TRAFFIC SAFETY FACTS
Research Note

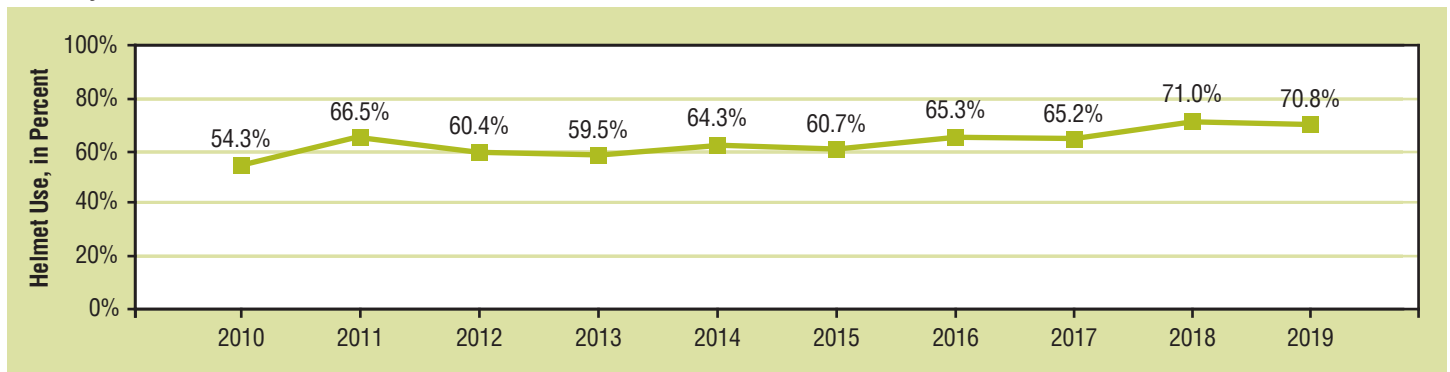# Motorcycle Helmet Use in 2019—Overall Results

Use of DOT-compliant motorcycle helmets was 70.8 percent[1] in 2019, not statistically different at the 0.05 level from 71.0 percent in 2018. This result is from the National Occupant Protection Use Survey (NOPUS), the only survey that provides nationwide probability-based observed data on motorcycle helmet use in the United States. NHTSA's National Center for Statistics and Analysis conducts the NOPUS every year. Throughout this Research Note the term *helmet use* refers to the use of DOT-compliant motorcycle helmets unless otherwise stated.

Figure 1 shows the motorcycle helmet use trend since 2010. Figure 2 shows the percentages of motorcyclists using DOT-compliant helmets, noncompliant helmets, and no helmet in 2018 and 2019. Figure 3 shows helmet use in States that require all motorcyclists to be helmeted compared to States that require some or no motorcyclists to be helmeted.
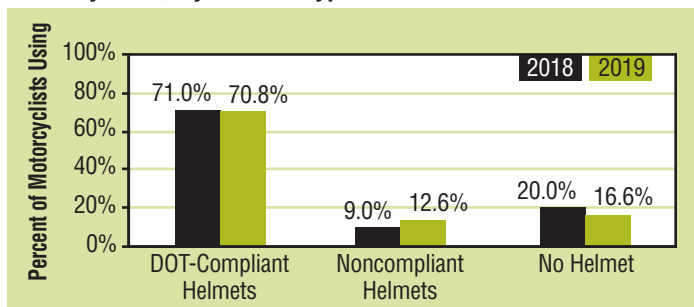
The 2019 survey found only one significant year-to-year change: Use of noncompliant helmets in States that do not require all motorcyclists to be helmeted increased significantly from 3.5 percent in 2018 to 14.8 percent in 2019 (Table 2).

Figure 1
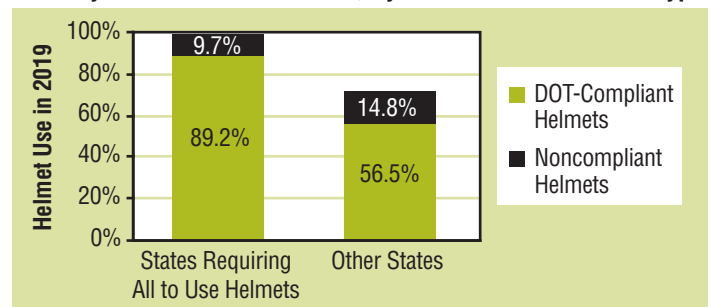**Motorcycle Helmet Use, 2010–2019**

Source: NOPUS

Figure 2
Motorcyclists, by Helmet Type

Source: NOPUS

Figure 3
Motorcycle Helmet Use in 2019, by State Law and Helmet Type

Source: NOPUS

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[1] The data presented in this research note is reflective of helmet use during an average daylight moment.

Table 1
Use of Helmets Compliant With Federal Safety Regulations by Major Motorcyclist Characteristics

Motorcyclist Group	2018		2019		2018–2019 Change		
	Helmet Use[1]	95% Confidence Interval[2]	Helmet Use[1]	95% Confidence Interval[2]	Change, in Percentage Points[5]	95% Confidence Interval[3]	P-Value
All Motorcyclists	71.0%	(61.6, 78.9)	70.8%	(62.7, 77.8)	-0.2	(-8.0, 7.6)	0.96
Riders	71.4%	(61.7, 79.4)	75.0%	(65.1, 82.9)	3.7	(-4.3, 11.7)	0.36
Passengers	68.8%	(50.8, 82.5)	48.0%	(30.0, 66.6)	-20.8	(-49.0, 7.3)	0.14
Motorcyclists in[4]							
States Where Use Is Required for All Motorcyclists	83.0%	(71.8, 90.3)	89.2%	(82.0, 93.7)	6.2	(-3.9, 16.4)	0.22
Other States	56.9%	(45.2, 67.8)	56.5%	(44.8, 67.5)	-0.4	(-9.6, 8.7)	0.93
Motorcyclists on							
Expressways	74.1%	(58.9, 85.0)	73.7%	(55.4, 86.4)	-0.3	(-16.9, 16.3)	0.97
Surface Streets	70.1%	(59.8, 78.7)	69.3%	(62.8, 75.1)	-0.8	(-8.3, 6.6)	0.82
Motorcyclists Traveling in							
Fast Traffic	76.3%	(65.3, 84.6)	72.8%	(60.1, 82.7)	-3.5	(-15.5, 8.6)	0.56
Medium-Speed Traffic	67.0%	(55.0, 77.2)	75.7%	(64.6, 84.1)	8.6	(-1.4, 18.7)	0.09
Slow Traffic	69.1%	(54.0, 81.0)	64.1%	(55.3, 72.0)	-5.0	(-19.1, 9.0)	0.47
Motorcyclists Traveling in							
Heavy Traffic	73.3%	(61.7, 82.4)	72.1%	(60.4, 81.4)	-1.2	(-12.0, 9.6)	0.82
Moderately Dense Traffic	72.5%	(59.6, 82.5)	71.4%	(54.4, 84.0)	-1.1	(-15.9, 13.7)	0.88
Light Traffic	64.1%	(54.1, 73.0)	66.3%	(58.0, 73.6)	2.2	(-8.2, 12.6)	0.67
Motorcyclists in							
Not Clear Weather Conditions	73.5%	(40.0, 92.0)	71.3%	(61.4, 79.5)	-2.2	(-29.3, 24.9)	0.87
Clear Weather Conditions	70.8%	(61.7, 78.5)	70.8%	(62.1, 78.1)	-0.1	(-7.7, 7.6)	0.99
Motorcycle Riders When							
They Are the Sole Rider	70.9%	(61.0, 79.1)	74.0%	(63.2, 82.5)	3.1	(-5.1, 11.4)	0.44
They Have Passengers	73.8%	(56.2, 86.1)	79.7%	(65.3, 89.1)	5.8	(-13.9, 25.6)	0.55
Motorcyclists in the							
Northeast	71.1%	(52.7, 84.4)	74.1%	(56.5, 86.3)	3.0	(-6.3, 12.3)	0.52
Midwest	57.7%	(42.2, 71.7)	43.4%	(30.9, 56.8)	-14.2	(-29.7, 1.2)	0.07
South	74.5%	(54.0, 87.9)	74.6%	(60.3, 85.0)	0.1	(-18.8, 19.0)	0.99
West	84.2%	(68.5, 92.9)	83.7%	(74.6, 90.0)	-0.5	(-12.5, 11.5)	0.93
Motorcyclists in							
Urban Areas	69.1%	(58.1, 78.3)	67.8%	(57.3, 76.8)	-1.2	(-11.5, 9.0)	0.81
Rural Areas	73.5%	(62.6, 82.1)	76.5%	(65.9, 84.5)	3.0	(-6.6, 12.7)	0.53
Motorcyclists Traveling During							
Weekdays	71.0%	(60.8, 79.4)	69.4%	(62.4, 75.6)	-1.6	(-10.0, 6.9)	0.70
Weekday Rush Hours	71.3%	(60.1, 80.3)	73.1%	(64.5, 80.2)	1.8	(-9.2, 12.8)	0.74
Weekday Non-Rush Hours	70.8%	(57.7, 81.2)	66.8%	(57.9, 74.6)	-4.0	(-16.6, 8.6)	0.52
Weekends	71.0%	(57.1, 81.8)	72.6%	(57.2, 84.0)	1.6	(-12.7, 15.9)	0.82
Motorcycle Riders Who							
Are Riding Alone	70.9%	(61.0, 79.1)	74.0%	(63.2, 82.5)	3.1	(-5.1, 11.4)	0.44
Have Passengers Using DOT-Compliant Helmets	83.8%	(62.0, 94.3)	87.8%	(76.8, 94.0)	4.0	(-15.2, 23.3)	0.67
Have Passengers Using Noncompliant Helmets	NA	NA	90.0%	(84.0, 93.9)	NA	NA	NA
Have Unhelmeted Passengers	NA	NA	NA	NA	NA	NA	NA
Passengers on Motorcycles on Which							
Riders Are Using DOT-Compliant Helmets	78.1%	(54.1, 91.6)	52.9%	(31.2, 73.6)	-25.2	(-58.0, 7.5)	0.13
Riders Are Using Noncompliant Helmets	NA	NA	NA	NA	NA	NA	NA
Riders Are Unhelmeted	NA	NA	NA	NA	NA	NA	NA

[1] Use of helmets meeting the safety requirements of Federal Motor Vehicle Safety Standard 218, observed between 7 a.m. and 6 p.m. among motorcycle riders and passengers.
[2] The Wilson Confidence Interval has the form: $\{(2n_{EFF}p + t^2) \pm t\sqrt{(t^2 + 4n_{EFF}pq)}\}/2(n_{EFF} + t^2)$, where p is the estimated percentage of Helmet Use, $n_{EFF} = n/DEFF$ is the effective sample size (where n is the sample size and $DEFF$ is the design effect), $t \equiv t_{1-\alpha/2}(df)$, is a multiplier from the t-distribution with df degrees of freedom, and $q = 1 - p$. For percentages, these endpoints are multiplied by 100.
[3] The regular symmetric interval was used for the estimated change in percentage point, which is in the form: $p \pm t_{1-\alpha/2}(df)\sqrt{v(p)}$, where p is the estimated change in percentage point, $v(p)$ is its estimated variance, and $t_{1-\alpha/2}(df)$ is a multiplier from the t-distribution with df degrees of freedom. The degrees of freedom used in 2019 is different from that used in 2018.
[4] Use rates reflect the laws in effect at the time data was collected.
[5] The "Change in Percentage Points" column was computed using unrounded estimates and may not equal the difference between the percentages displayed in the table which are rounded to the nearest tenth.
NA: Data not sufficient to produce a reliable estimate.
Source: National Occupant Protection Use Survey, NCSA.

Table 2
Use of Noncompliant Helmets by Major Motorcyclist Characteristics

Motorcyclist Group	2018		2019		2018–2019 Change		
	Helmet Use[1]	95% Confidence Interval[2]	Helmet Use[1]	95% Confidence Interval[2]	Change, in Percentage Points[6]	95% Confidence Interval[3]	P-Value[4]
All Motorcyclists	9.0%	(5.5, 14.4)	12.6%	(7.9, 19.5)	3.5	(-4.7, 11.7)	0.39
Riders	7.6%	(4.7, 12.1)	7.6%	(3.6, 15.3)	0.0	(-6.2, 6.2)	1.00
Passengers	17.3%	(7.0, 36.8)	39.2%	(19.2, 63.6)	21.9	(-9.8, 53.7)	0.17
Motorcyclists in[4]							
States Where Use Is Required for All Motorcyclists	13.7%	(7.9, 22.8)	9.7%	(5.5, 16.5)	-4.0	(-12.7, 4.7)	0.35
Other States	**3.5%**	**(1.4, 8.4)**	**14.8%**	**(7.9, 25.9)**	**11.2**	**(1.6, 20.9)**	**0.02**
Motorcyclists on							
Expressways	8.0%	(3.2, 18.5)	13.3%	(4.5, 33.3)	5.3	(-10.6, 21.3)	0.50
Surface Streets	9.3%	(5.4, 15.8)	12.2%	(7.7, 18.7)	2.8	(-5.2, 10.9)	0.48
Motorcyclists Traveling in							
Fast Traffic	5.7%	(2.6, 11.9)	12.0%	(5.0, 26.3)	6.4	(-4.7, 17.5)	0.25
Medium Speed Traffic	8.3%	(4.3, 15.2)	5.6%	(3.7, 8.5)	-2.7	(-8.1, 2.8)	0.33
Slow Traffic	14.9%	(7.5, 27.5)	18.9%	(13.2, 26.3)	4.0	(-7.7, 15.6)	0.49
Motorcyclists Traveling in							
Heavy Traffic	9.6%	(5.7, 15.5)	13.1%	(6.6, 24.2)	3.5	(-6.9, 13.9)	0.50
Moderately Dense Traffic	5.9%	(2.3, 14.3)	9.3%	(4.3, 18.9)	3.4	(-7.1, 13.9)	0.51
Light Traffic	11.8%	(5.5, 23.7)	16.2%	(10.0, 25.1)	4.4	(-7.4, 16.2)	0.45
Motorcyclists in							
Not Clear Weather Conditions	NA	NA	NA	NA	NA	NA	NA
Clear Weather Conditions	8.8%	(5.5, 14.0)	12.4%	(7.7, 19.3)	3.6	(-4.5, 11.6)	0.37
Motorcycle Riders When							
They Are the Sole Motorcyclists	6.7%	(4.1, 10.7)	8.3%	(3.7, 17.7)	1.6	(-5.7, 9.0)	0.65
They Have Passengers	12.2%	(4.5, 28.8)	4.5%	(1.9, 10.1)	-7.7	(-20.1, 4.7)	0.22
Motorcyclists in the							
Northeast	10.7%	(3.6, 27.7)	19.4%	(10.1, 34.0)	8.8	(-12.1, 29.6)	0.40
Midwest	7.9%	(3.7, 16.0)	8.2%	(3.5, 17.9)	0.3	(-8.6, 9.2)	0.94
South	8.2%	(3.1, 19.8)	6.3%	(2.5, 15.2)	-1.9	(-11.5, 7.6)	0.68
West	10.7%	(4.9, 21.8)	11.2%	(5.4, 21.6)	0.5	(-10.5, 11.4)	0.93
Motorcyclists in							
Urban Areas	11.9%	(6.7, 20.2)	15.9%	(9.6, 25.3)	4.0	(-7.7, 15.7)	0.49
Rural Areas	5.3%	(3.0, 9.4)	6.1%	(3.0, 12.0)	0.8	(-4.8, 6.4)	0.78
Motorcyclists Traveling During							
Weekdays	9.3%	(5.3, 15.7)	14.5%	(8.7, 23.3)	5.2	(-3.9, 14.4)	0.25
Weekday Rush Hours	11.7%	(5.9, 21.7)	9.7%	(6.2, 14.9)	-2.0	(-10.0, 6.0)	0.61
Weekday Non-Rush Hours	7.7%	(4.2, 13.9)	17.9%	(9.9, 30.2)	10.2	(-1.7, 22.1)	0.09
Weekends	8.7%	(4.0, 17.9)	10.1%	(3.7, 24.6)	1.4	(-11.3, 14.0)	0.83
Motorcycle Riders Who							
Are Riding Alone	6.7%	(4.1, 10.7)	8.3%	(3.7, 17.7)	1.6	(-5.7, 9.0)	0.65
Have Passengers Using DOT-Compliant Helmets	NA	NA	NA	NA	NA	NA	NA
Have Passengers Using Noncompliant Helmets	NA	NA	NA	NA	NA	NA	NA
Have Unhelmeted Passengers	NA	NA	NA	NA	NA	NA	NA
Passengers on Motorcycles on Which							
Riders Are Using DOT-Compliant Helmets	19.1%	(6.8, 43.5)	44.3%	(23.2, 67.6)	25.2	(-7.6, 57.9)	0.13
Riders Are Using Noncompliant Helmets	NA	NA	NA	NA	NA	NA	NA
Riders Are Unhelmeted	NA	NA	NA	NA	NA	NA	NA

[1] Use of helmets that do NOT meet the safety requirements of Federal Motor Vehicle Safety Standard 218, observed between 7 a.m. and 6 p.m. among motorcycle riders and passengers.

[2] The Wilson Confidence Interval has the form: $\{(2n_{EFF}p + t^2) \pm t\sqrt{(t^2 + 4n_{EFF}pq)}\}/2(n_{EFF} + t^2)$, where p is the estimated percentage of Helmet Use, $n_{EFF} = n/DEFF$ is the effective sample size (where n is the sample size and $DEFF$ is the design effect), $t = t_{1-\alpha/2}(df)$, is a multiplier from the t-distribution with df degrees of freedom, and $q = 1 - p$. For percentages, these endpoints are multiplied by 100.

[3] The regular symmetric interval was used for the estimated change in percentage point, which is in the form: $p \pm t_{1-\alpha/2}(df)\sqrt{v(p)}$, where p is the estimated change in percentage point, $v(p)$ is its estimated variance, and $t_{1-\alpha/2}(df)$ is a multiplier from the t-distribution with df degrees of freedom. The degrees of freedom used in 2019 is different from that used in 2018.

[4] A p-value of 0.05 or less indicates that there is a statistically significant difference (at the alpha=0.05 level) between the 2018 and 2019 estimates for the group in question, indicated with boldface type.

[5] Use rates reflect the laws in effect at the time data was collected.

[6] The "Change in Percentage Points" column was computed using unrounded estimates and may not equal the difference between the percentages displayed in the table which are rounded to the nearest tenth.

NA: Data not sufficient to produce a reliable estimate.

Source: National Occupant Protection Use Survey, NCSA.

Survey Methodology

NOPUS is the only survey that provides nationwide probability-based observed data on motorcycle helmet use in the United States. The survey observes helmet use as it actually occurs at randomly selected roadway sites to provide the best tracking of helmet use in this country.

The survey data is collected by sending observers to probabilistically sampled roadways to observe motorcyclists between 7 a.m. and 6 p.m. Observations are made either while standing at the roadside or, in the case of expressways, while riding in a vehicle in traffic. In order to capture the true behavior of motorcyclists, NOPUS observers do not stop motorcycles or interview motorcyclists. The 2019 NOPUS data was collected from June 2 to June 17, 2019, while the 2018 data was collected from June 4 to June 20, 2018.

The NOPUS uses a complex multistage probability sample, statistical data editing, imputation of unknown values, and complex estimation procedures. Table 3 shows the sample sizes of the 2019 NOPUS Moving Traffic Survey which included a total of 828 motorcyclists riding on 707 motorcycles at the 1,877 data collection sites.

Table 3
Sites, Motorcycles, and Motorcyclists Observed

Numbers of	2018	2019	Percentage Change
Sites Observed*	1,882	1,877	-0.3%
Motorcycles Observed	659	707	7.3%
Motorcyclists Observed	786	828	5.3%

*The number of sites observed reflects the number of sites in the sample frame minus those sites unavailable due to restricted access, traffic problems, or safety issues.

Because NOPUS selects the sites probabilistically, we can test the statistical significance of its results. Statistically significant changes in helmet use between 2018 and 2019 are identified in Table 2 by a p-value that is 0.05 or less in the table's far-right column.

Data collection, estimation, and variance estimation for the NOPUS are conducted by Westat, Inc., under the direction of the NCSA under Federal contract number 693JJ918D000001.

Definitions

NHTSA established standards for motorcycle helmets to ensure a certain degree of protection in a crash in Federal Motor Vehicle Safety Standard 218 (Code of Federal Register, Title 49, Volume 5, Part 571, Section 218, October 2003). *DOT-compliant helmets* are helmets that meet this safety standard, while *noncompliant helmets* are helmets that do not.

DOT-compliant helmets are marked with an identifying sticker on the backs of the helmets. However, because of the prevalence of counterfeit stickers, NOPUS data collectors categorize DOT-compliant helmets as helmets that cover the motorcyclists' ears, are at least 1 inch thick, have hefty chin straps, and do not have protrusions longer than two-tenths of an inch.

NHTSA defines helmet use as the use of DOT-compliant helmets.

At the time of the 2019 survey, 19 States and the District of Columbia required all motorcyclists to wear helmets. Table 4 lists States with motorcycle helmet laws in effect for all motorcyclists. Twenty-eight States required only a subset of riders or motorcycle passengers to use helmets (such as those under age 17, 18, or 21). Three States, Illinois, Iowa, and New Hampshire, had no motorcycle helmet requirement (Highway Loss Data Institute, 2019).

Table 4
States With Laws* Requiring Helmet Use for All Motorcyclists

Alabama	Mississippi	Oregon
California	Missouri	Tennessee
District of Columbia	Nebraska	Vermont
Georgia	Nevada	Virginia
Louisiana	New Jersey	Washington
Maryland	New York	West Virginia
Massachusetts	North Carolina	

*States and the District of Columbia with laws in effect as of May 31, 2019

"Expressways" are defined as roadways with limited access, while "surface streets" comprise all other roadways. "Rush hour" is defined as 7 to 9:30 a.m. and 3:30 to 6 p.m. on weekdays.

During the observation period, a roadway is defined to have "fast traffic" if the average speed of passenger vehicles that pass the observer exceeds 50 mph, with "medium-speed traffic" defined as 31 to 50 mph, and "slow traffic" defined as 30 mph or slower.

During the observation period, a roadway is defined to have "heavy traffic" if the average number of vehicles on the roadway is greater than 5 per lane per mile, with "moderately dense traffic" defined as greater than 1 but less than or equal to 5 vehicles per lane per mile, and "light traffic" as less than or equal to 1 vehicle per lane per mile.

As of 2018, "Not Clear Weather Conditions" includes sites where light precipitation or light fog is present.

The survey uses the following definitions of geographic regions, defined by the States below:

Northeast: CT, MA, ME, NH, NJ, NY, PA, RI, VT

Midwest: IA, KS, IL, IN, MI, MN, MO, ND, NE, OH, SD, WI

South: AL, AR, DC, DE, FL, GA, KY, LA, MD, MS, NC, OK, SC, TN, TX, VA, WV

West: AK, AZ, CA, CO, HI, ID, MT, NM, NV, OR, UT, WA, WY

Please note that NHTSA uses the following data-reporting guidelines for NOPUS publications:

An estimate whose numerator is based on fewer than five observations in the sample, and/or whose denominator is based on fewer than 30 observations in the sample is reported as "NA" in publications, including any related estimates.

More Information

For questions regarding the information presented in this report, contact the National Center for Statistics and Analysis at 800-934-8517 or by e-mail at ncsarequests@dot.gov. Additional data and information on the survey design and analysis procedures will be available in upcoming publications to be posted at https://crashstats.nhtsa.dot.gov.

Helmets are estimated to be 37-percent effective in preventing fatal injuries to motorcycle riders and 41-percent effective for motorcycle passengers (Deutermann, 2004; Deutermann, 2005).

NHTSA estimates that helmets saved the lives of 1,872 motorcyclists in 2017 (NCSA, 2019). For more information on the campaign by NHTSA and the States to raise helmet use, visit www.nhtsa.gov/road-safety/motorcycles.

The NOPUS also observes other types of restraints, such as seat belts and child restraints, and observes driver electronic device use. This publication is part of a series that presents overall results from the survey on these topics. Please see publications in the series, such as *Seat Belt Use in 2019 – Overall Results,* at https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/812875 for the latest data on these topics.

References

Deutermann, W. (2004). *Motorcycle helmet effectiveness revisited* (Report No. DOT HS 809 715). National Highway Traffic Safety Administration. Available at https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/809715

Deutermann, W. (2005). *Calculating lives saved by motorcycle helmets* (Report No. DOT HS 809 861). National Highway Traffic Safety Administration. Available at https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/809861

Highway Loss Data Institute. (2019, May). Motorcycle Helmet Use Laws by State (web page). Insurance Institute for Highway Safety. Available at www.iihs.org/topics/motorcycles/motorcycle-helmet-laws-table

National Center for Statistics and Analysis. (2019, March). *Lives Saved in 2017 by Restraint Use and Minimum-Drinking-Age Laws* (Traffic Safety Facts CrashStats. Report No. DOT HS 812 683). National Highway Traffic Safety Administration.

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National Highway Traffic Safety Administration

This research note and other general information on highway traffic safety may be accessed at: www-nrd.nhtsa.dot.gov/CATS/index.aspx