

Traffic Safety Facts

Research Note

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Restraint Use Patterns Among Fatally Injured Passenger Vehicle Occupants

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Summary

In 2004, the majority (55%) of the occupants of passenger vehicles (passenger cars, light trucks, vans, and SUVs) killed in motor vehicle crashes were unrestrained (Motor Vehicle Traffic Crash Fatality Counts and Injury Estimates for 2004, NHTSA DOT HS 809 923). When examined more closely, the data shows that the proportion of unrestrained fatalities was higher among males, on rural roadways, in pickup trucks and SUVs, in single-vehicle crashes, and in the age group of 8 to 44 years old.

Background

A total of 42,636 people died on the Nation's highways in 2004. Of these fatalities, nearly 75 percent were occupants of passenger vehicles. This data is from the National Highway Traffic Safety Administration's Fatality Analysis Reporting System (FARS), which annually collects data on fatal crashes from the 50 States, the District of Columbia, and Puerto Rico. FARS data is made available by NHTSA's National Center for Statistics and Analysis (NCSA).

Restraint use among passenger vehicle occupants in fatal crashes has increased in the past few years. Research has found that lap/shoulder safety belts, when used, reduce the risk of fatal injury to front-seat passenger car occupants by 45 percent and the risk of moderate-to-critical injury by 50 percent. For light-truck occupants, safety belts reduce the risk of fatal injury by 60 percent and moderate-to-critical injury by 65 percent (Occupant Protection, Traffic Safety Facts, NHTSA DOT HS 809 909). This Research Note looks at the various patterns in restraint use among fatally injured passenger vehicle occupants.

The percentage of unrestrained (restraint not used) passenger vehicle occupants killed in the last five years has decreased by 5 percentage points from 60 percent in 2000 to 55 percent in 2004. Table 1 shows passenger vehicle occupant fatalities by year and restraint use.

Table 1
Passenger Vehicle Occupant Fatalities by Year and Restraint Use

Calendar Year	Restraint Use				Total	
	Not Used		Used		Number	Percent
	Number	Percent	Number	Percent		
2000	19,391	60	12,834	40	32,225	100
2001	19,051	59	12,992	41	32,043	100
2002	19,272	59	13,571	41	32,843	100
2003	18,196	56	14,075	44	32,271	100
2004	17,575	55	14,118	45	31,693	100

Source: NCSA, FARS 2000-2003 (Final), 2004 (ARF)

Unknown restraint use is distributed proportionally to the known use categories.

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Definitions

The term “occupant” is used for drivers, passengers, and the unknown occupant types of a motor vehicle in transport. The term “passenger vehicle occupant” refers to the occupants of

passenger cars, sport utility vehicles, pickup trucks, vans, and other light trucks. Restraint usage is classified into the following three categories.

Classification of Restraint Use

Classification	Categories Used
Used	Shoulder belt, lap belt, lap and shoulder belt, child safety seat, restraint used – type unknown, safety belt used improperly, child safety seat used improperly
Not Used	None used (vehicle occupant)
Unknown	Unknown if used

Data Analysis

Analyses of data based on cross tabulations of different variables are presented below.

Passenger Vehicle Occupant Fatalities in 2004 by Sex and Restraint Use

Out of the 31,693 passenger vehicle occupants killed in 2004, 20,529 (65%) were males, 11,163 (35%) were females, and the sex of the remainder was unknown. Table 2 shows

passenger vehicle occupant fatalities by sex and restraint use. Among the 20,529 fatally injured male passenger vehicle occupants 12,456 (61%) were not restrained and of the 11,163 female passenger vehicle occupants 5,129 (46%) were not restrained. The data clearly shows that, among those killed in fatal crashes, restraint use among males is much lower than among females.

Table 2

Passenger Vehicle Occupant Fatalities in 2004 by Sex and Restraint Use

Sex	Restraint use				Total	
	Not Used		Used		Number	Percent
	Number	Percent	Number	Percent		
Male	12,456	61	8,073	39	20,529	100
Female	5,129	46	6,034	54	11,163	100
Unknown	1	100	0	0	1	100
Total	17,575	55	14,118	45	31,693	100

Source: NCSA, FARS 2004 (ARF)

Unknown restraint use is distributed proportionally to the known use categories.

Passenger Vehicle Occupant Fatalities in 2004 by Roadway Function Class and Restraint Use

In 2004, 20,302 (64%) of the passenger vehicle occupant fatalities occurred on rural roadways, 11,200 (35%) occurred on urban roadways, and the rest occurred on unknown roadway types. Among the fatally injured passenger vehicle occupants on rural roadways, 11,691 (58%) were unrestrained

and on urban roadways, 5,764 (51%) were unrestrained. The proportion of unrestrained passenger vehicle occupant fatalities is higher on rural roadways. Table 3 shows passenger vehicle occupant fatalities by roadway function class and restraint use.

Table 3
Passenger Vehicle Occupant Fatalities in 2004 by Roadway Function Class and Restraint Use

Roadway Function Class	Restraint Use				Total	
	Not Used		Used		Number	Percent
	Number	Percent	Number	Percent		
Rural	11,691	58	8,611	42	20,302	100
Urban	5,764	51	5,436	49	11,200	100
Unknown	102	54	89	46	191	100
Total	17,575	55	14,118	45	31,693	100

Source: NCSA, FARS 2004 (ARF)

Unknown restraint use is distributed proportionally to the known use categories.

Passenger Vehicle Occupant Fatalities in 2004 by Vehicle Body Type and Restraint Use

Out of the 31,693 passenger vehicle occupants killed in 2004, 19,091 (60%) were occupants of passenger cars, 4,735 (15%) were occupants of sport utility vehicles, 5,801 people (18%) were occupants of pickup trucks, 2,036 people (6%) were occupants of vans, and the rest were from other light trucks.

Table 4 shows passenger vehicle occupant fatalities by vehicle type and restraint use. The data clearly shows that restraint use among fatally injured occupants of SUVs and pickup trucks is much lower compared to passenger cars and vans.

Table 4
Passenger Vehicle Occupant Fatalities in 2004 by Vehicle Body Type and Restraint Use

Passenger Vehicle Body Type	Restraint Use				Total	
	Not Used		Used		Number	Percent
	Number	Percent	Number	Percent		
Passenger Cars	9,446	49	9,645	51	19,091	100
SUVs	2,953	62	1,782	38	4,735	100
Pickups	4,031	69	1,770	31	5,801	100
Vans	1,108	54	928	46	2,036	100
Other Light Trucks	19	64	11	36	30	100
Total	17,575	55	14,118	45	31,693	100

Source: NCSA, FARS 2004 (ARF)

Unknown restraint use is distributed proportionally to the known use categories.

Passenger Vehicle Occupant Fatalities in 2004 by Crash Type and Restraint Use

In 2004, out of the 31,693 passenger vehicle occupants killed in fatal crashes, 15,611 (49%) were killed in single-vehicle crashes and 16,082 (51%) were killed in multivehicle crashes. Among the fatally injured passenger vehicle occupants in single-vehicle crashes, more than two-thirds (69%) were unrestrained and 31 percent were restrained. Among fatally

injured passenger vehicle occupants in multivehicle crashes 42 percent were unrestrained. The data shows restraint use among fatally injured passenger vehicle occupants in single-vehicle crashes is much lower than in multivehicle crashes. Table 5 shows passenger vehicle occupant fatalities in 2004 by crash type and restraint use.

Table 5
Passenger Vehicle Occupant Fatalities in 2004 by Crash Type and Restraint Use

Crash Type	Restraint Use				Total	
	Not Used		Used		Number	Percent
	Number	Percent	Number	Percent		
Single-vehicle Crashes	10,732	69	4,879	31	15,611	100
Multivehicle Crashes	6,824	42	9,258	58	16,082	100
Total	17,575	55	14,118	45	31,693	100

Source: NCSA, FARS 2004 (ARF)

Unknown restraint use is distributed proportionally to the known use categories.

Passenger Vehicle Occupant Fatalities in 2004 by Age Group and Restraint Use

In 2004, among fatally injured passenger vehicle occupants of all age groups, restraint use was lower in the age range of 8 to 44. Nearly two-thirds of the passenger vehicle occupants killed in the 8-44 age range were unrestrained. The next

highest among unrestrained passenger vehicle occupants killed were in the 45-54 age group (more than 50%). Table 6 shows passenger vehicle occupant fatalities in 2004 by age group and restraint use.

Table 6
Passenger Vehicle Occupant Fatalities in 2004 by Age Group and Restraint Use

Age Group	Restraint Use				Total	
	Not Used		Used		Number	Percent
	Number	Percent	Number	Percent		
0-7	311	41	440	59	751	100
8-15	683	62	425	38	1,108	100
16-20	3,174	62	1,961	38	5,135	100
21-24	2,373	66	1,222	34	3,595	100
25-34	3,209	64	1,843	36	5,052	100
35-44	2,632	62	1,622	38	4,254	100
45-54	2,093	54	1,752	46	3,845	100
55-64	1,281	48	1,407	52	2,688	100
65 +	1,786	34	3,405	66	5,191	100
Unknown	51	68	23	32	74	100
Total	17,575	55	14,118	45	31,693	100

Source: NCSA, FARS 2004 (ARF)

Unknown restraint use is distributed proportionally to the known use categories.

Findings

Based on the data presented above, following are some key findings:

- In 2004, a majority of the passenger vehicle occupants killed were unrestrained (55%).
- Among the passenger vehicle occupants killed, the unrestrained proportion was higher among males (61%) than females (46%).
- The proportion of unrestrained passenger vehicle occupant fatalities was higher on rural roadways (58%) compared to urban roadways (51%).
- Among vehicle types, unrestrained passenger vehicle occupant fatalities were highest in pickup trucks (69%) followed by SUVs (62%).
- Unrestrained passenger vehicle occupant fatalities were higher in single-vehicle crashes.
- Among all age groups, unrestrained passenger vehicle occupant fatalities were above 60 percent in the 8 to 44 age range.

A State-by-State breakdown of passenger vehicle occupants killed in 2004 by restraint use and sorted by “percent restraint not used” (column 3) is shown in Table 7.

Table 7
Passenger Vehicle Occupant Fatalities in 2004 by State and Restraint Use Sorted by Percent Not Used

State	Restraint Use				Total	
	Not Used		Used		Number	Percent
	Number	Percent	Number	Percent		
Mississippi	603	78	175	22	778	100
South Carolina	602	73	224	27	826	100
Rhode Island	47	72	18	28	65	100
Montana	134	72	52	28	186	100
North Dakota	58	71	24	29	82	100
South Dakota	109	70	46	30	155	100
New Hampshire	86	70	37	30	123	100
Missouri	655	69	293	31	948	100
Arkansas	385	68	180	32	565	100
Kentucky	528	67	265	33	793	100
Massachusetts	201	65	108	35	309	100
Tennessee	687	64	380	36	1,067	100
Louisiana	443	63	262	37	705	100
Kansas	243	62	147	38	390	100
Nebraska	133	62	81	38	214	100
Wyoming	80	61	50	39	130	100
Florida	1,271	61	809	39	2,080	100
West Virginia	197	61	127	39	324	100
Wisconsin	377	61	243	39	620	100
Arizona	482	60	315	40	797	100
Ohio	591	60	390	40	981	100
Utah	131	60	87	40	218	100
Pennsylvania	665	60	445	40	1,110	100
Oklahoma	358	60	244	41	602	100
Virginia	433	59	297	41	730	100
New Mexico	231	58	165	42	396	100
Maine	87	57	65	43	152	100
Colorado	280	57	212	43	492	100
Alabama	534	56	417	44	951	100
Alaska	38	55	31	45	69	100
Minnesota	249	55	203	45	452	100
Hawaii	45	55	37	45	82	100
Georgia	702	55	577	45	1,279	100
Connecticut	105	54	88	46	193	100
Idaho	109	53	96	47	205	100
Indiana	376	53	336	47	712	100
Illinois	518	53	467	47	985	100
Iowa	158	52	147	48	305	100
New Jersey	224	50	227	50	451	100
Nevada	129	49	133	51	262	100
Vermont	37	49	39	51	76	100

Table 7
Passenger Vehicle Occupant Fatalities in 2004 by State and Restraint Use Sorted
by Percent Not Used

State	Restraint Use				Total	
	Not Used		Used		Number	Percent
	Number	Percent	Number	Percent		
North Carolina	562	47	623	53	1,185	100
District of Columbia	10	46	11	54	21	100
Delaware	48	46	56	54	104	100
Texas	1,226	45	1,481	55	2,707	100
Maryland	202	45	248	55	450	100
Washington	173	42	241	58	414	100
New York	389	41	559	59	948	100
California	1,134	41	1,652	59	2,786	100
Michigan	350	40	525	60	875	100
Oregon	109	32	234	68	343	100
NATIONAL*	17,575	55	14,118	45	31,693	100
Puerto Rico	149	60	100	40	249	100

Source: NCSA, FARS 2004 (ARF)

Unknown restraint use is distributed proportionally to the known use categories.

* Not equal to sum of States due to individual rounding.