

INJURY IN ARKANSAS: A STATE PROFILE



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AUTHORSHIP

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Introduction

Injuries to adults and children account for over 31 million hospital visits and 150,000 deaths in the United States annually, making injuries the leading cause of death for Americans under the age of 34 and a major cause of death and disability at all ages. The state of Arkansas suffers disproportionately from injuries, with a higher incidence rate per capita in many injury categories and in most age groups. This document is intended to provide current, accurate information about the location, victims, and consequences of injuries in Arkansas.

Injuries can affect everyone—all types and ages of people in every context of life. We have chosen to highlight this by organizing this profile around the locations where common injuries occur: in motor vehicles, in the home, during recreation, and at work. The *motor vehicle section* describes traffic related injury, pedestrian injury, and motorcycle injury. In the *home section*, fires, falls, and poisoning are profiled. *Recreational injuries* discussed include drowning, bicycles, all terrain vehicles, and others. *Work-related injuries* in industrial and agricultural settings are described. Finally, sections on *intentional injuries* and *special injury populations* are also included.

For each injury type, information regarding national injury patterns will be summarized. For Arkansas, state and county-level mortality data, state-level hospitalization information, and reviews of other specialized databases will be presented, as available. While no emergency department level injury surveillance system currently exists in Arkansas, detailed information on emergency medical services ambulance runs are tabulated and presented as a proxy for emergency department usage. Promising prevention strategies for certain injury classifications will be summarized. Resources and opportunities for prevention activities in Arkansas will be reviewed, and issues of data availability discussed.

Data Resources

Injury mortality data are readily available for both Arkansas and the United States from state vital statistics and in summary form from the Centers for Disease Control.¹ These data formed the basis for mortality figures cited throughout this report and are an important basis for many analyses of injury trends and comparisons. For purposes of this report, injury mortality data through 1998 using ICD-9 external cause of injury codes (E-Codes) were tabulated and reviewed using suggested framework and categories developed by the Centers for Disease Control.² Starting in 1999, mortality data reporting changed format substantially with the introduction of ICD-10 based coding. These data are not directly comparable to the previous information, so were not included in the current report. A follow up report including data from 1999 forward is planned when further data are available.

Much of the information presented in this report is in the form of rates. Denominator data from the 2000 census were used throughout the report.³ Of note, when rates are generated, they are generally considered unreliable if the numerator is less than 20. Total numbers for some injury types are low in Arkansas, and rates presented must be interpreted with caution for this reason. If possible, larger aggregations of demographic groups were used in the report to avoid this problem. In some cases, however, rates are presented graphically to illustrate important patterns in this report even when some subgroups may have actual numbers too small to generate useful rates. When this is



the case, this is noted on the chart. In most cases, rates are rounded to a single decimal point for simplicity.

For most of the profile, crude injury rates are reported, based on data from the Center for Health Statistics at the Arkansas Department of Health. Age-adjusted rates and total national injury statistics regarding numbers of injury deaths used in the report were obtained from the WISQARS interactive injury database, Centers for Disease Control, unless otherwise noted. General resources reviewed for background information are noted in each section. A detailed tabulation of data used for this report is available from the Office of Injury Prevention.

Injury morbidity—the burden of nonfatal injury—can be much harder to estimate using



surveys and contact with participating hospitals, is planned to continue to improve data quality. (Personal communication, JE Carson, Arkansas Department of Health)

There is no current summary of data on emergency department visits or clinic visits related to injury in Arkansas, so some minor injuries not resulting in hospitalization are not accounted for in this report. EMS run data are used as a proxy for emergency system use due to injury in the state at this time. Development of an injury surveillance system at the emergency department level is under consideration for the state should resources allow.

A variety of other data resources, including specialized registries, poison center data, and

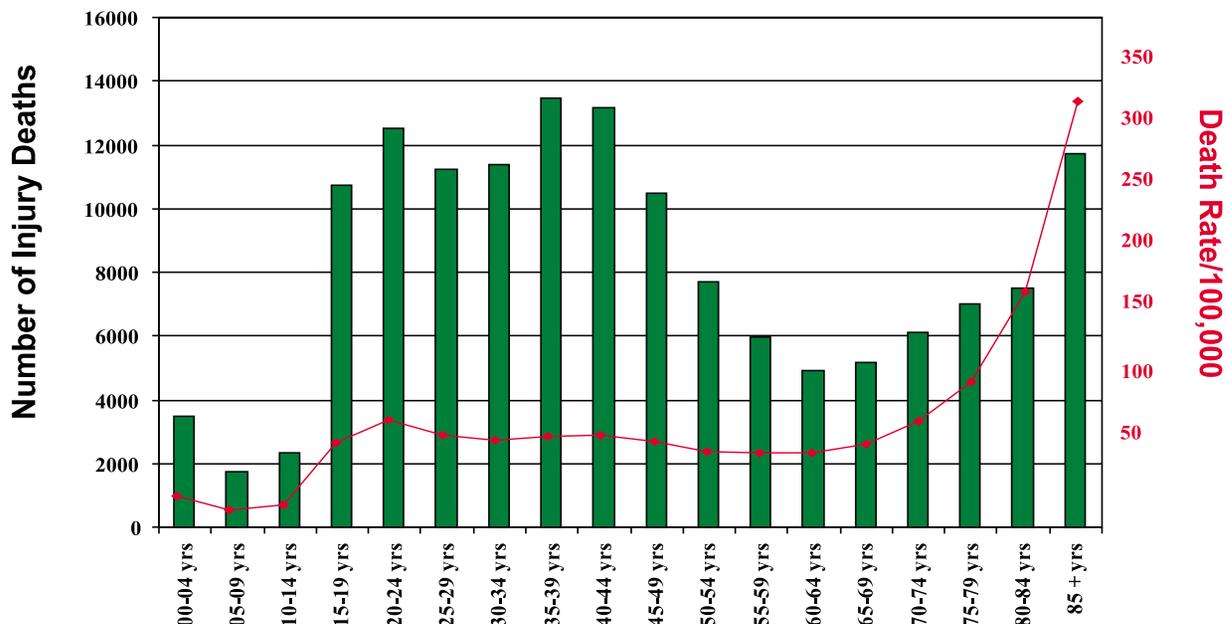
survey information, were reviewed. While these data were readily shared for use in the project, they are collected for a variety of clinical and administrative purposes and in a number of different formats. As a result, the data are not always easily comparable, even when collecting data on similar injuries.

In conclusion, a large amount of information regarding injury in Arkansas is available. This information is a valuable tool in developing a better understanding of the enormous injury problem in the state. This profile provides a single snapshot view of this complex problem. Ongoing and systematic review and analysis of these disparate data sources will be required to ensure that injury prevention interventions are effectively targeted and evaluated.

existing data than injury mortality. Arkansas, like many states, has no current surveillance system for injuries. Instead, specialized databases for some high impact injuries, such as traumatic brain injury and spinal cord injury, are relied upon to track temporal and severity trends for these injury types. In addition, this report cites hospital discharge data, collected by the Arkansas Department of Health since 1997, for estimates of injury morbidity using E-coded data. Compliance with and understanding of coding issues for this relatively new data system is improving, but there is no simple and comprehensive means of estimating the completeness of the injury coding in this database. For all injury types, review of the available data reveals increases over the 1997-2000 period for hospital discharge, probably more reflective of increased reporting than real trends in injury hospitalizations. ADH currently estimates that the database probably underestimates the number of injury-related hospitalizations—and thus the impact of injury on the medical system—by about 3%, based on review of data submitted. Ongoing evaluation of the system, including

Figure 1

Deaths and Death Rates, United States, 1998



Source: Centers for Disease Control

Injury in Arkansas: Overview

Injuries may be broadly categorized as *intentional* and *unintentional*. Intentional injuries include such crimes as murder, assault, domestic violence and child abuse. Unintentional injuries are those traditionally thought of as “accidents,” and include such things as motor vehicle injuries, sport injuries, and work place injuries. Nationwide, injuries killed 1,469,280 people in the decade 1989-1998, and 146,941 in 1998 alone. Injuries are most numerous among younger persons, while

injury death rates are highest among the elderly (Figure 1). Injuries are among the leading causes of death for persons ages one year to 34 years, and in the top ten leading causes of death for other age groups (Figure 2).

Intentional and unintentional injuries have significant social, economic and personal costs. For example, in 1994 the total direct cost of all fall injuries for Americans age 65 and older was \$20.2

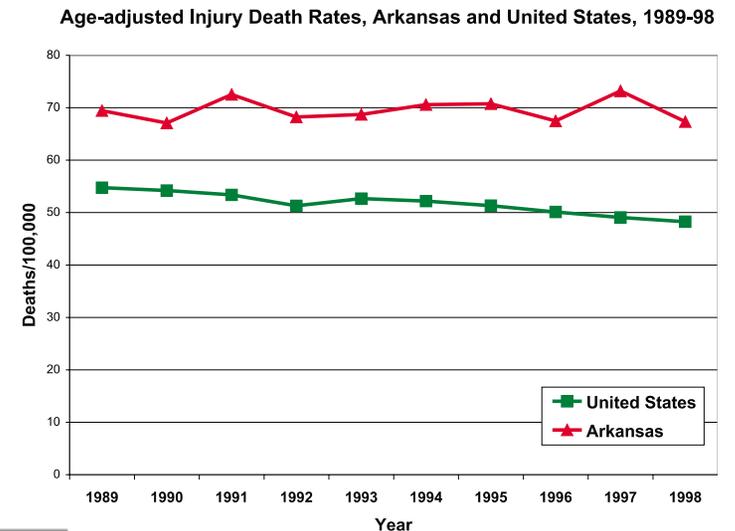
Figure 2

United States											
10 Leading Causes of Deaths by Age Group: 1996-1998											
Rank	Age Groups										
	<1	1-4	5-9	10-14	15-24	25-34	35-44	45-54	55-64	65+	Total
1	Congenital Anomalies 16,771	Unintentional Injuries 2,081	Unintentional Injuries 2,464	Unintentional Injuries 3,242	Unintentional Injuries 41,535	Unintentional Injuries 21,448	Malignant Neoplasms 51,170	Malignant Neoplasms 135,803	Malignant Neoplasms 260,186	Heart Disease 1,824,785	Heart Disease 2,185,194
2	Short Gestation 11,925	Congenital Anomalies 1,791	Malignant Neoplasms 1,557	Malignant Neoplasms 1,514	Homicide 18,208	Suicide 16,896	Unintentional Injuries 41,525	Heart Disease 905,367	Heart Disease 195,381	Malignant Neoplasms 1,150,087	Malignant Neoplasms 1,623,642
3	SIDS 8,863	Malignant Neoplasms 1,227	Congenital Anomalies 862	Suicide 818	Suicide 12,674	Homicide 15,988	Heart Disease 40,037	Unintentional Injuries 11,204	Bronchitis, Emphysema, Asthma 30,317	Cerebro-vascular 419,998	Cerebro-vascular 478,181
4	Respiratory Disease, Syst. 3,958	Homicide 1,184	Homicide 533	Homicide 808	Malignant Neoplasms 4,976	HIV 14,953	HIV 26,456	Cerebro-vascular 17,196	Cerebro-vascular 28,805	Bronchitis, Emphysema, Asthma 283,777	Bronchitis, Emphysema, Asthma 327,640
5	Maternal Complications 3,836	Heart Disease 643	Heart Disease 413	Congenital Anomalies 613	Heart Disease 3,134	Malignant Neoplasms 13,837	Suicide 20,399	Liver Disease 16,797	Diabetes 25,504	Pneumonia & Influenza 235,529	Unintentional Injuries 294,427
6	Placenta Cord Membranes 2,870	Pneumonia & Influenza 484	Pneumonia & Influenza 218	Heart Disease 580	Congenital Anomalies 1,252	Heart Disease 9,843	Homicide 11,136	Suicide 14,914	Unintentional Injuries 21,315	Diabetes 142,659	Pneumonia & Influenza 262,947
7	Fetal Infections 2,346	Septicemia 245	HIV 194	Bronchitis, Emphysema, Asthma 287	HIV 883	Cerebro-vascular 2,068	Liver Disease 10,515	Diabetes 12,979	Liver Disease 18,844	Unintentional Injuries 89,181	Diabetes 188,154
8	Unintentional Injuries 2,122	HIV 233	Bronchitis, Emphysema, Asthma 159	Pneumonia & Influenza 180	Bronchitis, Emphysema, Asthma 677	Diabetes 1,903	Cerebro-vascular 8,159	HIV 12,892	Pneumonia & Influenza 11,228	Alzheimer's Disease 85,647	Suicide 82,013
9	Pneumonia & Influenza 1,358	Perinatal Period 213	Benign Neoplasms 134	Cerebro-vascular 140	Pneumonia & Influenza 638	Pneumonia & Influenza 1,633	Diabetes 5,822	Bronchitis, Emphysema, Asthma 8,467	Suicide 8,834	Nephritis 85,296	Nephritis 75,517
10	Intrauterine Hypoxia 1,341	Benign Neoplasms 183	Cerebro-vascular 102	HIV 139	Cerebro-vascular 533	Liver Disease 1,592	Pneumonia & Influenza 4,255	Pneumonia & Influenza 6,480	Septicemia 5,704	Septicemia 54,425	Liver Disease 75,414

Source: National Center for Health Statistics, 2000
Chart developed by the National Center for Injury Prevention and Control

www.cdc.gov/nipc

Figure 3



billion, and that is just one type of injury in one age group.¹ These costs do not include the additional financial costs of lost productivity (short-term and life-time), increased insurance premiums, worker’s compensation claims, and litigation costs. The financial cost of injury is estimated at more than \$224 billion in medical care, rehabilitation, lost wages and lost productivity. The federal government pays about \$12.6 billion each year in injury-related medical costs and about \$18.4 billion dollars in death and disability benefits. Insurance companies and other private sources pay about \$161 billion.¹

Injury in Arkansas

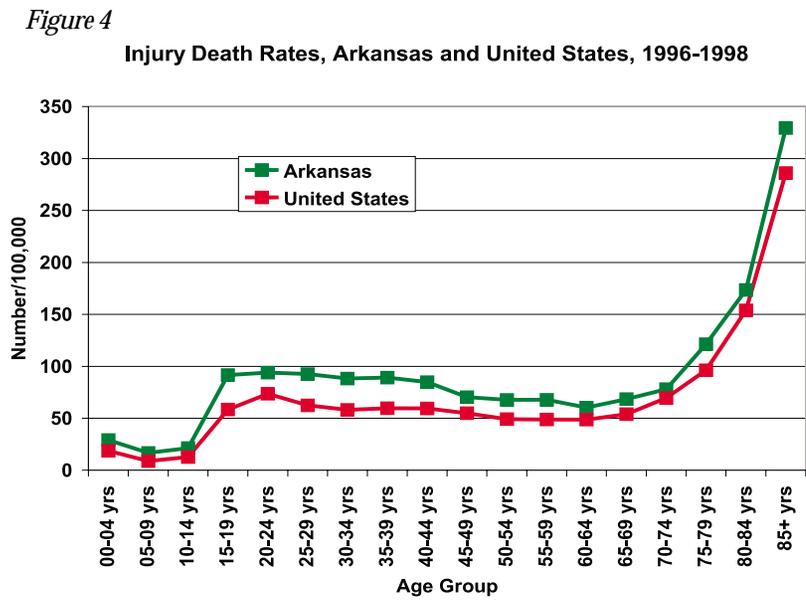
All of these costs affect Arkansas disproportionately. Rates of injury in Arkansas have been consistently higher than those for the United States over the past decade (Figure 3). In

Arkansas, unintentional injuries are among the top five causes of death for all but persons 65 and older, and are the leading cause of death for Arkansans between one and 34 years. Between 1996 and 1998, 3,894 Arkansans died of unintentional injuries. More than half of these were due to motor vehicle traffic-related injuries.

Intentional injuries are also a major problem in Arkansas. Arkansas reported 1,023 suicide and 771 homicide deaths during 1996-1998. The crude rate of violence-related deaths in Arkansas during the period 1989-1998 was 24.4/100,000 compared to a national rate of 20.9/100,000—17% higher than the national rate.

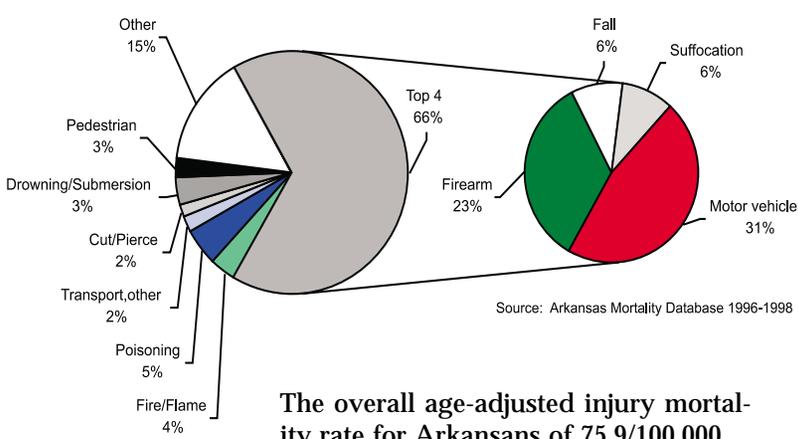
Injury-Related Deaths

Injury deaths are tracked by the Arkansas Department of Health and tabulated by the Centers for Disease Control, allowing for accurate comparison of national and Arkansas injury mortality. Arkansas injury mortality rates are higher than United States rates for all age groups (Figure 4).



Source: National Center for Injury Prevention and Control, CDC

Figure 5 Leading Causes of Deaths by Type of Injury
Arkansas, 1996-1998



Source: Arkansas Mortality Database 1996-1998

The overall age-adjusted injury mortality rate for Arkansans of 75.9/100,000 was 38% higher than that for the United States during 1996-1998. For some age groups, the differences between Arkansas and national rates are much more striking: mortality rates range from 12% higher (for adults ages 70-79 years) to 89% higher (for children ages 5-9 years).

A total of 5,861 Arkansans died from injuries between 1996 and 1998. Motor vehicle injuries (31%), firearm injuries (23%), falls (6%), and suffocation (6%) were the top causes of injury death for the overall population (Figure 5). Together these mechanisms accounted for two-thirds of all injury deaths.

Nearly 70% of all injury deaths occurred in males. While motor vehicle and firearm-related injuries were the top causes of death in both men and women, men had markedly higher rates of death for both injury mechanisms (Figure 6). Nearly twice as many men were killed in motor vehicle crashes than women (1139 vs. 651), and the rate for motor vehicle deaths in men was nearly twice as high (29.9/100,000 compared to 16.3/100,000 for women). For men, the rate of firearm death was almost as high as for motor vehicles (28.9/100,000). Firearm deaths were much less

Acknowledgements

Many different entities across the state of Arkansas collect injury information. The authors of this document gratefully acknowledge the assistance of the following organizations for their assistance in the creation of this document:

- Arkansas Children's Hospital
- Arkansas Burn Center
- Pediatric Trauma Service
- Arkansas Crime Information Center
- Arkansas Department of Health
- Behavioral Risk Factor Survey
- Center for Health Statistics
- Division of Emergency Medical Services and Trauma Systems
- Arkansas Commission on Child Abuse, Rape and Domestic Violence
- Arkansas Department of Education
- Youth Risk Behavior Survey
- Arkansas Department of Labor
- Arkansas Fire Academy
- Arkansas Medical Examiners Office
- Arkansas Poison Control Center
- Arkansas Spinal Cord Commission
- Arkansas State Highway Department
- University of Arkansas Division of Agriculture Cooperative Extension Service

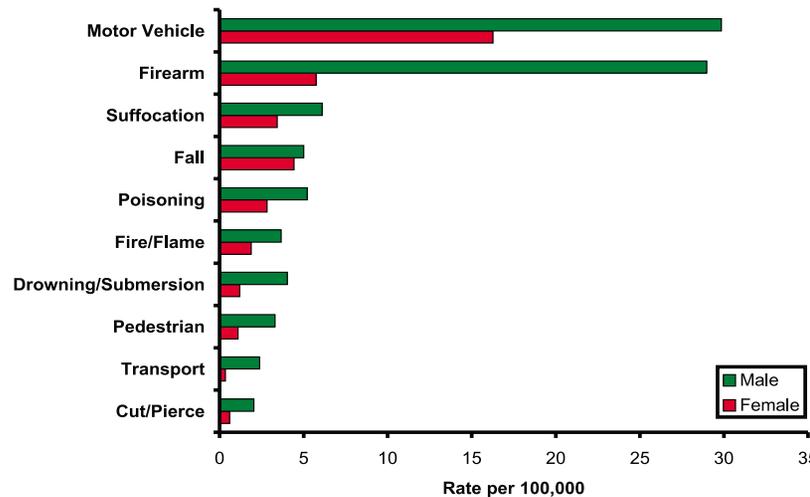
Arkansas has higher rates of injury death than the United States as a whole—nearly 40% higher.

Injuries kill nearly 2,000 Arkansans each year. Motor vehicle injuries, firearm-related injuries, and falls are the major causes.

Males are much more likely to die from injuries: motor vehicle death rates are nearly twice as high for men as for women; firearm-related deaths are five times higher.

Falls are the primary reason for injury-related hospitalization in Arkansas, especially among the elderly.

Figure 6 10 Leading Causes of Injury Death by Sex, Arkansas, 1996-1999



Source: Arkansas Mortality Database 1996-1998

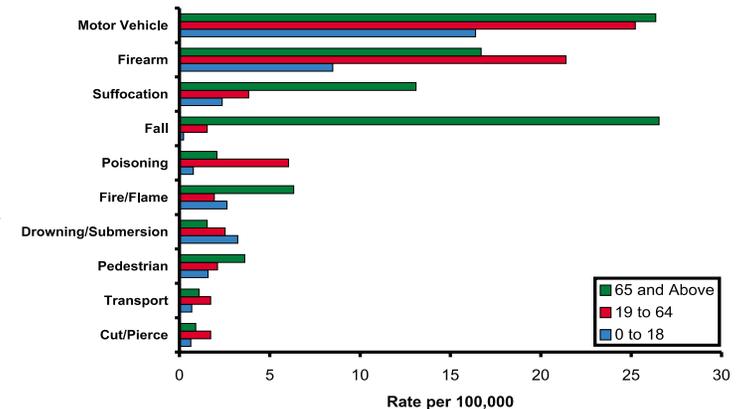
common in women (5.8/100,000). Falls and suffocation were also leading causes of death for both sexes.

For all age groups except those older than 65 years, motor vehicle crashes were the most common injury type. Injury patterns differ by age categories of children (0-18 years), adults (19-64 years), and elderly (65 years or older), as shown in Figure 7 and 8. While motor vehicle deaths predominate for all age categories, firearm deaths are more common in young adults, drowning more common in children, and fire and flame-related events are common in both children and the elderly.

Rates for some injury types are higher for non-white Arkansans than for whites (Figure 9, page 8). Firearms killed more non-white residents than any other injury cause, including motor vehicles, with rates of 23.9/100,000 for non-whites and 15.4/100,000 for whites. Non-whites were more likely to die in fires, with rates more than twice as high as for whites (5.3 vs 2.1/100,000, respectively). Drowning, pedestrian injuries, and cutting/piercing type injuries also demonstrated higher rates in non-whites, while poisoning and falls were more common among white residents.

Figure 8

10 Leading Causes of Injury-Related Death by Age Group, Arkansas, 1996-1998

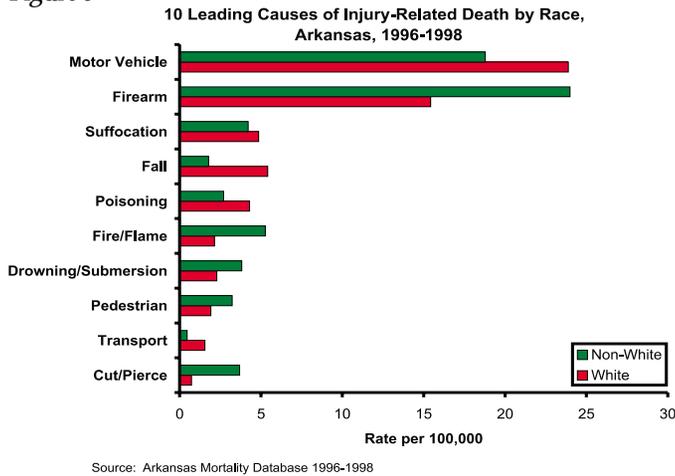


Source: Arkansas Mortality Database 1996-1998

Figure 7 5 Leading Causes of Injury Death by Age, Arkansas, 1996-1998

	0 to 4		5 to 9		10 to 14		15 to 24		25 to 34		35 to 44		45 to 54		55 to 64		65 and Above										
	Total	Rate	Total	Rate	Total	Rate	Total	Rate	Total	Rate	Total	Rate	Total	Rate	Total	Rate	Total	Rate									
1	Motor Vehicle	31	5.7	Motor Vehicle	32	5.6973	Motor Vehicle	42	7.3	Motor Vehicle	449	39.3	Motor Vehicle	328	31.0	Motor Vehicle	289	24.2	Motor Vehicle	184	17.5	Motor Vehicle	143	18.6	Motor Vehicle	294	26.2
2	Drowning	25	4.6	Fire/Flame	15	2.7	Firearm	24	4.1	Firearm	321	28.1	Firearm	252	23.8	Firearm	279	23.4	Firearm	174	16.6	Firearm	96	12.5	Motor Vehicle	292	26.0
3	Fire/Flame	24	4.4	Drowning	10	1.8	Drowning	13	2.2	Drowning	39	3.4	Poisoning	66	6.2	Poisoning	110	9.2	Poisoning	59	5.6	Poisoning	28	3.6	Firearm	185	16.5
4	Suffocation	24	4.4	Pedestrian	10	1.8	Fire/Flame	9	1.6	Suffocation	39	3.4	Suffocation	52	4.9	Suffocation	51	4.3	Suffocation	34	3.2	Fire/Flame	26	3.4	Suffocation	145	12.9
5	Pedestrian	13	2.4	Firearm	4	0.7	Pedestrian	8	1.4	Poisoning	26	2.3	Drowning	35	3.3	Drowning	31	2.6	Drowning	21	2.0	Transport	24	3.1	Fire/Flame	70	6.2

Figure 9

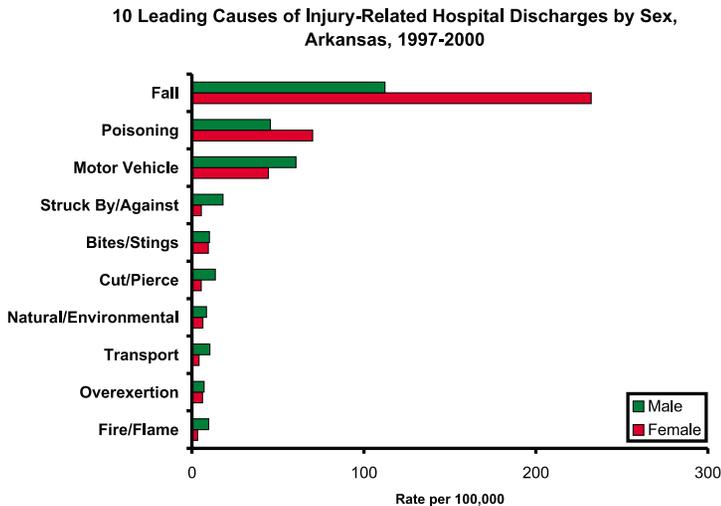


Source: Arkansas Mortality Database 1996-1998

Injury-related Hospitalization Discharges

The Arkansas Hospital Discharge database includes information on all hospital discharges in the state since 1997. Complete data are available for 1998-2000. Injuries can be identified by E-code using this database, providing a

Figure 11



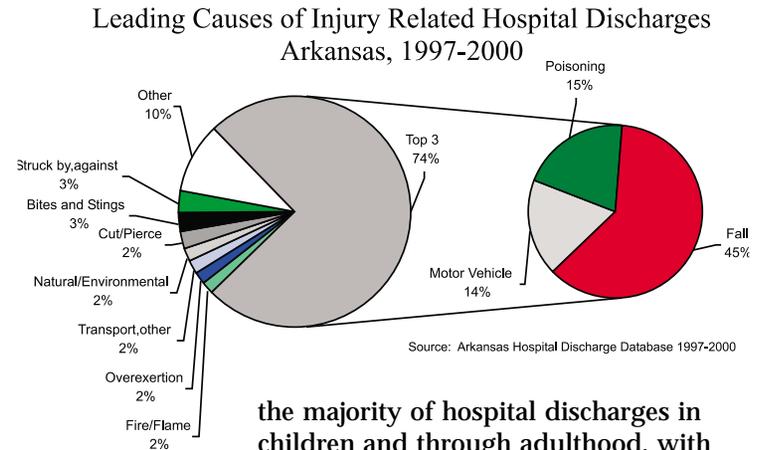
Source: Arkansas Hospital Discharge Database 1997-2000

useful estimate of significant morbidity due to injury in the state. A total of 40,870 hospital discharges for injury were recorded in this period. The three leading causes of injury-related hospital discharge, accounting for 74% of all cases reported, were falls (45%), motor vehicles (14%), and poisonings (15%) (Figure 10). Each of the other injury types constituted less than 5% of the total. Most of the hospitalizations were for unintentional injury (34,862; 85%). Self-inflicted injuries accounted for 4,160 (10%) and assaults for 1,147 (3%). The remaining 3% were of undetermined intent.

Overall, females outnumbered males for number of injury hospitalizations, with a total of 21,979 discharges (56%). Elderly women over 65 years are over-represented, making up nearly a third of all discharges. For younger adults and for children, males predominate, with 60% of admissions for children and 55% of admissions for adults ages 19-65 years. Injury types vary greatly by sex. Females were much more likely to be admitted for falls or poisoning, while males were admitted for falls or motor vehicle-related injuries (Figure 11). Rates for falls in women were more than twice as high as those for men. Women also had higher rates of poisoning-related discharges. For all other injury types, men had higher rates of hospital discharge.

Age differences in injury-related hospital discharges are dramatic (Figure 12). Falls in the elderly produce by far the highest rates of injury-related hospital discharge (889.3/100,000). Motor vehicles, falls, and poisonings account for

Figure 10



Source: Arkansas Hospital Discharge Database 1997-2000

the majority of hospital discharges in children and through adulthood, with widely varying rates between age groups. For children, there were 999 motor vehicle hospitalizations, accounting for 27% of all injury-related discharges in this group (34.0/100,000 children). For adults 19-64, poisoning was the primary cause of injury hospital discharge, with a rate of 74.0/100,000. For the elderly, other than falls, motor vehicles and poisoning were common reasons for hospitalization (Figure 13).

Hospital discharge rates for nearly all injury types are higher for non-whites than for whites in Arkansas (Figure 14). For many injury types, including motor vehicles and falls, rates are 50-80% higher for non-whites than for whites. Only for the injury type of "Other transport" (including all terrain vehicles and other forms of transportation) are hospital rates higher for whites than non-whites.

Injury-Related Emergency Service Use

Arkansas Emergency Medical Services (EMS) maintains a centralized database of information characterizing all ambulance runs in the state. These data provide a valuable proxy for emergency care required for injury in the state. A total

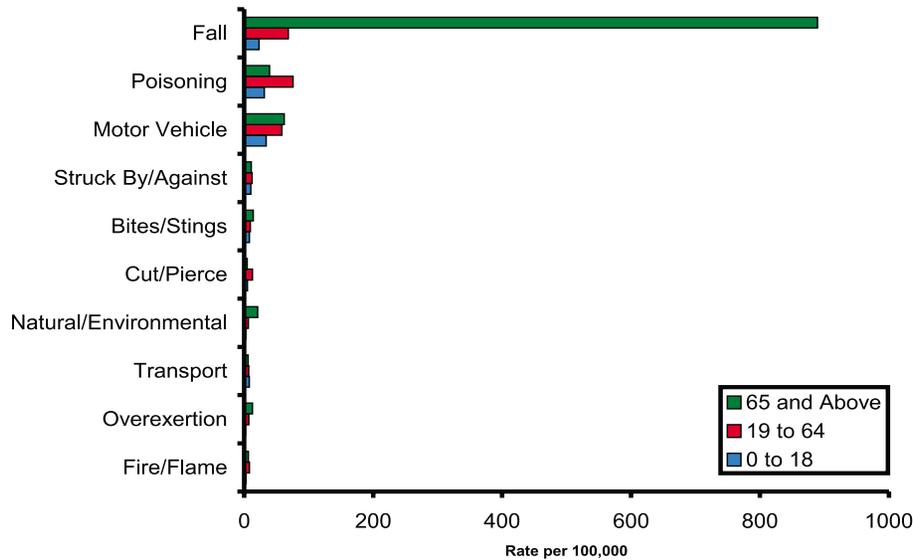
Figure 12

5 Leading Causes of Injury-Related Hospital Discharges by Age, 1997-2000

	0 to 4		5 to 9		10 to 14		15 to 24		25 to 34		35 to 44		45 to 54		55 to 64		65 and Above										
	Total	Rate	Total	Rate	Total	Rate	Total	Rate	Total	Rate	Total	Rate	Total	Rate	Total	Rate	Total	Rate									
1	Poisoning	175	24.1	Fall	188	25.1	Motor Vehicle	175	22.7	Motor Vehicle	1394	91.6	Poisoning	1307	92.6	Poisoning	1389	87.2	Fall	1143	81.8	Fall	1441	140.3	Fall	13304	889.26
2	Fall	172	23.7	Motor Vehicle	116	15.5	Fall	157	20.3	Poisoning	1271	83.5	Motor Vehicle	813	57.6	Motor Vehicle	881	55.3	Poisoning	807	57.7	Motor Vehicle	476	46.3	Motor Vehicle	929	62.1
3	Motor Vehicle	76	10.5	Bites/Stings	66	8.8	Poisoning	152	19.7	Fall	361	23.7	Fall	482	34.2	Fall	848	53.2	Motor Vehicle	587	42.0	Poisoning	344	33.5	Poisoning	590	39.4
4	Bites/Stings	71	9.8	Pedestrian	45	6.0	Transport	100	13.0	Struck by/against	236	15.5	Cut/Pierce	236	16.7	Struck by/against	232	14.6	Bites/Stings	141	10.1	Bites/Stings	111	10.8	Natural/Environmental	312	20.9
5	Hot Object	55	7.6	Struck by/against	45	6.0	Struck by/against	84	10.9	Cut/Pierce	217	14.3	Struck by/against	158	11.2	Cut/Pierce	218	13.7	Struck by/against	137	9.8	Struck by/against	101	9.8	Bites/Stings	209	14.0

Figure 13

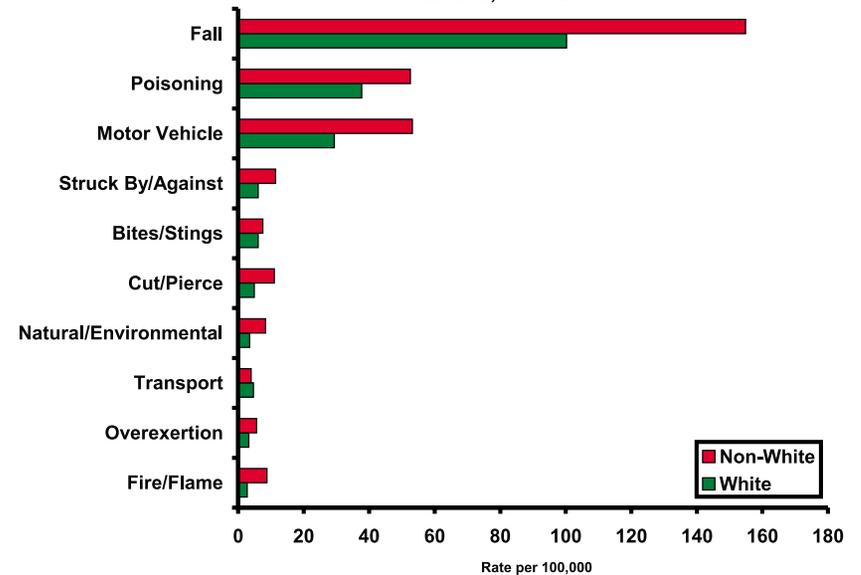
10 Leading Causes of Injury-Related Hospitalizations by Age Group, Arkansas, 1997-2000



Source: Arkansas Hospital Discharge Database 1997-2000

Figure 14

10 Leading Causes of Injury-Related Hospitalizations by Race, Arkansas, 1997-2000



of 214,996 EMS runs for injury were tallied during 1996-2000. Most of these injuries were due to motor vehicles (41%) and falls (32%). A variety of other injury types including assaults, bicycles, fires and burns, and pedestrian injuries make up the remaining 27% (Figure 15).

Reasons for EMS runs varied by sex of the victim, with females demonstrating higher rates than males for both falls and motor vehicle injuries (Figure 16). Males were more frequently injured in assaults, shootings, as pedestrians, motorcyclists, and on ATV's and bicycles. Overall, females constituted 54% of all EMS cases for this time period.

Marked differences were demonstrated by age for EMS runs (Figures 17 and 18). For younger persons, motor vehicles were by far the most common injury type (56% of all cases for children 0-18, 51% of all cases for those 19-64 years). In the elderly, however, a total of 45,781 falls, constituting 73% of all cases, were reported. For this group, motor vehicle injuries form a distant second at 13%. Assaults, relatively common for adults 19-64 (11,691, 10%), were less frequent in

children (1,742, 5%) and very unusual in the elderly (435, 1%). Almost all bicycle, pedestrian, and ATV injuries occurred prior to age 65, mostly in children less than 18 years.

EMS runs also differ according to race (Figure 19). While motor vehicles were the most common form of injury, they constituted a larger proportion overall for non-white groups. Assaults were the third most common reason for transport for African-Americans (5695 cases, 46% of all assaults). In contrast, virtually all ATV injuries (1398, 94%) were in white patients.



Figure 15

Leading Causes of Injury-Related EMS Runs, Arkansas, 1996-2000

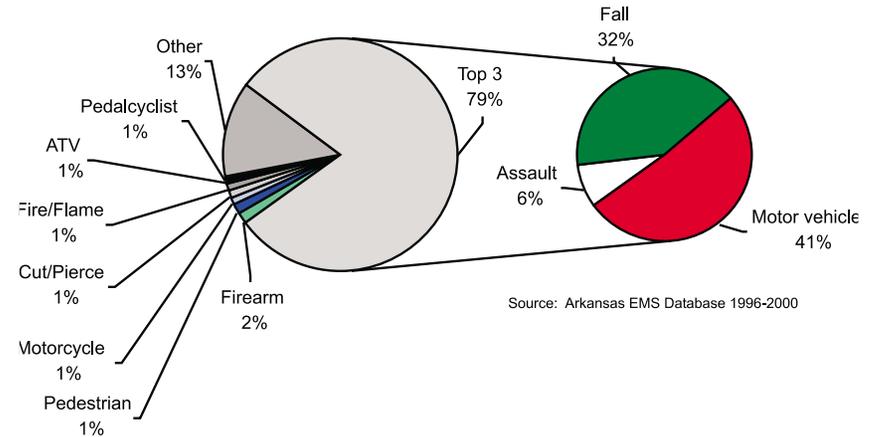


Figure 16

10 Leading Causes of Injury-Related EMS Runs by Sex, Arkansas, 1996-2000

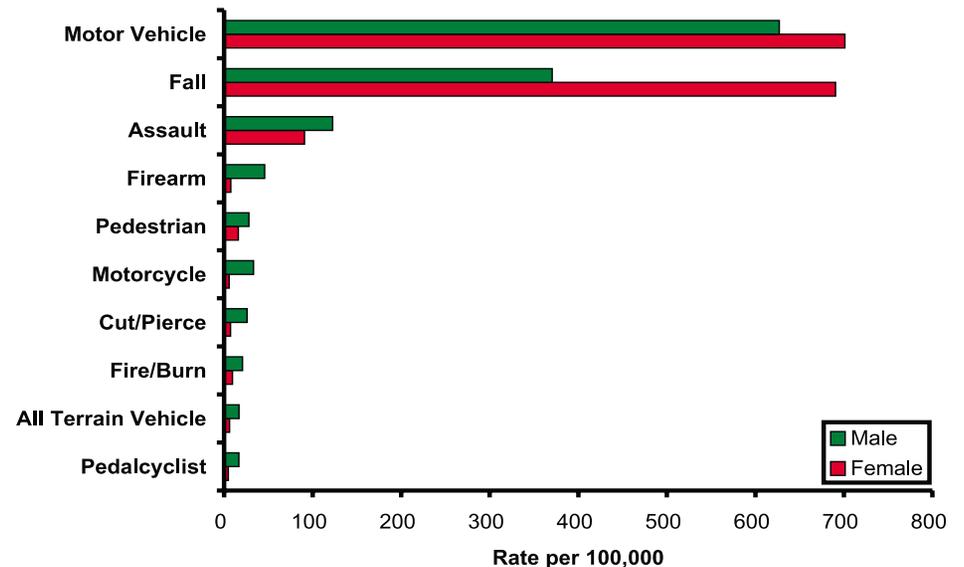
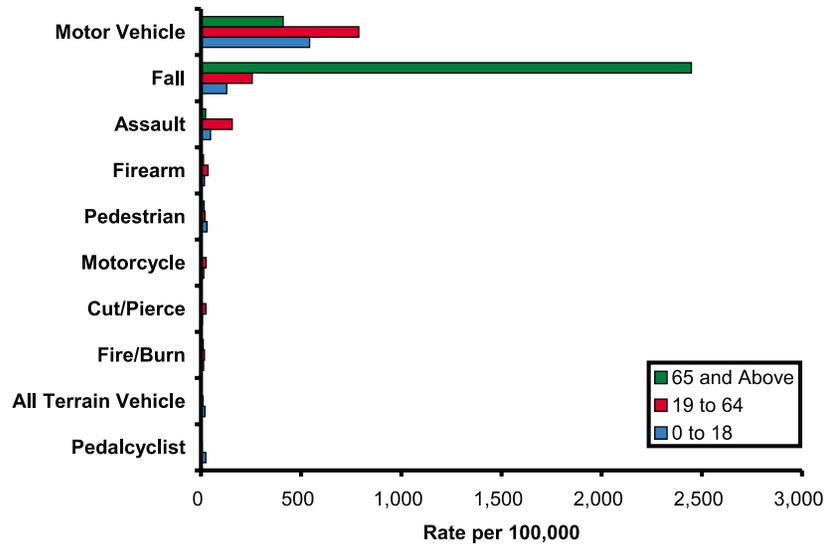


Figure 17

5 Leading Causes of Injury-Related Emergency Medical Service Runs by Age, 1996-2000

	0 to 4		5 to 9		10 to 14		15 to 24		25 to 34		35 to 44		45 to 54		55 to 64		65 and Above										
	Total	Rate	Total	Rate	Total	Rate	Total	Rate	Total	Rate	Total	Rate	Total	Rate	Total	Rate	Total	Rate									
1	Motor Vehicle	1336	147.1	Motor Vehicle	2693	287.68	Motor Vehicle	3518	364.68	Motor Vehicle	27954	1469.9	Motor Vehicle	16374	928.11	Motor Vehicle	12955	650.8	Motor Vehicle	8784	502.63	Motor Vehicle	5447	424.25	Fall	45781	2448.1
2	Fall	825	90.9	Fall	975	104.2	Fall	1559	161.6	Assault	3889	204.49	Assault	3825	216.8	Fall	4530	227.57	Fall	4520	258.64	Fall	4792	373.23	Motor Vehicle	7660	409.6
3	Pedestrian	164	18.1	Pedestrian	347	37.1	Pedacyclist	421	43.6	Fall	3258	171.3	Fall	3445	195.3	Assault	3475	174.6	Assault	1394	79.8	Assault	410	31.9	Assault	435	23.261
4	Fire/Burn	109	12.0	Pedacyclist	306	32.7	Assault	340	35.2	Firearm	1095	57.6	Firearm	810	45.9	Firearm	641	32.2	Motorcycle	371	21.2	Pedestrian	152	11.8	Pedestrian	285	15.2
5	Bites/Stings	79	8.7	Bites/Stings	111	11.9	ATV	337	34.9	Motorcycle	758	39.9	Cut/Pierce	636	36.0	Cut/Pierce	528	26.5	Firearm	303	17.3	Firearm	147	11.4	Firearm	225	12.0

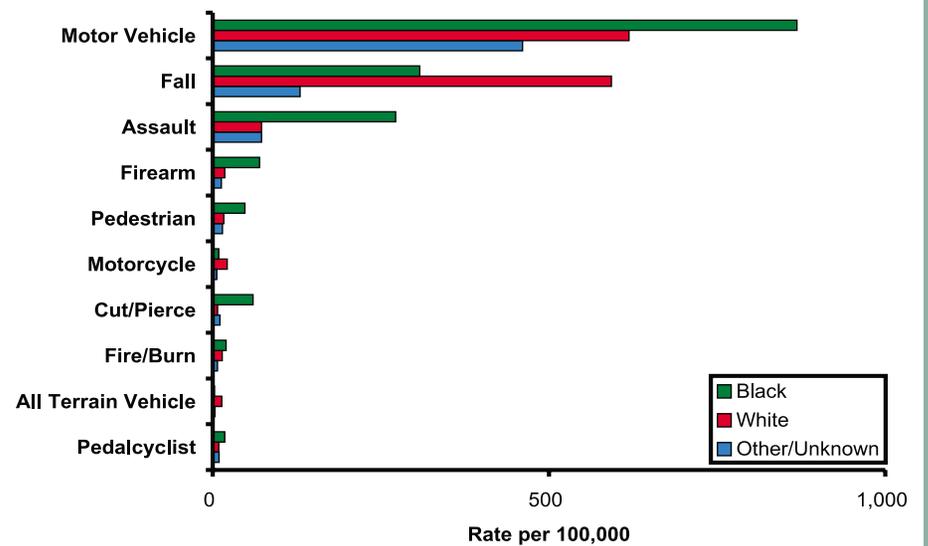
Figure 18 10 Leading Causes of Injury-Related EMS Runs by Age Group, Arkansas, 1996-2000



Source: Arkansas EMS Database 1996-2000

Figure 19

10 Leading Causes of Injury-Related EMS Runs by Race, Arkansas, 1996-2000



Source: Arkansas EMS Database 1996-2000

Motor Vehicle Injuries

United States

Motor vehicle crashes result in devastating levels of injury death and disability in the United States. In recent years, motor vehicle crashes have led to more than 42,000 deaths and nearly 3.4 million injuries a year nationwide.¹ A disproportionate number of these injuries occurred in the South and Northwest regions of the country. Motor vehicles cause more deaths in children than any other source of injury. Adolescents ages 15-19 are especially at risk, with 5,073 killed in car crashes in 1998 alone. Death rates for adolescents and for the elderly, the fastest growing segment of the population, are especially high. In 1998, more than 7,000 Americans age 65 and older died and another 246,000 suffered nonfatal injuries in motor vehicle crashes.



Arkansas

Arkansas has a higher rate of motor vehicle injury than most other states. In 1998, Arkansas ranked sixth in unintentional motor vehicle traffic-related mortality with an overall age-adjusted rate of 26.07/100,000 – well above the national rate of 15.6/100,000 (Figure M-1). A total of 2,045 Arkansans were killed between 1996 and 1998 due to motor vehicle-related injuries, including traffic injuries, pedestrian injuries, and injuries related to other types of transport. Unintentional motor vehicle traffic fatalities in Arkansas have remained fairly consistent over the past decade and have been at least 50% above national rates during this period (Figure M-2). The Centers for Disease Control estimates that these increased rates result in 225 excess deaths to Arkansans annually.

Motor vehicle traffic-related injuries are the leading cause of injury death for Arkansas overall and for most demographic subgroups. These rates vary considerably by age and sex (Figure M-3). Motor vehicle injuries are the leading cause of injury death for younger children. Overall death rates are similar for young children regardless of sex. After age 15 years, motor vehicle death rates dramatically increase. Rates are particularly high for males for all subsequent age groupings. Adolescent and young adult males ages 15-24 have death rates that are 78% higher than those for comparably aged females (51.7/100,000 for males vs. 28.9/100,000 for females). For individuals ages 25-34 years, the rates are even more dramatically different between the sexes, with male rates 2 ½ times higher than for females. Similar to national figures, rates in the elderly are higher than for middle-aged adults, increasing fairly abruptly after age 65 years, especially for males.

Overall, there are not large differences in motor vehicle traffic death rates by race: the rate for whites is 26.4/100,000 compared to 25.2/100,000 for

RISK FACTORS & SOLUTIONS:

Motor vehicle-related injuries are the leading causes of injury death for Arkansas.

Arkansas motor vehicle death rates have consistently been at least 50% higher than national rates over the past decade.

A properly worn lap-shoulder belt reduces the risk of fatal or serious injury to front seat passengers by 45-50%.

Research has shown that increased seat belt use results from safety belt use laws, primary rather than secondary enforcement of these laws, and enhanced enforcement of seat belt laws.

Figure M-1

In 2000, 52.4% of people in Arkansas used safety belts and 64.8% used child safety seats. This rate of usage is among the nation's lowest.

23% of Arkansas' high school students report never or rarely wearing a seat belt when riding in a car driven by someone else.

67% of adults in Arkansas report always wearing a seat belt; 17% report that they sometimes, seldom, or never wear seat belts.

Unintentional Motor Vehicle, Traffic-Related Death Rates United States, 1996-1998

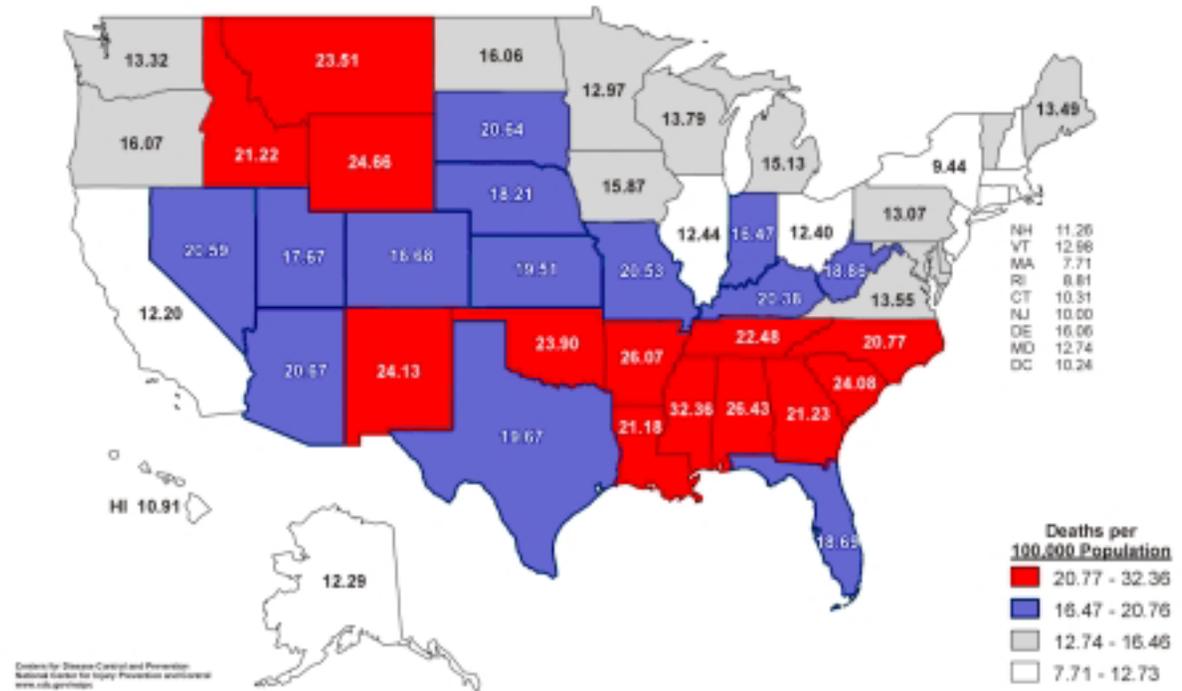
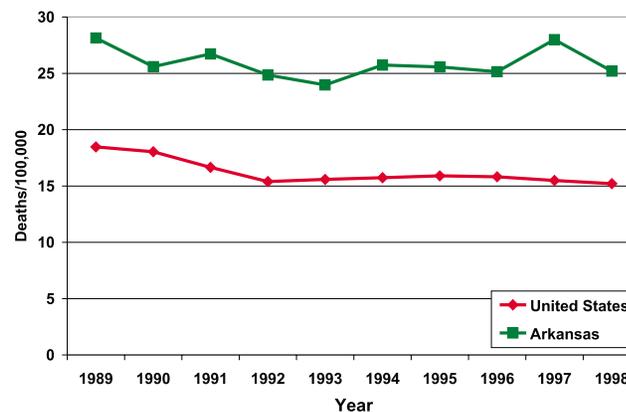


Figure M-2

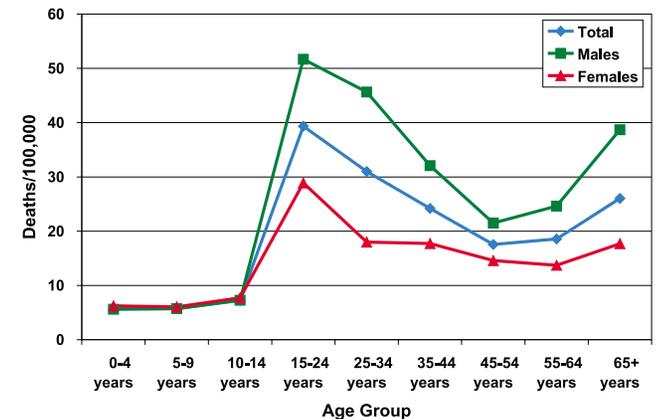
Arkansas vs. United States, 1989-98



Source: National Center for Injury Prevention and Control, CDC

Figure M-3

Motor Vehicle Death Rates by Age, Arkansas, 1996-1998

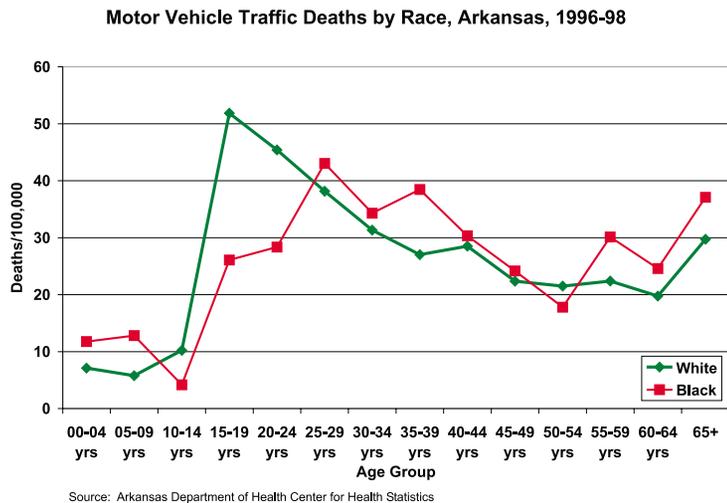


Source: Arkansas Department of Health Center for Health Statistics

- Sources:**
- National Highway Traffic Safety Administration, 2001
 - Youth Risk Behavior Survey, 2001
 - Behavioral Risk Factor Survey, 1997

African Americans. Some differences are revealed over the age spectrum, however, and in particular the rate for African American children ages 5-9 years is more than twice as

Figure M-4



high as that for white children (Figure M-4). For children under five years old, the rate is 65% higher. For most adult age categories, rates for African Americans are comparable to those for the white population.

Injury deaths from motor vehicle crashes are concentrated in rural counties (Figure M-5). Twelve Arkansas counties were at or above the national 90th percentile for motor vehicle fatalities in the past decade. Highest rates for motor vehicle traffic deaths were demonstrated in Searcy, Sharp, and Howard counties, each with rates at least twice as high as the state as a whole.

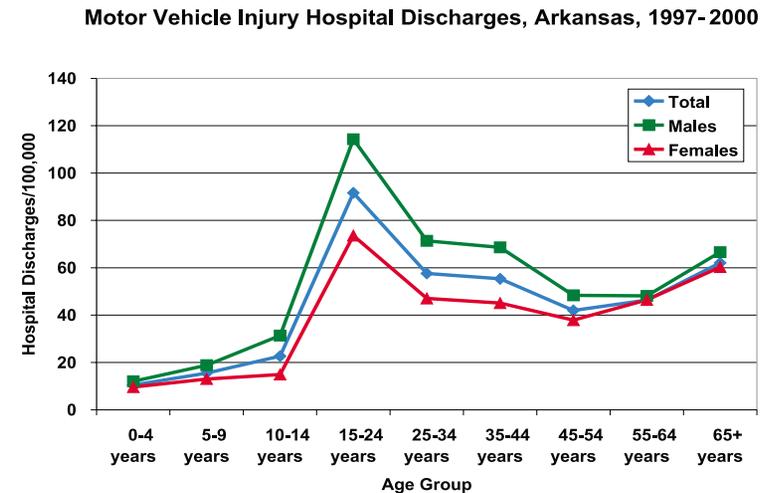
Motor vehicle crashes led to 5,447 hospital discharges in Arkansas between 1997 and 2000 for an overall rate of 50.9 discharges/100,000. Males made up 56.6% of these discharges, and had higher rates than females

(60.5 vs. 44.4/100,000). Hospital discharges were most common among young people ages 15-24 years and were particularly elevated for males in this age group, where the rate of hospital discharges was an alarming 114.3/100,000—more than twice as high as the general population (Figure M-6).

Motor vehicles were also the most common injury reason for emergency transport in Arkansas during the past five years. A total of 86,721 ambulance runs for motor vehicle-related injuries were recorded during 1996-2000.

Rates for EMS runs, like those for death and hospital discharge, peak in young persons ages 15-24 years. EMS rates for

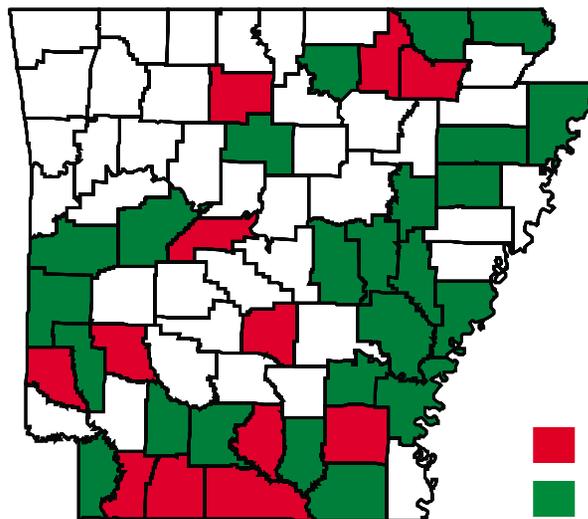
Figure M-6



this group are more than twice as high as the general population. In contrast to deaths and hospitalization, however, more EMS runs for motor vehicle injury are for female patients (N = 46,756; 54%).

Figure M-5

Motor Vehicle Deaths by County



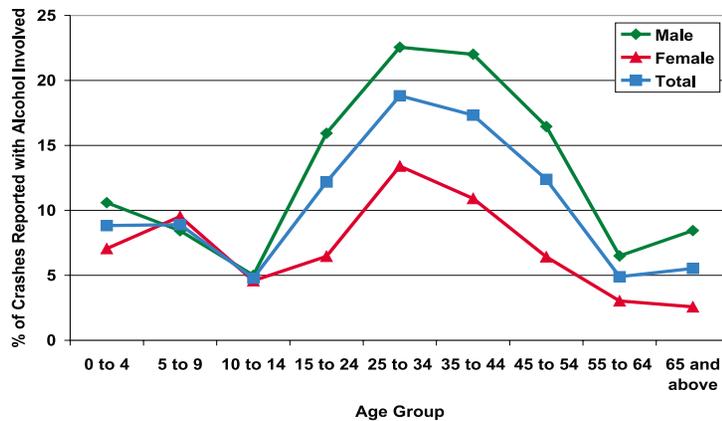
Source: Centers for Disease Control and Prevention

- at or above the 90th NATIONAL percentile
- at or above the 75th NATIONAL percentile, but below the 90th

More detailed information on crash conditions is available in Arkansas and provides insight into modifiable areas to guide interventions for prevention. Information about crash circumstances included in the EMS database includes vehicle speed estimates and condition after the crash. About a third of EMS transport cases were from crashes of vehicles traveling at greater than 40 miles per hour. In 20% of crashes, vehicle deformity of greater than 20 inches was noted, and 11% demonstrated at least one foot of intrusion into the vehicle passenger spaces. In 23,985 (28%) of cases, the absence of use of safety devices such as safety belts was observed and recorded at the crash scene.

Figure M-7

Alcohol Involvement in Motor Vehicle Crashes, Arkansas, 1997-1999



Source: Arkansas State Highway Department

* Some rates based on 20 or fewer deaths. These rates may be unstable. Use with caution.

The Arkansas Highway Department also catalogs information on motor vehicle crashes statewide. This database allows for detailed characterization of crash circumstances, including information on the vehicles involved,



time of crash, road characteristics, environmental factors, and driver factors such as alcohol use. A total of 6,648 crashes are described in the database during 1997-1999. From information collected at the scene, 252 (3.8%) crashes were described as resulting in fatalities, 3,597 (54.1%) resulted in “incapacitating injury,” and 2,799 (42.1%) resulted in “non-incapacitating injury.” The majority of the reported crashes occurred in rural areas (4,867, 73.2%) rather than urban areas (1,781, 26.8%).

The Highway Department data reveal patterns of behavior that increase risk for both crash and injury. Lap and shoulder belts were used in only 3,045 (45.8%) of the crashes, lap or shoulder belts in 256 (3.9%), and no restraint was found in 3,225 (48.5%) cases. Safety belt use was clearly associated with reported injury severity: no restraint was reported in 177 (70.2%) of fatal crashes, compared to 1,797 (50%) of crashes with incapacitating injury and 1,251 (44.7%) of crashes with less serious injuries.

Alcohol was involved in 853 (12.8%) of crashes, and when alcohol was present restraint use was less likely: only 36.9% of alcohol related crashes were reported with any form of restraint use. Alcohol involvement was more common with male drivers (16.7%) than female drivers (7.2%), as was evidence of alcohol or drug impairment as observed at the scene (12.1% for males, 5.2% for females). Alcohol use was involved in 16-22% of crashes involving adults ages 20-54 (Figure M-7). Children under 10 were present in the vehicle in about 8% of these cases. Alcohol use also was associated with severity of crashes and was involved in nearly a third of fatal crashes (29.1%). Alcohol use in less severe crashes was about 8%.



Motorcycles

United States:

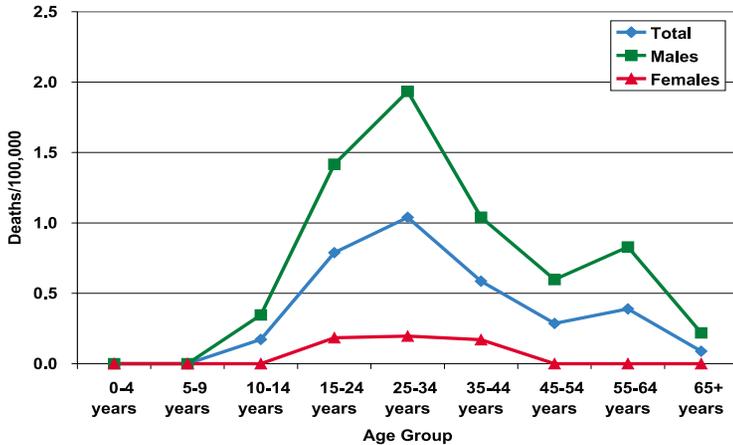
Motorcyclists are especially at risk on the road. The death rate for those on motorcycles per mile traveled is more than 35 times that of passengers in cars.² In the United States, 4,977 persons were killed on motorcycles between 1996 and 1998 (age-adjusted rate 0.66/100,000). Rates were highest among young adults ages 20-29 and twice as high among males compared to females.

Arkansas:

The overall age-adjusted rate for motorcycle related injury death in Arkansas was 0.54/100,000 during 1996-1998, with a total of 37 deaths reported. Motorcycle injury deaths are overwhelmingly found in young men with peak rates in those 25-34 years of age but with el-

Figure M-8

Motorcycle Injury Death Rates by Age, Arkansas, 1996-98



Source: Arkansas Department of Health, Center for Health Statistics. * Some rates based on 20 or fewer deaths. These rates may be unstable. Use with caution.

evated rates throughout the age range 15-44 (Figure M-8). Very few deaths occurred in women and none in young children.

Nearly 2,500 Arkansans were transported by EMS for motorcycle-related injuries during 1996-2000. Most of these were adults ages 19-64, making motorcycle injury the sixth most common cause of injury transported. An additional 504 (20%) cases were under 18. Consistent with national and state mortality figures, the vast majority of these victims are male (2,100, 85%).

Highway Department data indicate that motorcycle crashes were more likely than car or truck crashes to result in serious injury or death. Of 158 motorcycle crashes logged in the database, 67% resulted in “incapacitating injury,” compared to 49% for cars. Although adults drove most of the motorcycles involved, 10.1% had drivers less than 18 years of age. Only 3% of the motorcycle drivers were over 65 years old.

Pedestrians

United States:

Pedestrian injuries killed 16,526 people during 1996-1998 in the United States (1.81/100,000). Males were again nearly three times more likely to be involved. Rates were highest in the elderly ages 65 and older, where the overall rate of 3.7/100,000 was 78% higher than the general population. Since 1975 there has been a dramatic 39% decrease in pedestrian deaths in the United States.³ This has been attributed not only to injury control interventions like better sidewalks and pedestrian paths, but to a reduction in the amount of walking that people, especially children, do.^{4,5} Despite this, more than 700 U.S. children die each year when hit by cars. Very young children, males, and those in poor, crowded households are most at risk.

RISK FACTORS & SOLUTIONS:

Only 80% of Arkansas drivers report that their oldest child always rides in a seat belt.

Alcohol is involved in almost a third of all fatal car crashes. Children are often killed when adults drink and drive.

31% of Arkansas high school students reported riding with someone who had been drinking alcohol within the past 30 days.

16% of high school students reported driving one or more times after they had been drinking alcohol within the past 30 days.



Motorcycle helmet use is estimated to result in a 29% reduction in mortality and 67% reduction in head injury in the event of a crash.

NHTSA estimates \$12.1 billion was saved from 1994 to 1998 nationally as a result of the use of motorcycle helmets. An additional \$10 billion could have been saved if all individuals involved in motorcycle crashes had worn helmets.

44% of Arkansas high school students who rode a motorcycle in the past year reported never or rarely wearing a helmet.

Sources:

National Highway Traffic Safety Administration, 2001
 Youth Risk Behavior Survey, 2001
 Behavioral Risk Factor Survey, 1997

Arkansas:

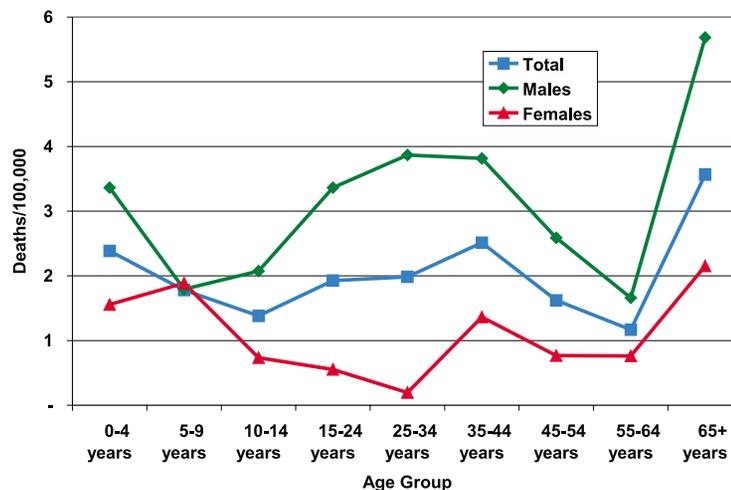
Pedestrian injuries were the eighth most common cause of injury death overall in Arkansas during 1996-98. A total of 170 pedestrian deaths, with an age-adjusted rate of 1.72/100,000, were reported. Rates for males are higher for essentially all age groups (Figure M-9). The highest pediatric rates were in preschool age children, where pedestrian injuries were among the top five causes of death. Highest overall rates were demonstrated in the elderly, with rates as high as 5.7/100,000 among males over 65 years of age. Pedestrian injury death rates were higher among non-white Arkansans than among whites.

A third of the 483 hospital discharges for pedestrian injury in Arkansas over the past five years were in children under 18



Figure M-9

Pedestrian Injury Death Rates, Arkansas, 1996-1998



Source: Arkansas Mortality Database 1996-1998

* Some rates based on 20 or fewer deaths. These rates may be unstable. Use with caution.

years. Rates were dramatically higher among children ages 10-14 years, where the rate of 10.1/100,000 was more than twice that of the general population. For males in this age group the rate was three times as high. Hospital discharge rates for the elderly were not elevated compared to the general population.

Pedestrian injuries were the fifth most common cause of EMS transport for children under 18 in Arkansas during 1996-2000. More than 1,000 children—5% of all pediatric injuries transported—were included, along with 1,764 adults.

Recreational Injuries



Drowning

United States:

Drowning is common throughout the United States. More drownings occur in warmer areas such as Florida and California, but some states with colder weather, including Alaska and South Dakota, have high rates of drowning deaths. In the United States, drowning is the second leading cause of accidental deaths in younger children (aged 1-14 years), with approximately 2,000 children dying each year. Circumstances of drowning vary by location and by age of the victim. Infant drowning deaths most often occur in bathtubs. Most preschool-age children drown in swimming pools, but children can drown in as little as one inch of water, including buckets. Drowning in natural bodies of water becomes more frequent in adolescence and adulthood.

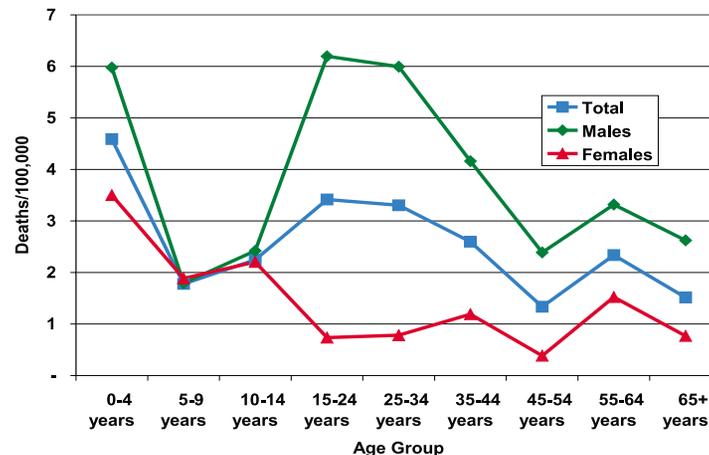
Arkansas:

In 1998, Arkansas had the seventh highest rate of unintentional drowning in the nation. During the period 1996-1998, drowning was the third leading cause of injury-related death for children and fifth for adults ages 19-64. A total of 202 people died of drowning, constituting about 3% of all injury deaths. Drowning was most common among males in young adulthood, and drowning death rates were much higher for males than females overall (Figure R-1). Rates for children under four were twice those for the general population. During this period, the death rate for drowning among non-whites was higher than that for whites, especially for children.

In contrast to the mortality data, drowning was a relatively uncommon reason for hospital discharge in Arkansas in recent years. Only 53 such discharges were included in the hospital discharge database. This may be due to the relative lethality of submersion injuries or to underreporting. Further review and

Figure R-1

Drowning Death Rates, Arkansas, 1996-1998



Source: Arkansas Department of Health, Center for Health Statistics * Some rates based on 20 or fewer deaths. These rates may be unstable. Use with caution.

RISK FACTORS & SOLUTIONS:

Most children drown in swimming pools; therefore installation of self-closing, self-latching gates on pool fences and increased use of personal flotation devices are good preventive measures.

Whenever young children are swimming, playing, or bathing in water, an adult should be constantly watching them.

Many drownings are associated with alcohol use, particularly when boats are driven. Avoiding alcohol when swimming and boating is important in drowning prevention.

Bicycle helmets are 85% protective against head injury and 88% protective against brain injury. All cyclists should wear helmets—at any age and whenever and wherever they ride.

In Arkansas, 93% of Arkansas high school students who rode a bicycle in the past year reported never or rarely wearing a helmet.

Only about 20% of Arkansans surveyed reported that their oldest child always or nearly always wore a helmet while riding a bicycle.

Sources:

Youth Risk Behavior Survey, 2001
Behavioral Risk Factor Survey, 1997

future analysis of ongoing hospital discharge information will be required. Of those 53 cases included in the hospital discharge database, 27 (51%) were in children 0-18 years, and 15 of these were in children under five years of age. Only three discharges for drowning were for elderly patients. Drowning related hospitalizations averaged 4.8 days in length, and eight (15.1%) of the patients died.

The EMS database records drowning and near-drowning-related EMS runs. For the period 1996-2000, 53 EMS runs were also recorded. These EMS records, however, have a different pattern than the hospital data. Only 13 (25%) of these runs were noted to be for children 0-18 years of age, and 37 (69%) were for adults ages 19-64. These differences are difficult to decipher with existing data, since these databases are not linked by individual patient. The data may reflect the same group of patients with different record keeping practices (e.g., no accurate age available at the scene but later available in the hospital), or may reflect two groups of patients entirely. It is possible that different methods of transport to medical care are used by different age groups, or that near-drowning in children results in hospitalization more frequently than in adults. Further analysis of these and other databases and detailed study of the problem of drowning is clearly indicated given both the importance of the problem and the lack of clarity in these data.

Bicycles

United States:

Nationally, approximately 900 deaths each year are attributed to bicycle injuries, with around 250 of these deaths being children. Children ages 5-14 years are at highest risk for injury and death. Particularly lethal are injuries resulting when bicyclists are hit by motor vehicles. Bicycle injuries also cause more than 500,000 emergency department visits each year.¹ Head injury is the most common cause of death and serious disability resulting from bicycle crashes. Males are more likely to die and sustain injury on bikes than females. Males are also more likely to have been drinking while biking, to be killed after



dark, and to be hit and run victims. Bicycle helmets have been shown to be 85-88% effective in preventing brain injury.²⁻⁹

Arkansas:

During 1996-1998, there were 20 deaths attributed to bicycles in Arkansas (0.25/100,000). All but four of these deaths were in males, consistent with national experience. The victim was a child under 19 in nine (45%) of these cases, and an adult 19-64 in 10 (50%) of cases. Only a single bicycle-related fatality was in a person 65 years old or more. Given data and data coding available at this time, it was impossible to determine the extent of bicycle-related hospital discharges during the period covered in this report. Future reports will attempt to determine the exact impact of this injury type on hospitalization.

A total of 1,368 Arkansans were transported by EMS for bicycle-related injuries between 1996-2000. Most of these were children under 18 years (877, 64%) or adults 18-64 years old (466, 32%). Rates are particularly high in young children, particularly boys ages 10-14 (66.4/100,000), and fall off precipitously after adolescence (Figure R-2). Typically, males outnumber females throughout the age spectrum.

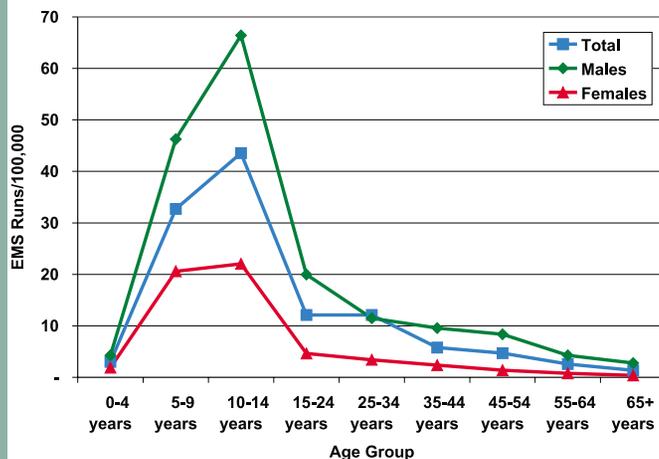
other transportation

United States:

All-terrain vehicles (ATV's) and other off-road vehicles are used widely for both work and recreation. The devices are also frequently used on farms and in rural communities for general transportation across fields and even on roads. Unfortunately, these devices are a frequent form of injury mortality and morbidity. In addition to adults, thousands of children, usually riding adult-sized vehicles, are injured yearly. About 200-300 people die yearly due to ATV's nation-

Figure R-2

Bicycle-Related EMS Runs, Arkansas, 1996-2000



Source: Arkansas EMS Database, 1996-2000 * Some rates based on 20 or fewer deaths. These rates may be unstable. Use with caution.

wide.⁶⁻¹⁰ While limited specific information is obtainable, data on “other transport” deaths and hospitalizations is available. This also includes data on deaths on trains and other vehicles.

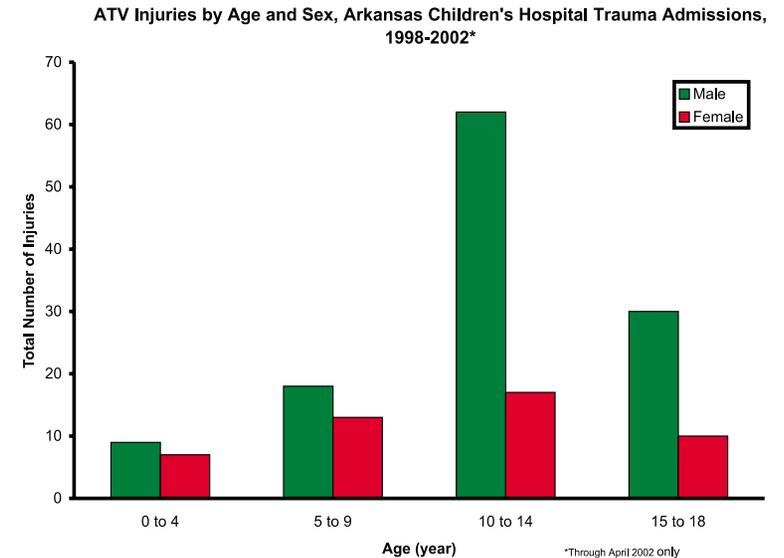
Arkansas:

The Arkansas age-adjusted rate of 1.5/100,000 for this category during 1996-1998 reflects 112 deaths during this period. This rate is twice as high as the national rate of 0.72/100,000. Males were much more frequently involved in these injuries (crude rate 2.4/100,000 vs. 0.4/100,000 for females). These injuries also demonstrated higher rates in whites than non-whites, in contrast to many other injury types (crude rate 1.6/100,000 for whites vs. 0.5 for non-whites).

Data from Arkansas Children's Hospital indicate that 151 children were admitted for treatment of ATV injuries between 1998 and 2001. Three of these children died of their injuries. A further 15 children were admitted in the first quarter of 2002 alone. Males ages 10-14 years were the most common group injured, but the youngest passenger injured was only six months old, and the youngest driver was three years old (Figure R-3).

All terrain vehicle injuries are specifically logged as part of the Arkansas EMS run database, allowing for a more complete description of ATV-related injury. Arkansas EMS transported 1,481 ATV crash patients between 1996 and 2000. Nearly half of these (701, 47%) were in patients under 18, almost all the remainder were in adults under 65. EMS run rates were highest for young children and young adults, consistent with

Figure R-3



Source: Arkansas Children's Hospital Trauma Registry *Through April 2002 only

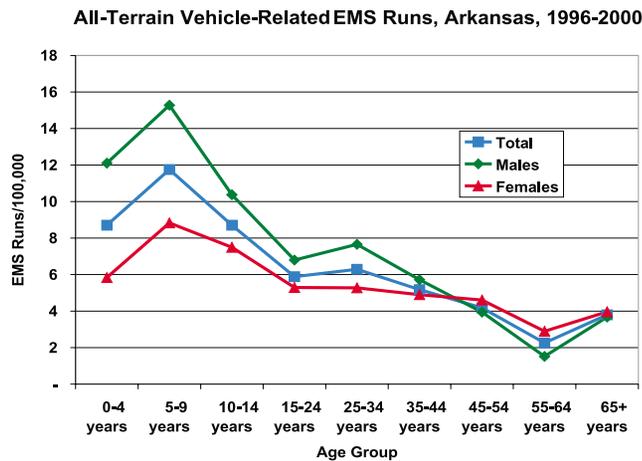
the pattern at Arkansas Children's Hospital, and fell off for older adults (Figure R-4). Rates for males were higher than females except in older adults. Nearly all the ATV injuries reported (94.4%) were in whites.

ATV injuries in the EMS database varied widely across the state of Arkansas. Rural counties had much higher rates, especially Newton, Sevier, Scott, Madison, and Polk counties.

Other Recreational and Environmental Injuries

This section discusses several environmental exposures often but not always associated with recreation. These injuries are fairly common but do not frequently result in death. Instead, they are significant causes of pain, suffering, and disfigurement. In more severe cases, hospitalization and disability do result.

Figure R-4



Source: Arkansas EMS Database, 1996-2000

Bites and stings

United States:

Animal bites and venomous stings are relatively common injuries that require medical attention. Dog bites in particular have gained public health attention because of the frequency and severity of some injuries, especially face, neck and head injuries in young children.

Arkansas:

Bites and stings resulted in 11 deaths in Arkansas during 1996-1998, eight of which were in males. The overall rate of deaths in this category was 0.14/100,000.

Rates of hospital discharge were substantially higher. A total of 1,027 hospital discharges occurred between 1997 and 2000 in Arkansas, for an overall rate of 9.6/100,000—making bites and stings the fifth most common injury mechanism for hospitalization. Among younger patients, males clearly predominate. The hospitalization rate was highest, however, for the elderly at 13.9/100,000 with elderly

women at particular risk (Figure R-5). Most of these hospitalizations resulted in discharges home (86.8%); three patients (<1%) died during admission.

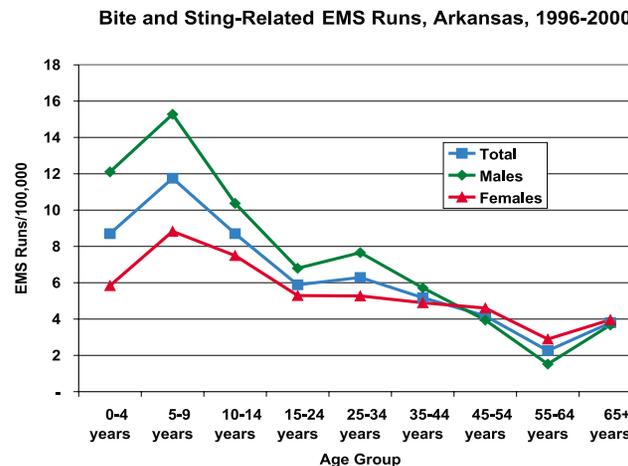
Bites and stings were also relatively common reasons for EMS transport in Arkansas; 772 such runs are included in the database. The pattern is similar to that seen for hospital discharges. In childhood there is a peak with males outnumbering females; in the elderly injuries in females are more frequent. (Figure R-6)

Natural and Environmental Exposures and Overexertion

Exposure to extremes of heat, cold, and other environmental factors can lead to injuries. Frequently, injuries also result from overexertion, often during sports or other recreation. While neither of these mechanisms is a common cause of injury death, they result in substantial morbidity.

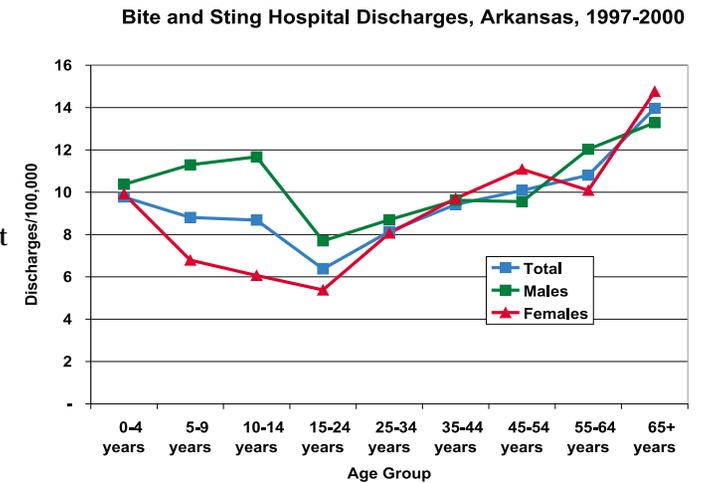
Ninety people died due to natural and environmental causes in the state during 1996-1998.

Figure R-6



Source: Arkansas EMS Database, 1996-2000

Figure R-5



Source: Arkansas Department of Health, Center for Health Statistics

Nearly a third of these were in the elderly, where both males and females were represented. In younger age groups, males were more frequently victims. Hospitalizations for these injuries were more common: 767 were discharged for a rate of 7.2/100,000. The elderly are at markedly higher risk, demonstrating rates nearly three times higher than the general population (20.9/100,000). About two-thirds of these patients were discharged home to self-care, while 17% were sent to other skilled or interim facilities.

Overexertion injuries did not lead to any deaths in Arkansas in this time period; however, 687 people were admitted for these injuries. Overexertion injuries were rarely reported in children and increased in frequency with age. As with natural and environmental injuries, the elderly had the highest rates of hospitalization. These admissions demonstrated an average length of stay of 3.1 days, and 81% of patients were discharged home.

The EMS run database did not specifically track natural/environmental injuries or overexertion injuries, so no proxy information for emergency services use is currently available.

Home Injuries

People generally consider their homes to be safe havens. However, many serious injuries occur each year in homes. About two-thirds of all childhood injuries and most injuries to children younger than five years of age occurred at home. Falls in the home are common, particularly in older persons, and can result in serious injuries and death. Several other types of injuries, including burns and poisonings, also occur most frequently in residences.

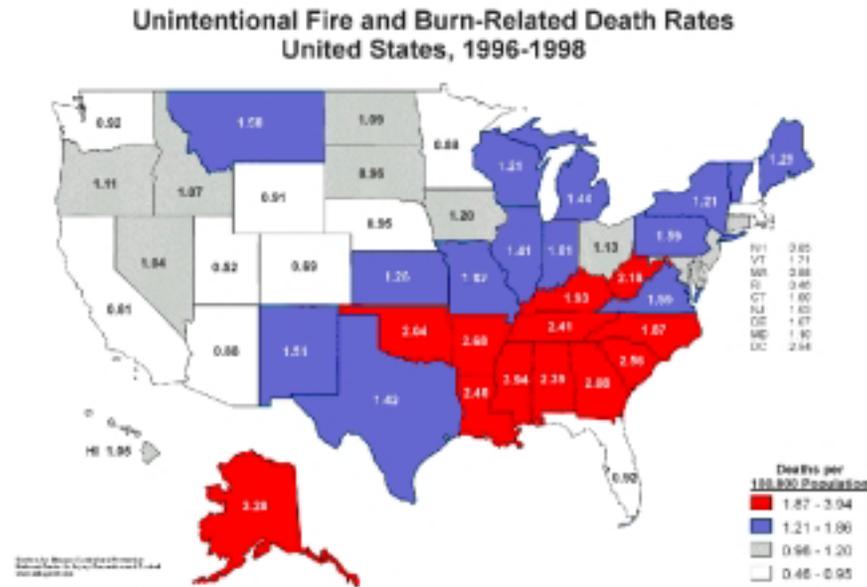
Fires and Burns

United States:

Burn injuries are the fourth leading cause of unintentional injury death in the U.S. About 80% of fire deaths result from residential fires. Smoking materials and lighters, heating equipment and electrical malfunction, cooking, and children playing with matches cause most home fires. The leading source of ignition in U.S.



Figure H-1



home fires is cigarettes. Older adults, young children under five years old, and people in substandard housing or mobile homes are at highest risk for fire-related deaths.^{1,3} Scalds and other hot substance injuries are more common in young children and occur when hot water and other hot liquids are contacted.

Arkansas:

Fire-Related Burns

In recent years, Arkansas has had consistently higher rates of overall fire-related deaths than the United States (Figure H-1). Only Alaska and Mississippi have higher rates of fire and flame deaths than Arkansas. Over the past decade, the Arkansas rate of fire-related injury death of 2.9/100,000 was about twice the national rate of 1.6/100,000, accounting for 31 excess deaths per year according to the CDC. Fires were

RISK FACTORS & SOLUTIONS:

Installation of smoke detectors on all floors of the home, a family escape plan, and instruction in “stop, drop and roll” could save many lives. Properly installed smoke alarms are 50-80% effective in preventing fire-related death.

Scald burns cause significant morbidity, especially in children. Decreasing hot water temperatures on water heaters to less than 120 degrees Fahrenheit can help prevent these injuries. Other scald burns can be avoided by cautioning parents about the dangers of cooking and hot beverages around young, curious children.

Most Arkansans without alarms had “never thought about” installing one (34%), while 13% had a detector but had not installed it, and 8.5% felt a detector was too expensive. 7% felt smoke alarms were not needed or important.

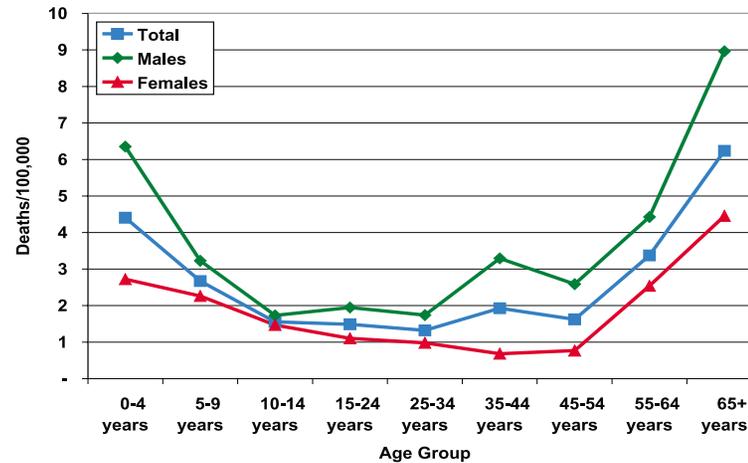
12% of households in Arkansas overall have no smoke detector in place.

Only 5% of households reported a smoke detector on each floor of the home.

Source:
Behavioral Risk Factor
Survey, 1997

Figure H-2

Fire and Flame Death Rates, Arkansas, 1996-1998



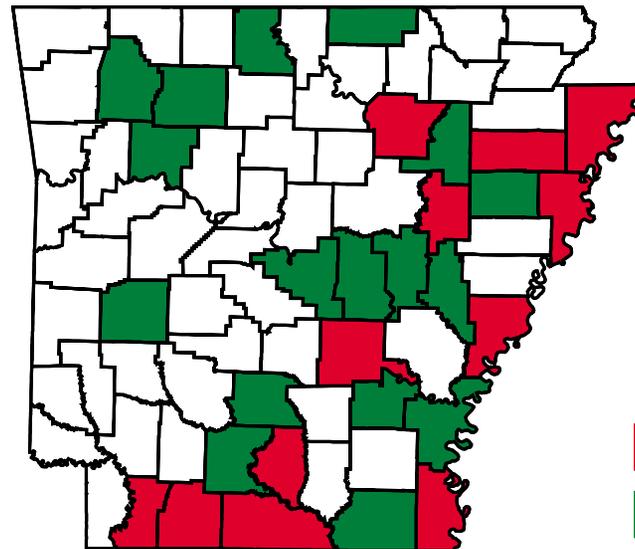
Source: Arkansas Department of Health, Center for Health Statistics. * Some rates based on 20 or fewer deaths. These rates may be unstable. Use with caution.

the sixth most common mechanism for injury death in the state and are among the top five causes of death for children under five years of age and adults over 55 years.

Between 1996 and 1998, more than 70 Arkansans died each year due to fires. Consistent with national figures, the highest death rates between 1996 and 1998 were demonstrated in the very young and the elderly. (Figure H-2) Although overall numbers are small for some age and gender subgroups and should be interpreted with caution, death rates for children under five were twice the overall state rate, and fires were the fourth leading cause of death for children overall. Death rates for the elderly were three times higher than the state rate. Rates for males were also substantially higher—often twice as high or more—than those for females in each age category. The crude death rate for non-whites was more than two times higher than that for whites (5.3/100,000 for non-whites vs. 2.3/100,000 for whites) during this period.

Figure H-3

Fire/Burn Deaths by County, 1989-1998



County level data for injury mortality during 1989-1998 (Figure H-3) demonstrate that 12 of 75 Arkansas counties have fire-related mortality rates at or above the 90th percentile for the US, and an additional 17 are at or above the 75th percentile. Highest fire-related injury death rates are noted in rural counties, particularly in the Delta area.

Fire and flame-related injuries accounted for about 2% of injury-related hospital discharges between 1997 and 2000 (N = 508). In contrast to the death figures, higher hospitalization rates occurred in adults ages 19-64 (8.1/100,000), followed by elderly adults (6.5/100,000). Males continued to have rates much higher than

Red at or above the 90th NATIONAL percentile
Green at or above the 75th NATIONAL percentile, but below the 90th

Source: Centers for Disease Control and Prevention



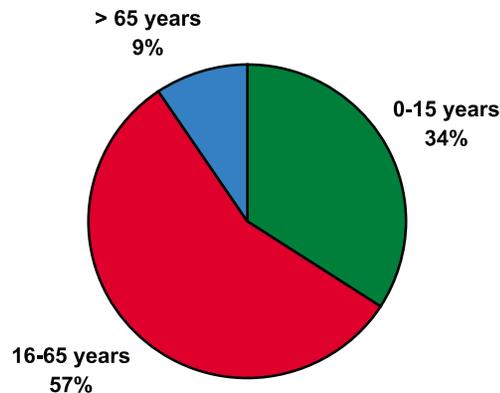
Similar patterns were notable for the 1,947 EMS runs in the state between 1996 and 2000. More runs occurred for adults than children, and for males than females. Overall fire-related EMS run rates for the state were 14.6/100,000.

The Arkansas Burn Center, located at Arkansas Children's Hospital, admits most severely burned patients in the state. The burn center registry indicates that admissions have increased in recent years, with approximately 200 new admissions annually in recent years. Children 0-15 years of age have constituted about one third of admissions, adults 16-65 more than half, and elderly adults the remainder of admissions. These proportions have remained stable over recent years. (Figure H-4)

females. Discharge records reveal that 3.6% of these fire/flame patients died, 80.7% of patients were discharged home, and 10% were transferred to another facility. The average length of stay for these patients was 5.6 days.

Figure H-4

Admissions to Arkansas Children's Hospital Burn Unit, 1997-2001



Source: Arkansas Children's Hospital Burn Center

Arkansas Fire Academy statistics identified 202 deaths and 554 injuries due to fires in the state between 1995 and 1998, the most recent years for which data are available. Most of the injuries and deaths were related to burns and smoke inhalation; fewer than 20% of the casualties were due to fractures, wounds, and other causes. Most casualties (54%) were transported to hospitals, 24% died at scene, and the remainder were treated and released or had other dispositions. Males accounted for 65% of reported casualties, and adults 19-64 years of age also accounted for 65%. Fire-related deaths occurred in residential settings 76% of the time. Estimated value of property loss during this period was more than \$330 million.

Other Burns

Scald burns are common causes of significant morbidity but do not result in large numbers of deaths. Contact with hot water or other substances killed five Arkansans during 1996-1998. All but one of these were males, and three of the five were either a young child or elderly person.

In contrast, 276 people were discharged from hospitals for such burns during 1997-2000. The overall population rate was 2.6/100,000 and as seen in fire-related burns, rates were highest for children 0-4 years (7.6/100,000) and the elderly (4.7/100,000). Rates for males were higher for all age groups. Most of these patients (72%) were discharged home, and 1.5% expired. Average length of stay was five days.

The EMS database does not differentiate between fire-related and other burns, so no clear record of other types of burns is currently available for emergency care resulting from these injuries.

Falls

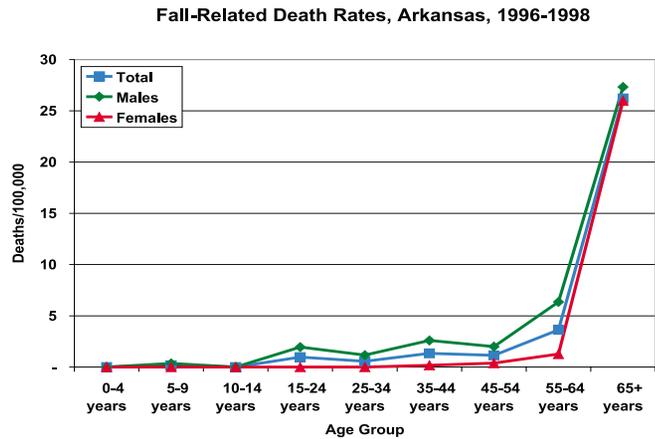
United States:

Falls, occurring primarily among the elderly, are the second highest cause of unintentional injury mortality, with 16,600 deaths in the U.S. attributable to falls in 1998. Falls in the elderly often cause fractures and secondary health problems associated with immobility.⁴ In children under the age of five, injuries from falls often require Emergency Department care. These serious falls are often associated with playground equipment, household furniture (such as falling off a bed or table), or baby walkers. Older children fall from playground equipment and in sports activities. Falls resulting in more severe injury or death to children are usually from a great height, such as a second-story or higher window. Approximately 300 children die each year from falls.

Arkansas:

The Arkansas death rate for falls is comparable to that of the U.S. as a whole, at 4.45 per 100,000 between 1996-1998. In Arkansas, approximately 112 persons died due to falls each year between

Figure H-5



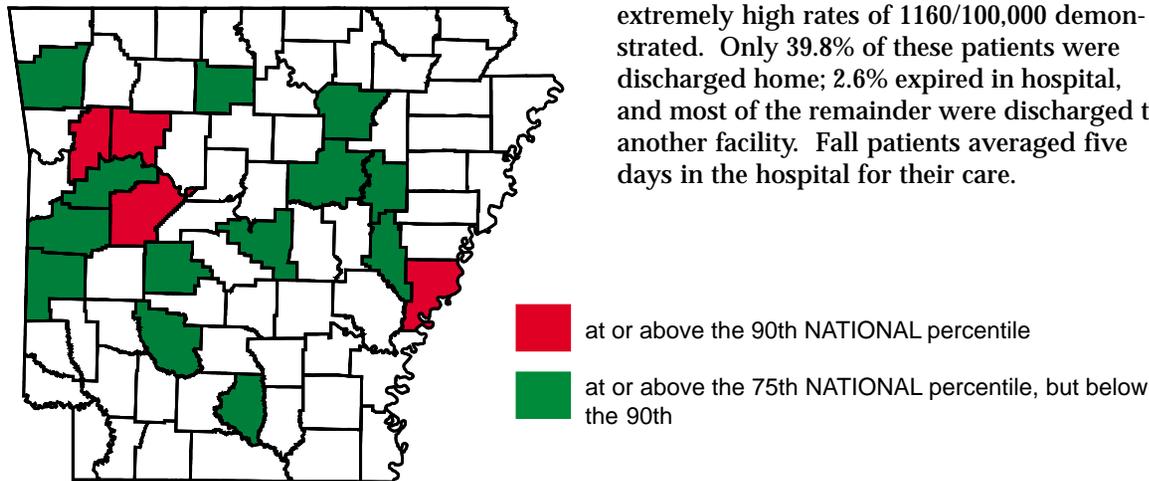
Source: Arkansas Department of Health, Center for Health Statistics. * Some rates based on 20 or fewer deaths. These rates may be unstable. Use with caution.

1989 and 1998. Falls are the fourth leading mechanism of injury death overall in Arkansas, and are the leading cause of death in the elderly.

Death rates are low for all age groups up to late adulthood, when rates climb considerably in the 55-64 year old age group, and then jump nearly

Figure H-6

Fall Deaths by County, 1989-1998

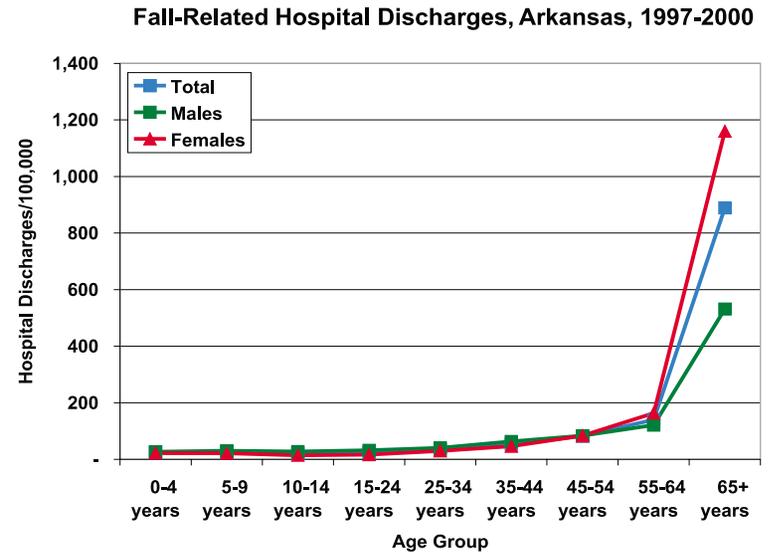


Source: Centers for Disease Control and Prevention

ten-fold for those 65 and older (Figure H-5). Males have higher rates than females throughout most of the age spectrum, but in the elderly the rates are similar. Fall death rates for most Arkansas counties are comparable to national rates. For three counties, rates are at or above the 90th national percentile (Figure H-6). Fall death rates are much higher for whites than non-whites in Arkansas (5.4/100,000 vs. 1.8/100,000 for non-whites).

Fall-related hospitalizations for the state demonstrate similar patterns, but with overall rates that clearly demonstrate the burden fall injury places on not only the victims but also on the health care system (Figure H-7). More than 18,000 people were discharged after fall injuries in Arkansas during 1997-2000. Nearly three quarters of these were among the elderly (13,309, 74%). Rates again jump sharply with age; for those 65 or older the rates were 889/100,000 overall, and even higher for females, where there were extremely high rates of 1160/100,000 demonstrated. Only 39.8% of these patients were discharged home; 2.6% expired in hospital, and most of the remainder were discharged to another facility. Fall patients averaged five days in the hospital for their care.

Figure H-7



Source: Arkansas Department of Health, Center for Health Statistics





Nearly 70,000 EMS runs for falls were logged between 1996 and 2000—more than any other cause except motor vehicles. Falls are among the leading causes of EMS runs for injury in the state for all age groups except young adults, where assaults are more common. Demographic patterns are similar to those for fall-related deaths and hospital discharges, with the elderly, particularly older females, making up the majority of patients involved. The overall rate for the elderly is a remarkable 2,447/100,000. A smaller peak of injury appears for children ages 5-9, where males outnumber females.

Poisoning

United States:

The introduction of child-resistant packaging in the 1970's greatly reduced the incidence of childhood poisonings by solids, liquids or medications.⁵ Similarly, poisonings from household gas and other sources of carbon monoxide have also decreased in the past few decades. Although the overall incidence of fatal poisonings began to decline after 1920, it increased again after 1950. This was due in large part to overdoses of narcotics.⁵

Arkansas:

Deaths due to ingestions of poisons in Arkansas tend to be below national rates. CDC mortality data for 1996-1998 demonstrated an Arkansas rate of 4.1/100,000 compared to 6.1/100,000 for the U.S. (Figure H-8). Rates have been lower over time for Arkansas than for the nation. Despite this, poisonings are the fifth most common cause of injury death overall for Arkansans, and are the third most common cause for adults ages 25-54.

Mortality rates for poisoning peak in middle life, and are highest for males (Figure H-9). Death rates are lowest in children ages 10-14, who are less likely to have unintentional poisoning characteristic of the youngest children. These children are not yet at significant risk for suicidal behavior that is a problem in later adolescence.

Poisoning-related hospital discharges demonstrate a different pattern than do deaths. Hospital discharge rates for poisoning are higher for females than for males at essentially every age, and the overall rates for females are 50% higher than for males (70.2/100,000 vs. 45.6/100,000) (Figure H-10). This reflects higher rates of suicide attempts in females, as discussed in the section on Intentional Injuries in this document. For children, hospital discharge rates are higher for males, consistent with patterns for other injury

RISK FACTORS & SOLUTIONS:

Among the elderly, falls have been on the increase. More than half of persons who die from falls are 65 years old or older.

Falls are the top cause of injury death, hospitalization, and EMS service calls for the elderly.

Strength and balance training, as well as environmental modifications in homes, such as grab bars and no slip flooring, have been shown to be effective in preventing falls in the elderly.

**RISK FACTORS
& SOLUTIONS:**

Unintentional poisonings most frequently occur in young children. Overall rates for unintentional poisonings have decreased in the past two decades.

Intentional poisonings are more common in females and become more common in adolescence and young adulthood.

Figure H-8

**Unintentional Poisoning Death Rates
United States, 1996-1998**

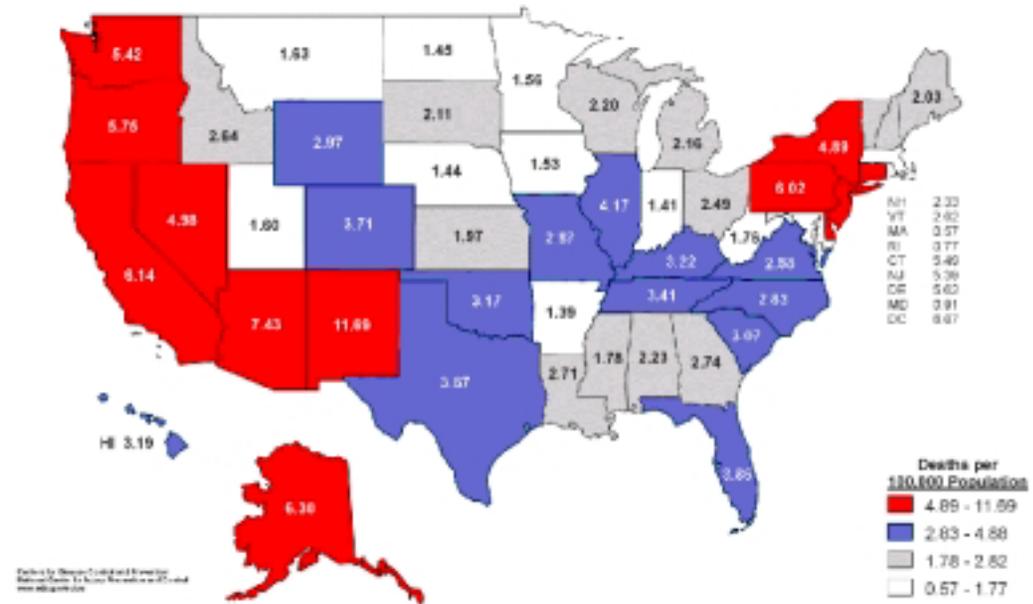
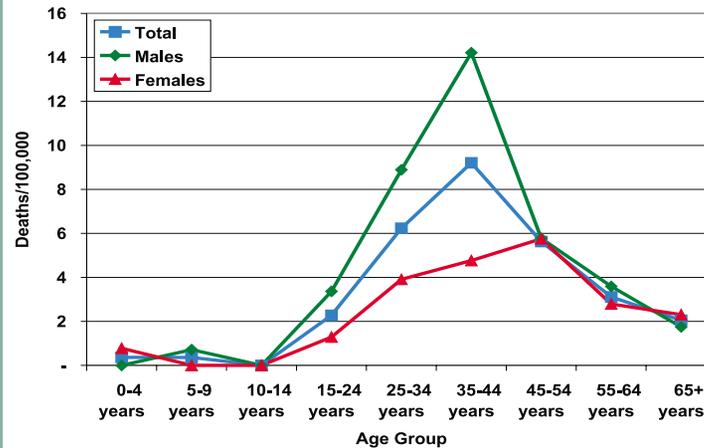


Figure H-9

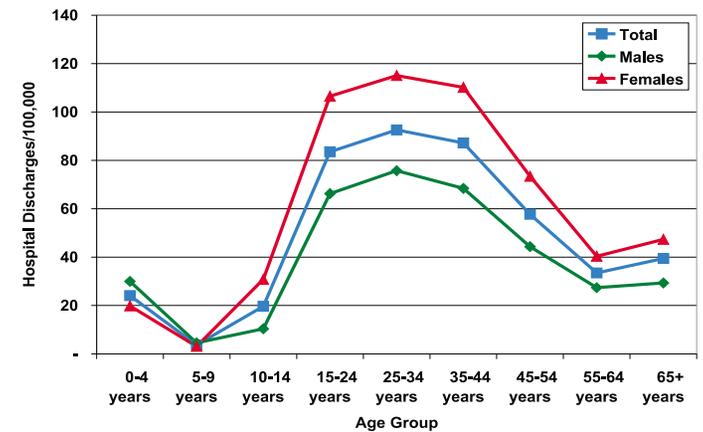
Poisoning Death Rates, Arkansas, 1996-1998



Source: Arkansas Department of Health, Center for Health Statistics
* Some rates based on 20 or fewer deaths. These rates may be unstable. Use with caution.

Figure H-10

Poisoning Hospital Discharges, Arkansas, 1997-2000



Source: Arkansas Department of Health, Center for Health Statistics

types. Most patients discharged after poisonings (71%) were sent directly home; 1% died, and the remainder were discharged to other facilities. Poisoning admissions tended to be shorter, at 2.5 days on average.

For reasons that are not clear from the data, poisoning EMS runs are comparatively infrequent and demonstrate a pattern different from both mortality and hospital discharge rates. Only 137 poisoning EMS runs are logged in the database during 1996-2000, with an overall rate of 1/100,000, substantially lower than the hospitalization rates and even lower than mortality rates. These figures may reflect a different pattern of transport to hospitals than other injuries, where poisoning victims either

are so severely affected that they die at home or have less acute poisonings allowing transport by personal vehicles rather than EMS. While serious poisonings resulting in deaths and hospitalizations are more frequent in adults, less serious poisonings occur most often in children. Data from the Arkansas Poison Control Center indicate that 36,892 calls were made due to poisonings during 1999-2001. Of these calls, 26,392 (72%) were for children ages 0-18. Most of these (20,719, 78%) were regarding children ages 0-4. Most poisonings reported to Arkansas Poison Control were oral ingestions (83%), while the remainder were inhalations, ocular exposures, dermal exposures, and other routes.

Outcomes of Arkansas poison center calls are shown in Figure H-11. Of calls with known outcome, nearly one-third of calls were found to have no effect, while an additional 19% had minor effect, 8% had a moderate medical effect, and 1% had a major effect. Of calls not followed clinically, most were judged to have potential minor clinical effect or as nontoxic exposures. Most of the ingestions in children had no effect, minor effect, or were not followed clinically. A total of 29 deaths were known to have occurred among the reported poisonings. All deaths were in adults. Most of the calls (82%) were deemed unintentional; however 15% were intentional ingestions and intent could not be determined in another 3%. Females had a higher proportion of intentional ingestions (Figure H-12).

Suffocation

United States:

Suffocation is a common form of injury death nationwide. Suffocations in the form of unintentional choking and hanging occur in infants and

children, while intentional suffocations are more common in adolescents and adults. Between 1996 and 1998, a total of 32,243 suffocation deaths occurred in the United States, at a rate of 3.4/100,000. Unintentional suffocations made up about 40% of these deaths and intentional injuries or injuries of unknown intent 60%.

Arkansas:

A total of 370 persons died of suffocation in Arkansas during 1996-1998. Of these, 210 (57%) were deemed unintentional, the remainder either intentional or undetermined. While the primary focus of this section is unintentional suffocation since intentional suffocation is discussed in the *Intentional Injuries* section of this report, death rates for suffocation of all intents are displayed in Figure H-13. Rates have one peak in infants and young children in whom most of these injuries are unintentional, and then reach substantially higher rates in adulthood where intentional suffocations are more common. Rates are highest in the elderly, in whom most of the deaths were unintentional in nature. For those over 65, the death rate is 12.9/100,000.

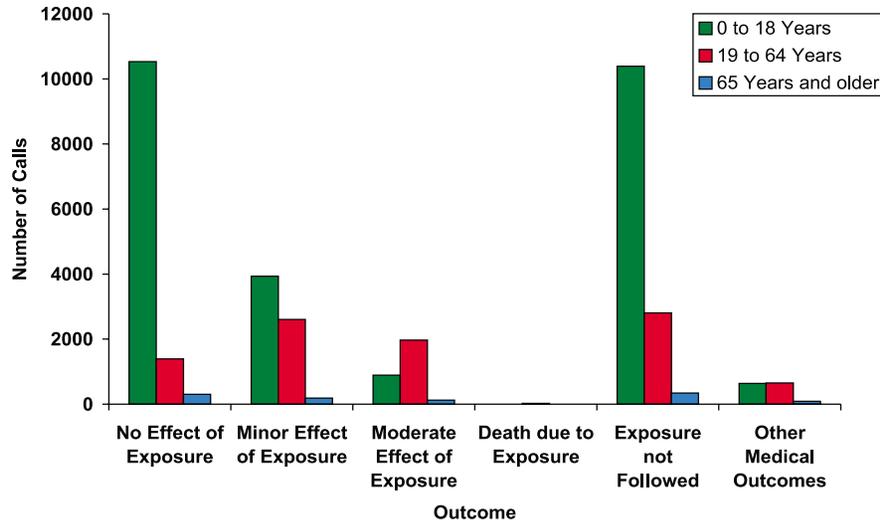
Hospital discharges for suffocation totaled 180 during 1997-2000, for an overall rate of 1.7/100,000. Rates again were five times higher for the elderly than for the other age groups, with males predominating. Suffocation resulted in higher proportion of deaths than many other injury types: 14.4% of those discharged died. Only 46.1% were discharged home. Mean length of hospital stay was 7.4 days.

Suffocation is not a separate category in the EMS database, so no specific information on this injury type is available from this source. No other databases with information about unintentional suffocation were identified for this report.



Figure H-11

Outcomes of Poison Center Calls by Age, Arkansas, 1999-2001

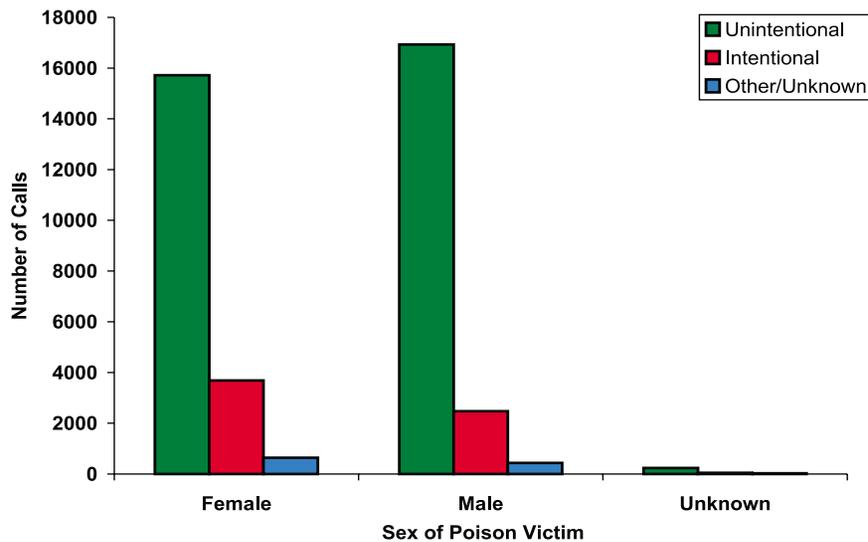


Source: Arkansas Poison Center 1999-2001



Figure H-12

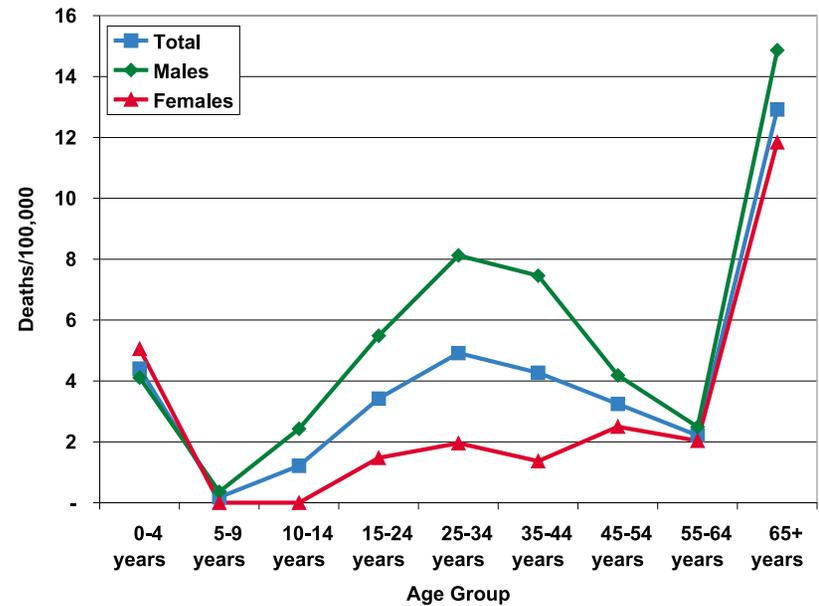
Intentionality of Poison Center Calls, Arkansas, 1999-2001



Source: Arkansas Poison Center 1999-2001

Figure H-13

Suffocation Death Rates, All Intentions, Arkansas, 1996-1998



Source: Arkansas Department of Health, Center for Health Statistics

* Some rates based on 20 or fewer deaths. These rates may be unstable. Use with caution.

Occupational Injuries



United States:

Over the past century, there has been significant improvement in both occupational morbidity and mortality. Data from the National Safety Council estimated that from 1933 through 1997, deaths from unintentional, work-related injuries declined 90%, from 37/100,000 workers to 4/100,000 workers. Recently, overall occupational injury numbers in both Arkansas and the United States as a whole have decreased (Figure O-1).¹

In 1998, there were approximately 131 million people employed in the United States. About 15 of these workers were fatally injured each day, totaling 5,543 preventable work-related deaths.² Deaths, of course,

are the most serious injuries and represent only the extreme of the injury spectrum. Large numbers of nonfatal and disabling injuries also occur in the workplace. In addition to the human burden of injury and death, it has been estimated that the cost of morbidity and mortality due to occupational injury has an annual cost of \$145 billion.³ Despite clear improvements, workplace injuries remain a major health hazard and are associated with tremendous personal and social costs.

Nationally, in 1997, fatal transportation accidents accounted for 42% of all occupational deaths (Figure O-2). Most of these deaths (22%) were highway crashes. Assaults and other violent acts, including suicide, were the second most common fatal occupational event, accounting for 17% of the total cases. Of these cases 14% were homicides and 3% were suicides. The third leading cause of fatal occupational injury was contacts with objects and equipment at 17%. These top three causes of occupational fatalities have been consistent over time.

Rates of fatal occupational injuries vary across the nation and with different industry types. States with the highest fatal occupational injury rates include Alaska, Wyoming, Montana, Idaho, West Virginia and Mississippi, while the greatest number of deaths occurred in California, Texas, Florida, Illinois and Pennsylvania (Figure O-3). Industries with the highest fatality rates include mining, agriculture, forestry and fishing followed by construction, transportation and public utilities.

From 1980-1995, male workers died most frequently from motor vehicle incidents, falls and machine-related injuries. In contrast, female workers died most frequently from homicides, followed by falls and machine-related injuries.⁴ The National Traumatic Occupational Fatalities Surveillance System data collected by the National Institute for Occupational Safety and Health indicates that most deaths occurred in the 25-34 year old age group while the Census of Fatal Occupational Injuries collected by the U.S. Department of Labor identifies the 35-44 year old age group with the

RISK FACTORS & SOLUTIONS:

Construction Industry Falls:

Risk factors for falls include the use of ladders, scaffolding, the presence of floor and wall openings and working for a small company employing 10 or fewer workers.

Many interventions have been suggested including environmental modification to the worksite, worker education and legislation aimed at changing safety rules.

Although there are few studies on effectiveness of different interventions, fall protection regulation that is enforced with inspections may be associated with a decrease in fall injury rates.

Transportation-Related Injuries:
 Properly used safety belts have been effective in reducing morbidity and mortality. The risk of fatal injury to drivers is reduced by 45% when a shoulder and lap belt are used.

Worksite-based programs to increase driver safety belt use generally have a positive impact. These programs include single strategy (education alone) and multi-strategy (education plus incentives) interventions.

Sources:
 See Occupational References 9 and 10, page 46

Figure O-1

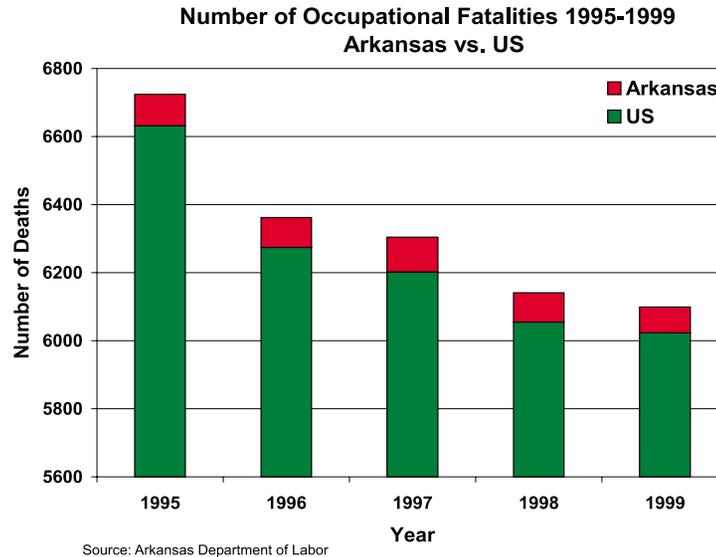


Figure O-3

United States Occupational Injury by State 1980-1998

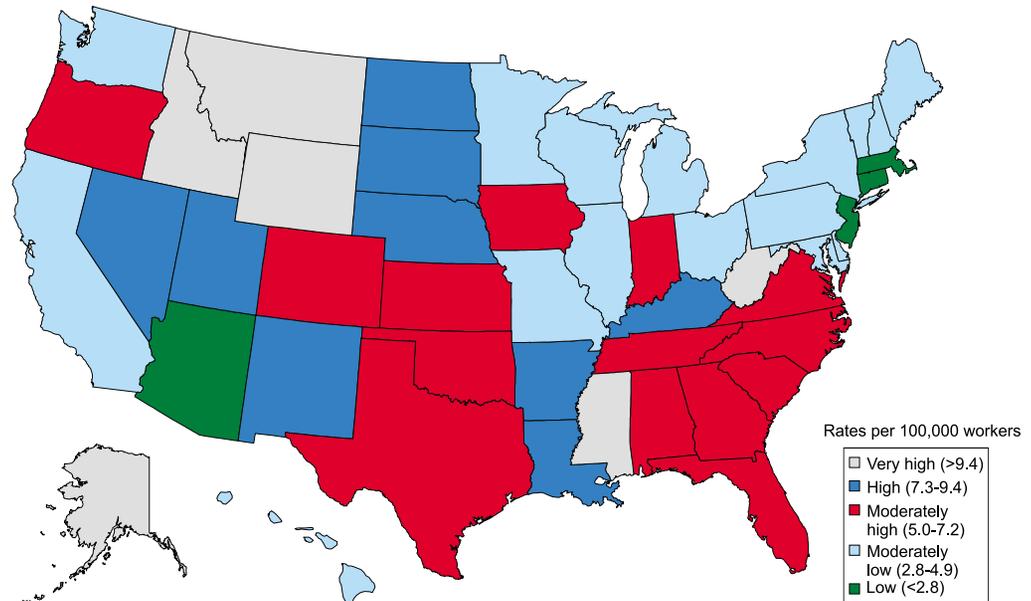
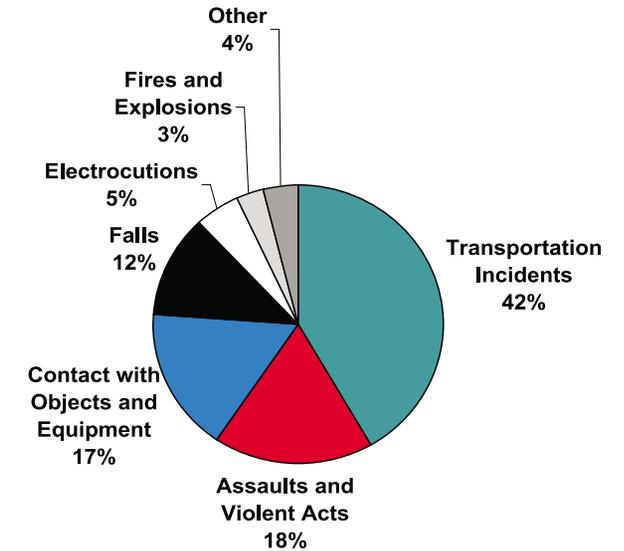


Figure O-2

Distribution of Fatal Occupational Injuries, United States, 1997



highest number of fatalities. In both databases, however, death rates increase dramatically in workers 65 and older.

Occupational injuries that result in fatalities represent the most severe injuries and consequences. There are far more occupational injuries that do not result in death but nevertheless cause tremendous disability and economic loss. Nationally, there were 4.2 million emergency department visits for work-related injuries in 1999. In 1996, there were 358 million work loss days related to acute conditions. The industries with the highest incidence of nonfatal injury include construction, followed by manufacturing and transportation and public utilities. The non-fatal occupational injury rate for men (3.4/ 100 full time workers) is almost twice that of women (2/100 full time workers). While fatalities are more frequent in the older population, there are higher overall and nonfatal injury incidence rates in the younger workers age 16-24. Hands and fingers were the most common part of the body injured, accounting for 30% of all injuries. Lacerations and punctures (26%), sprains and strains (25%), and contusions, abrasions and hematomas (19%) were the most common injuries recorded in 1998.

Arkansas:

The mortality and hospital discharge databases analyzed for the majority of this report do not indicate whether the injuries described were occupational in nature. However, these databases contain a proxy, machinery deaths and admissions, which may represent occupational injuries. From 1996-1998 there were 59 deaths related to machinery. Occupation injury deaths overwhelmingly affect more men than women. Nearly all (98%) of these deaths were men during this timeframe. The highest death rates were found in the 65+ age group and men aged 55-64. Again this data suggests increasing frequency of machinery injury deaths. There has been an increase in the death rates from .6/100,000 in 1996 to .9/100,000 in 1998. Given the small

numbers, it was not possible to analyze county specific data.

The hospital discharge database also contains machinery-related hospital admissions. There were 408 admissions to Arkansas hospitals for machine-related injuries. The state rate for these admissions was 3.8/100,000. As seen in the mortality database, men are most affected. Men accounted for 84.6% of the admissions while 15.4% were women. The highest rates of admission were found in 24-35 year old men and women.

Racial and ethnic differences are difficult to interpret in this database because 33.4% of admissions did not contain race data and 14.2% contained no information on ethnicity. Given these limitations .7% of hospital admissions for the white population was secondary to machine injury while 3.1% of all blacks admitted were admitted for machine injury. This database records injuries less severe than death. In the hospital discharge



RISK FACTORS & SOLUTIONS:

On average, 103 children are killed annually working on farms (1990-1996).

In 1998, an estimated 32,000 children and adolescents were injured performing farm work.

In an average year, 136 American farm workers are crushed to death by tractor rollovers (1992-1998).

Every day, about 500 agricultural workers suffer lost-work-time injuries, and about 5% of these result in permanent impairment.

In Arkansas, 10.5 % of all fatal occupational injuries occurred in the farming, forestry and fishing occupational group.

Prevention Strategies include:

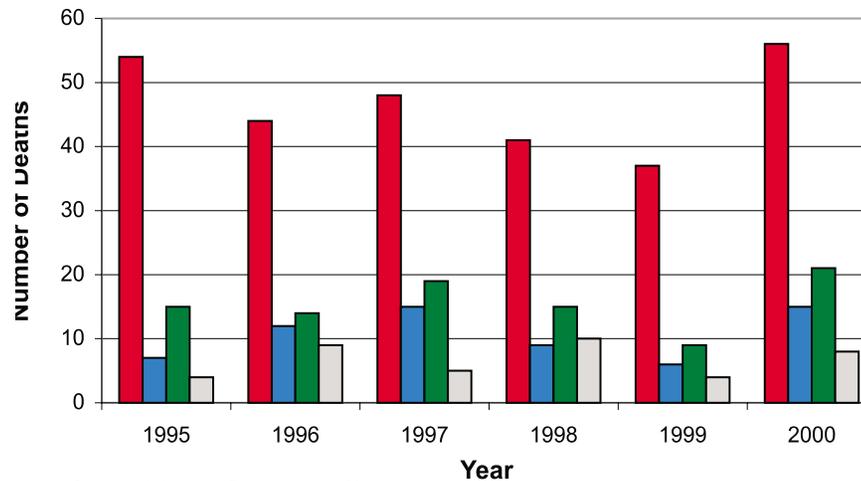
Machinery design changes to reduce risk of injury, educational measures to decrease risk-taking, and regulatory efforts for proper use of farm equipment and child labor statutes.

Sources:

Centers for Disease Control and Prevention
 National Institute for Occupational Safety and Health
 Arkansas Department of Labor
 See Occupational References 7 and 8, page 46

Figure O-4

Fatal Occupational Injury by Event or Exposure, Arkansas, 1995-2000



Source: Arkansas Department of Labor

- Transportation
- Assaults and violence
- Contacts with Objects and Equipment
- Falls

database, 85.3% of all machine-related injuries (n=348) were discharged to home while only .5% (n=2) died.

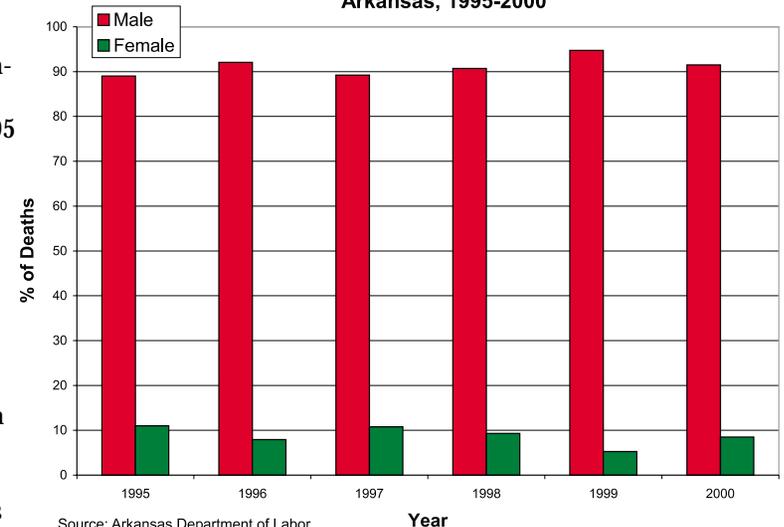
Other data sources provide some specific information regarding the significant problem of work-related injury in the state. According to 1980-1995 data from the U.S. Department of Health and Human Services, Arkansas had an occupational injury mortality rate of 8.3/100,000 as compared to the United States at 5.3/100,000 workers. According to these figures, Arkansas has the 10th highest fatal occupational injury rate in the nation.

The Arkansas Department of Labor compiles data on injuries in the state. From 1995-2000 there were between 76 and 106 fatal occupational injuries per year in the state. Most of these deaths occurred in transportation accidents (51%),

followed by contacts with objects and equipment (17%), assaults and violent acts (12%) (Figure O-4). Most transportation fatalities occurred on Arkansas highways (28% of cases). Occupational deaths from homicides were secondary to shootings. Males accounted for 91% of all fatalities, and most deaths occurred in the 25-54 year old age group. Most deaths (81%) were in whites and 12% occurred in blacks. Data for the Hispanic population is limited and may reflect misclassification in data collection (Figure O-5)(Figure O-6, page 34)(Figure O-7, page 34). In 1999, the transportation and public utilities industry made up 23.7% of occupational fatalities followed by construction (19.7%), and manufacturing (17.1%). Most of the fatal injuries consistently occurred in the occupations of “operators, fabricators and laborers” (Figure O-8, page 34).

Figure O-5

Arkansas Percent Fatal Occupational injuries by Sex, Arkansas, 1995-2000



Source: Arkansas Department of Labor

Figure O-6

Arkansas Number of Fatal Occupational Injuries by Age, Arkansas, 1995-2000

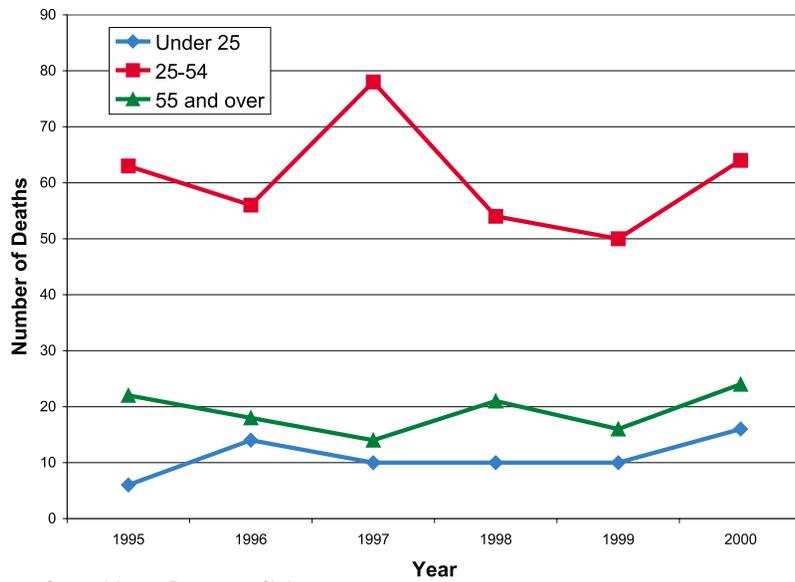


Figure O-7

Arkansas Fatal Occupational Injury by Race/ Ethnicity, Arkansas, 1995-2000

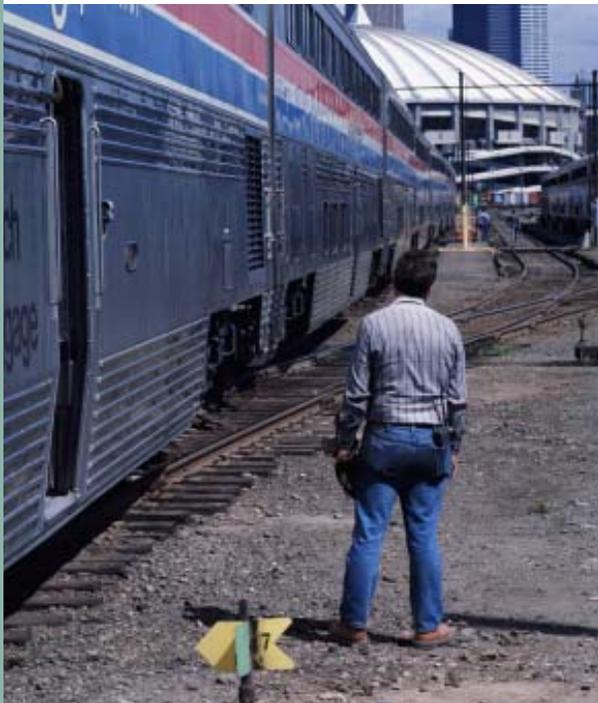
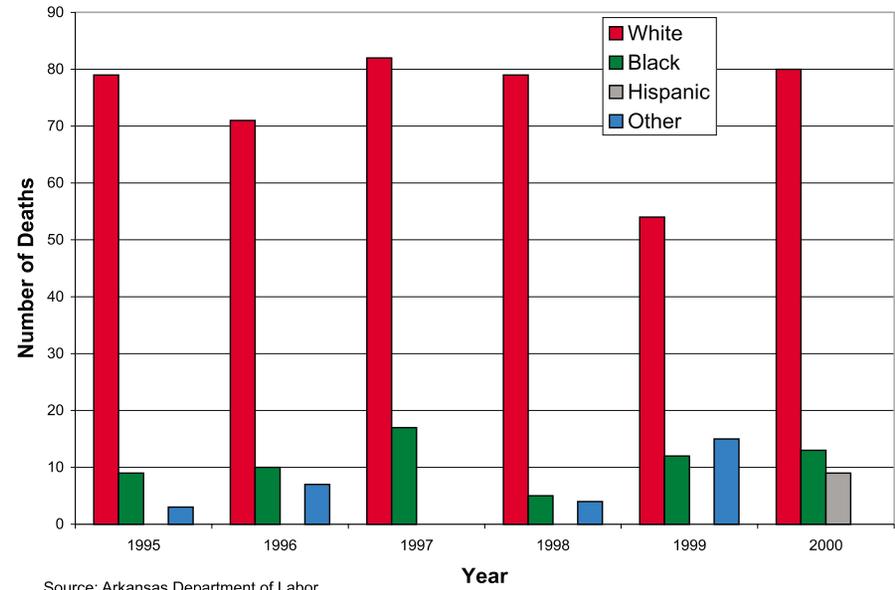
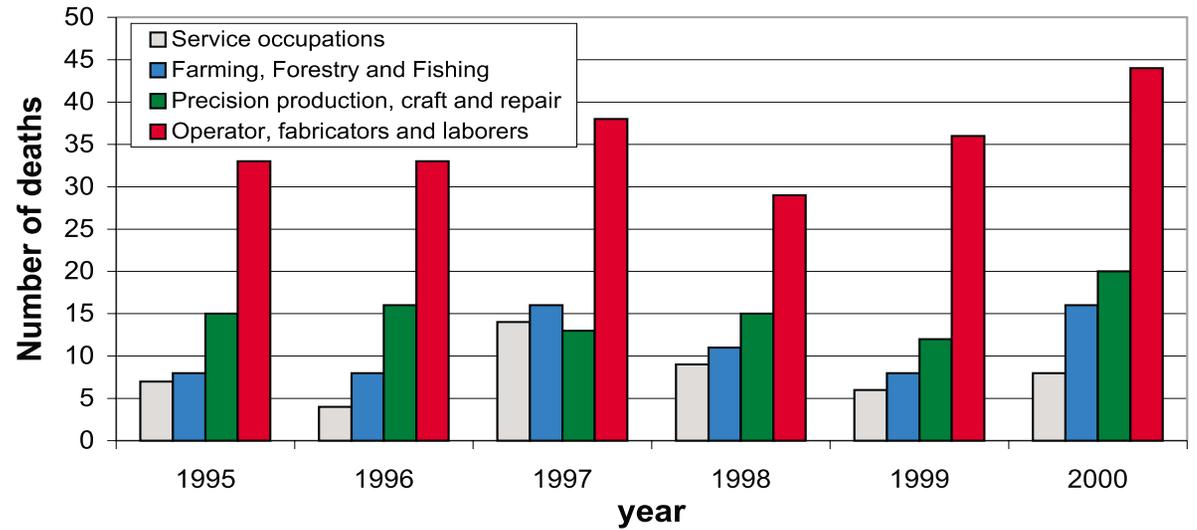


Figure O-8

Fatal Injuries by Occupation, Arkansas, 1995-2000



Nonfatal work injuries and illnesses, also tracked by the Arkansas Department of Labor, have decreased for the previous seven years (Figure O-9). In 1999, there were 14,672 work-related injuries and 6.8 work-related injuries per 100 full time Arkansas workers. Sprains and strains accounted for 45.6% of the work-related injuries that required recuperation away from work. Injuries involving the trunk of the body accounted for 35% of injuries followed by back injuries 24% and lower extremity injuries (24%). The most frequent event that lead to injury was contact with objects or equipment (25.2%). Younger males (63%) and whites (64%) made up the majority of injuries. The leading occupation for injury in the state was operators, fabricators and laborers with 51.9% of all reported occupational injuries.

Other data sources also contain some information indicating work-related injuries. The EMS run database contains some information on occupational injury in the state. Of the 214,996 emergency runs during 1996-2000, 5,714 (2.7%) were classified as work-related. Of these, 2074 (36%)

were falls, 1138 (20%) were motor vehicle collisions and 1608 (28%) were other trauma. Out of a total of 1,920 cases of traumatic brain injury in the state TBI database, 3.2% (61) were classified as work-related.

The Arkansas Highway Department maintains a database that contains information on incidents involving trucks. This classification includes single, two unit or multi-unit trucks which we have used as a proxy for a subset of work-related traffic injuries in the state. From 1997-1999, there were 6,648 motor vehicle collisions and 288 (4.3%) involved trucks. Most of these incidents (80.9%) occurred in rural areas. Truck crashes are increased over this time period. Fatalities were reported in 3% of the crashes, 57% included an incapacitating injury, and 40% a non-incapacitating injury. Alcohol was involved in 8.7% or 25 cases.

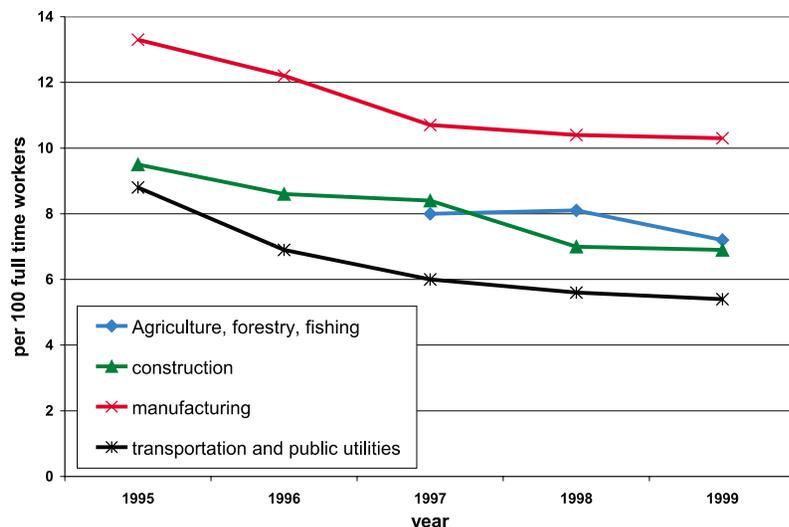


higher mortality for blacks, American Indians and Hispanics than for whites. Risk factors for injury have been identified which include previous history of injury, current work limitation, alcohol use, and prescription drug use. Other risk factors include working on farms less than 49 acres, and the presence of nonresident farm workers. Most injuries nationally are due to livestock, machinery and falls.⁷

Data for Arkansas-specific farm injuries was collected and reported in 1985.⁸ It reported that during that year there were 29.5 accidents per 100 farms. Statewide there were an estimated 15,000 injuries during the survey period. These injuries took place on farms of all sizes; however, larger farms had a larger percentage of injuries. This study did not control for number of workers that may account for this increased number. Most injuries were considered severe (64.2%). Consistent with the national data, males suffered 80% of the injuries reported. The 25-64 age group accounted for 63.8% of injuries while persons aged 15-24 accounted for about 17% of the injuries. Tractors and farm machinery were involved in 37.7% of all work related farm accidents, followed by animal-related injuries. Most machinery accidents occurred with harvesting equipment while making repairs or adjustments.

Figure O-9

Nonfatal Occupational Injury Incidence Rates by Industry Division, Arkansas, 1995-1999



Given the rural nature of Arkansas and its economy, agricultural deaths and injuries have increased importance. Agriculture is among the most hazardous industries in the US. It accounts for a significant amount of worker morbidity and mortality. There were approximately 780 agricultural occupational deaths and 140,000 nonfatal injuries in 1998. The annual cost is estimated to be \$209 million per year.⁶

The risk of agricultural injury is increased in persons younger than 19 and older than 65. Men have a 4.5-fold increase compared to women. There is a

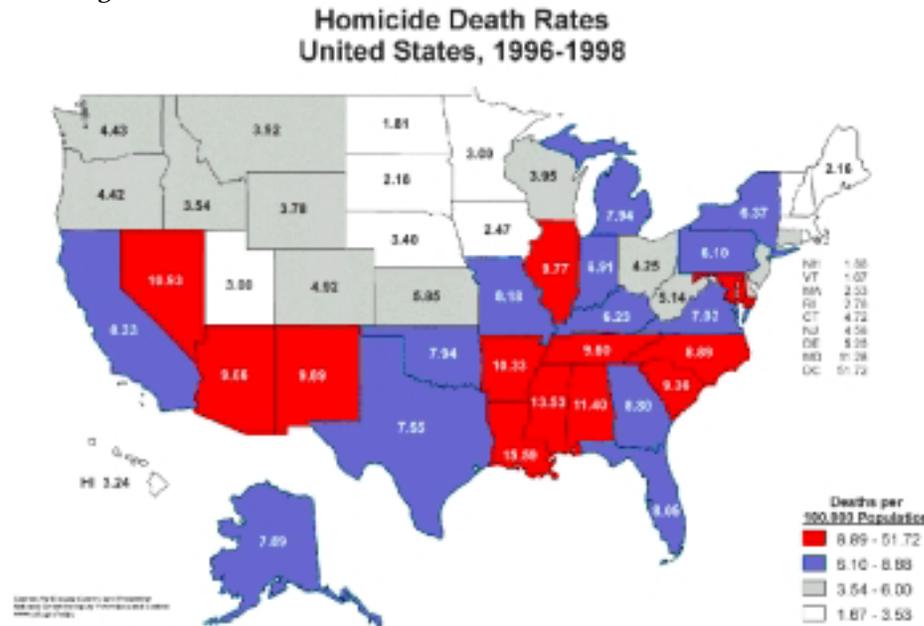
Intentional Injuries

United States:

Intentional injury morbidity and mortality is now recognized as a major public health problem in the US. This type of injury and the problems it causes have traditionally been handled through the criminal justice system. However, intentional injury morbidity and mortality have an obvious impact on the health of individuals, local communities and society as a whole.

In the U.S. in 1998, 18,272 people died as a result of homicide and 30,575 died from suicide.^{1,2} These are the most severe consequences of intentional injury. Homicide and suicide are only the extremes of violence in our society. In 1998 The U.S. Department of Justice esti-

Figure I-1



ated that there were 8.1 million violent crimes reported that included rape or sexual assault, robbery, aggravated assault and simple assault.³ These absolute numbers and rates of these crimes have been trending downward since 1994.

Homicide

United States:

The age-adjusted homicide rates have trended downward in the U.S. over time. The rates have decreased from 10.8/100,000 in 1991 to 7.1/100,000 in 1998. Regions of the U.S. are differentially affected by homicide mortality. From 1995-1998, Arkansas and the mid-south had the highest homicide mortality rate, along with Arizona, Nevada and New Mexico. The lowest rates occurred in the northeast. Homicide rates also tend to be higher in metropolitan cities than in smaller cities and rural areas



RISK FACTORS & SOLUTIONS:

Firearms are the single greatest risk factor for homicide. "Firearms" include handguns, long guns, assault weapons and air guns.

Over half of all homicides in teens ages 15-19 were firearm-related in 1998. Teenagers are more likely to die of gunshot wounds than of all natural causes combined.

Factors associated with increased risk for youth violence include:

- History of early aggression
- Beliefs supportive of violence
 - Cognitive deficits
 - Poor supervision
- Parental alcohol or drug abuse
 - Exposure to violence
 - Poverty
- Family disruption
- Academic failure

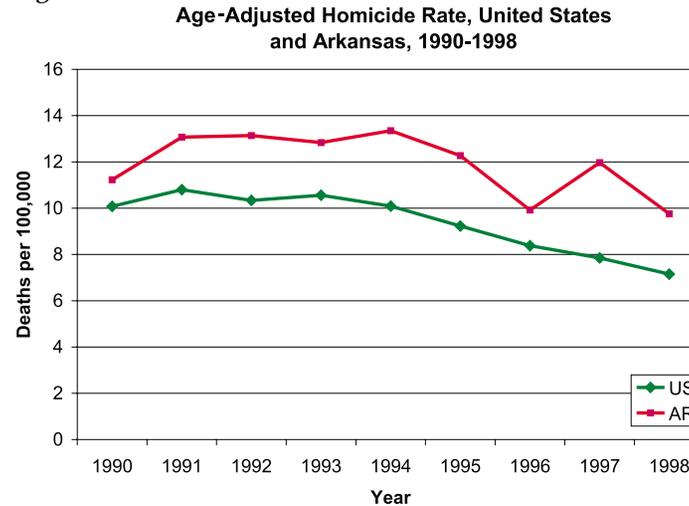
In Arkansas:

- 52% of 9th grade males and 28% of 9th grade females reported being in a physical fight one or more times in the last 12 months.
- 10.2% of 12th grade students reported being hit, slapped or physically hurt by their boyfriend or girlfriend in the past 12 months.
- 23% of students reported carrying a weapon such as a gun, knife, or club on one or more of the past 30 days.

Sources:

Injury Factbook 2001-2002
 National Center for Injury Prevention and Control
 Centers for Disease Control and Prevention
 Youth Risk Behavior Survey, 1999

Figure I-2



Source: Arkansas Department of Health, Center for Health Statistics

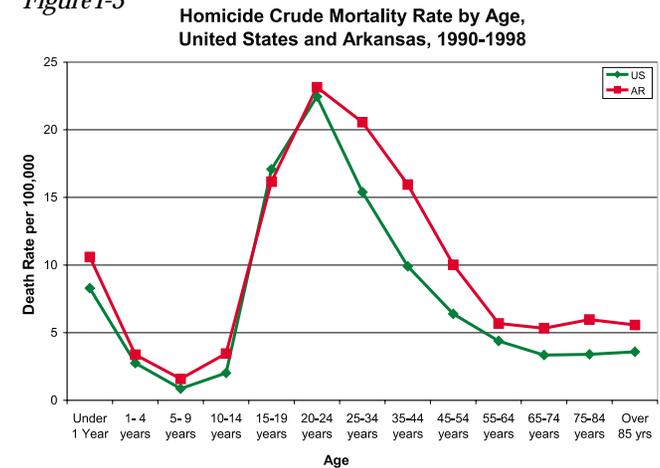
(Figure I-1).⁴

Homicide is the second leading cause of death for persons age 15-24 years of age.⁵ In 1998, the homicide rate for all males in this age group is almost six times (24.8/100,000) the female rate at 4.3/100,000. The homicide rate for black males in this age group is 96.5/100,000 (the leading cause of death) while the rate for white males is 12.2/100,000.⁶ Homicides are most often committed with guns, especially handguns.⁷

Arkansas:

Although homicide mortality has been trending downward, Arkansas' homicide mortality rate has consistently been higher than the national homicide rate. From 1995-1998 the age-adjusted homicide rate for Arkansas was 45% higher than the nation's (10.9/100,000 vs. 7.5/100,000) (Figure I-2). As with the nation as a whole, homicide mortality disproportionately affects young people and minorities. Mortality peaks in the 20-24 year old age group and in minorities, but to a greater degree (Figure I-3). The homicide rate for men from 1995-1998 in Arkansas is three times that of women (5.3/100,000 vs. 16.8/100,000). The overall age-adjusted homicide mortality rate for African Americans from 1995-1998 is six times that of the white population (34.4/100,000 vs. 6.1/100,000)(Figure I-4).

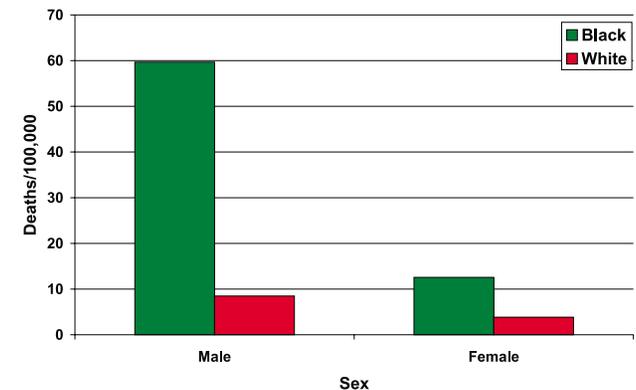
Figure I-3



Source: Arkansas Department of Health, Center for Health Statistics

Figure I-4

Homicide Age-Adjusted Mortality Rate by Sex and Race, Arkansas, 1995-1998



Source: Arkansas Department of Health, Center for Health Statistics

State mortality data from 1996-1998 reported that there were 755 deaths from assaults. Consistent with national data, the highest rates were seen in the 15-24 year age group. Firearm mortality rates were also highest in this age group. The most common mechanism for homicide in Arkansas is firearm use. Approximately 68.1% of homicides from 1996-1998 were caused by firearms followed by "other causes" and cutting and piercing (Figure I-5, page 38).⁸

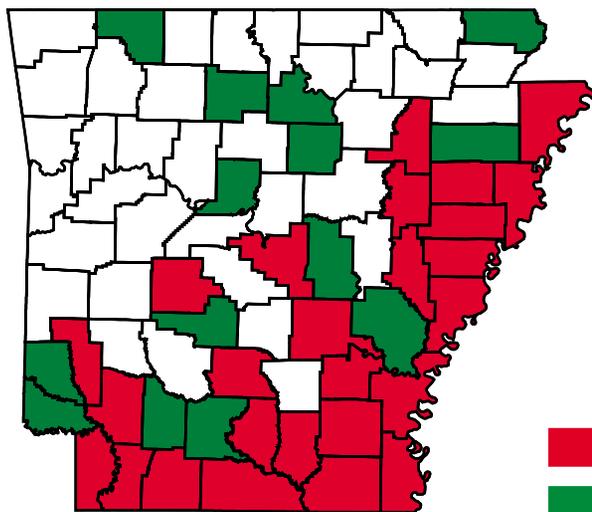
Within the state there is regional variation with respect to homicide mortality (Figure I-6, page 38). The highest

homicide mortality rates are concentrated in the southeastern half of the state. Counties with the highest assault mortality rates include Jefferson, Phillips, and Crittendon counties. The counties with the highest firearm mortality rates include Cleburne, Jefferson and Mississippi counties.

The State medical examiners also collect information on homicides in the state. The medical examiner's database from 1996-2000 contained 1271 cases of homicide. There has been a downward trend in the number of cases since 1997. Sixty-four children, or 5% of the homicides, occurred in children age 0-4. Almost 60% of homicides occurred in the 15-39 year age groups. Forty-two percent of all of the African American deaths were due to homicide, while 18.5% of non-African American deaths were due to homicide. Three quarters of the homicide deaths were male. There was no difference in urban vs. rural residence. Firearms caused 65.5% of all homicides reported in this database.

Figure I-6

Homicide Deaths by County



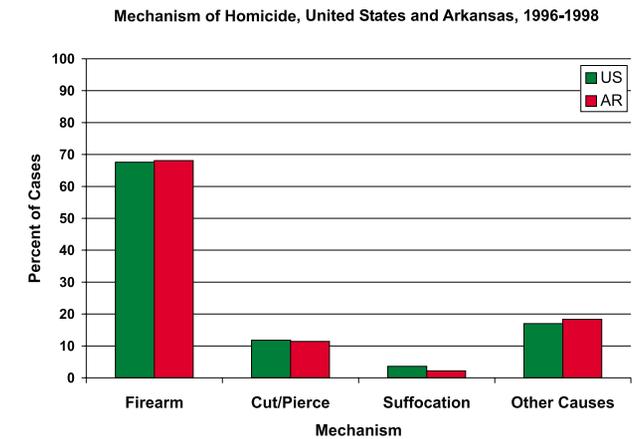
Source: Centers for Disease Control and Prevention

In the hospital discharge database from 1997-2000 there were 1,147 (2.8%) discharges categorized as "assault." The data suggest an upward trend but may represent improved data collection efforts. Hospital discharge data provides some information on less severe intentional injuries. Only 1.8% of assaults hospitalized during this time period resulted in death. The largest percent of assaults (23.5%) required one day of admission to the hospital. In this database 27.7% of assaults were caused by fire and flame, 23.4% by being struck by or against an object, 17.3% by cutting and piercing, 16.6% by firearm. Hospitalization for assaults were more likely for men than women. Men had a hospital discharge rate three times that of women (16.6/100,000 vs 5.6/100,000). Thirty-eight percent of all assaults occurred in the 15-29 year old age group. About 5% of all assaults occurred in persons 65 years of age or older. The data on hospital discharges by race is incomplete, with 33.4% of the cases having race data missing.

The EMS database contained information on many types of intentional injuries. These include both assaultive and self-inflicted injuries. During 1996-2000, 5.9% or 13,868 reports were secondary to assaults, 1.5% for shootings, .9% for stabbings and .1% for sexual assaults. The number and rates of calls for assaults has been increasing overtime. In 1996 there were 2,495 calls and in 2000 there were 3,106 calls. The assault rate for males was higher than that of females (122.5/100,000 vs. 90.8/100,000). The rate of assault EMS runs for African Americans was 3.7 times that of the white population. Counties with the highest rates of EMS runs for assault include Sevier, Lee and Mississippi counties. Again, numbers of assaults were highest for young men aged 15-24 years of age. Sexual assaults occurred at a state rate of 12.7/100,000. Sexual assaults occurred more in women, with the

- at or above the 90th NATIONAL percentile
- at or above the 75th NATIONAL percentile, but below the 90th

Figure I-5



highest rates in the 25-34 year old age group (29.9/100,000). Only Pulaski County and Jefferson County yielded reliable rates for sexual assault (7.9/100,000 and 26.5/100,000 respectively). There are no additional details surrounding these events.

Specialized databases in the state give more detailed information on homicide mortality in the state and additional limited information on forms of assaultive injury such as child and domestic abuse. The Arkansas Crime Information Center (ACIC) collects information on a broad range of crimes including murder, rape and aggravated assault. Between 1996 and 2000 they reported 983 deaths due to murder. The weapon type used most often was a handgun, making up 38%-53% of all murders each year. Age of the victim was most often in the young adult age group. Males were more likely to be victims as were African Americans. The most common circumstances were arguments about money, property, or felonious acts. Most often offenders were acquaintances or known to the victim. Most situations involved a single victim and single offender.

The ACIC also gives some information about less deadly forms of intentional injury - such as assault and rape - that have the potential to

escalate to homicide. From 1996-2000, there were 43,636 aggravated assaults. The total number per year has remained essentially constant over time, averaging 8,727 offenses per year. The weapon types most often used were hands, fists and feet. Firearms were used in about 20% of the cases yearly.

Assaults to commit rape are included in the data. From 1996-2000 there were 4,561 rapes reported. However, this may represent a gross underestimate of the problem in Arkansas. National data suggest that as many as 84% of women who are raped do not report the offense to the police.⁹

The 2000 data showed that 49.9% of the rapes occurred in women under the age of 17 and 28% were under the age of 13. The most common location of rape was the victim's residence or the suspect's residence (40% and 22.1% respectively). Sixty-one percent of victims knew their attackers. Conversely, 20.3% were unknown to the victim and 12.8% were family members of the victim. Most victims who reported a rape or an attempted rape received medical attention (56.9%). The extent of injuries and consequences are not collected in this database. Jefferson, Sebastian, Crittenden, Miller and Pulaski counties reported rape most frequently.¹⁰

Domestic violence data is not currently collected by the Arkansas Crime Information Center. National data indicates that crimes of domestic abuse, sexual assault and child maltreatment are severely under-reported.¹¹ The data for the state is therefore scattered across different sources collecting data for different purposes. The Arkansas Coalition Against Domestic Violence collects domestic homicide information. In 1998, Arkansas ranked third in the nation for domestic homicides despite an overall decline in violent crimes. The coalition reported 18 domestic homicides in the year 2000. A proxy for domestic abuse is the number of protective orders filed. Those who fear or have experienced abuse by

another family member may obtain protective orders. The Administrative Office of the Courts collects this information. From October 1997 through September 2000 there were 24,631 Orders of Protection filed. There was also an upward trend over time. The protective order rate for Arkansas is 43 orders for every 10,000 adults. The Victim Assistance Grant program also tracks the numbers of victims of domestic violence and other crimes and services used. In 2000, 7,175 reported domestic violence, 2,812 required shelter and 6,645 required emergency legal advocacy.¹²

Child abuse, like domestic violence, is likely to be under-reported. The Arkansas State Police and the Department of Human Services, Division of Children and Family Services collect this data. In 1998, 8,578 children were victims of maltreatment or 13.1 victims for every 1,000 children. The offenders were most often parents (73%) followed by non-caretakers (12%). In 2000, 19 child died due to maltreatment and 7,023 cases of child maltreatment were founded. The statewide victim assistance program reported 473 cases of child physical abuse and 1,503 cases of child sexual abuse.

Suicide

United States:

More people die from suicide than homicide in the United States. In 1998, there were 30,575 suicides in the United States.¹³ Suicide was the eighth leading cause of death in the United States, with a rate of 11.3 suicides per 100,000 Americans.¹⁴ The overall rate of suicide has remained constant over the last 50 years. However the overall rates mask some important trends and point to the need for intervention. From 1980-1992 the suicide rate for children age 10-14 increased 121%, by 27% for adolescents 15-19 and by more than 10% for the elderly age 70 and older. The highest suicide rate

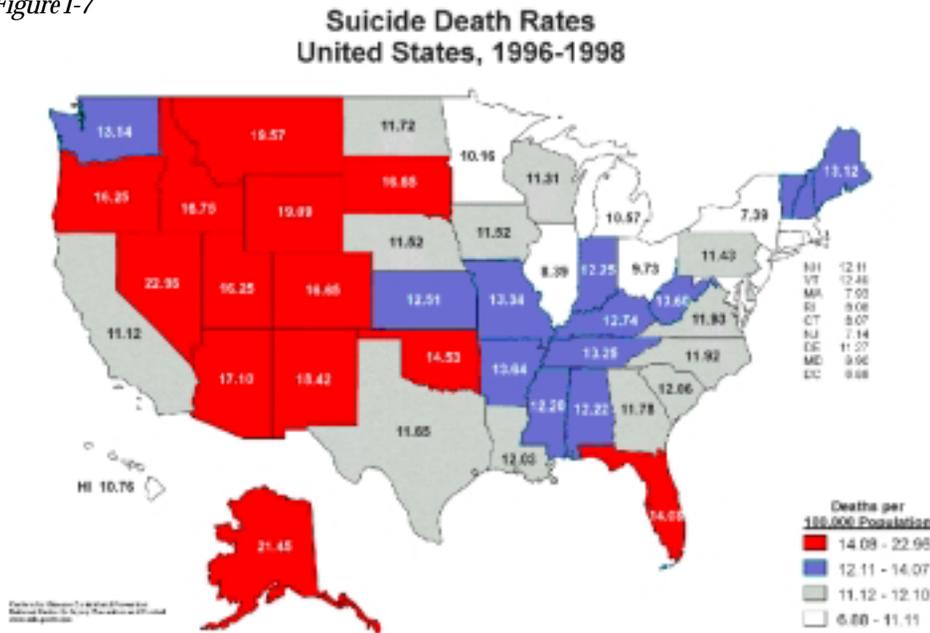


during this time was found in the 80-84 year old age group. The rate increase in this group was 36%.¹⁵

In 1998, suicide was the third leading cause of death for 15-24 year olds and the fourth leading cause of death for 25-44 year olds. These numbers are thought to be an underestimate of the true mortality rate secondary to the social stigma associated with suicide deaths. Suicide deaths reflect only a small portion of suicidal behavior. In 1998, an estimated 671,000 visits to hospital emergency departments were due to self directed violence.¹⁶

Suicide death rates varied by race, sex and geographic location. Males were four times more likely to die from suicide than females. However, females are more likely to attempt suicide. White males accounted for 73% of all suicides. White males and females make up 90% of all suicides. Suicide rates increased most rapidly among young black males. Suicide rates are higher in the western states and lower in the

Figure I-7



eastern and Midwestern states. Nearly three out of every five suicides in 1998 were committed with a firearm (Figure I-7).¹⁷

Arkansas:

While the overall U.S. suicide rate has been level, the Arkansas suicide mortality rate has remained above that of the rest of the nation. Arkansas specific data shows that the age-adjusted suicide rate in the state in 1998 was 13.6/100,000 population, while the U.S. rate was 11.3/100,000. Arkansas has remained above the national rate since the early 1990's (Figure I-8).

The mortality rate by age reflects the national trends. The highest suicide mortality rates are in the young adult and elderly age groups. The age-adjusted suicide rate for males in the state is almost five times higher than the female rate (4.7/100,000 vs. 21.9/100,000). The highest rate of death occurs in boys age 10-14 and elderly men (Figure I-9). The suicide rate for white males in Arkansas is 1.7 times that of the African American population (24.0/100,000 vs. 14.0/100,000).

Finally, as with the rest of the nation, the most frequent mechanism of death in completed suicides is by firearm in 71% of cases, followed distantly by suffocation in 13% of cases. The Arkansas counties with the highest suicide mortality rates include Greene, Baxter, and Garland counties (Figure I-10).

The Hospital Discharge database can provide an indication of the magnitude of suicide attempts that may not end in death. In this database there were 4,160 persons discharged from Arkansas hospitals with self-inflicted injuries (10.2%). One

thousand seventy-four persons aged 15-24 were admitted with self-inflicted injuries, nearly two-thirds of whom were women. The highest rates of self-inflicted injury occurred in the 25-34 year old age group at 92.4/100,000, which is more than twice the state rate. The most frequent mechanism was poisoning (88.5%). Sixty-seven

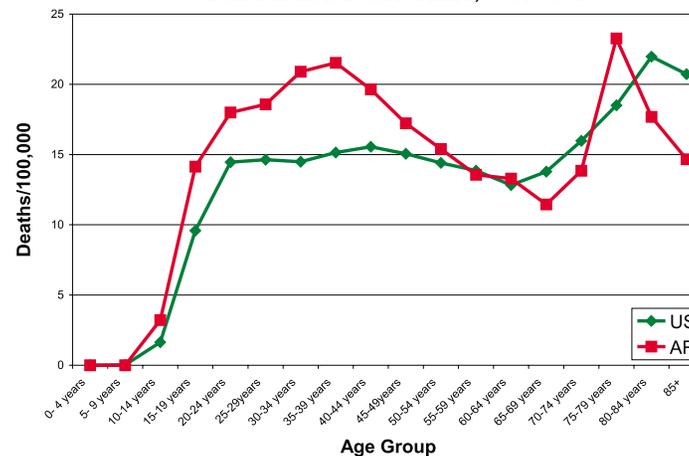
RISK FACTORS & SOLUTIONS:

Each day approximately 86 Americans commit suicide and 1,500 people attempt suicide.

Many risk factors are associated with suicide:

- Mental disorders such as depression and personality disorders
- Alcohol/substance abuse
 - Access to firearms
 - Problems of social adjustment
- Serious medical illnesses
 - Social isolation
- Recent bereavement and family history of completed suicide

Figure I-8 Crude Suicide Mortality Rate by Age, Arkansas and United States, 1995-1998



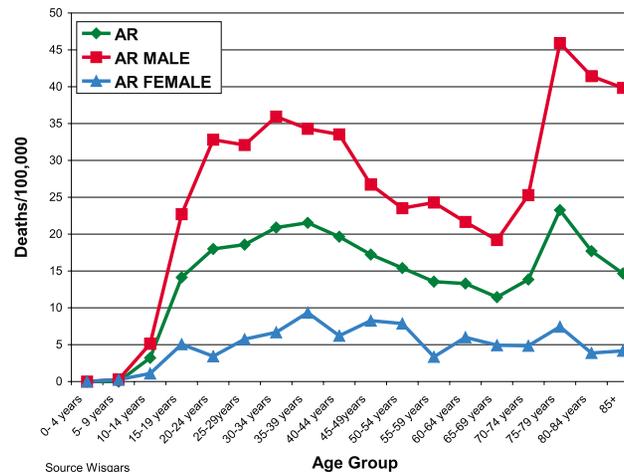
Source: Wisqars, Centers for Disease Control and Prevention

While studies are currently underway to develop effective prevention strategies, there are some things communities can do:

- *Build support for families, communities and neighborhoods*
- *Ensure accessible and effective care for mental illness, physical illness and substance abuse disorders*
- *Expand suicide prevention efforts, emphasizing nonviolent handling of disputes, conflict resolution and skill building in problem solving*
- *Promote awareness of suicide resources such as mental health centers, counseling centers and hotlines*

Figure I-9

Crude Suicide Mortality Rate by Sex, Arkansas, 1995-1998



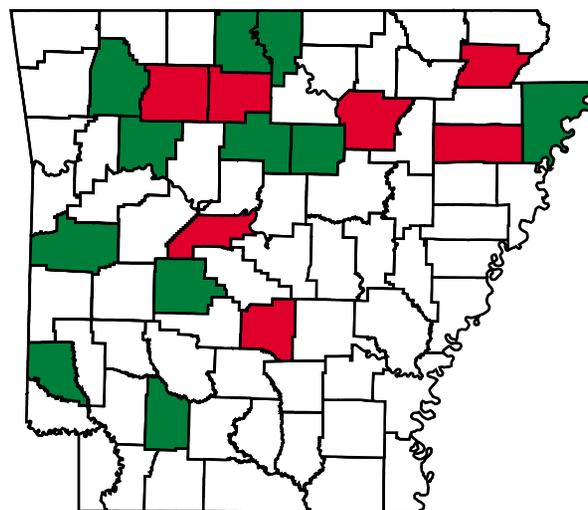
Source: Wisqars

percent of these admissions had a length of stay that was one or two days indicating less severe injuries. Two thirds of patients were discharged to home care; About 1% died; 5% were transferred to a mental health center.

The EMS database provides another look at the problem of suicide in the state. Less than 1% of EMS runs were for

Figure I-10

Suicide Deaths by County



Source: Centers for Disease Control and Prevention

- at or above the 90th NATIONAL percentile
- at or above the 75th NATIONAL percentile, but below the 90th

self-inflicted injuries. Almost one-third were in the 15-24 year old age group, while 8.9% were 65 and over. Interestingly, 73.1% of these injuries were in men while only 26.7% were in females. There were significant differences by race. Eighty-four percent of the reported self-inflicted injuries were in whites while 12% occurred in the black population. Most of these injuries were less severe.

Finally of the 40,191 cases in the poison control database, 4,218 (10.8%) cases were intentional or suspected suicides. Eighty-one percent of these events occurred in a residence. EMS runs for suspected suicides were more likely to occur in rural areas. About 70% of the runs occurred in rural areas and 26.7% in urban areas.

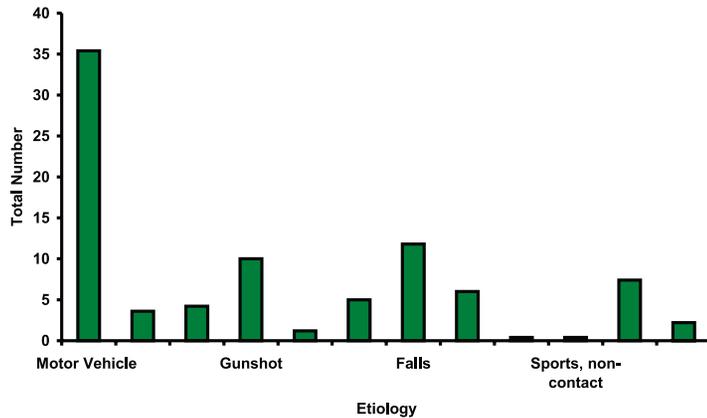
The Medical Examiner also collects data with respect to suicides. There were 831 suicides reported to the Medical Examiner's database between 1996-2000. The highest percentage of suicides occurred in ages 15-44 years of age. Most (88.2%) of the suicides occurred in "non blacks" and 79.3% in males. This database indicates that a preponderance (59%) of suicides occurred in rural areas rather than in urban areas (41%). The top four causes of suicide deaths were gunshot wounds, hanging, shot gun wounds and drug overdose.

The 1999 Youth Risk Factor Behavior Survey gives some more specific details on suicidality in teens. Nearly 20% of African American female students and 25% of white female students reported that they had seriously considered suicide in the last 12 months. Between 8% and 12% of male students seriously considered suicide in the last 12 months. The highest percent of those considering suicide were in the ninth grade (18.3%) and the 10th grade (23.1%). About 11% of female students and 4.4% of male students actually attempted suicide one or more times in the past 12 months.

Special Populations

Figure S-1

Etiology of Spinal Cord Injuries, Arkansas, 1996-2000



Source: Arkansas Spinal Cord Commission, Motor Vehicle Module 1996-2000

records of 406 Arkansas residents with SCI. Most spinal cord injury patients were male (78.3%) and white (73.4%).

Functional status resulting from SCI is compiled in the database, and indicates that 39.5% of the injuries resulted in complete lesions, 34.9% in incomplete, nonfunctional lesions, and 24% in incomplete, functional lesions. Only 1.6% of patients retained

normal function. Most spinal cord injuries resulted from motor vehicle crashes, falls, diving, or gunshots wounds as shown in Figure S-1.

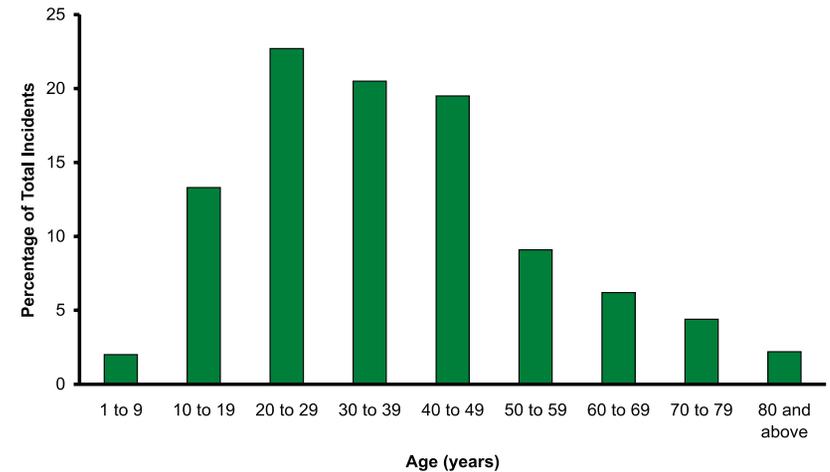
Spinal cord injury is overwhelmingly a condition of young and middle adulthood, with 71.8% of the injuries occurring in patients 20-59 years of age. Approximately 15% of injuries were in children 1-19 years old, and 12.8% in those 60 or older. (Figure S-2)

Traumatic Brain Injuries

Traumatic brain injury (TBI) is extremely common and has a high rate of mortality. For

Figure S-2

Spinal Cord Injuries by Age Group, Arkansas 1996-2000



Source: Arkansas Spinal Cord Commission, Surveillance Questionnaire 1996-2000

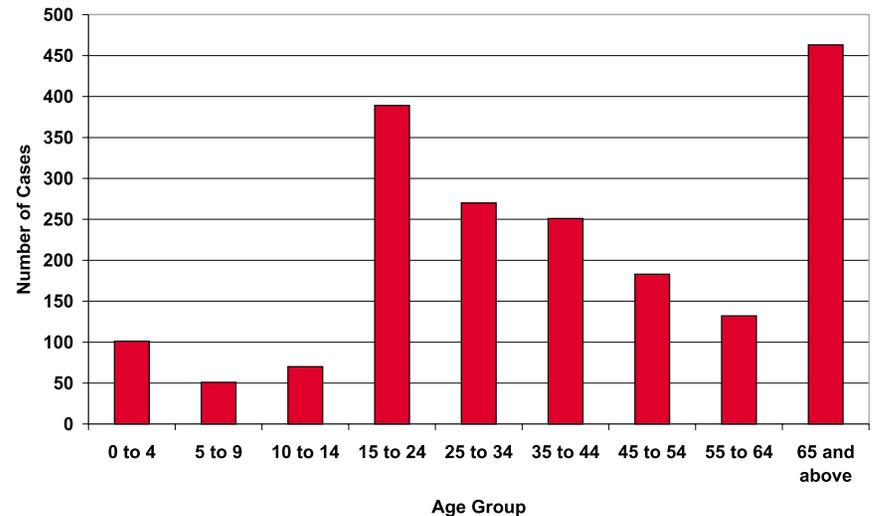
Spinal Cord Injuries

Spinal cord injuries are tracked by the National Spinal Cord Injury Database, which incorporates data on new injuries reported by 24 Model Spinal Cord Injury Care Systems (MSCICS) nationwide. Arkansas is one of the states included in this database. The Arkansas Spinal Cord Commission maintains a spinal cord injury registry in Arkansas and has been in existence since 1975. The Commission and the Office of Disabilities Prevention at the Arkansas Department of Health have worked with the Centers for Disease Control to maintain a surveillance system for SCI and develop model systems of care. State law requires reporting of SCI to the surveillance system. Previous study has indicated that Arkansas' data were similar to national data with regard to many demographic and injury circumstances indicators, including mean age and etiology of injury.^{1,2}

For purposes of this report, data were tabulated by the ASCC for the period 1996-2000, including

Figure S-3

Traumatic Brain Injury by Age, Arkansas, 1997-2000



Source: Arkansas Traumatic Brain Injury Registry, 1997-2000

survivors, serious disability and other long-term consequences are frequent. As a result, many states have special surveillance systems in place to both track and quantify these injuries and also to identify TBI patients and provide services and support.

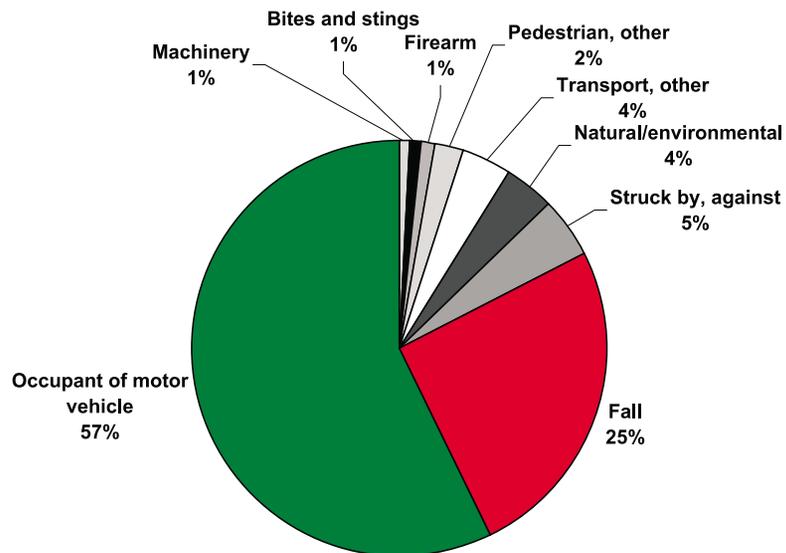
Traumatic brain injury surveillance data for Arkansas is available for years 1997-2000 from the Arkansas Department of Health. A total of 1,910 cases of TBI were included in this database. Most of the TBI cases were in males (1,231, 64.5%) and the median age was 37.5 years. TBI was most common in adolescents and young adults ages 15-24 and in the elderly (Figure S-3). The vast majority of unintentional TBI was due to motor vehicle crashes (57%) and to falls (25%) (Figure S-4).

Outcomes of TBI in the state are recorded in the registry. Nearly half of the unintentional TBI

patients (529, 48.2%) were discharged home, 35% died, and 14% were transferred to other facilities after initial hospitalization (Figure S-5). The functional status of surviving patients is also included, using the Glasgow Outcomes Scale, and reveals that 42 patients (5% of survivors with known outcome) demonstrated severe disability, 108 (13%) had moderate disability, and 528 (63%) were expected to have a good outcome (Figure S-6).

Figure S-4

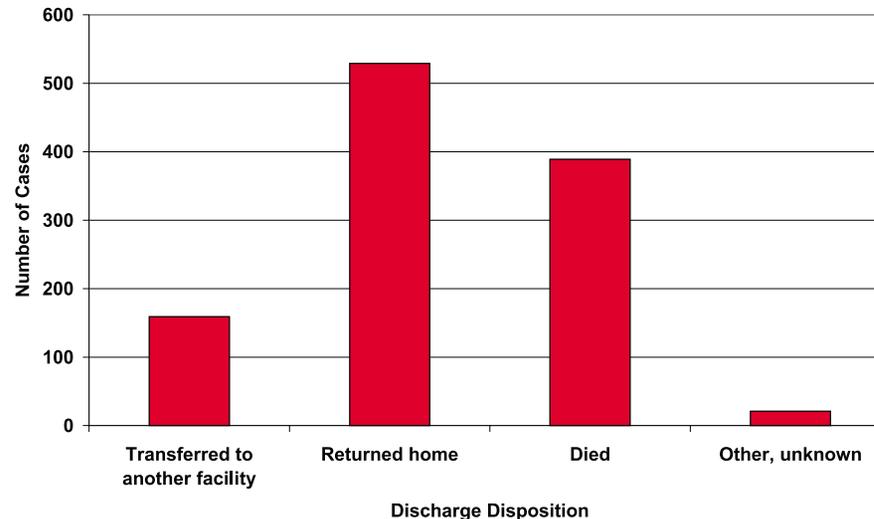
Mechanism of Unintentional Traumatic Brain Injuries, Arkansas, 1997-2000



Source: Arkansas Traumatic Brain Injury Registry, 1997-2000

Figure S-5

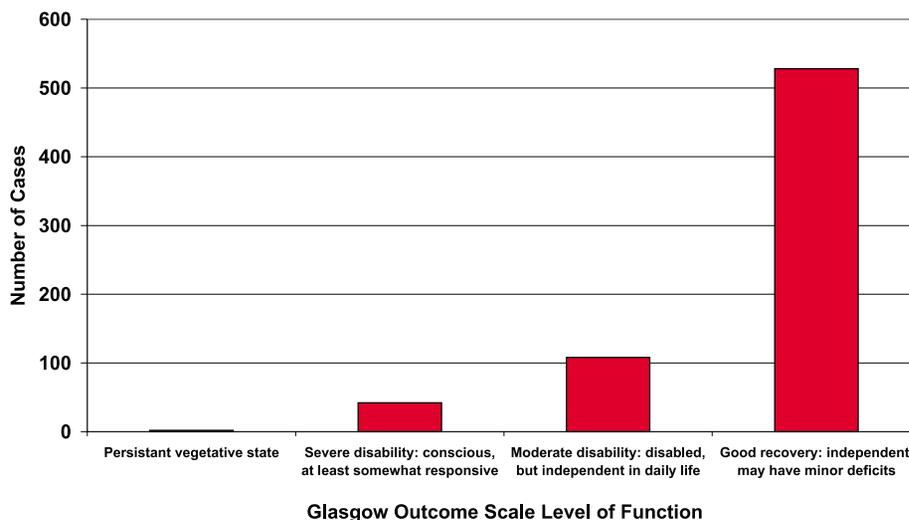
Outcomes of Traumatic Brain Injury, Arkansas, 1997-2000



Source: Arkansas Traumatic Brain Injury Registry, 1997-2000

Figure S-6

Functional Outcome of Traumatic Brain Injury, Arkansas, 1997-2000



Source: Arkansas Traumatic Brain Injury Registry, 1997-2000

Conclusion

The data presented in this report clearly demonstrate the magnitude of injury's impact in Arkansas, in terms of lives lost, hospitalizations, and emergency services used. Limited information about the longer term and broader influence of these injuries on the quality of survivor's lives is available, but what is known indicates that injury has major effects throughout the population with regard to disability, loss of function, and medical and other societal costs.

Arkansas' rates of injury places the state among the most severely affected in the nation. Interventions to improve these rates are available for many injury mechanisms, and increased efforts to implement these interventions are sorely needed to decrease unnecessary death and disability in the state. Ongoing surveillance of injury patterns and rates is also required to evaluate the progress of the state in preventing injuries to all Arkansans.

Useful websites

Census Data

<http://www.aiea.ualr.edu/CSDC/Census2000/DemoProfiles/AgeGroup.html>

<http://www.aiea.ualr.edu/CSDC/Census2000/DemoProfiles/AgeGender.html>

<http://www.aiea.ualr.edu/CSDC/Census2000/StatePop00.html>

<http://www.census.gov/>

Mortality Data

<http://www.healtharkansas.com/stats/dms98/DMSS061.HTM>

<http://www.injurypreventionweb.org/info/data/>



[matrix/ar-01.pdf](#)

<http://www.cdc.gov/nchs/releases/01facts/99mortality.htm>

<http://www.cdc.gov/ncipc/wisqars/>

<http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5017a4.htm>

Mapping

<http://www.cdc.gov/ncipc/maps/>

Injury Fact Sheets and General Information

<http://www.cdc.gov/>

http://www.cdc.gov/ncipc/fact_book/factbook.htm

<http://www.nhtsa.gov/>

<http://www.safekids.org>

<http://www.carseat.org/>

<http://www.cpsc.gov/>

Labor/Workforce Information

<http://www.cdc.gov/niosh/pdfs/2000-127.pdf>

Behavioral Surveys

<http://www.cdc.gov/brfss/brfsques.htm>

<http://www.cdc.gov/nccdphp/dash/yrbs/index.htm>

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¹ Injury Factbook 2001-2002. National Centers for Injury Prevention and Control, CDC. November 2001 p.7

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