researchers, faculty members, students, and others are encouraged to submit articles on subjects of rural health interest for possible publication as an *Alabama Rural Health Report*. A copy of the article should be mailed to the ARHA Publications Review Committee, P. O. Box 4509, Montgomery, AL 36103.

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