Motorcycle Helmet Use in 2020—Overall Results

Use of DOT-compliant motorcycle helmets was 69.0 percent[1] in 2020, not statistically different at the 0.05 level from 70.8 percent in 2019. 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 2011. Figure 2 shows the percentages of motorcyclists using DOT-compliant helmets, noncompliant helmets, and no helmet in 2019 and 2020. Figure 3 shows helmet use in States that require all motorcyclists to be helmeted compared to States that do not require helmets.

The 2020 survey found the following year-to-year changes in helmet use to be significant. Changes in noncompliant helmet use can be found in Table 2.

- Helmet use among riders with passengers decreased significantly from 79.7 percent in 2019 to 65.0 percent in 2020 (Table 1).

- Helmet use among passengers of riders wearing DOT-compliant helmets increased significantly from 52.9 percent in 2019 to 84.5 percent in 2020 (Table 1).
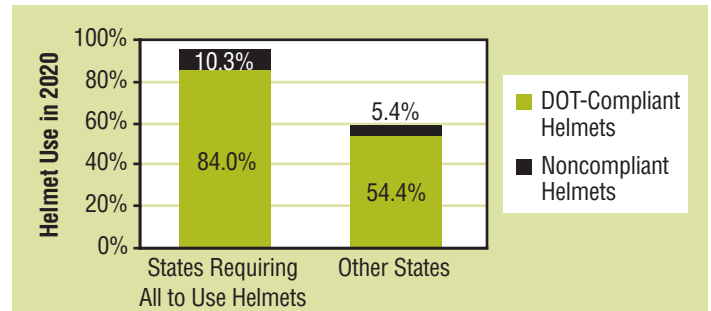
Figure 1
Motorcycle Helmet Use, 2011–2020
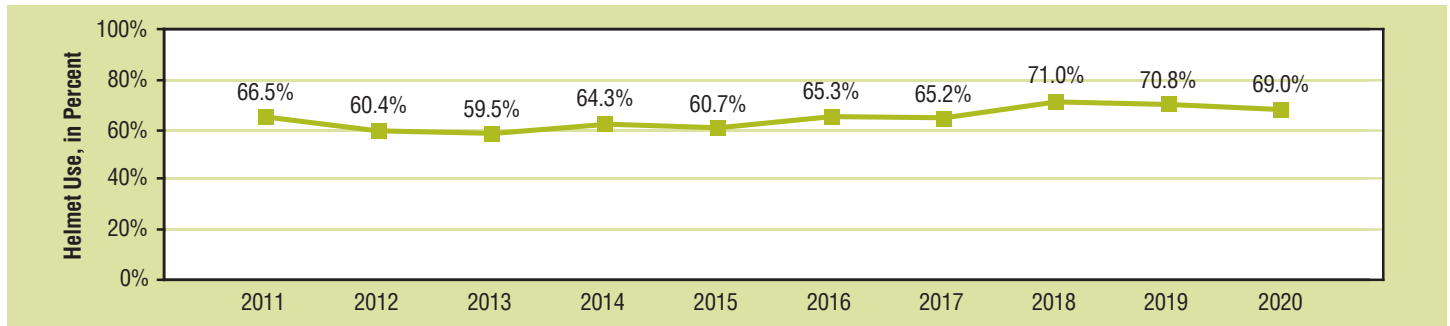
Source: NOPUS

Figure 2
Motorcyclists, by Helmet Type
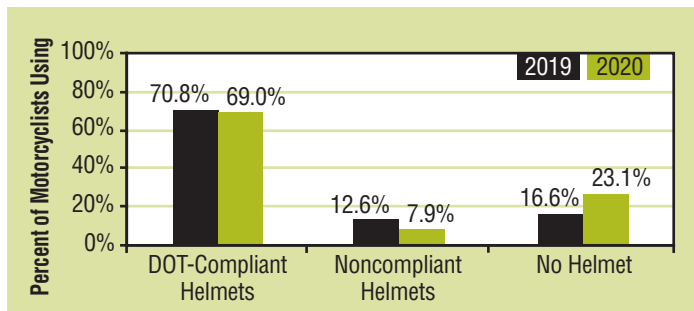
Source: NOPUS

Figure 3
Motorcycle Helmet Use in 2020, by State Law and Helmet Type

Source: NOPUS

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[1] The estimates presented in this Research Note are 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	2019		2020		2019–2020 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	70.8%	(62.7, 77.8)	69.0%	(58.8, 77.6)	-1.8	(-11.1, 7.5)	0.69
Riders	75.0%	(65.1, 82.9)	68.6%	(57.0, 78.3)	-6.4	(-17.7, 4.8)	0.25
Passengers	48.0%	(30.0, 66.6)	71.5%	(57.7, 82.1)	23.5	(-0.2, 47.1)	0.05
Motorcyclists in States Where[5]							
Use Is Required for All Motorcyclists	89.2%	(82.0, 93.7)	84.0%	(75.9, 89.8)	-5.2	(-11.2, 0.8)	0.09
Other States	56.5%	(44.8, 67.5)	54.4%	(40.7, 67.4)	-2.1	(-15.4, 11.2)	0.75
Motorcyclists on							
Expressways	73.7%	(55.4, 86.4)	72.9%	(57.6, 84.2)	-0.8	(-22.5, 20.9)	0.94
Surface Streets	69.3%	(62.8, 75.1)	67.2%	(57.0, 75.9)	-2.1	(-9.0, 4.7)	0.53
Motorcyclists Traveling in							
Fast Traffic	72.8%	(60.1, 82.7)	70.3%	(57.5, 80.6)	-2.5	(-18.3, 13.2)	0.74
Medium-Speed Traffic	75.7%	(64.6, 84.1)	76.8%	(67.1, 84.3)	1.2	(-9.7, 12.0)	0.83
Slow Traffic	64.1%	(55.3, 72.0)	55.4%	(37.9, 71.7)	-8.6	(-27.0, 9.7)	0.34
Motorcyclists Traveling in							
Heavy Traffic	72.1%	(60.4, 81.4)	77.0%	(66.6, 84.9)	4.9	(-7.3, 17.2)	0.42
Moderately Dense Traffic	71.4%	(54.4, 84.0)	61.2%	(44.2, 75.8)	-10.2	(-31.5, 11.0)	0.33
Light Traffic	66.3%	(58.0, 73.6)	57.4%	(32.7, 78.8)	-8.9	(-38.9, 21.0)	0.55
Motorcyclists in							
Not Clear Weather Conditions	71.3%	(61.4, 79.5)	74.3%	(52.1, 88.5)	3.1	(-18.7, 24.9)	0.77
Clear Weather Conditions	70.8%	(62.1, 78.1)	68.7%	(58.3, 77.6)	-2.0	(-11.4, 7.4)	0.66
Motorcycle Riders When							
They Are the Sole Rider	74.0%	(63.2, 82.5)	69.3%	(56.5, 79.7)	-4.7	(-17.9, 8.6)	0.48
They Have Passengers	**79.7%**	**(65.3, 89.1)**	**65.0%**	**(53.9, 74.7)**	**-14.6**	**(-27.8, -1.5)**	**0.03**
Motorcyclists in the							
Northeast	74.1%	(56.5, 86.3)	77.0%	(66.8, 84.8)	2.9	(-9.0, 14.8)	0.62
Midwest	43.4%	(30.9, 56.8)	53.7%	(31.4, 74.6)	10.3	(-10.3, 30.8)	0.32
South	74.6%	(60.3, 85.0)	69.8%	(54.5, 81.7)	-4.8	(-21.5, 11.8)	0.56
West	83.7%	(74.6, 90.0)	85.0%	(73.7, 92.0)	1.3	(-7.5, 10.1)	0.76
Motorcyclists in							
Urban Areas	67.8%	(57.3, 76.8)	67.4%	(55.3, 77.6)	-0.4	(-13.3, 12.5)	0.95
Rural Areas	76.5%	(65.9, 84.5)	71.0%	(54.5, 83.4)	-5.5	(-17.4, 6.5)	0.36
Motorcyclists Traveling During							
Weekdays	69.4%	(62.4, 75.6)	68.4%	(57.1, 77.8)	-1.0	(-10.4, 8.3)	0.82
Weekday Rush Hours	73.1%	(64.5, 80.2)	73.5%	(63.9, 81.2)	0.4	(-10.9, 11.7)	0.95
Weekday Non-Rush Hours	66.8%	(57.9, 74.6)	64.4%	(46.8, 78.8)	-2.4	(-18.7, 13.9)	0.76
Weekends	72.6%	(57.2, 84.0)	69.8%	(54.8, 81.6)	-2.8	(-18.9, 13.4)	0.73
Motorcycle Riders Who							
Are Riding Alone	74.0%	(63.2, 82.5)	69.3%	(56.5, 79.7)	-4.7	(-17.9, 8.6)	0.48
Have Passengers Using DOT-Compliant Helmets	87.8%	(76.8, 94.0)	76.9%	(59.4, 88.4)	-10.9	(-27.8, 6.0)	0.20
Have Passengers Using Noncompliant Helmets	90.0%	(84.0, 93.9)	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	**52.9%**	**(31.2, 73.6)**	**84.5%**	**(71.3, 92.3)**	**31.6**	**(5.2, 58.0)**	**0.02**
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), $t = t_{1-\alpha/2}(df)$, 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 2020 is different from that used in 2019.

[4] A p-value of 0.05 or less indicate that there is a statistically significant difference (at the alpha=0.05 level) between the 2019 and 2020 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.

Table 2
Use of Noncompliant Helmets by Major Motorcyclist Characteristics

Motorcyclist Group	2019		2020		2019–2020 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	12.6%	(7.9, 19.5)	7.9%	(4.9, 12.3)	-4.7	(-12.2, 2.8)	0.21
Riders	7.6%	(3.6, 15.3)	7.5%	(4.5, 12.2)	-0.1	(-6.7, 6.4)	0.97
Passengers	**39.2%**	**(19.2, 63.6)**	**10.1%**	**(4.7, 20.3)**	**-29.1**	**(-56.7, -1.6)**	**0.04**
Motorcyclists in States Where[5]							
Use Is Required for All Motorcyclists	9.7%	(5.5, 16.5)	10.3%	(5.9, 17.6)	0.6	(-6.2, 7.4)	0.85
Other States	14.8%	(7.9, 25.9)	5.4%	(1.9, 14.8)	-9.3	(-19.8, 1.1)	0.08
Motorcyclists on							
Expressways	13.3%	(4.5, 33.3)	11.1%	(5.0, 23.0)	-2.2	(-18.9, 14.6)	0.79
Surface Streets	12.2%	(7.7, 18.7)	6.3%	(4.0, 9.7)	-5.9	(-13.3, 1.5)	0.12
Motorcyclists Traveling in							
Fast Traffic	12.0%	(5.0, 26.3)	9.2%	(4.6, 17.5)	-2.9	(-15.3, 9.5)	0.64
Medium Speed Traffic	5.6%	(3.7, 8.5)	7.3%	(4.0, 13.0)	1.7	(-3.4, 6.8)	0.50
Slow Traffic	**18.9%**	**(13.2, 26.3)**	**6.0%**	**(3.0, 11.6)**	**-12.8**	**(-20.3, -5.4)**	**< 0.01**
Motorcyclists Traveling in							
Heavy Traffic	13.1%	(6.6, 24.2)	9.0%	(4.9, 16.1)	-4.1	(-14.5, 6.3)	0.43
Moderately Dense Traffic	9.3%	(4.3, 18.9)	5.5%	(2.2, 13.2)	-3.8	(-14.6, 7.0)	0.48
Light Traffic	16.2%	(10.0, 25.1)	8.2%	(4.1, 15.8)	-8.0	(-17.7, 1.6)	0.10
Motorcyclists in							
Not Clear Weather Conditions	NA	NA	NA	NA	NA	NA	NA
Clear Weather Conditions	12.4%	(7.7, 19.3)	7.6%	(4.6, 12.3)	-4.8	(-12.2, 2.6)	0.20
Motorcycle Riders When							
They Are the Sole Motorcyclists	8.3%	(3.7, 17.7)	7.8%	(4.4, 13.3)	-0.6	(-8.5, 7.4)	0.88
They Have Passengers	4.5%	(1.9, 10.1)	6.1%	(3.0, 12.3)	1.7	(-3.4, 6.7)	0.51
Motorcyclists in the							
Northeast	19.4%	(10.1, 34.0)	7.4%	(2.0, 24.0)	-12.1	(-31.0, 6.8)	0.20
Midwest	8.2%	(3.5, 17.9)	4.5%	(1.3, 14.1)	-3.7	(-10.8, 3.4)	0.29
South	6.3%	(2.5, 15.2)	12.9%	(7.6, 21.3)	6.6	(-5.3, 18.5)	0.26
West	11.2%	(5.4, 21.6)	6.5%	(2.2, 17.8)	-4.6	(-14.1, 4.9)	0.33
Motorcyclists in							
Urban Areas	15.9%	(9.6, 25.3)	10.0%	(6.0, 16.3)	-5.9	(-15.5, 3.7)	0.22
Rural Areas	6.1%	(3.0, 12.0)	5.1%	(2.7, 9.4)	-1.1	(-7.3, 5.1)	0.73
Motorcyclists Traveling During							
Weekdays	**14.5%**	**(8.7, 23.3)**	**5.6%**	**(3.3, 9.5)**	**-8.9**	**(-16.5, -1.3)**	**0.02**
Weekday Rush Hours	9.7%	(6.2, 14.9)	6.5%	(2.9, 14.0)	-3.2	(-9.4, 3.1)	0.31
Weekday Non-Rush Hours	**17.9%**	**(9.9, 30.2)**	**4.9%**	**(2.5, 9.4)**	**-13.0**	**(-23.9, -2.1)**	**0.02**
Weekends	10.1%	(3.7, 24.6)	10.8%	(5.0, 21.7)	0.7	(-12.7, 14.0)	0.92
Motorcycle Riders Who							
Are Riding Alone	8.3%	(3.7, 17.7)	7.8%	(4.4, 13.3)	-0.6	(-8.5, 7.4)	0.88
Have Passengers Using DOT-Compliant Helmets	NA	NA	7.0%	(3.3, 14.4)	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	**44.3%**	**(23.2, 67.6)**	**7.6%**	**(3.3, 16.7)**	**-36.6**	**(-62.3, -11.0)**	**0.01**
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 2020 is different from that used in 2019.

[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 2019 and 2020 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 are 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 2020 NOPUS data was collected from July 27 to August 16, 2020, which was 2 months later than the usual timeframe due to the coronavirus pandemic. The 2019 NOPUS data was collected from June 2 to June 17, 2019. Another consequence of the pandemic was the absence of the *Click It or Ticket* campaign that typically precedes the NOPUS data collection.

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 2020 NOPUS Moving Traffic Survey. A total of 719 motorcyclists were observed on the 620 motorcycles, which are respectively 13 percent and 12 percent less than the 2019 sample due to reduced traffic volume from the pandemic.

Table 3
Sites, Motorcycles, and Motorcyclists Observed

Numbers of	2019	2020	Percentage Change
Sites Observed*	1,877	1,875	-0.1%
Motorcycles Observed	707	620	-12.3%
Motorcyclists Observed	828	719	-13.2%

*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 2019 and 2020 are identified in Tables 1 and 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 2020 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). Illinois, Iowa, and New Hampshire, had no motorcycle helmet requirement (Highway Loss Data Institute, 2020).

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 July 27, 2020

"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.

References

Highway Loss Data Institute. (2020, 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. (2015, October). *Estimating lives and costs saved by motorcycle helmets with updated economic cost information* (Traffic Safety Facts Research Note. Report No. DOT HS 812 206). National Highway Traffic Safety Administration.

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.

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 email 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 (NCSA, 2015).

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.

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 2020 – Overall Results,* at https://crashstats.nhtsa.dot.gov for the latest data on these topics.

The suggested APA format citation for this report is:

National Center for Statistics and Analysis. (2021, June). *Motorcycle Helmet Use in 2020 – Overall Results.* (Traffic Safety Facts Research Note. Report No. DOT HS 813 143). National Highway Traffic Safety Administration.

U.S. Department of Transportation

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