

Traffic Safety Facts

Research Note

DOT HS 811 229

December 2009

Trends in Fatal Crashes Among Drivers With Invalid Licenses

Summary

A valid license is one of the key requirements to drive a motor vehicle as per the laws of every State. This research note analyzes data on drivers 16 and older in fatal crashes with invalid licenses. Major findings and statistical definitions are presented below.

- The number of drivers 16 and older involved in fatal crashes with invalid licenses is on average 6,934 each year and had a 2-percentage-point growth rate over the past decade (1998 to 2007).
- The proportion of invalid licenses for drivers 16 and older in fatal crashes increased from 11 percent to 14 percent in the past 10 years, averaging 12 percent.

Definitions

Driver with invalid license: A motor vehicle driver with invalid license in a crash includes a driver who does not have a license or who does not have a valid license for the class of vehicle being driven at the time of the crash, and includes a license that has been suspended, revoked, expired, denied, or cancelled.

Young drivers: Motor vehicle drivers 16 to 20 years old.

Young adult drivers: Motor vehicle drivers 21 to 40 years old.

Adult drivers: Motor vehicle drivers 41 to 64 years old.

Older drivers: Motor vehicle drivers 65 and older.

Annual proportion: The number of drivers 16 or older in fatal crashes with invalid licenses divided by the total number of drivers 16 or older in fatal crashes for a single year.

10-year proportion: The 10-year total drivers 16 and older in fatal crashes with invalid licenses divided by the 10-year total drivers 16 and older involved in fatal crashes.

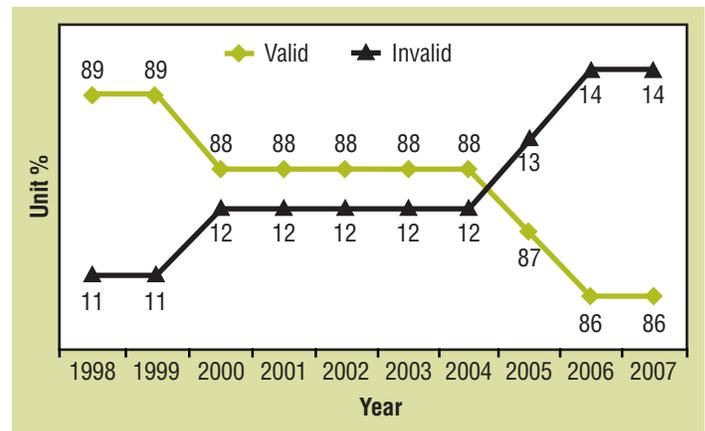
Yearly change rate: For drivers 16 or older in fatal crashes with invalid licenses, calculate change rate by the present year number minus previous year number, then divided by previous year number.

10-year average change rate: The geometric mean has been used to estimate the average rates of change. It is the ninth root of the product of a set of yearly change rates from 1998 to 2007.

Data

Five factors including year, State, sex, age, and license type compliance have been used to analyze and integrate the data from the Fatality Analysis Reporting System (FARS). FARS is a census of fatal crashes that occurred within the 50 States, District of Columbia, and Puerto Rico.

Figure 1
Annual Proportion of License Type Compliance in Fatal Crashes



Data Source: FARS 1998-2006 (Final) 2007 (ARF)

Only complete cases with these five factors from 1998 to 2007 have been used. In other words, fatal crash cases with any missing or unknown values among those five factors have not been used in the statistical procedure of this research note.

The number of complete cases accounted for 97 percent of total cases in FARS.

Analysis

The number of drivers 16 and older in fatal crashes with invalid licenses by year and driver type has been summarized in Table 1. This table also contains the yearly change rate and 10-year average change rate by driver type.

In addition, the data in the same table have been used to calculate the annual proportion and 10-year proportion of invalid licenses.

In total, there were 563,135 drivers 16 and older involved in fatal crashes from 1998 to 2007, 12 percent (69,337) of whom had invalid licenses at the time of the fatal crashes; that is 12 invalid licenses per 100 drivers.

Over the 10-year period, the number of drivers 16 and older with invalid licenses has increased by an average of 2 percent each year.

The 10-year proportion of invalid licenses was 14 percent for male drivers and 7 percent for female drivers. The 10-year average change rate is 2 percent for male drivers and 1 percent for female drivers. Both the proportion and rate for male drivers is two times higher than female drivers.

Among the four age groups, the young adult drivers had the highest 10-year proportion of invalid licenses at 17 percent, followed by the young drivers at 16 percent, the adult drivers at 8 percent, and the older drivers at an average of 3 percent.

The adult drivers had the greatest increase rate in invalid licenses, up by 5 percent per year on average. Young adult drivers had an average of 2 percent change rate in the past 10 years. The 10-year average change rate of number of invalid licenses is decreasing for both young and older drivers at a rate of 1 percent.

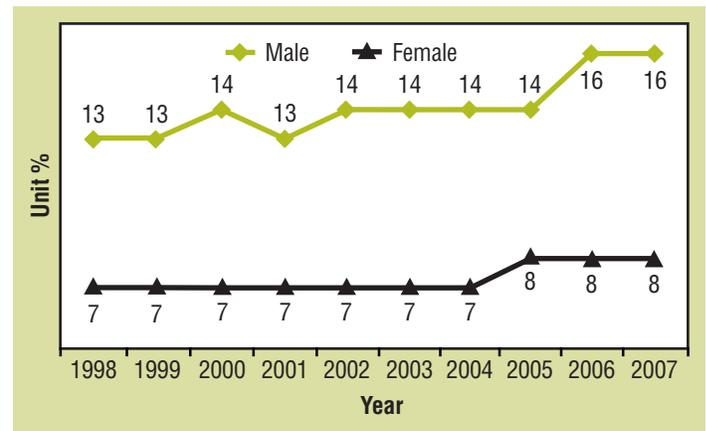
Trend data indicates the annual proportion of invalid licenses for drivers 16 and older in fatal crashes increased from 11 percent to 14 percent in past 10 years, in other words, the proportion of valid licenses decreased from 89 percent to 86 percent as shown in Figure 1.

From 1998 to 2007, the number of drivers 16 and older in fatal crashes with invalid licenses had a 2-percentage-point increase. However, the proportion of invalid licenses had a 3-percentage-point increase. This indicates that the increase in drivers with invalid licenses has outpaced the increase in the number of drivers involved.

As the data in Figure 2 shows, the annual proportion of invalid licenses for male drivers 16 and older in fatal crashes has increased from 13 percent in 1998 to 16 percent in 2007. This difference is a significant increase for male drivers. However, no significant change is seen in the annual proportion for female drivers, which increased from 7 percent to 8 percent in the same time interval.

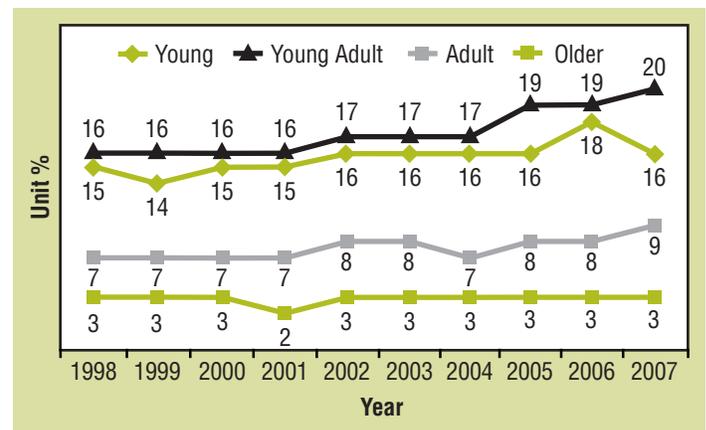
Figure 3 illustrates 10-year trend data in the annual proportion of drivers with invalid licenses for four age groups: young driver, young adult driver, adult driver, and older driver.

Figure 2
Annual Proportion of Invalid Licenses in Fatal Crashes By Sex



Data Source: FARS 1998-2006 (Final) 2007 (ARF)

Figure 3
Annual Proportion of Invalid Licenses in Fatal Crashes by Age Group



Data Source: FARS 1998-2006 (Final) 2007 (ARF)

Table 1

***Number and Change Rate for Drivers 16 and Older in Fatal Crashes With Invalid Licenses, by Driver Type by Year**

Group	Year	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	Average
Total	Number	6,385	6,331	6,670	6,587	7,042	6,902	6,883	7,348	7,692	7,497	6,934
	Rate		-1%	5%	-1%	7%	-2%	0%	7%	5%	-3%	2%
Male	Number	5,334	5,318	5,619	5,559	5,968	5,780	5,823	6,200	6,517	6,351	5,847
	Rate		0%	6%	-1%	7%	-3%	1%	6%	5%	-3%	2%
Female	Number	1,051	1,013	1,051	1,028	1,074	1,122	1,060	1,148	1,175	1,146	1,087
	Rate		-4%	4%	-2%	4%	4%	-6%	8%	2%	-2%	1%
Young	Number	1,186	1,088	1,208	1,220	1,341	1,245	1,215	1,170	1,300	1,124	1,210
	Rate		-8%	11%	1%	10%	-7%	-2%	-4%	11%	-14%	-1%
Young Adult	Number	3,936	3,901	4,034	3,934	4,163	4,046	4,160	4,493	4,581	4,539	4,179
	Rate		-1%	3%	-2%	6%	-3%	3%	8%	2%	-1%	2%
Adult	Number	1,086	1,160	1,216	1,274	1,375	1,428	1,345	1,524	1,612	1,667	1,369
	Rate		7%	5%	5%	8%	4%	-6%	13%	6%	3%	5%
Older	Number	177	182	212	159	163	183	163	161	199	167	177
	Rate		3%	16%	-25%	3%	12%	-11%	-1%	24%	-16%	-1%

Source: FARS 1998-2007(Final)

*Only contains fatal crashes for which sex, age, and license status are known.

Note: An example below shows how to calculate the 10-year average change rate at 2% for Total.

$0.97=7497/7692$ for 2006 to 2007, $1.05=7692/7348$ for 2005 to 2006, $1.07=7348/6883$ for 2004 to 2005, $1.0=6883/6902$ for 2003 to 2004, and so on for other years are: $0.98=6902/7042$, $1.07=7042/6587$, $0.99=6587/6670$, $1.05=6670/6331$, and $0.99=6331/6385$ for 1998 to 1999. $1.02 =$ the ninth root of $(0.99 \times 1.05 \times 0.99 \times 1.07 \times 0.98 \times 1.0 \times 1.07 \times 1.05 \times 0.97)$, hence, the 10-year average change is 2% per year.

As the figure shows, the annual proportion of invalid licenses for young drivers ranges from 15 percent to 18 percent with no definitive direction in trend. The annual proportion of invalid licenses for young adult drivers has risen over the past 10 years – from 16 percent to 20 percent.

The annual proportion of invalid licenses for adult drivers also increased to 9 percent from 7 percent. The annual proportion of invalid licenses for older drivers is relatively constant, with only slight fluctuations around 3 percent.

Trend in Each State

Table 2 shows a breakdown for drivers 16 and older in fatal crashes with invalid licenses by State and by year.

It also presents the trend in each State by 10-year average change rate. As Table 2 shows, West Virginia has the highest increasing rate, increasing by 9 percent per year on average, and Rhode Island has the greatest decreasing rate, declining by 18 percent per year on average.

The average number ranges from 10 per year in the District of Columbia to 888 per year in California. The 10-year proportion of invalid licenses ranges from 6 percent in Maine, Mississippi, and New Hampshire to 22 percent in Arizona, as depicted in Table 3 for drivers 16 and older in fatal crashes with invalid licenses.

Table 2

***Number of Drivers 16 and Older in Fatal Crashes With Invalid Licenses, by State by Year**

State	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	10-Year Average Change Rate
Alabama	220	223	195	168	188	184	241	248	266	265	2%
Alaska	13	15	15	21	19	13	28	20	12	9	-4%
Arizona	174	244	256	251	258	236	225	255	293	240	4%
Arkansas	102	99	119	83	82	93	115	113	101	101	0%
California	681	680	717	757	942	981	1,049	1,033	1,018	1,017	5%
Colorado	109	116	133	161	148	149	148	158	119	123	1%
Connecticut	49	46	55	57	66	47	55	45	59	40	-2%
Delaware	17	10	21	26	19	33	23	20	26	28	6%
Dist of Columbia	10	2	5	8	15	24	13	11	5	10	0%
Florida	319	269	343	310	319	376	332	510	698	664	8%
Georgia	209	194	214	227	234	203	222	290	267	252	2%
Hawaii	22	38	28	28	20	27	23	35	45	31	4%
Idaho	45	31	40	36	37	35	44	38	42	32	-4%
Illinois	212	223	254	223	229	217	194	200	203	202	-1%
Indiana	151	143	146	153	145	141	165	161	208	191	3%
Iowa	40	44	51	31	68	39	50	44	56	60	5%
Kansas	64	74	66	79	80	83	58	50	63	56	-1%
Kentucky	92	111	109	117	113	115	127	142	132	112	2%
Louisiana	232	226	229	257	191	150	190	155	163	207	-1%
Maine	13	13	11	15	11	15	16	17	21	18	4%
Maryland	60	58	55	67	71	57	59	86	74	76	3%
Massachusetts	43	58	43	54	62	39	51	47	44	37	-2%
Michigan	232	237	211	186	160	149	145	136	169	181	-3%
Minnesota	57	36	51	57	64	79	44	62	47	55	0%
Mississippi	97	129	117	65	97	56	15	20	33	64	-5%
Missouri	156	151	157	155	175	174	132	184	189	159	0%
Montana	33	43	41	59	46	53	43	39	47	49	4%
Nebraska	31	34	27	22	27	23	22	44	34	23	-3%
Nevada	36	41	48	47	38	63	66	78	83	79	9%
New Hampshire	7	16	8	15	14	7	12	16	6	9	3%
New Jersey	78	68	67	125	106	103	97	111	90	73	-1%
New Mexico	103	79	101	96	111	88	64	55	73	46	-9%
New York	217	214	218	165	187	188	199	188	219	165	-3%
North Carolina	307	289	332	296	318	295	307	289	348	370	2%
North Dakota	12	21	18	15	14	16	17	20	17	21	6%
Ohio	223	203	215	249	253	193	187	243	184	180	-2%
Oklahoma	96	105	111	95	94	131	118	136	118	101	1%
Oregon	79	58	62	67	62	80	81	80	75	83	1%
Pennsylvania	218	195	223	237	265	241	180	193	203	240	1%
Rhode Island	12	8	15	12	12	17	10	13	7	2	-18%
South Carolina	142	129	93	74	124	164	160	196	188	210	4%
South Dakota	20	31	30	29	28	39	28	38	39	30	5%
Tennessee	218	216	251	235	215	223	280	251	244	196	-1%
Texas	617	601	631	605	777	725	684	734	699	754	2%
Utah	38	37	40	29	41	26	50	34	32	48	3%
Vermont	17	17	7	19	7	9	11	8	10	10	-6%
Virginia	90	105	107	118	118	95	111	119	141	138	5%
Washington	136	112	123	132	110	110	107	122	133	120	-1%
West Virginia	34	37	50	52	62	55	54	48	92	71	9%
Wisconsin	87	98	121	120	114	144	132	149	162	152	6%
Wyoming	14	20	12	20	18	18	19	15	27	13	-1%
National	6,284	6,247	6,592	6,525	6,974	6,821	6,803	7,299	7,624	7,413	2%
Puerto Rico	101	84	78	62	68	81	80	49	68	84	-2%

Source: FARS 1998-2006 (Final) and 2007 (ARF) *Only contains fatal crashes for which sex, age, and license status are known.

Table 3

***Drivers 16 and Older in Fatal Crashes With Invalid Licenses, by State by Statistics**

State	10-Year Average (Number per Year)	10-Year Proportion	Numbers for 10-Year (1998-2007)					
			Male	Female	Young	Young Adult	Adult	Older
Alabama	220	18%	1,845	353	281	1,374	494	49
Alaska	17	17%	140	25	34	92	33	6
Arizona	243	22%	2,007	425	493	1,465	420	54
Arkansas	101	14%	834	174	153	605	228	22
California	888	21%	7,452	1,423	1,520	5,340	1,739	276
Colorado	136	19%	1,144	220	254	784	293	33
Connecticut	52	14%	469	50	96	346	72	5
Delaware	22	14%	186	37	31	131	56	5
Dist of Columbia	10	21%	90	13	21	67	13	2
Florida	414	11%	3,467	673	781	2,437	789	133
Georgia	231	12%	1,935	377	336	1,462	452	62
Hawaii	30	21%	265	32	50	169	74	4
Idaho	38	13%	308	72	73	233	64	10
Illinois	216	13%	1,865	292	349	1,366	389	53
Indiana	160	14%	1,358	246	220	980	361	43
Iowa	48	9%	412	71	73	287	108	15
Kansas	67	12%	543	130	123	386	134	30
Kentucky	117	11%	1,013	157	166	732	250	22
Louisiana	200	19%	1,618	382	246	1,191	487	76
Maine	15	6%	132	18	31	83	31	5
Maryland	66	8%	594	69	137	402	112	12
Massachusetts	48	9%	409	69	98	285	80	15
Michigan	181	11%	1,534	272	259	1,124	378	45
Minnesota	55	7%	471	81	92	337	109	14
Mississippi	69	6%	558	135	125	398	150	20
Missouri	163	12%	1,368	264	264	963	364	41
Montana	45	19%	365	88	84	232	121	16
Nebraska	29	8%	240	47	62	167	47	11
Nevada	58	13%	481	98	95	328	137	19
New Hampshire	11	6%	92	18	20	68	18	4
New Jersey	92	10%	819	99	154	591	156	17
New Mexico	82	18%	670	146	208	454	136	18
New York	196	11%	1,731	229	338	1,259	328	35
North Carolina	315	17%	2,667	484	463	1,976	620	92
North Dakota	17	16%	127	44	37	90	41	3
Ohio	213	13%	1,812	318	357	1,288	440	45
Oklahoma	111	13%	909	196	171	647	257	30
Oregon	73	13%	623	104	129	395	181	22
Pennsylvania	220	12%	1,928	267	385	1,333	432	45
Rhode Island	11	12%	103	5	27	61	16	4
South Carolina	148	12%	1,267	213	182	903	355	40
South Dakota	31	18%	251	61	62	176	66	8
Tennessee	233	16%	1,909	420	342	1,378	543	66
Texas	683	16%	5,694	1,133	1,554	4,030	1,127	116
Utah	38	11%	321	54	91	216	62	6
Vermont	12	12%	100	15	20	79	12	4
Virginia	114	10%	980	162	200	684	236	22
Washington	121	17%	1,038	167	232	735	210	28
West Virginia	56	12%	479	76	87	329	126	13
Wisconsin	128	14%	1,053	226	245	795	204	35
Wyoming	18	10%	139	37	26	112	34	4
National	6,858	14%	57,815	10,767	11,877	41,365	13,585	1,755
Puerto Rico	76	12%	654	101	220	422	102	11

Source: FARS 1998-2006 (Final) and 2007 (ARF) *Only contains fatal crashes for which sex, age, and license status are known.

For More Information

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