Traffic Safety Facts
Research Note

States With Primary Enforcement Laws Have Lower Fatality Rates

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Summary

This Research Note compares the percentage of unrestrained passenger vehicle occupant fatalities and fatality rates between States that have primary safety belt use laws and States that do not have them for the most recent years, 2000–2004. Besides having a smaller percentage of passenger vehicle occupant fatalities that were unrestrained, the fatality rates in primary enforcement States were much lower than for all other States. In primary enforcement States the passenger vehicle occupant fatality rates were 1.03 per 100 million vehicle miles traveled (VMT) and 10.69 per 100,000 population. This compares to 1.21 and 13.13 (respectively) for all other States.

Introduction

Safety belt use is the most effective countermeasure available to passenger vehicle occupants to prevent fatalities and injuries in highway motor vehicle traffic crashes. In order to encourage the use of safety belts, most States have enacted safety belt laws. The enacted safety belt laws vary widely, but these laws generally can be classified as primary or secondary. The primary laws permit law enforcement officers to stop a vehicle and issue a citation for a safety belt violation, even if this is the only violation the officers notice. The secondary laws allow the officers to issue safety belt citations to motorists only after they stop the drivers for other violations.

Eighteen jurisdictions enacted primary enforcement laws before 2000 and kept them in force through 2004. These primary jurisdictions are: Alabama, California, Connecticut, District of Columbia, Georgia, Hawaii, Indiana, Iowa, Louisiana, Maryland, Michigan, New Jersey, New Mexico, New York, North Carolina, Oklahoma, Oregon, and Texas. The category "All Other States" in the tables below includes those that have secondary laws or have no adult safety belt use law (New Hampshire). If a State converted from secondary to primary laws in the middle of a year between 2000 and 2004, it was included in the appropriate group except for the year that the law upgraded, in which case it was excluded altogether. Namely, data for Washington

in 2002, Delaware and Illinois in 2003, and Tennessee in 2004 were excluded. This analysis also excludes the infant and toddler fatalities up to age 4, since most States, including secondary States, have child restraint laws that typically call for primary enforcement.

State safety belt use surveys, conducted in accordance with Section 157, Title 23, of the U.S. Code, show that the observed daytime rate of safety belt use is in general higher in primary States compared to other States.[1] Other studies have shown that the safety belt use rates in States that upgrade to primary safety belt laws typically increase 7 to 9 percentage points the following years,[2-5] and a significant number of fatalities could be reduced if all States with secondary laws converted to primary laws.[6–9]

The purpose of this study is to assess the advantage of primary laws by comparing the passenger vehicle (PV) restraint use of fatally injured occupants and the fatality rates with respect to two exposure measures, Vehicle Miles Traveled [10] and population [11] between primary enforcement jurisdictions and all other jurisdictions for the most recent years, 2000–2004.

Results
Restraint use

Table 1 clearly shows that the percentage of passenger vehicle occupant fatalities who were unrestrained in the primary States is much lower than that in all other States during 2000–2004, 51 percent versus 65 percent. As for the differences among age groups, the unrestrained percentages between primary States and all other States are: 56 versus 66 for the 5 to 15 age group; 55 versus 73 for the 16 to 20 age group; and 50 versus 64 for the 21 and older age group. It also shows the unrestrained percentage for the 16 to 20 age group is higher than that for the other two age groups in all other States.

Fatality Rate per 100 Million VMT

Table 2 shows the passenger vehicle occupant fatalities, total VMT, and passenger vehicle occupant fatality rate per 100 million VMT in States with primary safety belt use laws and all other States during 2000–2004. The fatality rates are higher in all other States when compared to those in the primary States. Table 2 shows

the passenger vehicle occupant fatality rate for all other States (1.21) is 17 percent higher than that for the primary States (1.03). Since the State level VMT estimates cannot be broken out by either vehicle type or age, the fatality rate by VMT was examined only as a whole.

Fatality Rate per 100,000 Population
Table 3 shows the passenger vehicle occupant fatality rate per 100,000 population by age group in primary States and all other States during 2000–2004. The total fatality rates are higher in all other States, as compared

to those in the primary States, in every age group: 3.38 versus 2.67 for the 5 to 15 age group; 29.08 versus 23.71 for the 16 to 20 age group; and 13.63 versus 11.21 for the 21 and older age group. In both types of States, the fatality rate for the 16 to 20 age group is more than eight times the rate for the 5 to 15 age group and more than two times the rate for the 21 and older age group. Thus, both the population-based fatality rate shown in Table 3 and the VMT-based fatality rate shown in Table 2 clearly show the same pattern of lower fatality rates for States having primary safety belt use laws.

Table 1
Passenger Vehicle Occupant Fatalities by Age and Restraint Use In States with Primary Safety Belt Use Laws and All Other States, 2000-2004

Occupant Age	Restraint Use					Total
	Restrained		Unrestrained			
	Number	%	Number	%		
Primary Safety Belt Use Law States						
5-15	1,320	44	1,685	**56**		3,005
16-20	5,288	45	6,527	**55**		11,815
21+	27,693	50	27,362	**50**		55,055
Total	34,301	49	35,574	**51**		69,875
All Other States						
5-15	1,047	34	2,066	**66**		3,113
16-20	3,307	27	8,985	**73**		12,292
21+	21,211	36	37,121	**64**		58,332
Total	25,565	35	48,172	**65**		73,737

- Occupant with unknown age and unknown restraint use are not included in the table
- For the fatality counts, if the law changed in the middle of a year, that State was excluded from that year altogether in both State groups, but included in other years in appropriate group

Source: Fatality Analysis Reporting System (FARS) 2000–2003 Final Files and 2004 Annual Report File

Table 2
Passenger Vehicle Occupant Fatalities, Total VMT, and Passenger Vehicle Occupant Fatality Rate Per 100 Million VMT in States with Primary Safety Belt Use Laws and All Other States, 2000–2004

Year	Fatalities in States [†]		Total VMT [‡]		Fatality Rate per 100 Million VMT	
	Primary	All Other States	Primary	All Other States	Primary	All Other States
2000	14,870	16,760	1,406,156	1,340,769	1.06	1.25
2001	15,083	16,396	1,423,027	1,372,583	1.06	1.19
2002	15,001	16,822	1,451,698	1,349,034	1.03	1.25
2003	15,494	15,094	1,519,723	1,255,147	1.02	1.20
2004	16,161	13,908	1,670,860	1,220,710	0.97	1.14
Total	**76,609**	**78,980**	**7,471,464**	**6,538,243**	**1.03**	**1.21**

- Fatalities include all occupants with ages 5+, regardless of the restraint use (used, not used, and unknown).
- For the Fatality counts and VMT, if the law changed in the middle of a year, that State was excluded from that year altogether in both State groups, but included in other years in appropriate group

Source: [†] Fatality Analysis Reporting System (FARS) 2000–2003 Final Files and 2004 Annual Report File
　　　[‡] Federal Highway Administration (FHWA)

Table 3
Passenger Vehicle Occupant Fatalities, Population, and Passenger Vehicle Occupant Fatality Rate Per 100,000 Population by Age in States with Primary Safety Belt Use Laws and All Other States, 2000-2004

Occupant Age	Year	Fatalities in States [†]		Population in States [‡]		Fatality Rate per 100,000 Population	
		Primary	All Other States	Primary	All Other States	Primary	All Other States
5-15	2000	642	783	23,816,969	21,349,057	2.70	3.67
	2001	641	632	23,894,811	21,290,696	2.68	2.97
	2002	621	684	23,881,623	20,321,719	2.60	3.37
	2003	642	643	24,825,463	18,137,326	2.59	3.55
	2004	743	579	26,917,191	17,195,768	2.76	3.37
	Total	**3,289**	**3,321**	**123,336,057**	**98,294,566**	**2.67**	**3.38**
16-20	2000	2,522	2,787	10,519,335	9,773,820	23.97	28.51
	2001	2,579	2,779	10,563,995	9,815,327	24.41	28.31
	2002	2,638	2,925	10,600,523	9,382,026	24.89	31.18
	2003	2,589	2,473	11,084,596	8,450,338	23.36	29.27
	2004	2,678	2,276	12,091,037	8,106,417	22.15	28.08
	Total	**13,006**	**13,240**	**54,859,486**	**45,527,928**	**23.71**	**29.08**
21+	2000	11,706	13,190	101,236,205	96,309,440	11.56	13.70
	2001	11,863	12,985	102,623,709	97,552,872	11.56	13.31
	2002	11,742	13,213	104,030,384	94,502,402	11.29	13.98
	2003	12,263	11,978	109,731,692	86,237,696	11.18	13.89
	2004	12,740	11,053	120,560,379	83,197,086	10.57	13.29
	Total	**60,314**	**62,419**	**538,182,369**	**457,799,496**	**11.21**	**13.63**
Total		**76,609**	**78,980**	**716,377,912**	**601,621,990**	**10.69**	**13.13**

- Fatalities include all occupants with ages 5+, regardless of the restraint use (used, not used, and unknown)
- For the Fatality counts and Population, if the law changed in the middle of a year, that State was excluded from that year altogether in both State groups, but included in other years in appropriate group

Source: [†] Fatality Analysis Reporting System (FARS) 2000–2003 Final Files and 2004 Annual Report File
[‡] U. S. Bureau of Census

Fatality Rate per 100,000 Population by State in 2004

For 2004, Table 4 shows the detailed information of passenger vehicle occupant fatality rate per 100,000 population by age group in each individual State. States with primary safety belt use laws at the end of 2004 are highlighted in the table. Tennessee upgraded in the middle of 2004, and was excluded in the analysis in Tables 1 to 3 for the year 2004. Total fatality rates are higher in all other States, compared to those in the primary States in every age group.

Conclusions

Safety belt use can reduce fatalities and injuries in highway traffic crashes. Increased use of safety belts would save more lives when motor vehicle crashes inevitably occur. In this study, data shows that the percentage of passenger vehicle occupant fatalities that were unrestrained in the primary States is much lower than that in secondary States, 51 percent versus 65 percent during 2000–2004. The total passenger vehicle occupant fatality rate per 100 million VMT for All Other States (1.21) is 17 percent higher than that for the primary States (1.03). The total passenger vehicle occupant fatality rate per 100,000 population for All Other States (13.13) is 23 percent higher than that for the primary States (10.69). Studies demonstrate the advantage of primary safety belt enforcement laws. Significant crash fatalities could be prevented if All Other States (those with secondary laws and with no adult safety belt use laws) were upgraded to primary laws. Converting these States to primary enforcement laws is a straightforward way to save a significant number of lives in highway motor vehicle traffic crashes in the United States.

Table 4: Passenger Vehicle Occupant Fatality Rate per 100,000 Population by Age in States in 2004

State[†]	Fatalities				Population				Fatality Rate per 100,000 Pop			
	5-15	16-20	21+	Total[‡]	5-15	16-20	21+	Total	5-15	16-20	21+	Total
AL	41	153	731	925	672,256	318,181	3,243,645	4,234,082	6.10	48.09	22.54	21.85
AK	3	10	54	67	115,907	57,688	432,082	605,677	2.59	17.33	12.50	11.06
AZ	48	118	607	773	937,092	394,682	3,962,156	5,293,930	5.12	29.90	15.32	14.60
AR	29	91	432	552	413,289	196,090	1,957,695	2,567,074	7.02	46.41	22.07	21.50
CA	133	462	2,147	2,742	5,930,895	2,547,284	24,781,648	33,259,827	2.24	18.14	8.66	8.24
CO	23	92	365	480	712,397	315,813	3,234,114	4,262,324	3.23	29.13	11.29	11.26
CT	7	33	151	191	528,713	235,926	2,525,917	3,290,556	1.32	13.99	5.98	5.80
DE	6	22	74	102	117,726	56,030	602,827	776,583	5.10	39.26	12.28	13.13
DC	0	4	16	20	64,465	26,554	427,475	518,494	0.00	15.06	3.74	3.86
FL	94	300	1,653	2,047	2,459,027	1,117,965	12,728,877	16,305,869	3.82	26.83	12.99	12.55
GA	50	174	1,021	1,245	1,404,712	620,056	6,125,551	8,150,319	3.56	28.06	16.67	15.28
HI	1	14	66	81	177,135	87,742	909,204	1,174,081	0.56	15.96	7.26	6.90
ID	7	28	163	198	226,112	109,941	953,727	1,289,780	3.10	25.47	17.09	15.35
IL	34	142	794	970	1,992,512	885,007	8,945,570	11,823,089	1.71	16.05	8.88	8.20
IN	28	127	543	698	992,029	439,320	4,375,663	5,807,012	2.82	28.91	12.41	12.02
IA	23	38	240	301	417,318	213,664	2,142,630	2,773,612	5.51	17.78	11.20	10.85
KS	21	59	299	379	414,988	206,127	1,925,605	2,546,720	5.06	28.62	15.53	14.88
KY	30	128	626	784	602,583	282,177	2,994,548	3,879,308	4.98	45.36	20.90	20.21
LA	29	115	546	690	706,255	347,573	3,137,951	4,191,779	4.11	33.09	17.40	16.46
ME	5	32	110	147	176,809	94,015	978,801	1,249,625	2.83	34.04	11.24	11.76
MD	21	74	347	442	861,414	388,825	3,933,241	5,183,480	2.44	19.03	8.82	8.53
MA	8	62	236	306	900,464	414,611	4,705,768	6,020,843	0.89	14.95	5.02	5.08
MI	49	152	662	863	1,589,161	725,075	7,148,542	9,462,778	3.08	20.96	9.26	9.12
MN	17	73	350	440	758,993	377,960	3,631,981	4,768,934	2.24	19.31	9.64	9.23
MS	33	116	622	771	456,453	217,676	2,020,483	2,694,612	7.23	53.29	30.78	28.61
MO	34	175	725	934	849,392	415,261	4,118,496	5,383,149	4.00	42.14	17.60	17.35
MT	4	33	148	185	127,927	71,601	674,827	874,355	3.13	46.09	21.93	21.16
NE	16	35	159	210	261,746	132,002	1,231,417	1,625,165	6.11	26.51	12.91	12.92
NV	14	38	207	259	373,188	149,576	1,642,989	2,165,753	3.75	25.41	12.60	11.96
NH	3	22	98	123	193,920	92,634	940,268	1,226,822	1.55	23.75	10.42	10.03
NJ	10	61	377	448	1,336,974	571,604	6,208,834	8,117,412	0.75	10.67	6.07	5.52
NM	23	65	296	384	300,049	149,551	1,320,323	1,769,923	7.67	43.46	22.42	21.70
NY	36	173	726	935	2,808,880	1,286,343	13,885,820	17,981,043	1.28	13.45	5.23	5.20
NC	52	199	913	1,164	1,291,249	564,711	6,085,148	7,941,108	4.03	35.24	15.00	14.66
ND	8	8	65	81	85,087	49,334	464,191	598,612	9.40	16.22	14.00	13.53
OH	47	175	749	971	1,724,461	808,116	8,196,399	10,728,976	2.73	21.66	9.14	9.05
OK	29	104	456	589	518,650	258,912	2,503,751	3,281,313	5.59	40.17	18.21	17.95
OR	14	56	263	333	528,499	244,397	2,595,621	3,368,517	2.65	22.91	10.13	9.89
PA	28	187	884	1,099	1,771,753	850,944	9,064,470	11,687,167	1.58	21.98	9.75	9.40
RI	2	13	50	65	153,496	71,880	793,718	1,019,094	1.30	18.09	6.30	6.38
SC	21	117	677	815	628,069	291,440	2,998,287	3,917,796	3.34	40.15	22.58	20.80
SD	13	18	121	152	115,556	61,070	542,537	719,163	11.25	29.47	22.30	21.14
TN	42	181	832	1,055	849,503	396,993	4,269,762	5,516,258	4.94	45.59	19.49	19.13
TX	147	421	2,064	2,632	3,754,448	1,677,797	15,214,969	20,647,214	3.92	25.09	13.57	12.75
UT	10	28	172	210	431,919	197,731	1,526,596	2,156,246	2.32	14.16	11.27	9.74
VT	5	15	56	76	85,183	45,316	459,714	590,213	5.87	33.10	12.18	12.88
VA	21	140	563	724	1,103,388	519,230	5,338,823	6,961,441	1.90	26.96	10.55	10.40
WA	10	89	307	406	923,851	446,485	4,446,049	5,816,385	1.08	19.93	6.91	6.98
WV	8	47	265	320	237,357	116,989	1,359,899	1,714,245	3.37	40.17	19.49	18.67
WI	22	96	494	612	808,470	408,252	3,953,994	5,170,716	2.72	23.51	12.49	11.84
WY	5	20	103	128	70,742	40,296	364,624	475,662	7.07	49.63	28.25	26.91
National	1,364	5,135	24,625	31,124	44,962,462	20,594,447	208,027,227	273,584,136	3.03	24.93	11.84	11.38
Primary	743	2,678	12,740	16,161	26,917,191	12,091,037	120,560,379	159,568,607	2.76	22.15	10.57	10.13
Others	579	2,276	11,053	13,908	17,195,768	8,106,417	83,197,086	108,499,271	3.37	28.08	13.29	12.82
PR *	----	----	----	249 *	----	----	----	3,894,855 *	----	----	----	6.39 *

[†] States with primary safety belt use laws at the end of 2004 are highlighted in the table. TN upgraded in the middle of 2004, it is shown here as primary state although is was excluded from calculation altogether in the year 2004.
[‡] Fatalities include all occupants with ages 5+, regardless of the restraint use (used, not used, and unknown)
[*] Population data by age for PR is not available. Total population and total PV occupant fatality rate per 100,000 population were shown in the table
Source: Fatality Analysis Reporting System (FARS) 2004 Annual Report File and U. S. Bureau of Census

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