

Hospital Costs and Safety Belt Use in Arkansas (2001–2005)



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Arkansas traffic crash facts

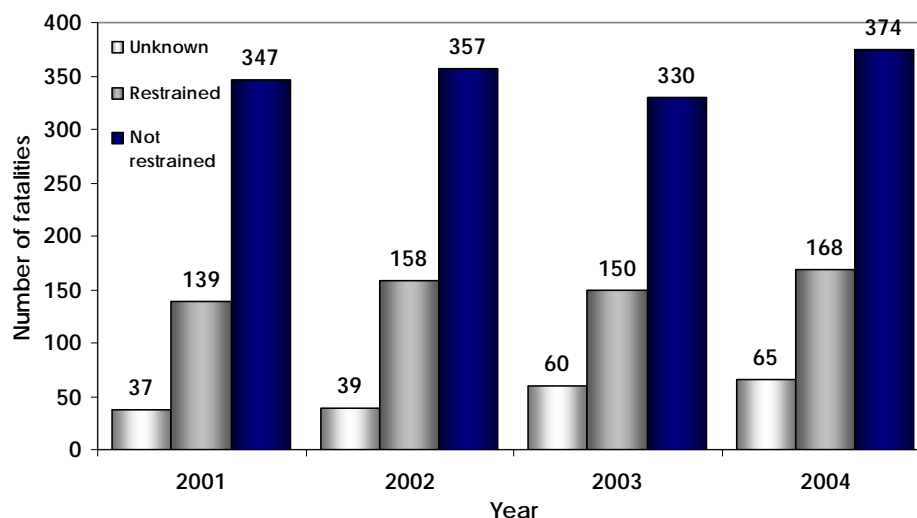
- **Every day** in Arkansas, on average **two people die** in traffic crashes.¹
- Arkansas's rate of traffic fatalities in 2004 was **25.6 per 100,000** population—a rate **1.8 times higher than national average** (14.6/100,000) and 3.4 times higher than the state with the lowest rate (7.4/100,000).²
- Arkansas had the **3rd highest traffic fatality rate** (per 100 million vehicle miles traveled) in the country in 2004.³
- Among fatal injuries from passenger vehicle crashes in Arkansas in 2005, **68% of the people killed were not restrained**.⁴
- The overall **economic impact of traffic crashes** in Arkansas was estimated to be **\$1.965 billion** in 2000.⁴
- Arkansas currently has a secondary safety belt law, meaning that citations for not wearing a safety belt can only be written if a vehicle is stopped for another reason. Primary laws are more readily enforced than secondary laws and the average safety belt use rate in states with primary laws was 10 percentage points higher than in states without primary laws in 2005 (84 versus 73 percent safety belt use).⁶

Only 2 out of 3 Arkansans routinely use their safety belts.⁴

According to NHTSA, if Arkansas converted to a primary safety belt law, the state could expect a 12 percentage point gain in safety belt use, which over one year would:

- *prevent 50 fatalities*
- *prevent 530 serious nonfatal injuries*
- *save \$104 million in economic costs.⁵*

Figure 1: Arkansas traffic-crash related fatalities by safety restraint use*



*Non-motorist and motorcycle fatalities not included. Data source: Highway Safety Office. *Arkansas 2004 Traffic Crash Statistics*. Little Rock, AR: Arkansas State Police. 2006.

Table 1: Traffic crashes and fatalities in Arkansas, 2001–2004

Facts*	2001	2002	2003	2004	4-yr Ave.
Crashes	68,797	70,904	70,914	74,059	71,169
Fatal crashes	538	557	564	626	571
Individual fatalities	611	641	641	721	654
Nonfatal injuries	47,003	52,474	55,944	64,331	54,938
Fatalities/100,000 population	22.7	23.7	23.5	25.6	24.0
Fatalities/100 million vehicle miles traveled	2.1	2.2	2.1	2.3	2.2
Fatalities, % not restrained*	71%	69%	69%	69%	70%

*Non-motorist and motorcycle fatalities not included. Data sources: *Highway Safety Office. *Arkansas 2004 Traffic Crash Statistics*. Little Rock, AR: Arkansas State Police. 2006.

Table 2: Severity of injuries caused by traffic crashes in Arkansas, 2001–2004

Number of persons	2001	2002	2003	2004	4-yr Ave.
Fatal injury	611	641	641	721	654
Incapacitating injury	4,516	3,856	3,462	3,508	3,836
Non-incapacitating injury	12,320	12,648	12,977	13,927	12,968
No visible injury	30,166	35,966	39,505	46,896	38,133
No injury/property damage only	135,814	137,185	130,545	131,148	133,673

Data source: Highway Safety Office. *Arkansas 2004 Traffic Crash Statistics*. Little Rock, AR: Arkansas State Police. 2006.

Hospital costs and use related to traffic crashes in Arkansas

The Arkansas State Police 2001–2005 traffic crash data was merged with the hospital discharge data set of the Center for Health Statistics in the Arkansas Department of Health and Human Services Division of Health to determine the health impact of safety belt use in terms of hospital costs and hospital service use.

The data described below are limited to those individuals who were involved in traffic crashes in Arkansas and were subsequently hospitalized in the state as a result of the crash during the years 2001 through 2005. Factors considered as potential influences on cost and length of hospital stay after a traffic crash included safety belt use, age, gender, race, and rural/urban crash location. Use of a safety belt, year of hospitalization, and age group had substantial effects on hospital charges and length of stay after a crash.

Key findings

- On average, 39 percent of persons hospitalized in Arkansas as a result of a traffic crash were **not** wearing safety belts over the 5-year period.
- The average individual hospital charge over the 5-year period for someone who was not restrained in a vehicle crash was **\$13,746 higher** (44 percent higher) than the average charge for someone who was restrained (\$44,736 versus \$30,990).
- The average length of individual hospital stay for those not restrained in a vehicle crash was **1.71 days longer** (23 percent longer) than for those restrained.
- For all those who were not restrained, hospital charges averaged **more than \$4 million extra per year** compared with all those who were restrained. Over 5 years, an extra **\$22 million** was spent on hospitalizations in Arkansas because people did not wear safety belts.
- The average number of days spent in hospitals was **528 days more per year** for all those not wearing safety belts compared with those who were restrained, totaling more than **2,700 extra hospital days** over 5 years because of non-safety belt use.

Figure 2: Average hospital charges for persons in traffic crashes by year and safety restraint use



Figure 3: Average length of hospital stay for persons in traffic crashes by year and safety restraint use

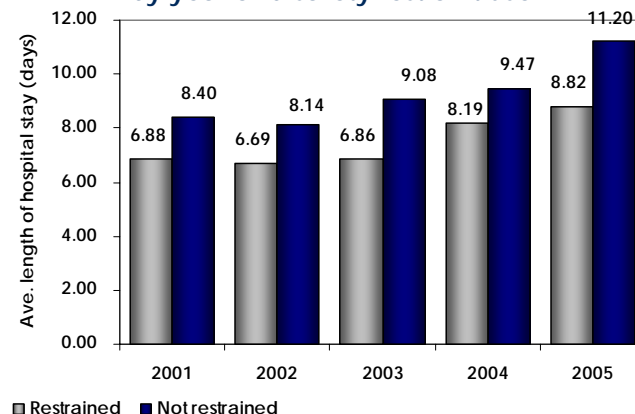
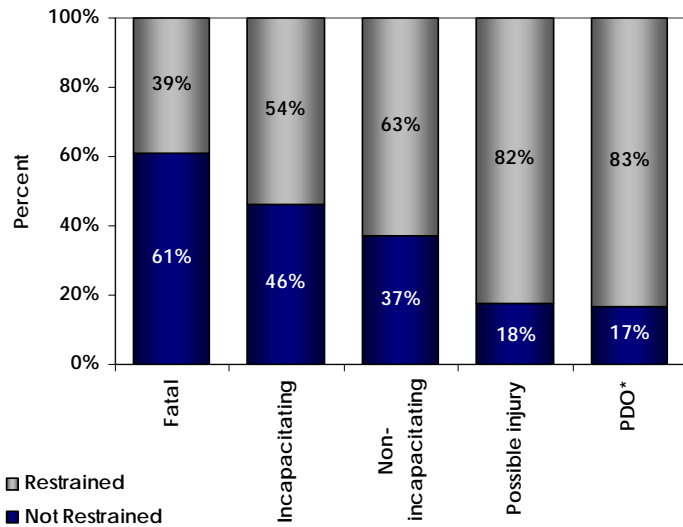


Figure 4: Severity of injury for persons hospitalized after traffic crash by safety restraint use (2001–2005)



Injury type is taken from the Arkansas State Police (ASP) dataset: Fatal injury—any injury that directly results in the death of a living person within 30 days of a motor vehicle crash. Incapacitating injury—any injury, other than a fatal injury, which prevents the injured person from walking, driving, or normally continuing the activities the person was capable of performing before the injury occurred. Non-incapacitating injury—any injury other than a fatal injury or an incapacitating injury, which is evident to observers at the scene. Possible injury—any injury reported or claimed which is not a fatal injury, incapacitating injury or non-incapacitating evident injury. PDO (property damage only)—no personal injury reported in state police dataset. *Some PDOs in the ASP data are considered “false negatives” in the matched data set, that is, a hospitalization did result from the traffic crash.

Figure 5: Average hospital charges for persons in traffic crashes by age and safety restraint use (2001–2005)

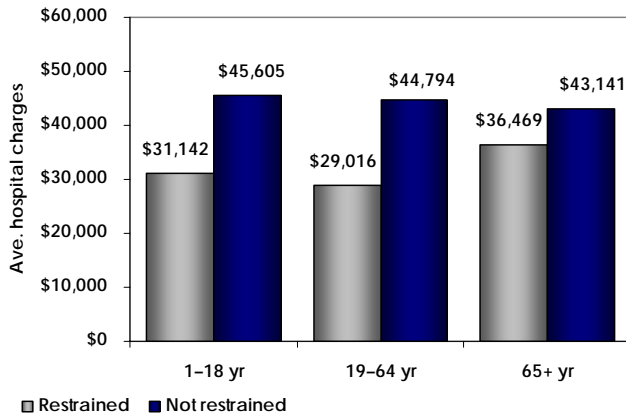


Figure 6: Average length of hospital stay for persons in traffic crashes by age and safety restraint use (2001–2005)

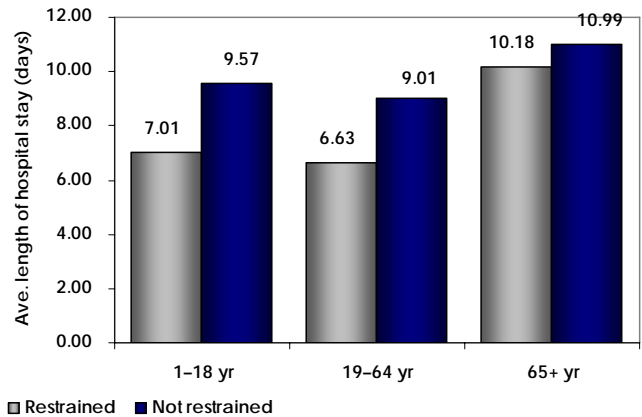
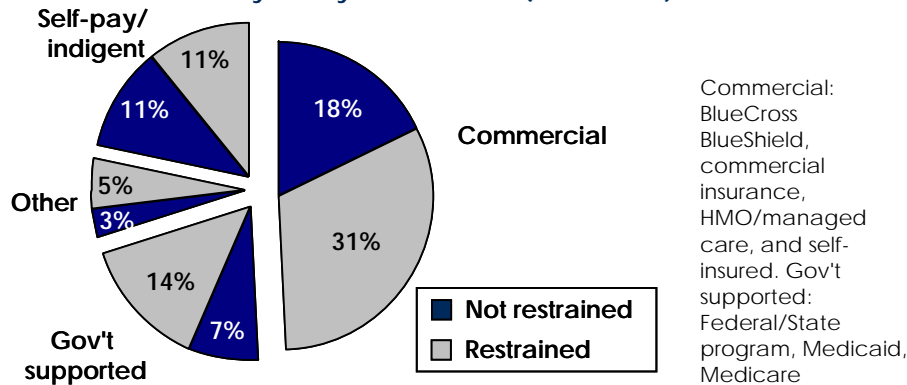


Figure 7: Hospital payment source for persons in traffic crashes by safety restraint use (2001–2005)



Methodology

The aftermath of a traffic crash can range from no injuries to persons involved (property damage only) to death at the scene. Figure 8 shows the data analyzed in this report, focusing only on those 4,013 persons involved in traffic crashes who were hospitalized in Arkansas as a result of the crash.

The Arkansas State Police provided 2001–2005 traffic crash data to the Center for Health Statistics in the Arkansas Department of Health and Human Services Division of Health, which is responsible for maintaining the state’s hospital discharge data set (HDDS). Vehicles that do not typically have safety belts, such as motorcycles, all-terrain vehicles, and buses, were excluded from the analyses. The analyses do not cover the medical, economic, or societal costs of traffic crashes.

Traffic crash data were matched to records in the HDDS (Table 3 and Figure 9) to determine the health impact of safety belt use in terms of hospital costs and use. A total of 637 “false” linkages of those who were hospitalized for causes not related to a traffic crash were deleted. Charges and length of stay were added together for 473 individuals who were involved in a crash and were discharged from two hospitals (ie, the person was initially admitted to one hospital because of a crash and then transferred to another for continued care).

Figure 8: Matching traffic crash and hospital discharge data
Arkansas State Policy Traffic Crash Database

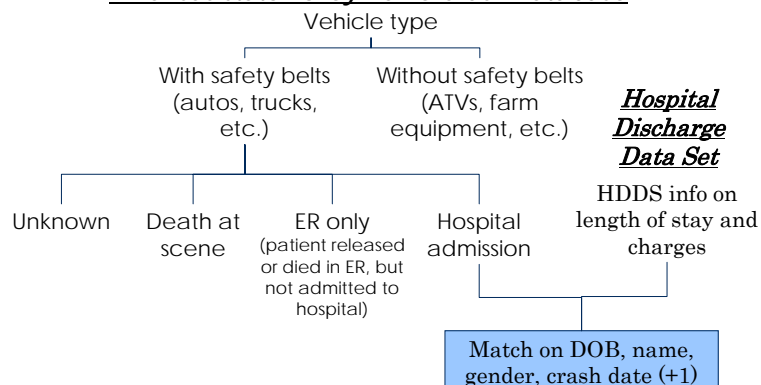
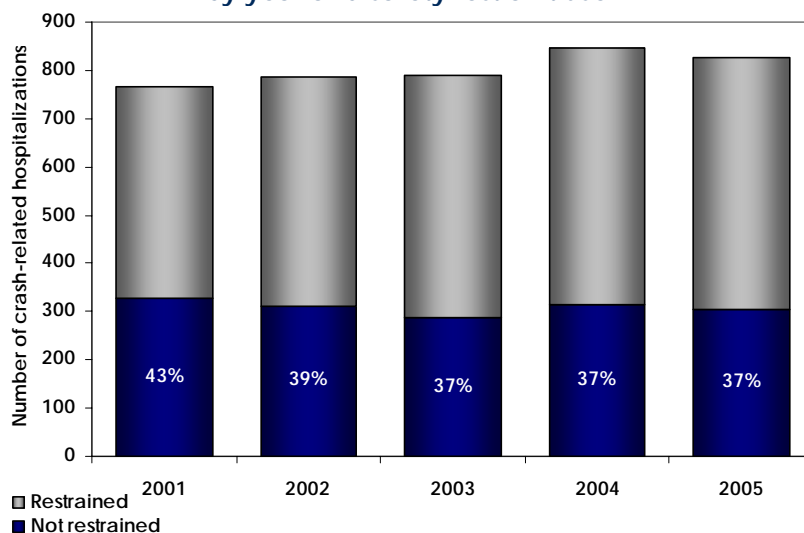


Table 3: Data match for traffic crashes and hospital discharge data

Year	No. of crashes	Individuals meeting conditions*	Total individuals in HDDS	Total individuals matched
2001	68,796	123,088	417,578	767
2002	70,903	127,289	423,465	786
2003	70,913	125,733	428,453	790
2004	74,059	131,347	430,327	845
2005	69,516	126,465	429,482	825
Total	354,187	633,922	2,129,305	4,013

*Data included only for individuals involved in a traffic crash in a vehicle that potentially has restraints.

Figure 9: Hospitalizations after traffic crash by year and safety restraint use



Demographics

Within the linked dataset, demographic information was compared among those who were and who were not wearing safety belts. Among those hospitalized after a traffic crash:

- Males who were hospitalized after a crash were more likely than females to be unrestrained (45% versus 29%).
- Those who were hospitalized after a crash were more likely to have been unrestrained in rural (43%) compared with urban (33%) areas.
- When alcohol was involved in the crash, the persons in the vehicle who were hospitalized were more likely to be unrestrained (64%) compared with those in a crash in which alcohol was not involved (31%).

Figure 10: Hospitalizations after traffic crash by gender and safety restraint use (2001–2005)

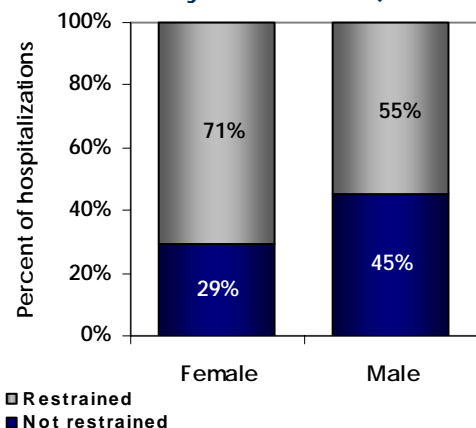
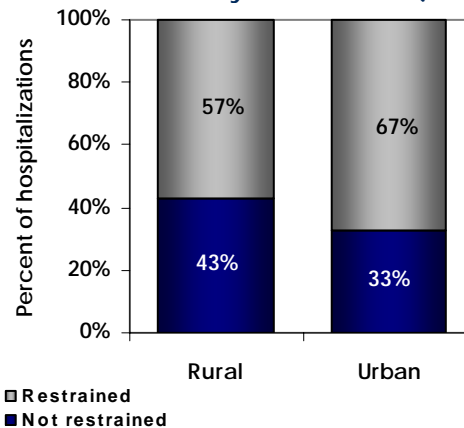


Figure 11: Hospitalizations after traffic crash by crash location and safety restraint use (2001–2005)



Statistical results

The average hospital charges of those who did not use safety belts were 44 percent higher and the average length of stay was 23 percent higher than for those who did use safety belts.

Factors that could affect the charges and length of stay in the hospital—age, gender, race, or a rural/urban crash location—were tested in a multiple regression model considering all of these factors simultaneously. Gender, race, rural or urban location, and whether the accident occurred “in city” had no significant effect on hospital charges or length of stay in the hospital. Use of a safety belt, year of hospitalization, and age group had an effect on charges and length of stay.

Advice on data analyses and reporting was provided by the Arkansas Center for Health Improvement and faculty from the Center for Health Promotion (College of Medicine, University of Arkansas for Medical Sciences and Arkansas Children's Hospital).

The analysis was conducted on records from 4,013 individuals who were hospitalized after a traffic crash, including 1,546 non-safety belt users and 2,467 safety belt users. Data were analyzed with SAS version 9.1.3, with total charges and length of stay as dependent variables. Least-squares means (LSM) with Tukey-Kramer adjustments for multiple comparisons were computed to compare use and non-use of safety belts. **Results indicate a statistically significant difference ($p < 0.0001$) between non-safety belt users and safety belt users for both average hospital charges and average length of hospital stay over 5-years.**

Data sources

1. Highway Safety Office. Arkansas 2004 Traffic Crash Statistics. Little Rock, AR: Arkansas State Police; 2006. http://www.asp.state.ar.us/hso/hso_index.html. Accessed 3 Oct 2006.
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