

Traffic Safety Facts

2019 Data

September 2021 (Revised)

DOT HS 813 112



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Motorcycles

The following definitions apply to terms in this fact sheet:

- For the purposes of this fact sheet, motorcycles include two- and three-wheeled motorcycles, off-road motorcycles, mopeds, scooters, mini bikes, and pocket bikes.
- The motorcycle rider is the person operating the motorcycle; the passenger is a person seated on, but not operating, the motorcycle; the motorcyclist is a general term referring to either the rider or passenger.
- Drivers or motorcycle riders are considered to be alcohol-impaired when their blood alcohol concentrations (BACs) are .08 grams per deciliter (g/dL) or higher.

Key Findings

- In 2019 there were 5,014 motorcyclists killed, which accounted for 14 percent of traffic fatalities.
- The number of motorcyclist fatalities in 2019 decreased from 2018, from 5,038 to 5,014.
- An estimated 84,000 motorcyclists were injured in 2019, a 2-percent increase from 82,000 motorcyclists injured in 2018.
- Per vehicle miles traveled in 2019, motorcyclist fatalities occurred nearly 29 times more frequently than passenger car occupant fatalities in traffic crashes.
- Thirty percent of motorcycle riders involved in fatal crashes in 2019 were riding without valid motorcycle licenses.
- In 2019 motorcycle riders involved in fatal crashes had higher percentages of alcohol impairment than drivers of any other motor vehicle type (29% for motorcycles, 20% for passenger cars, 19% for light trucks, and 2% for large trucks).
- Forty-two percent of motorcycle riders who died in single-vehicle crashes in 2019 were alcohol-impaired.
- Motorcycle riders killed in traffic crashes at night were almost three times more frequently alcohol-impaired than those killed during the day in 2019.
- In States without universal helmet laws, 57 percent of motorcyclists killed in 2019 were not wearing helmets, as compared to 9 percent in States with universal helmet laws.

This fact sheet contains information on fatal motor vehicle traffic crashes based on data from the Fatality Analysis Reporting System (FARS) and non-fatal motor vehicle traffic crashes from the National Automotive Sampling System (NASS) General Estimates System (GES) and Crash Report Sampling System (CRSS). Refer to the end of this publication for more information on FARS, NASS GES, and CRSS.

A motor vehicle traffic crash is defined as an incident that involved one or more motor vehicles in transport that originated on a public trafficway, such as a road or highway. Crashes that occurred on private property, including parking lots and driveways, are excluded. The terms “motor vehicle traffic crash” and “traffic crash” are used interchangeably.

Overview

In 2019:

- There were 5,014 motorcyclists killed in motor vehicle traffic crashes – lower than the 5,038 motorcyclists killed in 2018.
- Two-wheeled motorcycles accounted for 91 percent of all motorcycles involved in fatal crashes.
- Motorcyclists accounted for 14 percent of all traffic fatalities and 17 percent of all occupant (driver and passenger) fatalities.
- Of the 5,014 motorcyclists killed in traffic crashes, 94 percent (4,733) were riders and 6 percent (281) were passengers.

- There were an estimated 84,000 motorcyclists injured in 2019, a 2-percent increase from 82,000 motorcyclists injured in 2018.

Table 1 presents information about motorcyclists killed and injured from 2010 to 2019. From 2010 to 2019 motorcyclist fatalities increased by 11 percent and peaked in 2016. The number of registered motorcycles and motorcycle vehicle miles traveled (VMT) are also presented in Table 1, along with the respective fatality and injury rates.

Table 1

Motorcyclists Killed and Injured, and Fatality and Injury Rates, 2010-2019

Year	Killed	Registered Vehicles	Fatality Rate per 100,000 Registered Vehicles	VMT (millions)	Fatality Rate per 100 Million VMT
2010	4,518	8,009,503	56.41	18,513	24.40
2011	4,630	8,437,502	54.87	18,542	24.97
2012	4,986	8,454,939	58.97	21,385	23.32
2013	4,692	8,404,687	55.83	20,366	23.04
2014	4,594	8,417,718	54.58	19,970	23.00
2015	5,029	8,600,936	58.47	19,606	25.65
2016	5,337	8,679,380	61.49	20,445	26.10
2017	5,226	8,664,108	60.32	20,149	25.94
2018	5,038	8,659,741	58.18	20,076	25.09
2019	5,014	8,596,314	58.33	19,688	25.47
Year	Injured	Registered Vehicles	Injury Rate per 100,000 Registered Vehicles	VMT (millions)	Injury Rate per 100 Million VMT
2010	82,000	8,009,503	1,028	18,513	445
2011	82,000	8,437,502	968	18,542	441
2012	93,000	8,454,939	1,103	21,385	436
2013	89,000	8,404,687	1,056	20,366	436
2014	92,000	8,417,718	1,093	19,970	461
2015	89,000	8,600,936	1,032	19,606	453
2016†	104,000	8,679,380	1,203	20,445	511
2017†	89,000	8,664,108	1,023	20,149	440
2018†	82,000	8,659,741	945	20,076	408
2019†	84,000	8,596,314	975	19,688	426

Sources: FARS 2010-2018 Final File, 2019 Annual Report File (ARF); NASS GES 2010-2015 and CRSS 2016-2019; VMT and Registered Vehicles – Federal Highway Administration (FHWA)

†CRSS estimates and NASS GES estimates are not comparable due to different sample designs. Refer to end of document for more information about CRSS.

Motorcycles made up 3 percent of all registered vehicles in the United States in 2019 and accounted for only 0.6 percent of all VMT. Per registered vehicle in 2019, the fatality rate for motorcyclists (58.33) was more than 6 times the fatality rate for passenger car occupants (9.42) and almost 9 times the fatality rate for light-truck occupants (6.80), as shown in Table 2. The injury rate for motorcyclists (975) was lower than the injury rate for passenger car occupants (1,152), but higher than the injury rate of light-truck occupants (648).

Per VMT in 2019, the fatality rate for motorcyclists (25.47) was 29 times more than the passenger car occupant fatality rate (0.89) and nearly 40 times the fatality rate for light-truck occupants (0.64). The motorcyclist injury rate (426) was almost 4 times more than the injury rate of passenger car occupants (109) and nearly 7 times the injury rate of light-truck occupants (61).

Table 6

Alcohol-Impaired Motorcycle Riders Killed, by Crash Type and Day of Week, 2010 and 2019

Crash Type and Day of Week		2010			2019		
		Total Motorcycle Riders Killed	Alcohol-Impaired		Total Motorcycle Riders Killed	Alcohol-Impaired	
			Number	Percent		Number	Percent
Single-Vehicle	Weekday	869	302	35%	908	328	36%
	Weekend	1,055	500	47%	968	462	48%
	Total*	1,930	805	42%	1,886	797	42%
Multiple-Vehicle	Weekday	1,259	175	14%	1,604	253	16%
	Weekend	1,019	226	22%	1,242	333	27%
	Total*	2,278	400	18%	2,847	586	21%
Total	Weekday	2,128	477	22%	2,512	581	23%
	Weekend	2,074	726	35%	2,210	795	36%
	Total*	4,208	1,205	29%	4,733	1,383	29%

Source: FARS 2010 Final File, 2019 ARF

Weekday — Monday 6 a.m. to Friday 5:59 p.m.

Weekend — Friday 6 p.m. to Monday 5:59 a.m.

*Includes riders involved in fatal crashes when day of week was unknown.

Note: Percentages are computed based on unrounded estimates.

Motorcycle riders killed in traffic crashes at night were almost three times more frequently found to be alcohol-impaired than those killed during the day (44% and 15%, respectively).

State

NHTSA estimates that helmets saved the lives of 1,872 motorcyclists in 2017. If all motorcyclists had worn helmets, an additional 749 lives could have been saved (latest data available).²

Helmets are estimated to be 37-percent effective in preventing fatalities to motorcycle riders and 41 percent for motorcycle passengers. In other words, for every 100 motorcycle riders killed in crashes while not wearing helmets, 37 of them could have been saved had all 100 worn helmets.²

The reported helmet use rate for alcohol-impaired motorcycle riders killed in traffic crashes was 54 percent as compared to 67 percent for those with no alcohol (BAC=.00 g/dL).

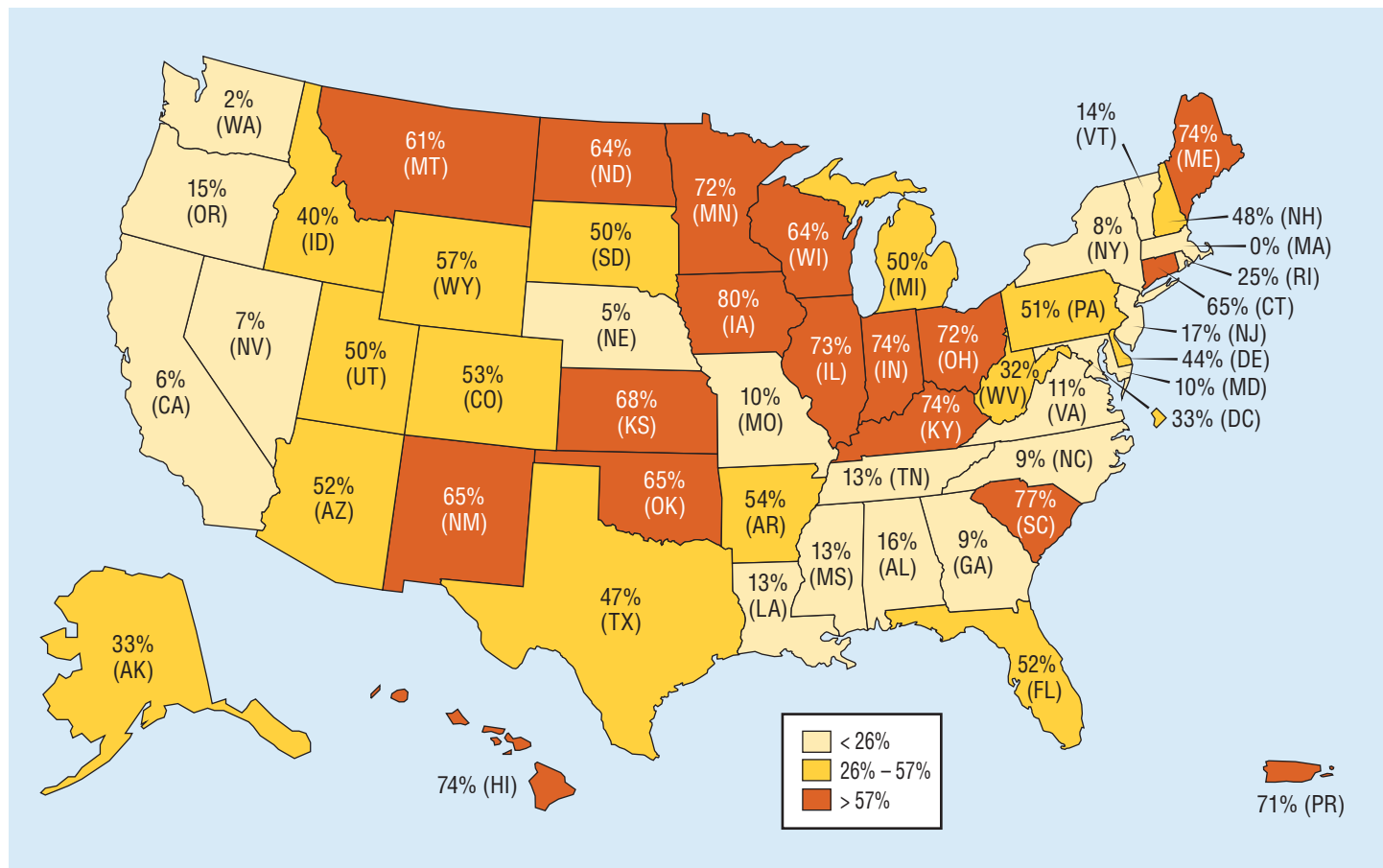
According to results from the National Occupant Protection Use Survey (NOPUS), the overall rate of DOT-compliant motorcycle helmet use in the United States was 70.8 percent in 2019. Helmet use continued to be significantly higher in States that required all motorcyclists to be helmeted than in other States.³

Reported helmet use rates for motorcyclists killed in 2019 were 62 percent for riders and 47 percent for passengers, compared with 63 percent and 53 percent, respectively, in 2018. Figure 3 presents the percentage of motorcyclists killed who were not helmeted by each State in 2019, based on known helmet use.

² National Center for Statistics and Analysis. (2019, December). Lives and costs saved by motorcycle helmets, 2017 (Traffic Safety Facts Crash•Stats Report No. DOT HS 812 867). National Highway Traffic Safety Administration. Available at <https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/812867>

³ National Center for Statistics and Analysis. (2020, June). Motorcycle helmet use in 2019 – Overall results (Traffic Safety Fact Research Note. Report No. DOT HS 812 936). National Highway Traffic Safety Administration. Available at <https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/812936>

Figure 3
Percentage of Known Unhelmeted* Motorcyclists Killed, 2019



Source: FARS 2019 ARF
 *Based on known helmet use.

All motorcycle helmets sold in the United States are required to meet Federal Motor Vehicle Safety Standard (FMVSS) 218, the performance standard that establishes the minimum level of protection for helmets designed for use by motorcyclists.

In 2019 only 19 States, the District of Columbia, and Puerto Rico required helmet use for all motorcyclists. Excluding the District of Columbia and Puerto Rico, the known helmet use percentages in fatal crashes ranged from 68 percent (West Virginia) to 100 percent (Massachusetts) for these 19 States.

In 28 States helmet use was required for only a subset of motorcyclists (typically, motorcyclists under age 18), and 3 States (Illinois, Iowa, and New Hampshire) did not require helmet use for motorcyclists of any age. The known helmet use percentages in fatal crashes ranged from 20 percent (Iowa) to 75 percent (Rhode Island) for these 31 States.

The most current information on helmet use laws is available on the Governors Highway Safety Association (GHSA) website at www.ghsa.org/state-laws/issues/motorcyclists. In States without universal helmet laws, 57 percent of motorcyclists killed in 2019

were not wearing helmets, as compared to 9 percent in States with universal helmet laws. According to NOPUS, in 2019 DOT-compliant motorcycle helmet use in States requiring all to use helmets was 89.2 percent compared to 56.5 percent in other States.

Table 7 shows that 39 percent of the 5,014 motorcyclists killed nationwide in traffic crashes were not helmeted, based on known helmet use. The State-level unhelmeted percentages ranged from a high of 80 percent (Iowa) to a low of 0 percent (Massachusetts).

Table 8 presents the percentage of motorcycle riders killed who were alcohol-impaired, by State where the crashes occurred. The percentages ranged from a low of 15 percent (South Dakota) to a high of 64 percent (Rhode Island), compared to the national average of 29 percent.

Additional data visualization tools for fact sheets can be found at <https://cdan.dot.gov/DataVisualization/DataVisualization.htm#>

Table 7
Motorcyclist Fatalities, by State and Helmet Use, 2019

State	Helmet Use						Total		Percent Based on Known Helmet Use	
	Helmeted		Unhelmeted		Unknown					
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Helmeted	Unhelmeted
Alabama	78	84%	15	16%	0	0%	93	100%	84%	16%
Alaska	4	67%	2	33%	0	0%	6	100%	67%	33%
Arizona	77	44%	84	48%	14	8%	175	100%	48%	52%
Arkansas	27	42%	32	50%	5	8%	64	100%	46%	54%
California	437	92%	28	6%	9	2%	474	100%	94%	6%
Colorado	48	47%	54	52%	1	1%	103	100%	47%	53%
Connecticut	15	33%	28	61%	3	7%	46	100%	35%	65%
Delaware	10	56%	8	44%	0	0%	18	100%	56%	44%
District of Columbia	2	67%	1	33%	0	0%	3	100%	67%	33%
Florida	280	47%	303	51%	8	1%	591	100%	48%	52%
Georgia	151	89%	15	9%	4	2%	170	100%	91%	9%
Hawaii	5	25%	14	70%	1	5%	20	100%	26%	74%
Idaho	15	60%	10	40%	0	0%	25	100%	60%	40%
Illinois	37	27%	100	72%	1	1%	138	100%	27%	73%
Indiana	32	25%	89	70%	6	5%	127	100%	26%	74%
Iowa	9	20%	35	80%	0	0%	44	100%	20%	80%
Kansas	13	32%	28	68%	0	0%	41	100%	32%	68%
Kentucky	24	26%	68	74%	0	0%	92	100%	26%	74%
Louisiana	69	79%	10	11%	8	9%	87	100%	87%	13%
Maine	7	26%	20	74%	0	0%	27	100%	26%	74%
Maryland	66	88%	7	9%	2	3%	75	100%	90%	10%
Massachusetts	28	61%	0	0%	18	39%	46	100%	100%	0%
Michigan	62	46%	61	46%	11	8%	134	100%	50%	50%
Minnesota	13	28%	33	72%	0	0%	46	100%	28%	72%
Mississippi	33	83%	5	13%	2	5%	40	100%	87%	13%
Missouri	106	86%	12	10%	5	4%	123	100%	90%	10%
Montana	9	39%	14	61%	0	0%	23	100%	39%	61%
Nebraska	21	84%	1	4%	3	12%	25	100%	95%	5%
Nevada	38	68%	3	5%	15	27%	56	100%	93%	7%
New Hampshire	15	50%	14	47%	1	3%	30	100%	52%	48%
New Jersey	68	80%	14	16%	3	4%	85	100%	83%	17%
New Mexico	17	31%	32	58%	6	11%	55	100%	35%	65%
New York	122	90%	11	8%	3	2%	136	100%	92%	8%
North Carolina	186	89%	19	9%	3	1%	208	100%	91%	9%
North Dakota	4	36%	7	64%	0	0%	11	100%	36%	64%
Ohio	45	28%	116	72%	1	1%	162	100%	28%	72%
Oklahoma	23	34%	42	62%	3	4%	68	100%	35%	65%
Oregon	46	81%	8	14%	3	5%	57	100%	85%	15%
Pennsylvania	85	48%	87	49%	4	2%	176	100%	49%	51%
Rhode Island	9	69%	3	23%	1	8%	13	100%	75%	25%
South Carolina	35	23%	115	75%	3	2%	153	100%	23%	77%
South Dakota	6	43%	6	43%	2	14%	14	100%	50%	50%
Tennessee	130	84%	20	13%	5	3%	155	100%	87%	13%
Texas	207	50%	187	45%	22	5%	416	100%	53%	47%
Utah	16	47%	16	47%	2	6%	34	100%	50%	50%
Vermont	6	75%	1	13%	1	13%	8	100%	86%	14%
Virginia	91	89%	11	11%	0	0%	102	100%	89%	11%
Washington	89	98%	2	2%	0	0%	91	100%	98%	2%
West Virginia	19	68%	9	32%	0	0%	28	100%	68%	32%
Wisconsin	31	36%	54	64%	0	0%	85	100%	36%	64%
Wyoming	6	40%	8	53%	1	7%	15	100%	43%	57%
U.S. Total	2,972	59%	1,862	37%	180	4%	5,014	100%	61%	39%
Puerto Rico	10	29%	24	71%	0	0%	34	100%	29%	71%

Source: FARS 2019 ARF

Note: Shading indicates requiring helmet use for all motorcyclists.

Important Safety Reminders

For Motorcyclists:

- Wearing a helmet is the single most effective way to protect yourself from a head injury. Use a motorcycle helmet for every ride, and ensure your passengers also use a helmet.
- Make sure your helmet has a valid U.S. Department of Transportation (DOT) label; the label means the helmet meets the Federal Motor Vehicle Safety Standards – this is also known as the FMVSS 218 standard. Novelty helmets without this label may not meet the same standard and will not provide the best protection needed in a crash.



- Check the fit of your helmet to ensure optimal protection.
- Wear protective gear like a sturdy jacket, pants, boots, and gloves; safety gear provides protection in case of falls or crashes, and improves comfort during the ride.
- Make yourself visible by using high-visibility colors and retro-reflective materials to maximize the ability of drivers to see you.
- Motorcycle riding requires full attention, skill, and coordination. Avoid combining riding with drinking alcohol or using other impairing drugs.

For Drivers:

- Always be on the look-out for motorcyclists.
- A motorcycle's smaller size means it can be hidden in your vehicle's blind spot.
- A motorcycle's size and narrow profile can make it difficult to judge its distance and speed. Take extra care when judging when to turn or merge.
- Keep a safe distance from the motorcycle in front of you; motorcyclists can slow their motorcycles by downshifting instead of using their brakes. This means the brake lights won't come on.
- Remember that motorcyclists sometimes change positions in their lane to avoid debris on the road.

— NHTSA's Research and Program Development