NEBRASKA MOTORCYCLE INFORMATION PACKET

As of January 2022

Contents

MOTORCYCLE HELMETS

➔ According to NHTSA motorcycle helmets are estimated to be 37 percent effective in preventing fatal injuries 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. *

➔ Studies show that unhelmeted riders involved in crashes are less likely to have insurance and more likely to have higher hospital costs than helmeted riders in similar crashes. *

➔ In States without universal helmet laws, 60 percent of motorcyclists killed in 2016 were not wearing helmets, as compared to 8 percent in States with universal helmet laws. *

➔ According to a May 2018 survey of 900 Nebraskans conducted by Research Associates, "75% indicated the Nebraska law requiring motorcycle helmets should be continued; 20% indicated it should be repealed; 5% had no opinion." +

➔ In 2019, less than 1% of the licensed Nebraska motorcyclists are under the age of 21. #

*National Highway Traffic Safety Administration—NHTSA– 2016 Traffic Safety Facts

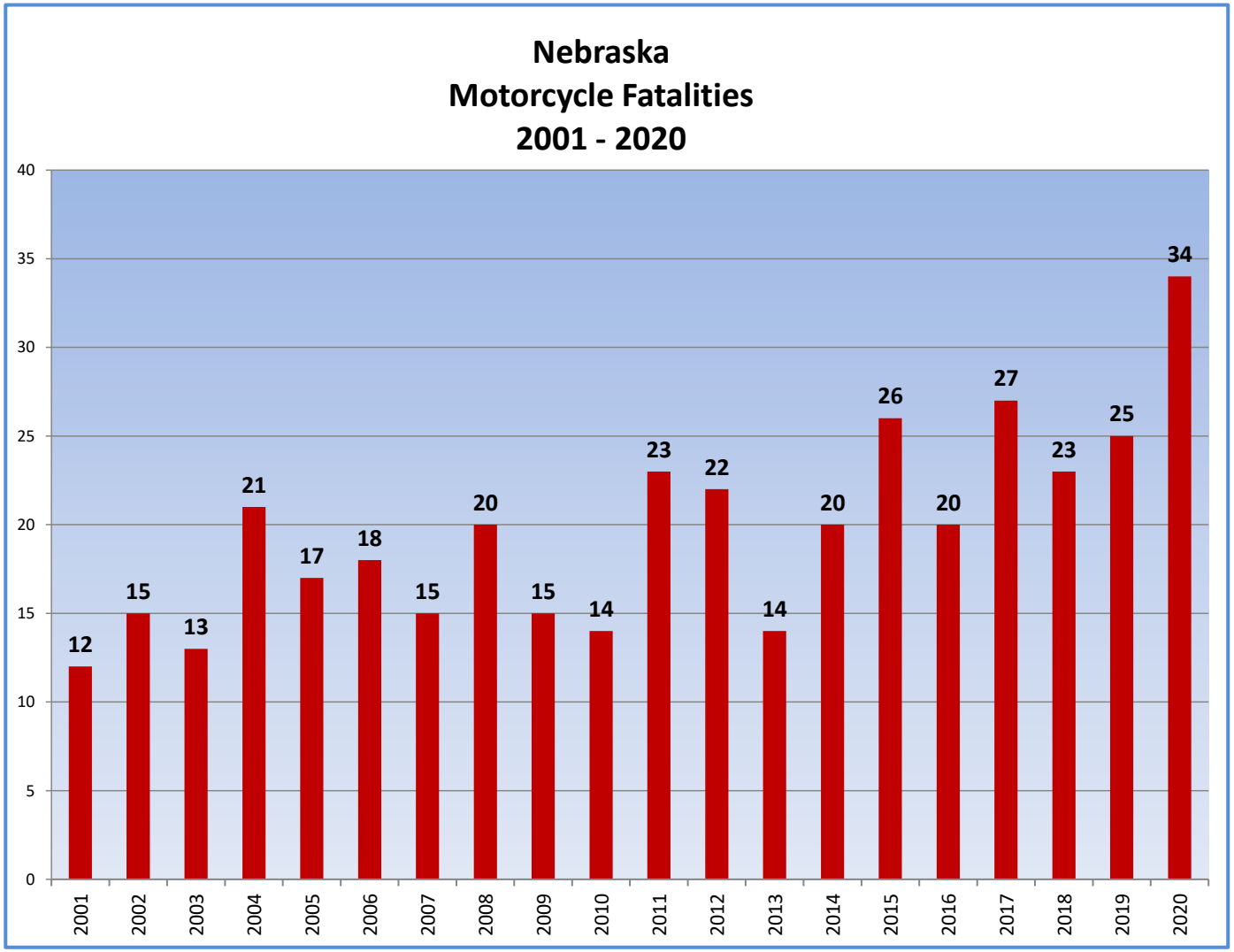
+NDOT-Highway Safety Office

#Nebraska Department of Motor Vehicles

^Motorcycle Crash Injuries and Costs

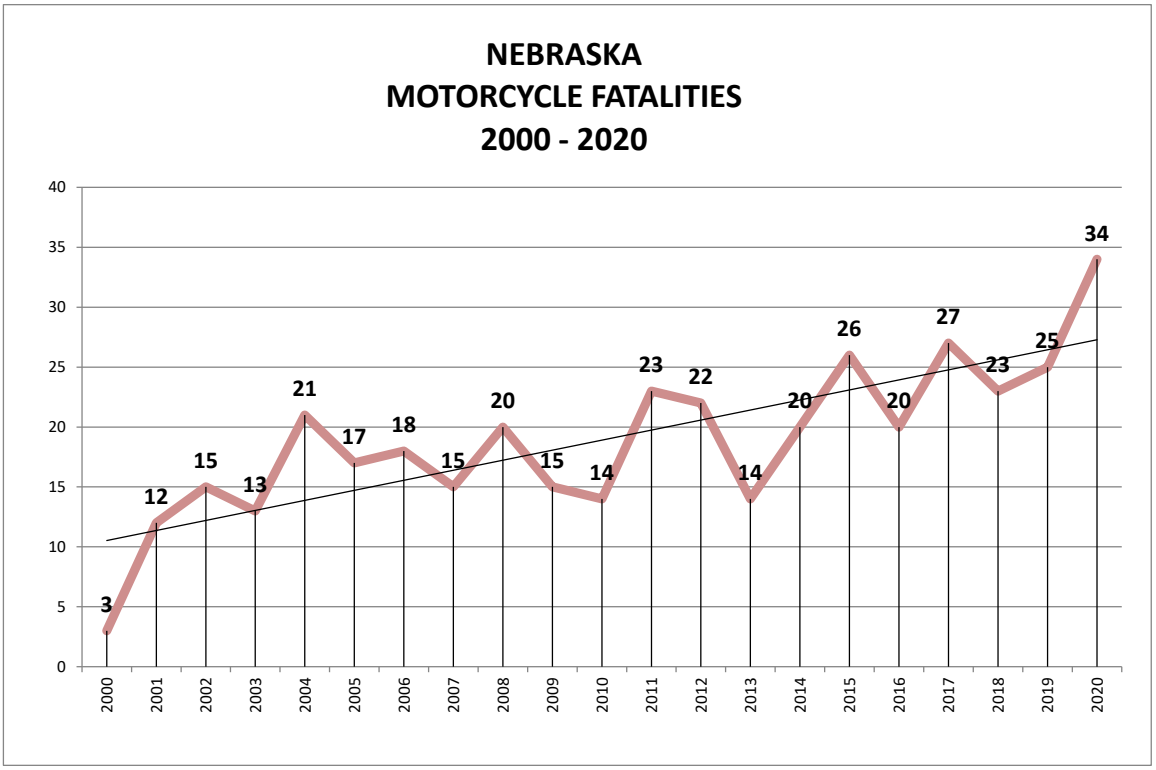
Nebraska Department of Transportation
Highway Safety Office, P.O. Box 94612
Lincoln, Nebraska 68509
402/471-2515
http://dot.nebraska.gov/safety/hso/

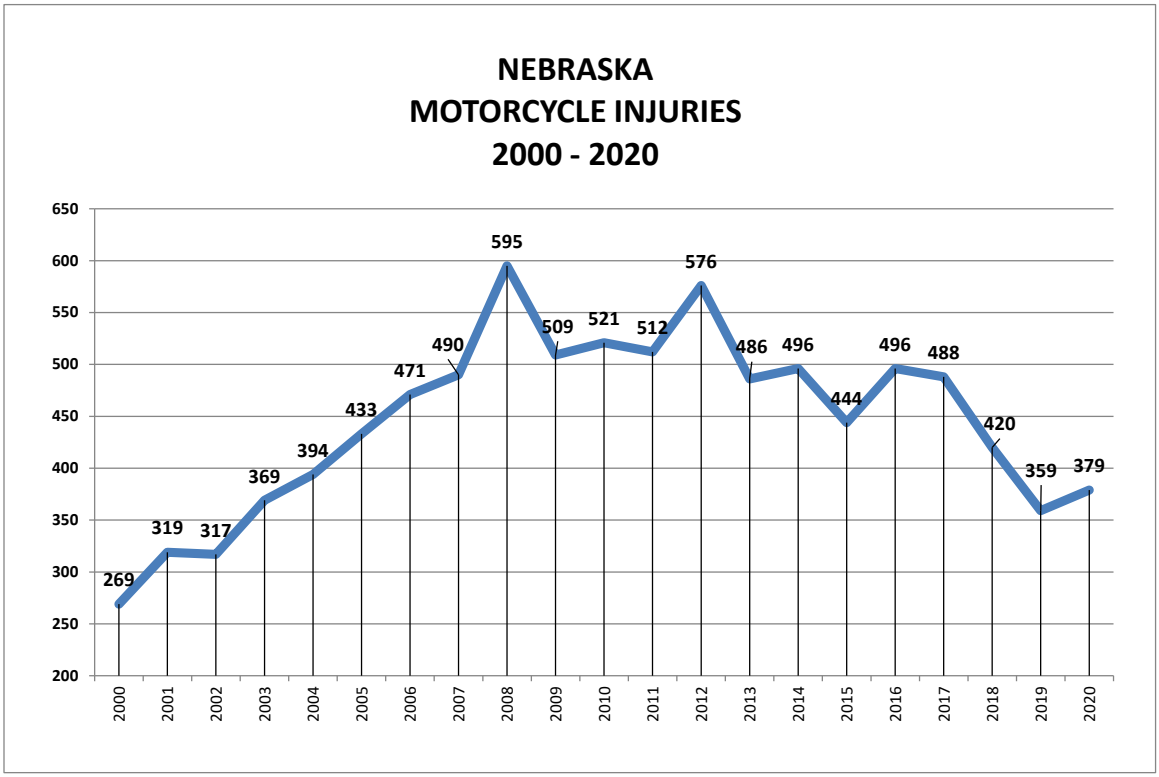
NDOT
Highway Safety Office



In 1974, the Motorcycle Safety Education Courses began.
On January 1, 1986, the Financial Responsibility (Proof of Insurance) Law became effective.
On January 1, 1989, the Nebraska Motorcycle Helmet Law became effective.

Provided by: NDOT-Highway Safety Office, PO Box 94612, Lincoln, NE 68509
As of October 27, 2021





* 1974 Motorcycle Safety Education Courses Started
* January 1, 1986 Financial Responsibility (Proof of Insurance) Law
*January 1, 1989 Mandatory Motorcycle Helmet Law

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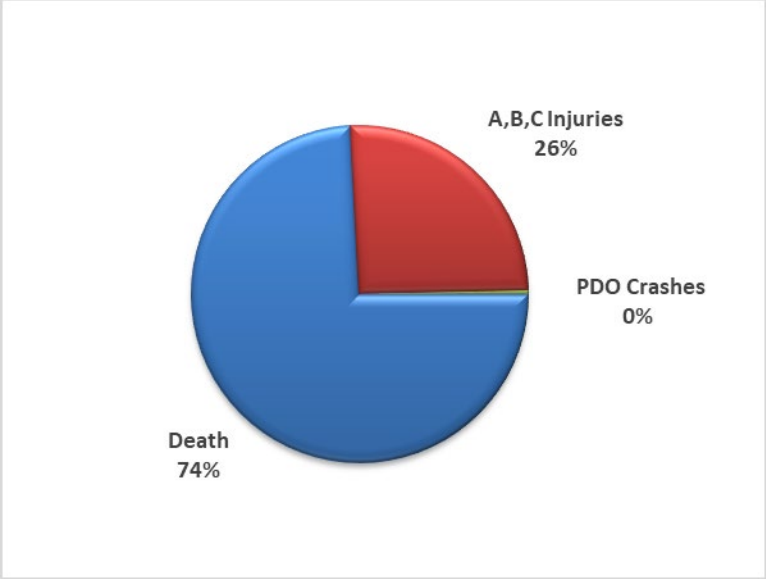
Last Date Modified: December 27, 2021

NEBRASKA
COST ESTIMATE
FOR
MOTORCYCLE CRASHES IN 2020

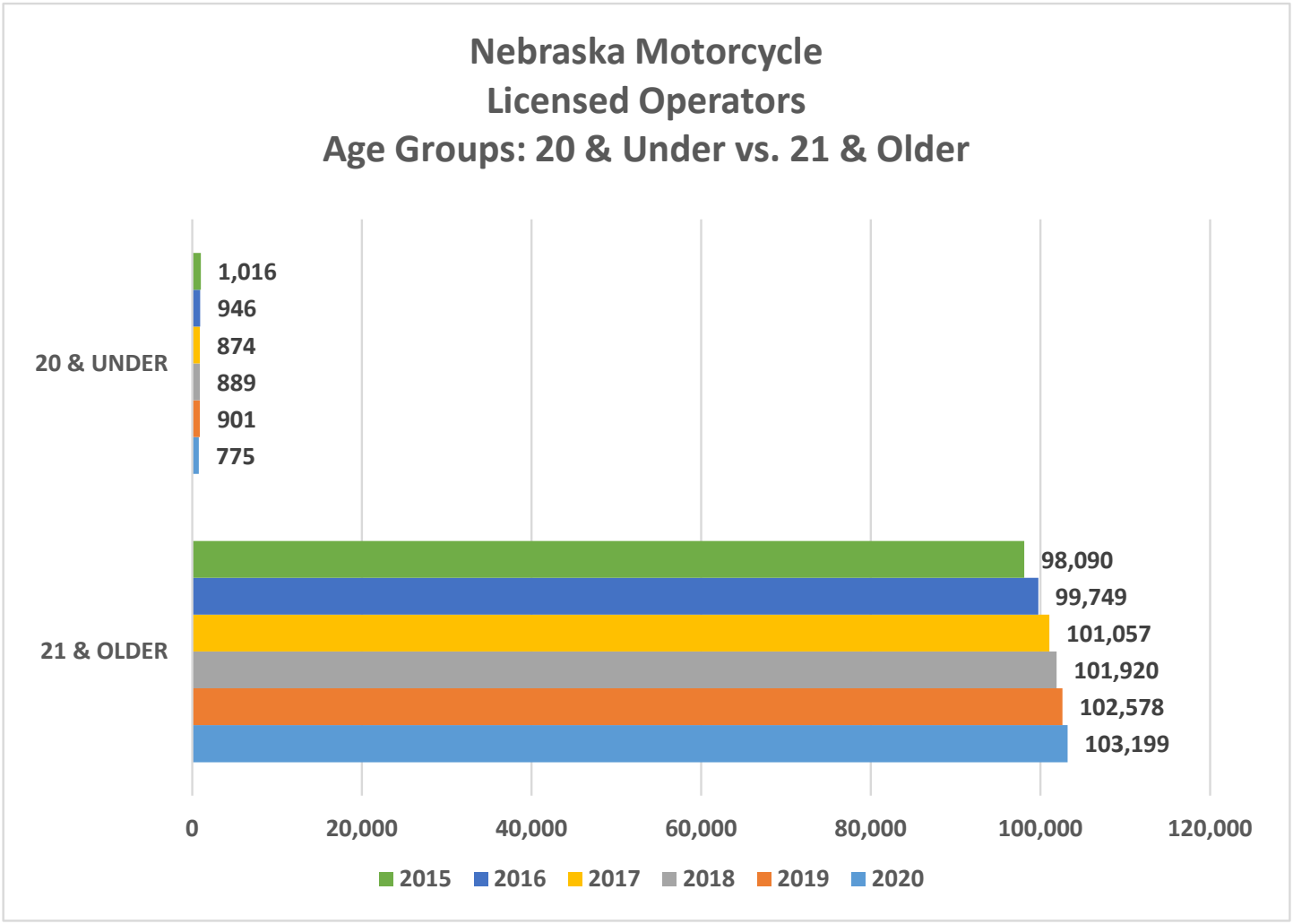
The cost of each type of motor-vehicle crash includes wage and productivity losses, medical expenses, administrative expenses, motor vehicle damage, and uninsured employer costs for crashes involving workers. The information below indicates the average economic costs in 2015 per death (not each fatal crash), per nonfatal disabling injury (A) (not each injury crash), visible, but not disabling injury (B), visible, but not disabling injury (C), and per property damage crash.

Type of Injury/Crash	Number of each type of Injury/Crash	Cost Per each type of Injury/Crash	Total Cost of all types of Injuries/Crashes
Death	34	$1,550,000	$52,700,000
Disabling Injury	130	$90,000	$11,700,000
Visible, but not Disabling Injury	188	$26,000	$4,888,000
Possible Injury	74	$21,000	$1,554,000
Property-damage crashes	52	$4,200	$218,400

Total Projected Costs in 2020	**$71,060,400**

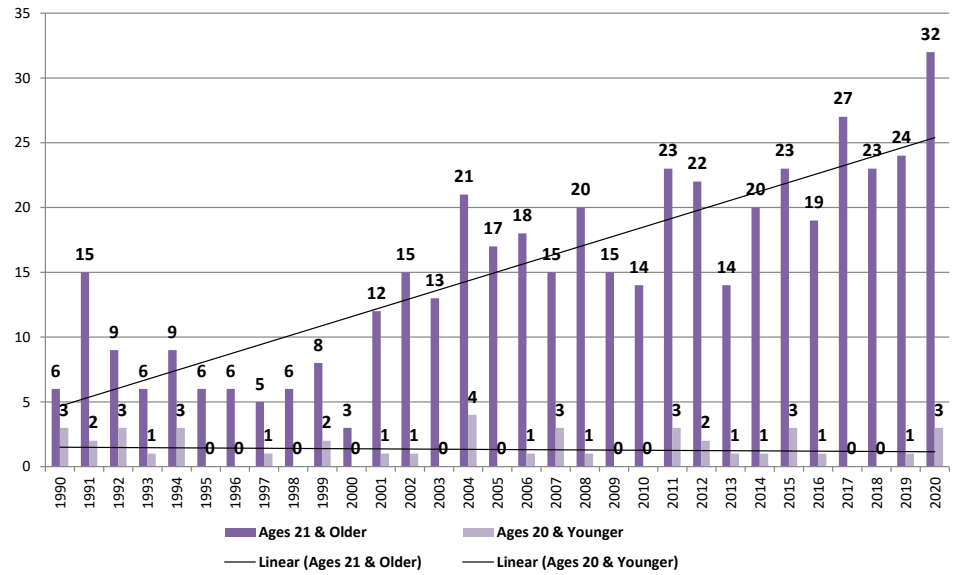


PDO – Property Damage Only
Source: National Safety Council, Injury Facts 2015 Edition
Prepared by: NDOT-Highway Safety Office, PO Box 94612, Lincoln, NE 68509
Revised 12/30/21

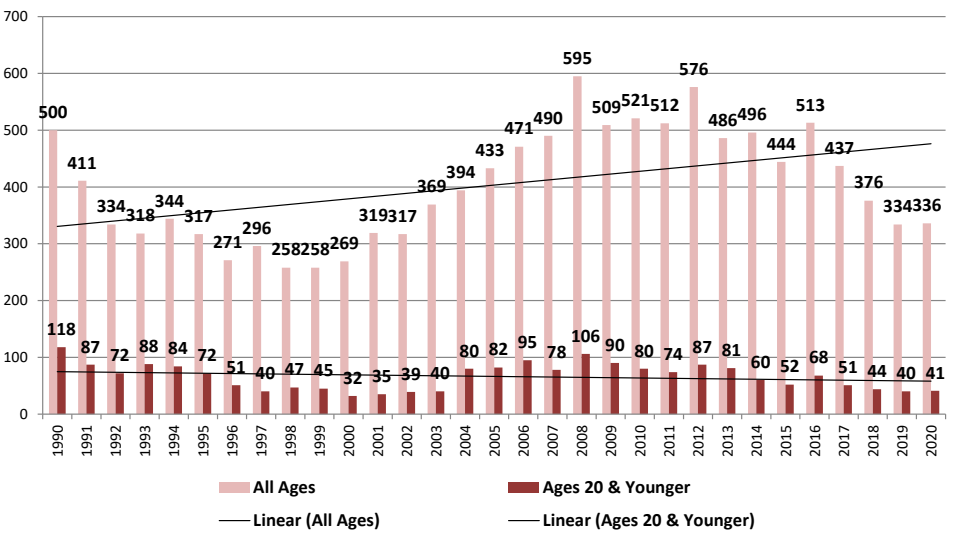


Prepared by: NDOT-Highway Safety Office, 5001 South 14th, PO Box 94612, Lincoln, NE 68509
Last Date Modified: December 30, 2021

Nebraska Motorcycle Fatalities (1990 - 2020)
(Age 21 & Older vs. Age 20 & Under)



Nebraska Motorcycle Injuries (1990 - 2019)
(All Age Groups vs. 20 & Under)



Includes Motorcycles, Dirtbikes, Motorscooters with A, B, C Injuries Only
A = Disabing injury, B = Visible, but not disabling injury, C = Possible injury
Source: Standard Summary of Nebraska Motor Vehicle Traffic Accidents
Prepared by: NDOT-Highway Safety Office, PO Box 94612, Lincoln, NE 68509
Last Date Modified: December 29, 2021

NEBRASKA MOTORCYCLE STATISTICS

	2012	2013	2014	2015	2016	2017	2018	2019	2020
Fatalities	22	14	20	26	20	27	23	25	34
Injuries (A, B & C)	576	486	496	444	496	488	426	379	392
Fatality Helmet Usage	20	14	19	22	16	26	20	22	27
Fatality Illegal/No Helmet Usage	1/1	0/0	0/1	1/3	2/2	2/1	3	2	7
Passengers Killed	3	0	2	0	1	5	1	1	1
Females Killed	5	2	1	0	1	5	1	0	1
Average Age of Fatality	44	36	36	39	39	46	41	39	40
Motorcycle Operator Fatality with "M" Endorsement on Drivers License	18	12	17	15	10	15	9	9	14
Total Crashes	588	550	535	490	514	540	470	426	447
Fatal Crashes	22	14	20	25	20	22	22	24	34
Injury Crashes	502	469	454	408	450	453	387	347	361
Property Damage Only	64	67	61	57	44	65	61	55	52
Interstate Crashes	41	31	28	25	34	32	37	22	25
Alcohol-Related Fatal Crashes	9	3	9	9	11	1	5	6	11
Alcohol-Related Fatalities	9	3	9	9	11	1	5	6	11
Unknown BAC, No Test, etc.	5	2	3	2	1	8	6	7	9
as a % of all Fatal Crashes	41%	21%	45%	36%	55%	5%	23%	25%	32%
as a % of all Fatalities	41%	21%	45%	35%	55%	4%	22%	24%	32%
Average Blood Alcohol Content	0.096	0.153	0.101	0.141	0.156	0.142	0.210	0.219	0.126
Licensed Drivers	92,244	94,817	97,332	99,106	100,695	101,931	102,809	103,479	103,974
20 & Under Licensed Drivers	1,259	1,202	1,172	1,016	946	874	889	901	775
% 20 & Under	1.4%	1.3%	1.2%	1.0%	0.9%	0.9%	0.9%	0.9%	0.7%
Motorcycle Registrations	55,461	55,833	55,475	55,585	55,360	54,880	53,566	50,646	49,542

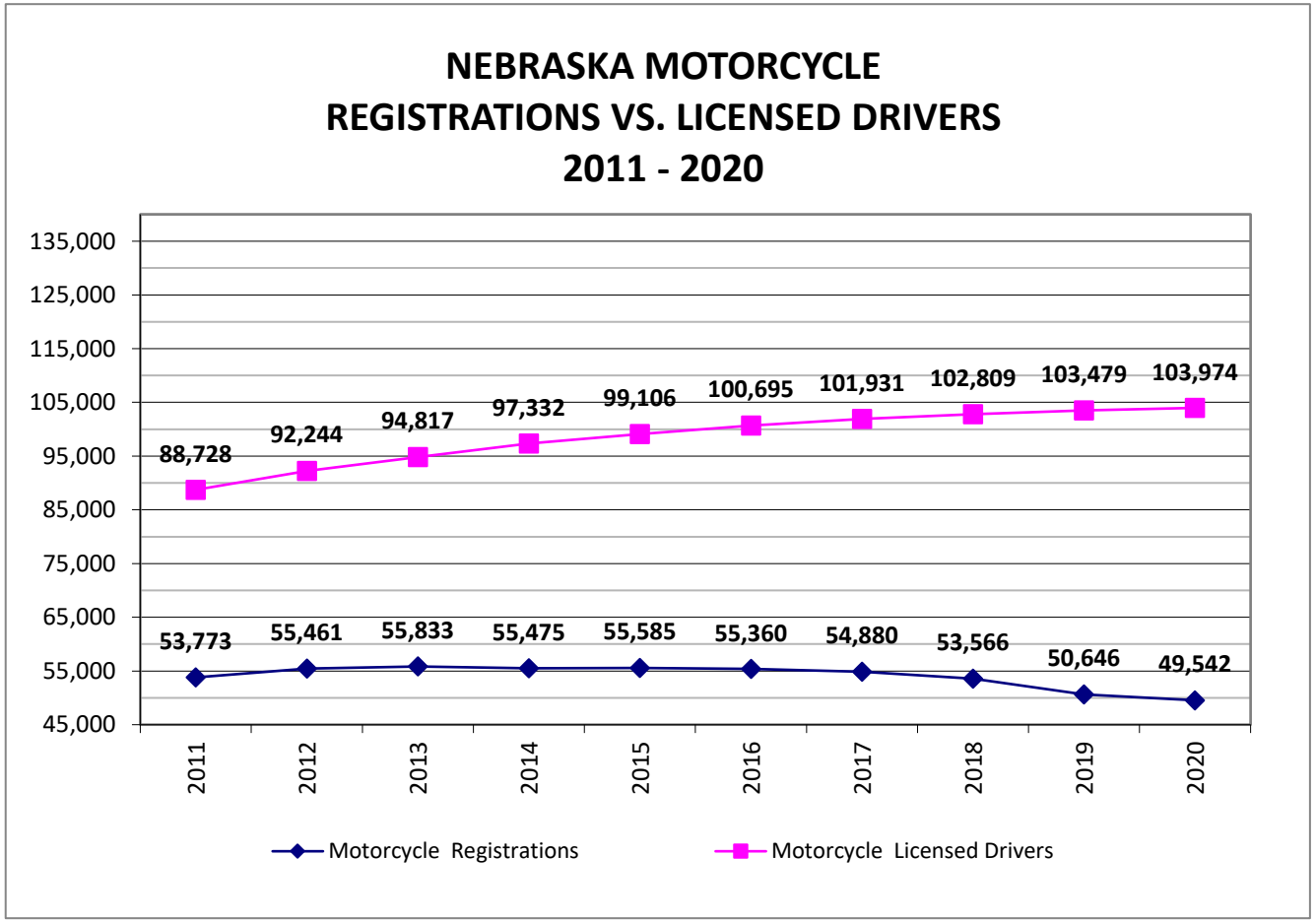
*** 1974** **Motorcycle Safety Education Courses Started**

*** January 1, 1986** **Proof of Insurance at time of Registration**

*** January 9, 1989** **Mandatory Motorcycle Helmet Law**

Source: NDOT Highway Safety Office, P O Box 94612, Lincoln, NE 68509

Last Date Modified: December 30, 2021



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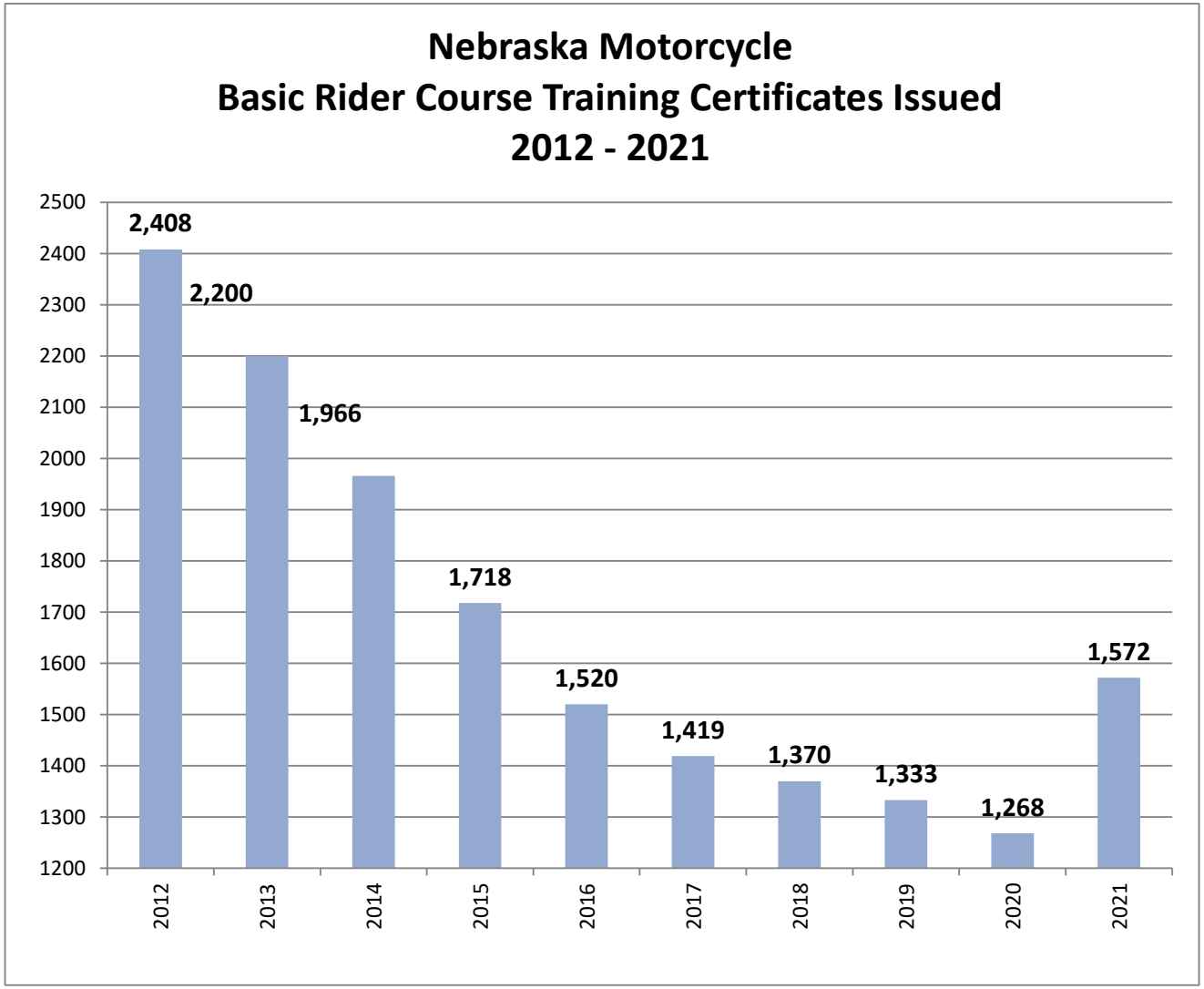


Prepared by: NDOT- Highway Safety Office, PO Box 94612, Lincoln, NE 68516

Source: Nebraska Department of Motor Vehicles, Driver Licensing Date Modified:January 7, 2022

No-helmet motorcycle law in Missouri tied to increase in deaths

By Isabelle Hanson
Published: Oct. 11, 2021 at 6:43 PM CDT
CAPE GIRARDEAU, Mo. (KFVS) - A Missouri law that went into effect in August 2020 is tied to an increase in motorcycle rider deaths on the road.

The law allows riders 26 and older to not wear a helmet.

According to the Missouri Department of Transportation, from January through October 3, 2020, 14 riders without helmets died in Missouri. For the majority of that time period, riders had to wear helmets.

From January through October 3, 2021, 72 riders died without helmets in Missouri. The law did not require them to wear a helmet during that time period.

That's a 414.29 percent increase in non-helmet, motorcycle deaths from January through October 3, 2020 compared to the same time period in 2021.

Chris Hutson, from Cape Girardeau, started riding on a mini-bike at 7 years old. He said he always wears a helmet because it is life-saving.

" I understand the freedoms and the feeling of riding, but sometimes you have to think about yourself, your loved ones, everyone around you, and the consequence that could happen for not being as safe," said Hutson.

Hutson also said it's important to wear helmets now, considering the amount of people on the road who are distracted while driving. According to Hutson, the technology of helmets keeps improving, and they work.

Additional preliminary motorcycle fatality information from Missouri DOT:

Motorcycle fatalities increased by 34% in 2021 over 2020.

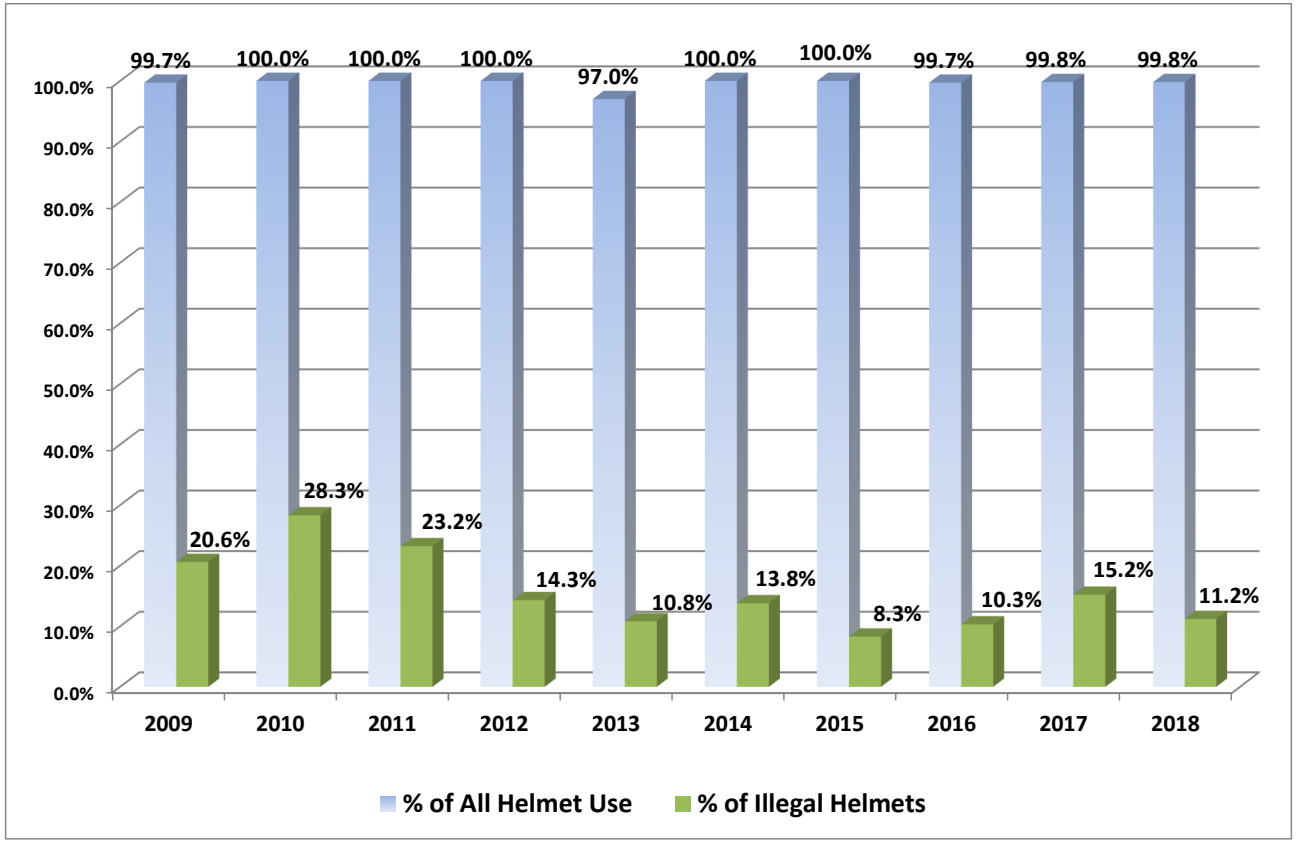
In comparison the overall traffic fatalities only increased by 2% in 2021.

Missouri estimates the total motorcycle fatalities for 2021 is 158! The unhelmeted motorcycle fatalities are 87 for 2021.

The previous high for motorcycle fatalities in Missouri was 123 and previous high unhelmeted fatalities was 20 which was in 2020 and included part of the year with the new no helmet law and was only 11 in 2019.

Nebraska

Motorcycle Helmet Use Rates



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On January 1, 1989, the Nebraska Motorcycle Helmet Law became effective.

Note: The percent (%) of Helmet Use includes the % of Illegal Helmet Use.
Source: Nebraska Helmet Use Observation Reports - Health Education, Inc.
Prepared by: NDOT - Highway Safety Office, PO Box 94612, Lincoln, NE 68509
As of August 21, 2018

NEBRASKA
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Nebraska CODES Traffic Safety Facts 2016

Helmet Use Reduces Injury Severity in Motorcycle Crashes

The Nebraska Crash Outcome Data Evaluation System (CODES) program determined a total of 5,712 occupants (5,120 drivers and 592 passengers) were involved in motorcycle crashes in Nebraska from 2005 to 2014. Of those 5,712 occupants, 79% wore a helmet, 6.6% did not use a helmet, and 14.4% had unknown helmet use.

Fatalities among those who wore a helmet reached 2.92% while nearly twice as many (5.59%) occupants who did not wear helmets died (Figure 1). Just under one in four helmet users had an inpatient hospital stay (24.59%) while 29.66% of occupants who did not wear a helmet were inpatients.

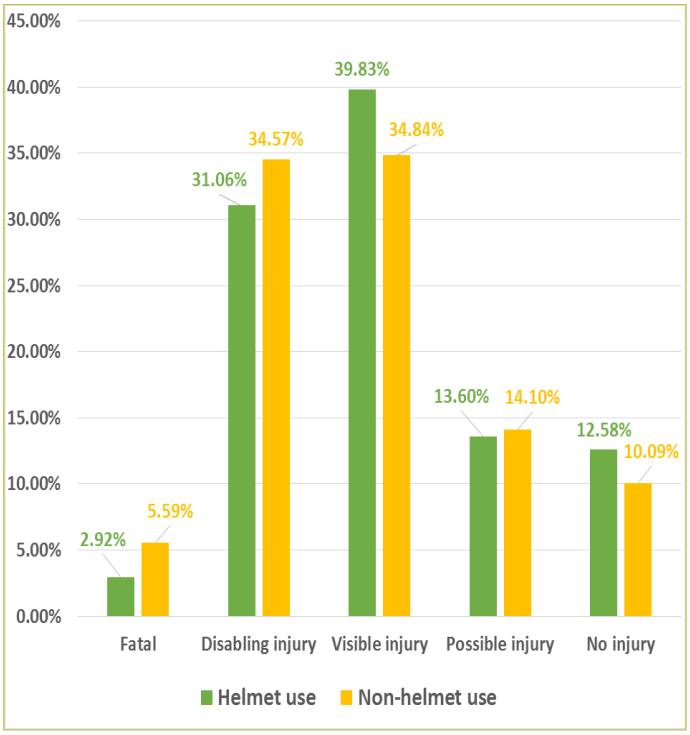

Figure 1. Helmet use and degree of injury following motorcycle crashes

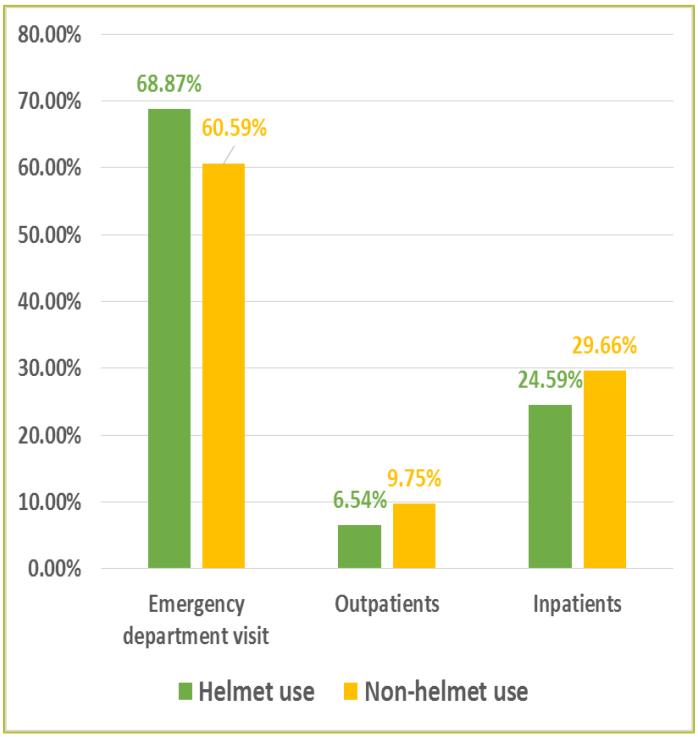

Figure 2. Helmet use and medical status following motorcycle crashes

Questions and comments regarding this fact sheet? Please contact:
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Tel: 402-471-7988
Email: celeste.reker@nebraska.gov

PUBLIC RELEASE: 6-MAR-2018

Helmet use associated with reduced risk of cervical spine injury during motorcycle crashes

JOURNAL OF NEUROSURGERY PUBLISHING GROUP

CHARLOTTESVILLE, Va. (MARCH 6, 2016). Despite claims that helmets do not protect the cervical spine during a motorcycle crash and may even increase the risk of injury, researchers from the University of Wisconsin Hospitals and Clinics in Madison found that, during an accident, helmet use lowers the likelihood of cervical spine injury (CSI), particularly fractures of the cervical vertebrae. These findings appear in a new article published today in the *Journal of Neurosurgery: Spine*: "Motorcycle helmets and cervical spine injuries: a 5-year experience at a Level 1 trauma center" written by Paul S. Page, MD, Zhikui Wei, MD, PhD, and Nathaniel P. Brooks, MD.

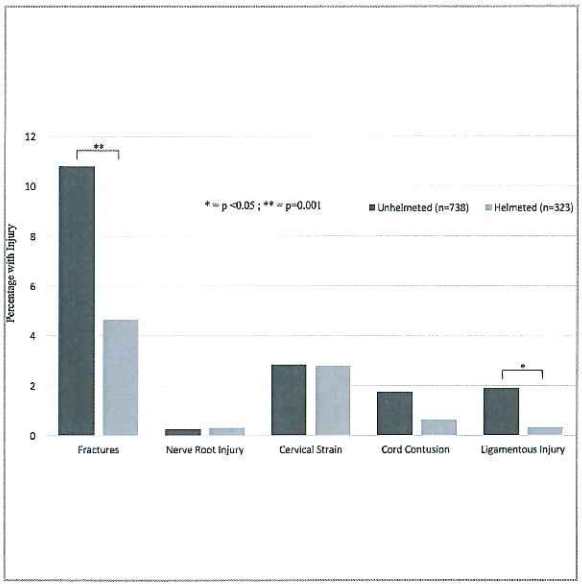

IMAGE: THIS IS A BAR GRAPH SHOWING THE CHARACTERIZATION AND DISTRIBUTION OF CERVICAL SPINE INJURIES IN HELMETED & UNHELMETED RIDERS AFTER MOTORCYCLE CRASHES. **view more ›**

In Europe you're unlikely to find someone riding a motorcycle without a helmet; universal laws requiring motorcycle helmet use are applied throughout the European Union. In the United States, on the other hand, laws on helmet use vary from state to state, with some states requiring helmet use for all riders and others limiting the requirement to persons under the age of 18.

According to National Highway Traffic Safety Administration (NHTSA) estimates, wearing helmets saved the lives of 1859 motorcycle riders in 2016; an additional 802 lives could have been saved if every motorcyclist had worn them. Wearing a helmet decreases the incidence and severity of traumatic brain injury during crashes. What then are the objections to universal laws requiring motorcycle helmet use?

Major reasons cited for not requiring helmets while riding a motorcycle include freedom of choice, avoiding any limitation on vision, and a perceived increased risk of receiving a cervical spine injury (CSI). This last reason is based on the belief that the added weight of a helmet might increase torque on the cervical spine.

Risk to the cervical spine is addressed in this study. Over the years there have been a variety of studies on helmet use and CSI in motorcycle crashes, with a couple of reports indicating an increased risk of CSI among helmeted riders and most studies finding no protective effect or harmful biomechanical risk to the cervical spine. Page and colleagues hypothesized that helmet use is not associated with an increased risk of CSI during a motorcycle crash and instead may provide some protection to the wearer. In this paper the researchers provide case evidence to support their hypothesis.

The researchers reviewed the charts of 1061 patients who had been injured in motorcycle crashes and treated at a single Level 1 trauma center in Wisconsin between January 1, 2010, and January 1, 2015. Of those patients, 323 (30.4%) were wearing helmets at the time of the crash and 738 (69.6%) were not. (Wisconsin law does not require all riders to wear a helmet.)

At least one CSI was sustained by 7.4% of the riders wearing a helmet and 15.4% of those not wearing one; this difference in percentages is statistically significant ($p = 0.001$). Cervical spine fractures occurred more often in patients who were not wearing helmets (10.8% compared to 4.6%; $p = 0.001$), as did ligament injuries (1.9% compared with 0.3%; $p = 0.04$); again these differences are statistically significant. There were no significant differences between groups (helmeted vs. unhelmeted riders) with respect to other types of cervical spine injuries that were sustained: nerve root injury, cervical strain, or cord contusion.

In summary, Page and colleagues show that helmet use is associated with a significantly reduced likelihood of sustaining a CSI during a motorcycle crash, particularly fractures of the cervical vertebrae.

Although the study population is small, the authors believe the results provide additional evidence in support of wearing helmets to prevent severe injury in motorcycle crashes. When asked about the findings, Dr. Brooks stated, "Our study suggests that wearing a motorcycle helmet is a reasonable way to limit the risk of injury to the cervical spine in a motorcycle crash."

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Page PS, Wei Z, Brooks NP. Motorcycle helmets and cervical spine injuries: a 5-year experience at a Level 1 trauma center. *J Neurosurg Spine*, published ahead of print March 6, 2018. DOI:10.3171/2017.7SPINE17540.

Disclosure: The author reports no conflict of interest concerning the materials or methods used in

this study or the findings specified in this paper.

For additional information, contact: Ms. Jo Ann M. Eliason, Communications Manager, JNS Publishing Group, One Morton Drive, Suite 200, Charlottesville, VA 22903; Email joanneliason@thejns.org; Phone 434-982-1209.

The Journal of Neurosurgery: Spine is a monthly peer-reviewed journal focused on neurosurgical approaches to treatment of diseases and disorders of the spine. It contains a variety of articles, including descriptions of preclinical and clinical research as well as case reports and technical notes. *The Journal of Neurosurgery: Spine* is one of four monthly journals published by the JNS Publishing Group, the scholarly journal division of the American Association of Neurological Surgeons. Other peer-reviewed journals published by the JNS Publishing Group each month include the *Journal of Neurosurgery*, *Neurosurgical Focus*, and the *Journal of Neurosurgery: Pediatrics*. All four journals can be accessed at http://www.thejns.org.

Founded in 1931 as the Harvey Cushing Society, the American Association of Neurological Surgeons (AANS) is a scientific and educational association with more than 10,000 members worldwide. The AANS is dedicated to advancing the specialty of neurological surgery in order to provide the highest quality of neurosurgical care to the public. All active members of the AANS are certified by the American Board of Neurological Surgery, the Royal College of Physicians and Surgeons (Neurosurgery) of Canada or the Mexican Council of Neurological Surgery, AC. Neurological surgery is the medical specialty concerned with the prevention, diagnosis, treatment and rehabilitation of disorders that affect the entire nervous system including the brain, spinal column, spinal cord, and peripheral nerves. For more information, visit http://www.AANS.org.

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Status Report, Vol. 53, No. 3 | May 8, 2018 Subscribe

Insurance payouts still rising for motorcyclist injuries under Michigan's weak helmet law

These motorcyclists traveling I-75 near Gaylord, Michigan, opted for the protection of helmets. Effective April 2012, Michigan implemented a partial helmet law that requires riders younger than 21 to wear helmets but makes helmets optional for riders 21 and older who meet certain criteria.

It's springtime in Michigan, and that means motorcyclists will be pulling their bikes out of storage and, in many cases, hitting the road without a helmet. Six years after the state weakened its helmet use law to exempt most riders, a new HLDI analysis indicates that the average insurance payment for injuries to motorcyclists in crashes has risen by 40 percent, compared with losses in nearby control states.

May marks the start of the seventh riding season in Michigan since lawmakers relaxed the motorcycle helmet law to cover only riders younger than 21. Motorcyclists 21 and older may ride without a helmet if they have either passed a motorcycle safety course or have held the motorcycle endorsement on their driver's license for at least two years. In addition, riders who choose not to wear helmets must have at least $20,000 in medical payment coverage and higher coverage for any passengers who ride unhelmeted, too. More motorcyclists are opting for the higher policy limits since the law change, HLDI has found.

This is HLDI's third look at the effects of Michigan's partial helmet law repeal. A 2013 HLDI analysis found that the average insurance payment on a motorcycle injury claim rose 22 percent in Michigan after the helmet law change took effect (see "Watch your head: Michigan's weakened helmet use law leads to costlier injury claims," May 30, 2013). The analysis controlled for policy limits to account for the new medical payment insurance requirement. HLDI updated the study in 2016 to add three more years of loss data and found a 37 percent increase in insurance losses. The latest study adds a fifth year of data to cover the 2010–16 May-to-September riding seasons.

HLDI examines motorcycle insurance loss data under collision and medical payment, or MedPay, coverages. Motorcycle collision coverage insures against physical damage to a motorcycle in a crash when the rider is at fault. MedPay covers injuries sustained by the motorcycle operator.

Insurance losses are measured as claim frequency, claim severity and overall losses. Claim frequency is the number of claims for a group of vehicles divided by the exposure for that group, expressed in the study as claims per 1,000 insured vehicle years. An insured vehicle year is one vehicle insured for one year, two vehicles insured for six months each. Claim severity is the

The effects of Michigan's weakened motorcycle helmet use law on insurance losses – five years later
HLDI Bulletin Vol. 34, No. 36

More on motorcycles

average loss payment per claim.

For all three analyses, Illinois, Indiana, Ohio and Wisconsin were used as control states because their laws on helmet use didn't change during the period. Analysts controlled for motorcycle age and class, rider demographic factors, geographic factors and weather. They also controlled for insurance policy limits for MedPay coverage.

A separate analysis that didn't take into account policy limits found that MedPay claim severity was 68 percent higher in Michigan after the law change, compared with the control states.

"With each year, the evidence against Michigan's weakened motorcycle helmet use law continues to mount," says Matt Moore, senior vice president of HLDI. "If lawmakers in Lansing are committed to the Wolverine state's 'Toward Zero Deaths' goal, requiring all motorcyclists to wear helmets is one proven way to save lives."

HLDI data don't include information on the type of injury or where a crash occurred. In this analysis, Michigan crashes are crashes of motorcycles insured and garaged in the state. Likewise, the control-state crashes are only crashes of motorcycles insured and garaged in those states. There also is no way to know how many of the claims involved unhelmeted motorcyclists.

Weakening Michigan's helmet law also has been associated with increases in the number of head injuries among hospitalized trauma patients and the proportion of injured riders with skull fractures, a 2016 study by IIHS and the University of Michigan found (see "Head injuries rise as riders ditch helmets in Michigan," Sept. 1, 2016). A separate study published in *The American Journal of Surgery* in 2016 found that the average acute care cost of unhelmeted riders at a single Michigan trauma center was nearly $28,000, 32 percent higher than for helmeted riders. What is more, the Spectrum Health Butterworth Hospital study found that 10 percent of riders involved in a crash who weren't wearing helmets died, compared with 3 percent of riders involved in a crash who wore helmets.

Michigan is one of 28 states that have helmet laws covering only some riders, usually those under 18. Illinois, Iowa and New Hampshire have no helmet requirements. Only 19 states and the District of Columbia require helmets for all motorcyclists.

The National Highway Traffic Safety Administration estimates that helmets cut the risk of a motorcycle fatality by 37 percent.

Estimated increase in medical payment claim severity after Michigan helmet law change
Michigan vs. control states, 2010–16

Created with Highcharts 4.0.1without adjusting for policy limitsadjusting for policy limits0%20%40%60%80%100%

Michigan bikers 21 and older who ride bare-headed must carry at least $20,000 in MedPay coverage. The average payout under this coverage rose 68 percent after the law change, compared with the control states. Adjusting for the higher policy limits, the average payout rose 40 percent.

Also in this issue

Study examines rising pedestrian deaths

SIDEBAR | Subaru EyeSight cuts pedestrian crashes

Volume 53, Number 3

ACCESS MORE ISSUES

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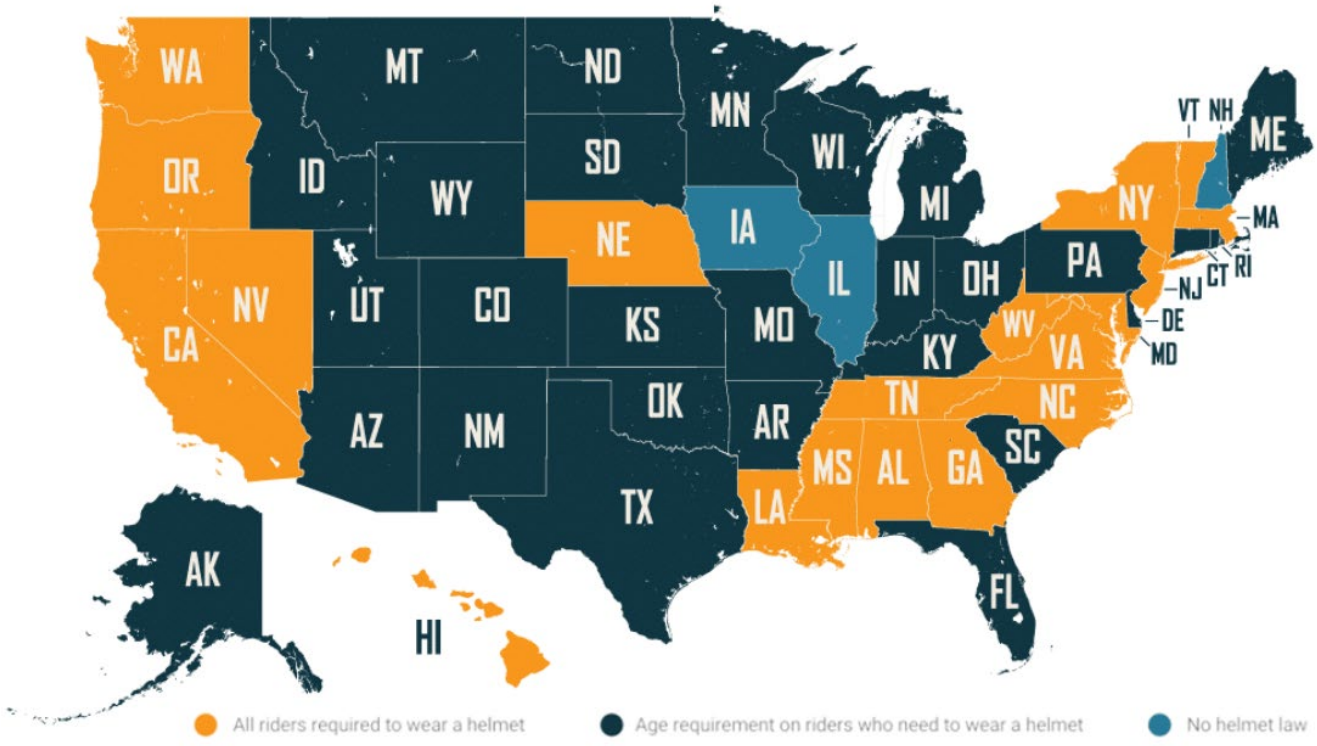
MOTORCYCLE HELMET LAWS BY STATE



Motorcycle Helmet Laws in the United States

Did you realize that many states have different laws when it comes to whether or not you're required to wear a helmet while on your bike? Whether you're planning on a cross-country trip or moving to a new state, you'll want to make sure you understand the motorcycle helmet laws in each state you're riding through.

States with Motorcycle Helmet Laws

Most states have some laws that require a rider and their passenger to wear helmets. Some states, such as Alaska, Arizona, Colorado, Hawaii, Indiana, New Mexico, Utah, and Maine, require riders and passengers ages 18 and under to wear a helmet.

Other states have motorcycle helmet laws for riders of all ages. For example, riders and passengers in states such as California, Maryland, Nevada, New York, Oregon, and Washington must wear a safety helmet at all times regardless of how old they are.

States without Motorcycle Helmet Laws

There are just a few states that don't have any requirements when it comes to helmet laws, regardless of the age of the rider. These rare states include Illinois, Iowa, and New Hampshire.

We've highlighted the most important information to know for each state below so it's easy for you to plan your next ride.

https://www.lawtigers.com/resources/helmet-laws/

https://www.ghsa.org/state-laws/issues/Motorcyclists

Motorcycles

Helmets and antilock brakes make riding less dangerous.

SELECT ANOTHER TOPIC

Overview
Q&As
Fatality Facts
State laws
News releases and articles
Public presentations
Regulatory and legislative policy
HLDI research
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General Helmets

May 2018

- close all answers

1. Why is it important for motorcyclists to wear helmets?

   Compared with cars, motorcycles are an especially dangerous form of travel. The National Highway Traffic Safety Administration (NHTSA) estimates that per mile traveled, the number of deaths on motorcycles in 2015 was nearly 28 times the number in cars.[1] Motorcycles often have high-performance capabilities, including rapid acceleration and high top speeds. They are less stable than cars in emergency braking and less visible to other motorists. Motorcyclists are more prone to crash injuries than car occupants because motorcycles are unenclosed, leaving riders vulnerable to contact with hard road surfaces, other vehicles and fixed objects such as trees. This is why wearing a helmet, as well as other protective clothing, is so important.

2. How effective are helmets?

   Helmets decrease the severity of head injuries, the likelihood of death and the cost of medical care. Helmets are highly effective in preventing brain injuries, which often require extensive treatment and may result in lifelong disability. NHTSA estimates that in the event of a crash, unhelmeted motorcyclists are 3 times more likely than helmeted riders to suffer traumatic brain injuries, and that motorcycle helmets reduce the likelihood of a crash fatality by 37 percent.[2] Norvell and Cummings found a 39 percent reduction in the risk of death after adjusting for the effects of rider age, gender and seat position.[3] A literature review estimated that helmets reduce the risk of death in a crash by 42 percent and the risk of head injuries by 69 percent.[4]

3. Are some helmets more effective than others?

   Helmets that are sold as head protection for motorcyclists are required to meet federal performance standards. Helmets that don't meet the standards are known as "novelty helmets." A recent study found riders using novelty helmets were about twice as likely to die in crashes than riders wearing certified, full-face helmets.[5]

   NHTSA laboratory tests also suggest that head injuries are much more likely with novelty helmets than with certified ones.[6]

   Certified helmets are available in different styles, including half-coverage (covering the upper half of the head, generally above the ears), open-face and full-face. One study evaluated the effectiveness of these different styles and found that crash-involved riders wearing half-coverage helmets were twice as likely to suffer traumatic brain injuries than riders wearing open-face or full-face helmets.[7]

4. Are there drawbacks to helmet use?

   Claims have been made that helmets increase the risk of neck injury and reduce peripheral vision and hearing, but there is no credible evidence to support these arguments. A study by J.P. Goldstein often is cited by helmet opponents as evidence that helmets cause neck injuries, allegedly by adding to head mass in a crash.[8] More than a dozen studies have refuted Goldstein's findings. A 1994 study analyzed 1,153 motorcycle crashes in four Midwestern states and determined that "helmets reduce head injuries without an increased occurrence of spinal injuries in motorcycle trauma."[9] More recently, a review of cases from a national database found that, among motorcyclists treated for trauma, helmeted riders were less likely than unhelmeted ones to have cervical spine fractures.[10]

   Regarding claims that helmets obstruct vision, studies show full-coverage helmets provide only minor restrictions in horizontal peripheral vision. A 1994 study found that wearing helmets does not restrict the ability to hear horn signals or to see a vehicle in an adjacent lane prior to initiating a lane change.[11] To compensate for any restrictions in lateral vision, riders

increased their head rotation prior to a lane change. There were no differences in hearing thresholds under three helmet conditions: no helmet, partial coverage and full coverage. The noise typically generated by a motorcycle is so loud that any reduction in hearing capability that may result from wearing a helmet is inconsequential. Sounds loud enough to be heard above the engine can be heard when wearing a helmet.

5. What is the history of helmet laws in the United States?

   In 1967, the federal government began requiring states to enact motorcycle helmet use laws to qualify for certain federal safety and highway construction funds. By the end of 1969, 39 states had universal helmet laws. By 1975, all but three states mandated helmets for all motorcyclists.

   As the U.S. Department of Transportation moved in 1976 to assess financial penalties on states without helmet laws, Congress responded to state pressure by revoking federal authority to assess penalties for noncompliance. Between 1976 and 1978, 20 states weakened their helmet use laws to apply only to young riders, usually those younger than 18. Eight states repealed helmet use requirements for all motorcyclists.

   In the 1980s and early 1990s, several states reinstated helmet laws applying to all riders. In 1991, Congress created incentives for states to enact helmet use and safety belt use laws. States with both laws were eligible for special safety grants, while states that had not enacted them by October 1993 had up to 3 percent of their federal highway allotment redirected to highway safety programs.

   Four years after establishing the incentives, Congress again reversed itself. In the fall of 1995, Congress lifted federal sanctions against states without helmet use laws, paving the way for state legislatures to repeal helmet laws. Now only 19 states and the District of Columbia have helmet laws covering all riders, and 28 states have laws covering some riders, usually people younger than 18. Three states (Illinois, Iowa and New Hampshire) do not have any helmet requirements.

6. How do helmet laws affect helmet use?

   In 2017, 97 percent of motorcyclists observed in states with universal helmet laws were wearing helmets. In states without such laws, helmet use was 48 percent.[12] Use of helmets judged to be compliant with federal safety regulations was 87 percent among motorcyclists in states with universal helmet laws and 44 percent in states without such laws.

   In a national telephone survey of motorcyclists, 22 percent of those who said they believe helmets keep riders safer reported not always wearing helmets while riding.[13] However, only 6 percent of motorcyclists in states with universal laws reported not always wearing helmets, suggesting that education alone would not be as beneficial in increasing helmet use as a universal helmet law.

7. How do helmet laws affect deaths and injuries?

   In states that either reinstated or enacted universal motorcycle helmet laws, deaths and injuries of motorcyclists decreased. In states that repealed or weakened their universal helmet laws, deaths and injuries typically rose.

   Some examples of the effect of helmet laws on helmet use and death and injury rates:

   - When California's helmet use law covering all riders took effect on January 1, 1992, helmet use jumped to 99 percent from about 50 percent before the law,[14] and the number of motorcyclist fatalities decreased 37 percent.[15]
   - Nebraska reinstated a helmet law on January 1, 1989, after repealing an earlier law in 1977. The state then saw a 22 percent reduction in serious head injuries among motorcyclists.[16]
   - From 1968 to 1977, Texas had a universal helmet use law estimated to have saved 650 lives, but the law was amended in 1977 to apply only to riders younger than 18. The weakened law coincided with a 35 percent increase in motorcyclist fatalities. Texas reinstated its helmet law for all motorcyclists in September 1989. The month before the law took effect, the helmet use rate was 41 percent. The rate jumped to 90 percent during the first month of the law and rose to 98 percent by June 1990.[17] Serious injury crashes per registered motorcycle decreased 11 percent.[18] But in September 1997, Texas again weakened its helmet law, requiring helmets only for riders younger than 21. Helmet use in Texas dropped to 66 percent by May 1998, and operator fatalities increased 31 percent in the first full year following the repeal.[19]
   - Kentucky repealed its universal helmet law in 1998, followed by Louisiana in 1999. These actions resulted in lower helmet use, and motorcyclist deaths quickly increased in these states by 50 percent and 100 percent, respectively.[20]
   - In 2000, Florida's universal helmet law was weakened to exempt riders 21 and older who have at least $10,000 of medical insurance coverage. An Institute study found that the motorcyclist death rate in Florida increased by about 25 percent after the state weakened its helmet law.[21] The death rate rose from 31 fatalities per 1,000 crash involvements before the law change (1998-99) to 39 fatalities per 1,000 crash involvements after (2001-2002). An estimated 117 deaths could have been prevented during 2001-02 if the law had not been changed. Another study of the Florida law found a similar effect. Motorcyclist deaths per 10,000 motorcycle registrations increased 21 percent during the two years after the law was changed compared with the two years before.[22]

- Michigan weakened its universal helmet law in 2012 to exempt riders 21 and older who have at least $20,000 of medical insurance coverage and have either passed a motorcycle safety course or held a motorcycle license endorsement for at least two years. After controlling for policy limits to account for the new medical insurance requirement, this law change was associated with a 22 percent increase in the average insurance payment for injuries to motorcyclists.[23] The weakened law also was associated with increases in head injuries and neurological interventions, but no significant change in deaths.[24]

In two studies, researchers modeled state motorcyclist fatality rates by helmet law type, after controlling for factors such as per capita income, population density and annual precipitation amounts.[25,26] Death rates were lowest in states with helmet laws that cover all riders. Rates in states with helmet laws that cover only some riders were lower than those in states with no helmet law, but not as low as rates in states with helmet laws that cover all riders. These results held for all three types of rates considered: deaths per 10,000 registered motorcycles, deaths per 100,000 population and deaths per 10 billion vehicle miles traveled.

8. How do helmet laws impact health care costs?

Unhelmeted riders have higher health care costs as a result of their crash injuries, and many lack health insurance. A 2002 review of 25 studies of the costs of injuries from motorcycle crashes reported that helmet use reduced the cost of medical treatment, length of hospital stay and probability of long-term disability for riders injured in a crash.[27] Studies that looked at who pays for injured riders' medical care found that just over half of injured riders have private health insurance coverage. For those without private insurance, most of the medical costs are paid by the government. A more recent study confirmed the earlier findings that unhelmeted riders had much higher hospital charges than helmeted ones.[28]

Here are a few examples of how states' helmet law changes affected health care costs:

- A recent study in Michigan found that unhelmeted rider's hospital costs averaged $27,760, compared with $20,967 for helmeted riders.[29]
- After California introduced a universal helmet use law in 1992, health care costs associated with head-injured motorcyclists declined.[30] The rate of motorcyclists hospitalized for head injuries decreased by 48 percent in 1993 compared with 1991, and total costs for patients with head injuries decreased by $20.5 million during this period.
- When Nebraska reinstated its universal helmet use law, acute medical hospital charges for injured motorcyclists declined 38 percent.[16]
- When Florida weakened its universal helmet law in 2000 to exclude riders 21 and older who have at least $10,000 of medical insurance coverage, hospital admissions of motorcyclists with head injuries increased 82 percent during the 30 months following the law change.[22] The average inflation-adjusted cost of treating these injuries went up from about $34,500 before the helmet law was weakened to nearly $40,000 after — 4 times as high as the $10,000 minimum medical insurance requirement.
- Studies conducted in Nebraska, Washington, California and Massachusetts illustrate the burden that injured motorcyclists place on taxpayers. Forty-one percent of motorcyclists injured in Nebraska from January 1988 to January 1990 lacked health insurance or received Medicaid or Medicare.[16] In Seattle, 63 percent of trauma care for injured motorcyclists in 1985 was paid by public funds.[31] In Sacramento, public funds paid 82 percent of the costs to treat orthopedic injuries sustained by motorcyclists during 1980-83.[32] Forty-six percent of motorcyclists treated at Massachusetts General Hospital during 1982-83 were uninsured.[32]

9. Are helmet laws that apply only to young motorcyclists effective?

No. Helmet use laws that apply only to young riders are virtually impossible to enforce. Helmet use for all riders is low in states where partial laws are in effect, and death rates are 20 to 40 percent lower in states with universal laws than in those with weak laws or no laws.[33]

In 2000, Florida weakened its helmet law to exclude riders 21 and older with at least $10,000 of medical insurance coverage. Even though riders younger than 21 still were required to wear helmets, an Institute study found that they were 97 percent more likely to die in crashes after the law change than before.[21] Helmet use among fatally injured motorcyclists younger than 21 declined from 72 percent before the law change to 55 percent after.

10. How have courts resolved challenges to helmet laws?

Courts have repeatedly upheld motorcycle helmet use laws under the U.S. Constitution. In 1972, a federal court in Massachusetts told a motorcyclist who objected to the law: "The public has an interest in minimizing the resources directly involved. From the moment of injury, society picks the person up off the highway; delivers him to a municipal hospital and municipal doctors; provides him with unemployment compensation if, after recovery, he cannot replace his lost job; and, if the injury causes permanent disability, may assume responsibility for his and his family's subsistence. We do not understand a state of mind that permits plaintiff to think that only he himself is concerned." The U.S. Supreme Court affirmed this

decision without hearing arguments in the case.[34]

11. Do people support mandatory helmet use laws?

According to a 2000 national telephone survey, 81 percent of respondents reported that they favored mandatory helmet use laws for motorcyclists. Support was more prevalent among females (88 percent) than males (72 percent) and among non-motorcyclists (83 percent) than those who drove motorcycles (51 percent). Support was higher in states requiring all riders to wear helmets (84 percent) compared with states with lesser requirements (75 percent) or no requirements (79 percent).[35]

In an Institute survey of motorcyclists conducted in 2009, 45 percent said they favor universal helmet laws.[13] Those who favor universal laws were more likely to report that they believe helmets keep riders safer than those who do not favor universal helmet laws (87 percent vs. 65 percent). Among motorcyclists who reported not always wearing helmets while riding, 57 percent said that a helmet law would encourage full-time helmet use.

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NTSB Recommends Mandatory Helmet Laws for Motorcyclists

October 09, 2018

By Dempsey & Kingsland, P.C.

For the first time in 12 years, motorcycling fatalities in the United States declined in 2009. While the reasons for the decline are not known, worsening economic conditions causing fewer new riders, fewer miles ridden, and casual riders selling their motorcycles have been cited as possible supporting factors.

Yet, while the drop in deaths of approximately 10 percent is certainly a step in the right direction, many experts felt that the numbers had nowhere to go but down after a particularly steep 5-year climb. In 2009, 4,462 motorcycle riders lost their lives in crashes.

According to the National Transportation Safety Board (NTSB), this is still far too many fatalities. Their solution? – nation-wide helmet laws.

The Drive for Helmet Laws

In November, the NTSB challenged resistance in a number of state capitols by announcing their stance that states should require all motorcycle riders to wear federally approved helmets.

But why such a push after a year in which fatalities actually declined? The Governors Highway Safety Association ("GHSA") warns against predicting a steady decline based on only one year of data. "We will need to see three to five years of decline before we are ready to say that a positive trend has developed," said GHSA Chairman Vernon Betkey.

A GHSA report released in early 2010 points out that motorcycle fatalities have significantly decreased in the past but then rose again. And historically the numbers are still at a peak: The National Highway Traffic Safety Administration reports that 2,294 motorcyclists were killed in 1998, compared to 5,290 in 2008.

The NTSB believes that now is a critical time to strike in order to reduce fatalities even further. "Too many lives are lost in motorcycle accidents," said Christopher A. Hart, NTSB vice chairman. "It's a public health issue."

Indeed, the most recent data (from 2008) show that 65 percent of riders killed in motorcycle accidents were not wearing helmets. Helmets hold a prominent place on the NTSB's "most-wanted list" of safety improvements that they believe can reduce preventable deaths on the highways.

Although the NTSB's "most-wanted list" gives it a powerful pulpit, the organization does not have the power to actually regulate helmet requirements. This responsibility falls on Congress, federal agencies and state legislatures.

Some jurisdictions are already ahead of the curve: 20 states (including Missouri) and the District of Columbia require all motorcycle riders and passengers to wear a helmet. In 27 states, certain riders are required to wear a helmet (usually those under a certain age, passengers, or those who are not covered by a health insurance policy, depending upon the state).

Kansas, for example, only prohibits motorcyclists 17 years old and younger from riding without a helmet. Just 3 states (Illinois, Iowa, and New Hampshire) have no motorcycle helmet laws. Since 1976, many states have actually scaled back on their helmet requirements.

When it comes to helmet laws, federal action seems unlikely. In 1967, Congress threatened to withhold federal highway funding from states that failed to enact universal motorcycle helmet requirements. But motorcyclists have long been a free-spirited breed. After 9 years of intense lobbying by motorcycle groups, Congress gave up on the requirement. Anti-helmet law advocates still appear to have a good deal of influence in Washington: in 2005, Congress prohibited states from using federal money to promote helmet use.

The Future of Helmet Laws

Will the NTSB get its wish for more sweeping motorcycle helmet requirements? For the time being, a broad initiative seems unlikely. Motorcycling groups touting freedom of choice when it comes to helmets hold a great deal of political sway.

At the same time, many states have already taken steps to ensure certain at-risk riders are protected by helmets, particularly those who are inexperienced or who cannot show proof of completing a motorcycle training and safety course.

Others, like Florida and Kentucky, ensure that cyclists' free-choice does not equal taxpayers' dollars spent on preventable medical treatment by requiring riders who cannot prove they are covered by a medical insurance policy to wear helmets.

Small steps toward more restrictive motorcycle safety laws seem to be the trend, rather than the broad helmet requirements promoted by the NTSB. Although the future of helmet laws is uncertain, hopefully 2009's decline in motorcycle fatalities will nonetheless grow into a long-term trend.

Traffic Safety Facts

2019 Data

April 2021

DOT HS 813 112

NHTSA

In this fact sheet for 2019 the information is presented as follows.

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.

U.S. Department of Transportation

National Highway Traffic Safety Administration

1200 New Jersey Avenue SE
Washington, DC 20590

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 2
Occupant* Fatality Rates, by Vehicle Type, 2018 and 2019

Rate		Vehicle Type					
		Motorcycles		Passenger Cars		Light Trucks	
		Fatality Rate	Injury Rate	Fatality Rate	Injury Rate	Fatality Rate	Injury Rate
2018	Per 100,000 Registered Vehicles	58.18	945	9.70	1,137	7.05	652
	Per 100 Million VMT	25.09	408	0.92	108	0.67	62
2019	Per 100,000 Registered Vehicles	58.33	975	9.42	1,152	6.80	648
	Per 100 Million VMT	25.47	426	0.89	109	0.64	61

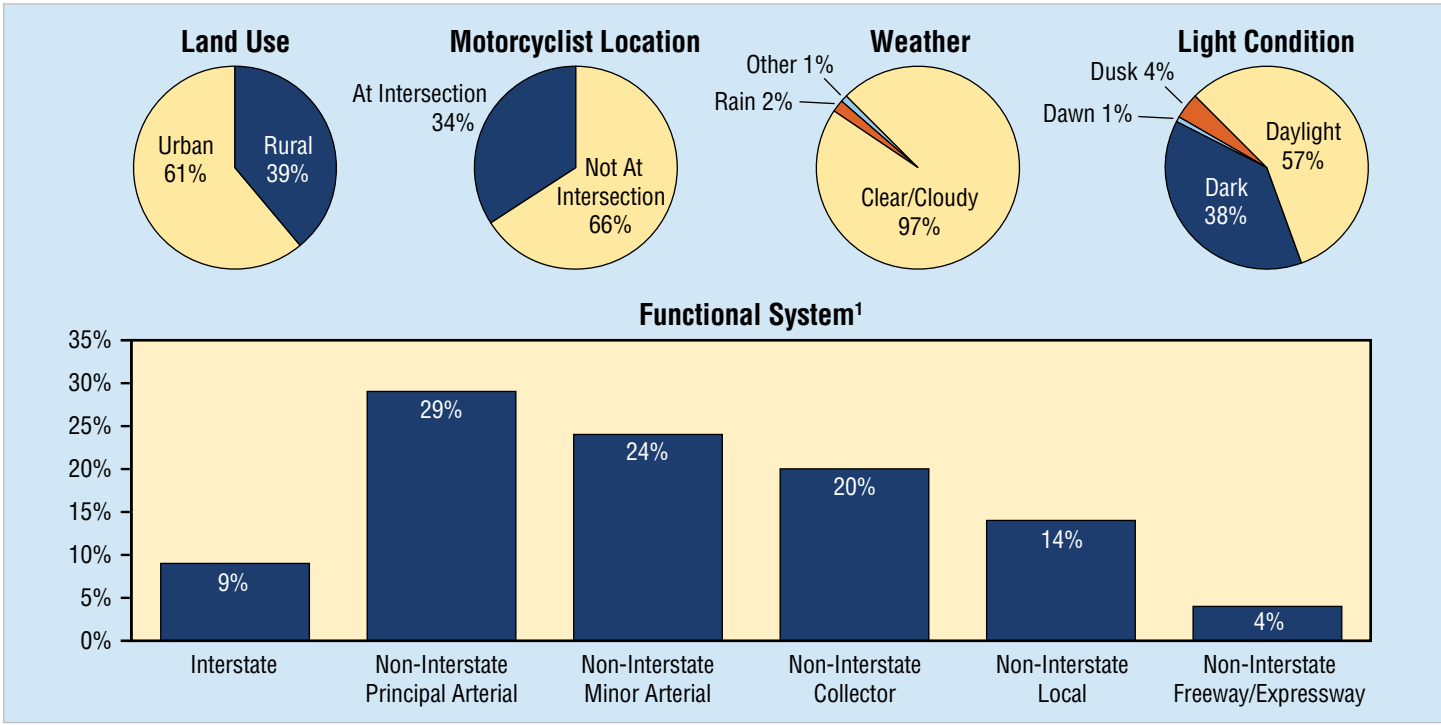
Sources: FARS 2018 Final File, 2019 ARF; CRSS 2018-2019; VMT and Registered Vehicles – FHWA
*Includes both riders/drivers and passengers.

Crash Characteristics

Figure 1 displays information about the environment surrounding the motorcyclist fatalities in 2019 including land use, motorcyclist location, light condition, weather, and functional system.[1] In 2019 (based on known values):

- 61 percent of the motorcycle fatalities occurred in urban areas compared to 39 percent in rural areas.
- 66 percent occurred at locations that were not intersections compared to 34 percent at intersections.
- 97 percent occurred in clear/cloudy conditions compared to 2 percent in rain conditions and 1 percent in snow/sleet, fog, or other conditions.
- 57 percent occurred during daylight compared to 38 percent in the dark, 4 percent during dusk, and 1 percent during dawn.
- 91 percent occurred on non-interstate roads compared to 9 percent on interstates.

Figure 1
Motorcyclist Fatalities in Relation to Land Use, Motorcyclist Location, Weather, Light Condition, and Functional System, 2019



Source: FARS 2019 ARF
Note: Unknowns were removed before calculating percentages.

[1] Definitions for the different functional system can be found at www.fhwa.dot.gov/planning/processes/statewide/related/highway_functional_classifications/fcauab.pdf

Crash Involvement

The most harmful event in 2019 for 2,811 (55%) of the 5,114 motorcycles involved in fatal crashes was collisions with motor vehicles in transport.

In two-vehicle crashes, 76 percent of the motorcycles involved in fatal crashes were struck in the front. Only 7 percent were struck in the rear.

Motorcycles were more frequently involved in fatal collisions with fixed objects than were other vehicle types. Twenty-three percent of motorcycles involved in fatal crashes in 2019 collided with fixed objects, compared to 16 percent for passenger cars, 13 percent for light trucks, and 4 percent for large trucks.

In 2019 there were 2,495 fatal two-vehicle crashes each involving a motorcycle and another type of vehicle. In 41 percent (1,034) of these crashes, the other vehicles were turning left while the motorcycles were going straight, passing, or overtaking other vehicles. Both vehicles were going straight in 558 crashes (22%).

Motorcyclists

Age

The 55-and-older age group accounted for 22 percent of motorcyclists killed in 2010, and increased to 28 percent in 2019. Over the 10-year period from 2010 to 2019, motorcyclist fatalities among the 55-and-older age group increased by 40 percent, from 1,000 to 1,399. In 2010, the average age of motorcycle riders killed in traffic crashes was 42, whereas in 2019 the average age was 43.

Weekday is defined as Monday 6 a.m. to Friday 5:59 p.m. and weekend is defined as Friday 6 p.m. to Monday 5:59 a.m. Table 3 shows that in 2010 and 2019 roughly half the motorcyclists were killed in traffic crashes during the weekend versus weekday. Additionally, motorcyclist fatalities on weekdays have increased by 16 percent from 2,244 in 2010 to 2,612 in 2019.

Based on the weekday and weekend definitions above, there are 108 weekday hours (4.5 days) and 60 weekend hours (2.5 days). There are 234 weekdays in a year (52 weeks x 4.5 days) and 130 weekend days (52 weeks x 2.5 days). There were more than 1.6 times as many motorcyclist fatalities in traffic crashes in 2019 on weekends (18.4) versus weekdays (11.2), which decreased from 1.8 times in 2010 (17.4 versus 9.6). Among the different age groups, the 50-to-54 and 45-to-49 motorcyclists have the highest rate of motorcyclists killed in traffic crashes on weekends (2.2 and 2.1, respectively) and weekdays (1.1) in 2010. In 2019 the 25-to-29 motorcyclists had the highest rate of fatalities during the weekend (2.5) and weekday (1.5).

Table 3
Motorcyclist Fatalities, by Age Group and Day of Week, 2010 and 2019

Age Group	2010			2019		
	Weekday	Weekend	Total*	Weekday	Weekend	Total*
<15	12	3	15	10	8	18
15-20	133	106	239	135	103	238
21-24	218	202	422	241	205	447
25-29	244	251	495	346	325	674
30-34	203	182	385	267	234	502
35-39	194	234	429	240	210	450
40-44	214	262	476	189	187	376
45-49	250	269	520	211	222	435
50-54	252	284	536	230	241	473
55-59	207	203	411	258	248	508
60-64	155	153	308	198	183	381
65+	161	119	281	287	222	510
Total*	**2,244**	**2,268**	**4,518**	**2,612**	**2,390**	**5,014**

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 unknown age and unknown day of week.

Motorcycle Engine Size

Table 4 presents motorcyclist fatalities by the engine size (displacement) of the motorcycles. Twenty-four percent of motorcyclists killed in traffic crashes in 2019 were riding motorcycles with engine sizes from 1,001 to 1,500 cubic centimeters (cc), down from 33 percent in 2010. Twenty-six percent of motorcyclists killed in 2019 were riding motorcycles with engine sizes of 1,501 cc or higher, up from 14 percent in 2010.

The number of motorcyclist fatalities on motorcycles with engine sizes of 1,000 cc or less showed an increase of 15 percent during this time. Motorcyclist fatalities on motorcycles with engine sizes between 1,001 and 1,500 cc decreased by 19 percent (from 1,475 to 1,195), while the number of motorcyclists killed on motorcycles with engine sizes 1,501 cc or higher increased by 103 percent (from 638 to 1,292).

Table 4
Motorcyclist Fatalities, by Engine Size (cc), 2010 and 2019

	Engine Size (cc)										Total	
	Up to 500		501–1,000		1,001–1,500		1,501 & Higher		Unknown			
Year	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
2010	209	5%	1,650	37%	1,475	33%	638	14%	546	12%	4,518	100%
2019	372	7%	1,768	35%	1,195	24%	1,292	26%	387	8%	5,014	100%

Source: FARS 2010 Final File, 2019 ARF
Notes: Other motorcycle characteristics beside engine size (displacement) influence power and speed capability. NHTSA has not determined that there is a causal relationship between displacement and fatality risk. FHWA motorcycle registration data not available by engine size.

Speeding

NHTSA considers a crash to be speeding-related if the driver was charged with a speeding-related offense or if an investigating police officer indicated that racing, driving too fast for conditions, or exceeding the posted speed limit was a contributing factor in the crash. Thirty-three percent of all motorcycle riders involved in fatal crashes in 2019 were speeding, compared to 19 percent for passenger car drivers, 15 percent for light-truck drivers, and 8 percent for large-truck drivers. As shown in Table 5, motorcycle riders 21-to-24 years old involved in fatal crashes had the highest speeding involvement at 49 percent.

Table 5
Motorcycle Riders Involved in Fatal Crashes, by Age Group and Speeding Involvement, 2019

	Speeding Involvement				Total	
	Speeding		Not Speeding			
Age Group	Number	Percent	Number	Percent	Number	Percent
<15	0	0%	13	100%	13	100%
15-20	103	44%	129	56%	232	100%
21-24	229	49%	234	51%	463	100%
25-29	316	46%	368	54%	684	100%
30-34	223	43%	297	57%	520	100%
35-39	178	38%	288	62%	466	100%
40-44	142	37%	247	63%	389	100%
45-49	129	30%	301	70%	430	100%
50-54	111	23%	375	77%	486	100%
55-59	110	21%	406	79%	516	100%
60-64	80	20%	311	80%	391	100%
65+	64	12%	456	88%	520	100%
Total*	**1,685**	**33%**	**3,426**	**67%**	**5,111**	**100%**

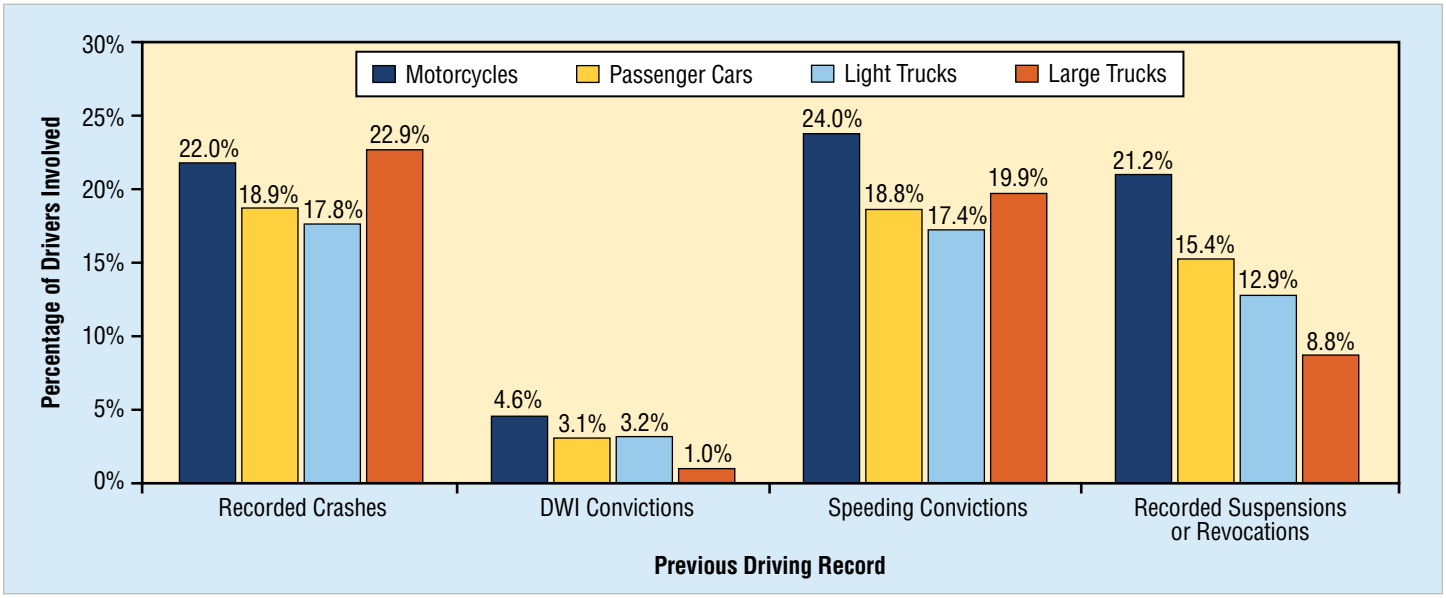
Source: FARS 2019 ARF
*Includes unknown age.

Licensing and Previous Driving Records

Thirty percent of motorcycle riders involved in fatal crashes in 2019 were riding without valid motorcycle licenses at the time of the crashes, while only 13 percent of passenger vehicle (passenger cars and light trucks) drivers in fatal crashes did not have valid licenses. A valid motorcycle license includes a rider having a valid driver license (non-CDL license status) with a motorcycle endorsement or a motorcycle-only license.

As shown in Figure 2, motorcycle riders involved in fatal crashes had the highest percentages of drivers with previous driving records as compared to other vehicle drivers. Motorcycle riders involved in fatal crashes were 1.4 times more likely than passenger car drivers to have previous license suspensions or revocations (21.2% and 15.4%, respectively). Note that FARS records drivers' previous driving records that occurred within 5 years from the crash date.

Figure 2
Previous Driving Records of Drivers Involved in Fatal Crashes, by Vehicle Type, 2019



Source: FARS 2019 ARF
Note: Excludes all drivers with previous records that were unknown.

Alcohol

In 2019 there were 4,733 motorcycle riders killed in traffic crashes. Of those, 1,383 (29%) were alcohol-impaired (BAC of .08 g/dL or higher). In addition, there were 354 (7%) motorcycle riders killed who had lower alcohol levels (BACs of .01 to .07 g/dL).

Motorcycle riders involved (killed or survived) in fatal crashes in 2019 had higher percentages of alcohol impairment than any other type of motor vehicle driver (29% for motorcycle riders, 20% for passenger car drivers, 19% for light-truck drivers, and 2% for large-truck drivers).

The highest percentages of alcohol-impaired motorcycle rider fatalities were in the 40-to-44 age group (40%) followed by the 35-to-39 age group (38%), 30-to-34 age group (35%) and 45-to-49 age group (35%), when compared to other age groups.

Forty-two percent of the 1,886 motorcycle riders who died in single-vehicle crashes in 2019 were alcohol-impaired as compared to 21 percent of the 2,847 motorcycle riders who died in multiple-vehicle crashes as shown in Table 6. Forty-eight percent of those killed in single-vehicle crashes on weekends in 2019 were alcohol-impaired.

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).

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).

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]

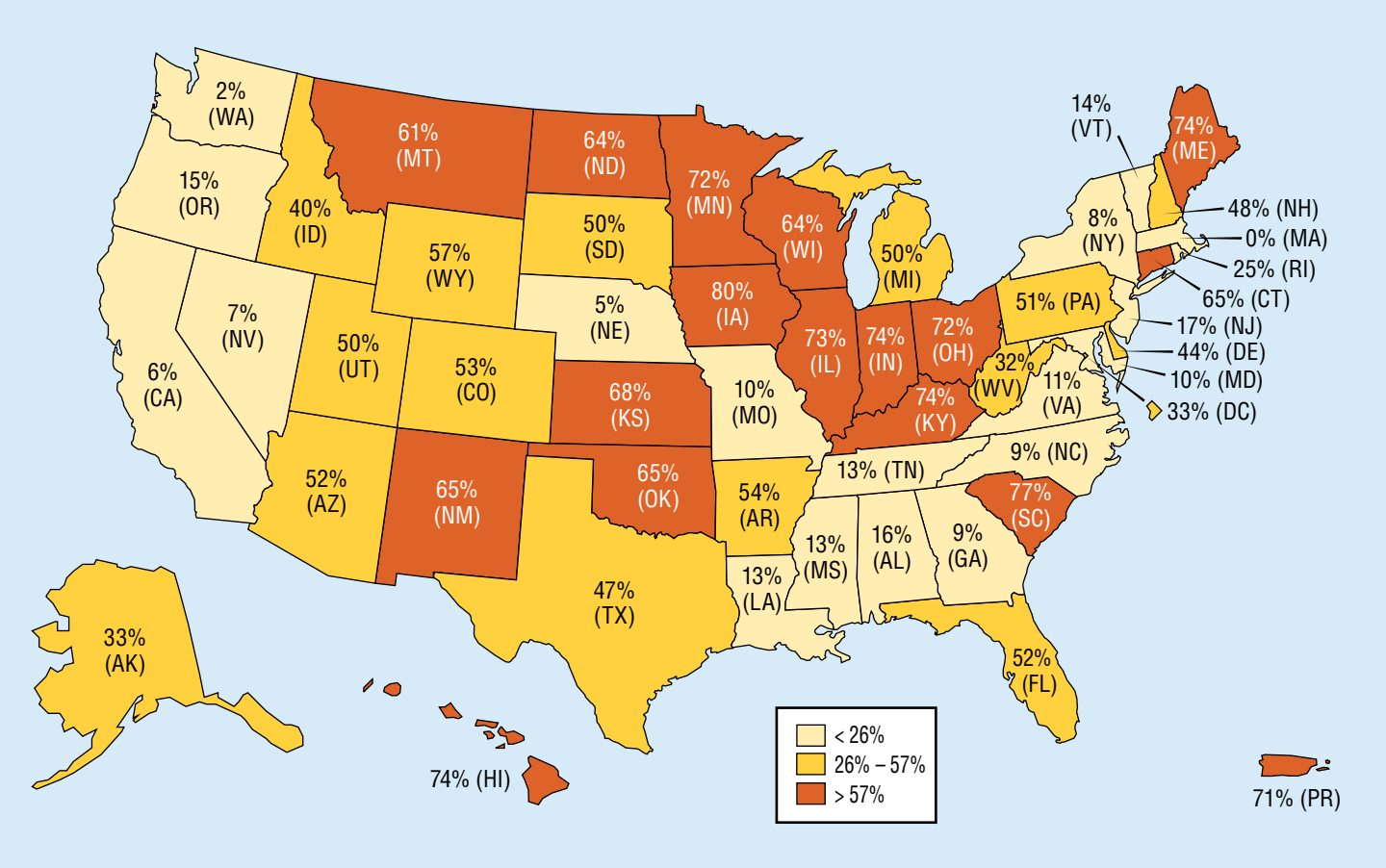
According to results from the National Occupant Protection Use Survey (NOPUS), the overall rate of DOT-compliant motorcycle helmet use in the United States was 70.8 percent in 2019. Helmet use continued to be significantly higher in States that required all motorcyclists to be helmeted than in other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

Table 8

Motorcycle Rider Fatalities, by State and Their BACs, 2019

State	Total Fatalities	Motorcycle Rider Fatalities, by Their BACs					
		BAC=.01+ g/dL		Alcohol-Impaired (BAC=.08+ g/dL)		Alcohol-Impaired (BAC=.15+ g/dL)	
		Number	Percent	Number	Percent	Number	Percent
Alabama	90	31	35%	27	30%	19	21%
Alaska	4	2	50%	1	25%	1	25%
Arizona	169	58	34%	46	27%	25	15%
Arkansas	58	15	26%	12	20%	8	13%
California	451	157	35%	123	27%	75	17%
Colorado	93	37	39%	28	30%	24	25%
Connecticut	43	22	51%	18	41%	10	24%
Delaware	15	6	41%	5	34%	3	19%
District of Columbia	3	1	33%	1	27%	1	40%
Florida	559	182	32%	149	27%	96	17%
Georgia	164	46	28%	38	23%	21	13%
Hawaii	20	8	38%	5	26%	4	20%
Idaho	24	11	47%	9	37%	7	27%
Illinois	131	61	46%	48	37%	28	21%
Indiana	120	40	33%	35	29%	21	17%
Iowa	38	20	54%	17	44%	9	23%
Kansas	36	13	37%	12	34%	7	19%
Kentucky	83	20	24%	16	19%	12	14%
Louisiana	85	32	38%	29	34%	18	21%
Maine	25	9	35%	8	30%	7	28%
Maryland	71	24	34%	18	25%	12	17%
Massachusetts	44	22	49%	20	44%	14	32%
Michigan	126	44	35%	38	30%	21	17%
Minnesota	41	18	44%	14	34%	12	29%
Mississippi	37	12	33%	8	22%	3	7%
Missouri	120	40	33%	29	24%	14	11%
Montana	22	11	51%	9	42%	8	37%
Nebraska	24	10	42%	7	30%	6	23%
Nevada	55	21	38%	14	26%	10	19%
New Hampshire	27	15	56%	8	29%	5	18%
New Jersey	79	38	49%	28	36%	13	17%
New Mexico	49	20	40%	15	30%	9	18%
New York	129	50	39%	33	26%	21	16%
North Carolina	203	60	29%	48	23%	28	14%
North Dakota	9	3	32%	3	32%	2	17%
Ohio	148	66	45%	49	33%	30	21%
Oklahoma	66	22	34%	17	25%	13	20%
Oregon	53	22	42%	15	28%	8	15%
Pennsylvania	166	53	32%	39	24%	20	12%
Rhode Island	11	10	91%	7	64%	4	36%
South Carolina	140	53	38%	45	32%	26	18%
South Dakota	14	3	23%	2	15%	2	11%
Tennessee	147	47	32%	42	28%	28	19%
Texas	400	178	44%	147	37%	85	21%
Utah	34	9	27%	7	21%	4	11%
Vermont	7	1	16%	1	16%	0	0%
Virginia	93	35	37%	32	35%	24	25%
Washington	89	36	40%	26	29%	14	16%
West Virginia	27	13	47%	11	39%	8	28%
Wisconsin	79	27	34%	23	29%	15	18%
Wyoming	12	6	48%	5	43%	4	32%
U.S. Total	**4,733**	**1,737**	**37%**	**1,383**	**29%**	**854**	**18%**
Puerto Rico	34	12	34%	11	31%	7	21%

Source: FARS 2019 ARF
Note: Percentages are computed based on unrounded estimates.

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.
- "Lane sharing" is when a motorcyclist travels in the same lane as another vehicle, for example when passing. In some States this is legal; it can help ease congestion.
- 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

Fatality Analysis Reporting System

FARS contains data on every fatal motor vehicle traffic crash within the 50 States, the District of Columbia, and Puerto Rico. To be included in FARS, a traffic crash must involve a motor vehicle traveling on a public trafficway that results in the death of a vehicle occupant or a nonoccupant within 30 days of the crash. The Annual Report File (ARF) is the FARS data file associated with the most recent available year, which is subject to change when it is finalized the following year to the final version known as the Final File. The additional time between the ARF and the Final File provides the opportunity for submission of important variable data requiring outside sources, which may lead to changes in the final counts. More information on FARS can be found at www.nhtsa.gov/crash-data-systems/fatality-analysis-reporting-system.

The updated final counts for the previous data year will be reflected with the release of the recent year's ARF. For example, along with the release of the 2019 ARF, the 2018 Final File was released to replace the 2018 ARF. The final fatality count in motor vehicle traffic crashes for 2018 was 36,835, which was updated from 36,560 in the 2018 ARF. The number of motorcycle fatalities from the 2018 Final File was 5,038, which was updated from 4,985 from the 2018 ARF.

The 2016 and 2017 Final Files have been amended, but this amendment did not change the overall number of fatal crashes or fatalities. However, the number of motorcycle fatalities from the 2017 amended Final File was 5,226, which was updated from 5,229 from the 2017 Final File.

Crash Report Sampling System

NHTSA's National Center for Statistics and Analysis (NCSA) redesigned the nationally representative sample of police-reported traffic crashes, which estimates the number of police-reported injury and property-damage-only crashes in the United States. The new system, called CRSS, replaced the National Automotive Sampling System (NASS) General Estimates System (GES) in 2016. More information on CRSS can be found at www.nhtsa.gov/crash-data-systems/crash-report-sampling-system-crss.

Methodology Change for Estimating People Injured

NCSA changed the methodology of estimating people nonfatally injured in motor vehicle traffic crashes. The new approach combines people nonfatally injured from both FARS and NASS GES/CRSS. This is done by extracting people nonfatally injured in fatal crashes from FARS with people nonfatally injured in police-reported injury crashes from NASS GES/CRSS. The old approach extracted people nonfatally injured from only NASS GES/CRSS, regardless of crash severity. This change in methodology caused some estimates of people injured to change for prior years.

The suggested APA format citation for this document is:

National Center for Statistics and Analysis. (2021, April). *Motorcycles: 2019 data* (Traffic Safety Facts. Report No. DOT HS 813 112). National Highway Traffic Safety Administration.

For more information:

Motor vehicle traffic crash data are available from the National Center for Statistics and Analysis (NCSA), NSA-230. NCSA can be contacted at NCSARequests@dot.gov or 800-934-8517. NCSA programs can be found at www.nhtsa.gov/data. Additional data tools, such as the State Traffic Safety Information (STSI), Fatality and Injury Reporting System Tool (FIRST), and more can be found at https://cdan.nhtsa.gov/. To report a motor vehicle safety-related problem or to inquire about safety information, contact the Vehicle Safety Hotline at 888-327-4236 or www-odi.nhtsa.dot.gov/VehicleComplaint/.

Other fact sheets available from NCSA are *Alcohol-Impaired Driving, Bicyclists and Other Cyclists, Children, Large Trucks, Occupant Protection in Passenger Vehicles, Older Population, Passenger Vehicles, Pedestrians, Rural/Urban Comparison of Traffic Fatalities, School-Transportation-Related Crashes, Speeding, State Alcohol-Impaired-Driving Estimates, State Traffic Data, Summary of Motor Vehicle Crashes,* and *Young Drivers.* Detailed data on motor vehicle traffic crashes are published annually in *Traffic Safety Facts: A Compilation of Motor Vehicle Crash Data.* The fact sheets and Traffic Safety Facts annual report can be found at https://crashstats.nhtsa.dot.gov/.

U.S. Department of Transportation
National Highway Traffic Safety Administration

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National Highway Traffic Safety Administration

TRAFFIC SAFETY FACTS
Research Note

NHTSA

DOT HS 813 143

June 2021

Motorcycle Helmet Use in 2020—Overall Results

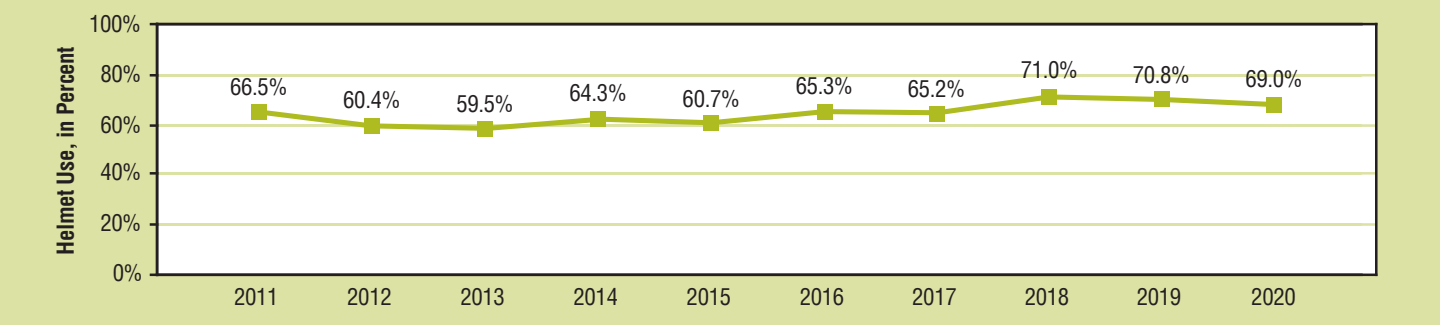
Use of DOT-compliant motorcycle helmets was 69.0 percent[1] in 2020, not statistically different at the 0.05 level from 70.8 percent in 2019. This result is from the National Occupant Protection Use Survey (NOPUS), the only survey that provides nationwide probability-based observed data on motorcycle 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.

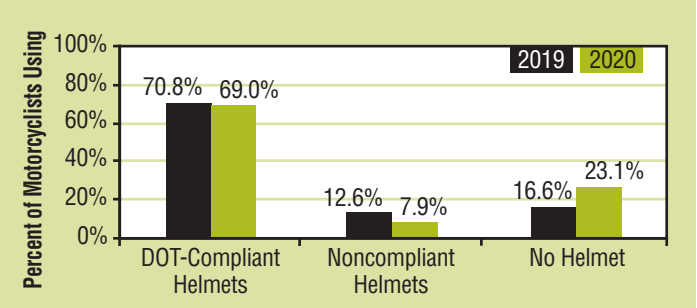
- Helmet use among riders with passengers decreased significantly from 79.7 percent in 2019 to 65.0 percent in 2020 (Table 1).
- Helmet use among passengers of riders wearing DOT-compliant helmets increased significantly from 52.9 percent in 2019 to 84.5 percent in 2020 (Table 1).

Figure 1
Motorcycle Helmet Use, 2011–2020



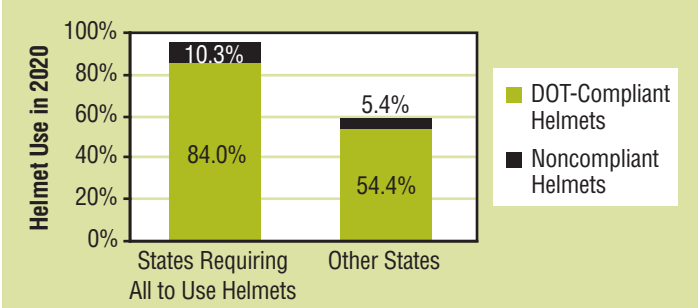
Source: NOPUS

Figure 2
Motorcyclists, by Helmet Type



Source: NOPUS

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



Source: NOPUS

[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

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

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TRAFFIC SAFETY FACTS
Crash • Stats

NHTSA

DOT HS 812 867 | A Brief Statistical Summary | December 2019

Lives and Costs Saved by Motorcycle Helmets, 2017

Findings

In 2017 the use of motorcycle helmets saved an estimated 1,872 lives. An additional 749 lives could have been saved in 2017 if all motorcyclists had worn helmets. Nearly $3.5 billion in economic costs and $21 billion in comprehensive costs were saved in 2017 by the use of motorcycle helmets. If all motorcyclists had worn helmets in 2017, an additional $1.5 billion in economic costs and $8.9 billion in comprehensive costs could have been saved. Economic costs include lost productivity, medical costs, legal and court costs, emergency medical service (EMS) costs, insurance administration costs, congestion costs, property damage, and workplace losses. Comprehensive costs include these economic costs plus the valuation for lost quality of life.

Methodology

This Crash*Stat contains information on fatal motor vehicle crashes and fatalities based on data from the Fatality Analysis Reporting System (FARS). Refer to the end of this publication for more information on FARS. Injury estimates are based on data from the National Automotive Sampling System (NASS) General Estimates System (GES). NASS GES was discontinued in 2016 and replaced with a new system called the Crash Report Sampling System (CRSS). For more information, read Crash Report Sampling System (CRSS) Replaces the National Automotive Sampling System (NASS) General Estimates System (GES) at the end of this publication.

The National Highway Traffic Safety Administration's National Center for Statistics and Analysis (NCSA) provides annual estimates of lives saved by motorcycle helmets, as well as the costs saved by injuries and fatalities prevented by the use of motorcycle helmets. The estimates are obtained using the effectiveness of motorcycle helmets in preventing death (37% for operators and 41% for passengers) and injuries (8% for minor injuries and 13% for serious injury). Information on the methodology of estimating the lives and costs saved estimates, as well as injury details, is available in the NHTSA documents listed in the references. The estimated number of lives saved is based on the number of helmeted motorcyclist fatalities, while the estimate of additional lives that could have been saved is based on the number of unhelmeted motorcyclist fatalities. Therefore, in years when there are fewer applicable motorcyclist fatalities, the corresponding estimates are lower. NHTSA does not have State-level data on motorcyclists who were injured. We estimate them from national and State totals of motorcyclist fatalities from FARS and national estimates of motorcyclists injured from the NASS GES and CRSS. The number of injured motorcyclists in a State is estimated by using the most recent 5-year average of national ratios of motorcyclists injured to motorcyclists killed. Because the number and types of injuries motorcyclists experience depend greatly on use of helmets, injury counts are estimated separately by helmet use status. Table 1 shows the national fatality and injured counts, and the ratios derived from them, for each of the most recent 5 years of available data, along with the 5-year-average ratio values for helmeted and unhelmeted motorcyclists for 2013 to 2017. These ratios vary somewhat each time a new year of data replaces the oldest year. Puerto Rico counts are not included in national totals.

Table 1: Motorcyclists Killed and Injured, Known Helmet Use, and Injury-to-Fatality Ratios, 2013-2017

Year	Fatalities		Injured		Injury-to-Fatality Ratio	
	Helmeted	Unhelmeted	Helmeted	Unhelmeted	Helmeted	Unhelmeted
2013	2,769	1,923	58,578	29,848	21.16	15.52
2014	2,821	1,773	57,075	34,538	20.23	19.49
2015	3,039	1,990	60,016	28,402	19.75	14.28
2016	3,181	2,156	73,090	31,359	22.98	14.54
2017	3,164	2,008	58,902	29,815	18.62	14.85
Average 2013-2017	**2,995**	**1,970**	**61,532**	**30,793**	**20.55**	**15.73**

Source: FARS 2013-2016 Final Files; 2017 Annual Report File (ARF); GES 2013-2015; CRSS 2016-2017.
Note: Unknown helmet use has been distributed proportionally to known categories.
Puerto Rico numbers are not included in Table 1 totals.

Costs are adjusted using the Department of Labor's Consumer Price Index (CPI). Blincoe et al. (2015) provides cost data for 2010. These costs are multiplied by the CPI ratio of the current data year (in this case, 2017) to the base year (2010). The CPI values, taken from the Bureau of Labor Statistics website (http://data.bls.gov/cgi-bin/surveymost?cu), are 218.056 for 2010, and

245.120 for 2017. So, the dollar values are multiplied by 1.124 (245.120/218.056), to get current year dollars. Table 2 provides, for 2017, and for each State as well as the Nation, the number of motorcyclist fatalities (total and by helmet use), the helmet use rate in fatal crashes, the estimated number of lives saved by motorcycle helmets, and the estimated number of additional lives that could have been saved at 100-percent helmet use. Table 3 provides the economic and comprehensive costs saved due to the lives saved and injuries prevented by the use of motorcycle helmets, as well as how much could have been saved if all motorcyclists had worn helmets, nationally and in each State in 2017.

Fatality Analysis Reporting System

The FARS contains data on every fatal traffic crash in the 50 States, the District of Columbia, and Puerto Rico. To be included in FARS, a crash must involve a motor vehicle traveling on a public trafficway and must result in the death of a vehicle occupant or a nonoccupant within 30 days of the crash. The Annual Report File (ARF) is the FARS data file associated with the most recent available year, which is subject to change when it is finalized about a year later. The final version of the file is aptly known as the "Final" file. The additional time between the ARF and the Final file provides the opportunity for submission of important variable data requiring outside sources, which may lead to changes in the final counts.

Crash Report Sampling System (CRSS) Replaces the National Automotive Sampling System (NASS) General Estimates System (GES)

NHTSA's National Center for Statistics and Analysis (NCSA) redesigned the nationally representative sample of police reported traffic crashes, which estimates the number of police-reported injury and property-damage-only crashes in the United States. The new system, called CRSS, replaced NASS GES in 2016. The 2016 CRSS data was released the last week of March 2018. For more information, see the Additional Resources section of the CRSS web page at: www.nhtsa.gov/national-center-statistics-and-analysis-ncsa/crash-report-sampling-system-crss.

References

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NCSA. (2015). *Estimating lives and costs saved by motorcycle helmets with updated economic cost information* (Report No. DOT HS 812 206). Washington, DC: National Highway Traffic Safety Administration. Available at https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/812206.

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U.S. Department of Transportation

National Highway Traffic Safety Administration

For questions regarding the information presented in this document, please contact NCSARequests@dot.gov. Internet users may access this Crash•Stats and other general information on traffic safety at www.nhtsa.gov/research-data. To report a safety-related problem or to inquire about motor vehicle safety information, contact the Vehicle Safety Hotline at 888-327-4236.

Table 2: Motorcyclist Fatalities by Helmet Use, Helmet Use Rates, Lives Saved, and Additional Lives Savable at 100-Percent Helmet Use, by State, 2017

State	Motorcyclists Fatalities				Helmet Use Rate in Fatal Crashes (Known)	Number of Lives Saved*	Additional Lives Savable at 100% Helmet Use*
	Total Motorcyclist Fatalities	Helmet Used	Helmet Not Used	Helmet Use Unknown			
Alabama	79	72	6	1	92.3%	43	2
Alaska	6	3	3	0	50.0%	2	1
Arizona	163	66	84	13	44.0%	42	34
Arkansas	65	30	33	2	47.6%	18	13
California	529	476	41	12	92.1%	287	16
Colorado	103	31	72	0	30.1%	18	27
Connecticut	57	22	33	2	40.0%	13	13
Delaware	10	6	4	0	60.0%	4	2
District of Columbia	4	3	0	1	100.0%	2	0
Florida	590	291	289	10	50.2%	174	110
Georgia	139	119	18	2	86.9%	72	6
Hawaii	25	11	14	0	44.0%	6	5
Idaho	25	10	15	0	40.0%	6	6
Illinois	162	49	109	4	31.0%	30	42
Indiana	149	41	105	3	28.1%	25	40
Iowa	48	14	33	1	29.8%	8	13
Kansas	56	21	32	3	39.6%	13	13
Kentucky	90	31	59	0	34.4%	18	22
Louisiana	96	78	13	5	85.7%	48	5
Maine	26	9	17	0	34.6%	5	6
Maryland	86	70	12	4	85.4%	43	5
Massachusetts	51	47	1	3	97.9%	29	0
Michigan	150	74	69	7	51.7%	46	27
Minnesota	55	16	36	3	30.8%	10	15
Mississippi	40	27	7	6	79.4%	19	3
Missouri	121	100	20	1	83.3%	60	8
Montana	23	9	14	0	39.1%	5	5
Nebraska	27	20	0	7	100.0%	16	0
Nevada	54	44	8	2	84.6%	27	3
New Hampshire	15	7	8	0	46.7%	4	3
New Jersey	83	75	3	5	96.2%	47	1
New Mexico	53	14	35	4	28.6%	9	14
New York	145	131	9	5	93.6%	80	4
North Carolina	176	161	14	1	92.0%	97	4
North Dakota	12	3	9	0	25.0%	2	3
Ohio	157	45	109	3	29.2%	27	42
Oklahoma	93	23	68	2	25.3%	14	26
Oregon	57	46	2	9	95.8%	32	1
Pennsylvania	187	96	88	3	52.2%	58	34
Rhode Island	11	6	5	0	54.5%	4	2
South Carolina	145	43	100	2	30.1%	26	38
South Dakota	16	6	10	0	37.5%	4	4
Tennessee	134	123	8	3	93.9%	74	3
Texas	490	234	243	13	49.1%	142	94
Utah	39	13	25	1	34.2%	8	10
Vermont	13	13	0	0	100.0%	8	0
Virginia	117	115	1	1	99.1%	68	0
Washington	80	78	0	2	100.0%	47	0
West Virginia	26	16	10	0	61.5%	9	4
Wisconsin	77	30	43	4	41.1%	19	17
Wyoming	17	4	13	0	23.5%	2	5
National	**5,172**	**3,072**	**1,950**	**150**	**61.2%**	**1,872**	**749**
Puerto Rico	28	13	15	0	46.4%	8	6

Source: FARS 2017 ARF
Shaded States are those with laws requiring helmet use for all motorcyclists, at the time of publication.
*Estimates for States may not add up to national totals due to independent rounding.

Table 3: Economic and Comprehensive Costs Saved by Helmet Use and Savable by 100-Percent Helmet Use, by State, 2017

State	*Economic Costs Saved	*Additional Economic Costs Savable at 100% Use	**Comprehensive Costs Saved	**Additional Comprehensive Costs Savable at 100% Use
Alabama	$67,287,832	$3,783,029	$413,792,678	$23,028,382
Alaska	$3,612,643	$2,665,414	$22,206,505	$16,225,140
Arizona	$68,608,576	$63,094,386	$421,792,050	$384,365,313
Arkansas	$27,995,815	$21,251,307	$172,205,688	$129,441,686
California	$569,682,947	$35,170,643	$3,502,779,513	$214,129,273
Colorado	$35,672,254	$54,984,512	$219,273,301	$334,931,437
Connecticut	$34,097,602	$31,972,114	$209,594,098	$194,702,428
Delaware	$6,478,520	$3,009,204	$39,822,727	$18,349,140
District of Columbia	$7,506,960	$0	$46,144,433	$0
Florida	$314,693,942	$210,245,349	$1,934,948,540	$1,280,786,507
Georgia	$116,446,483	$12,119,726	$715,974,232	$73,804,280
Hawaii	$12,285,605	$12,781,595	$75,518,224	$77,805,228
Idaho	$8,901,052	$9,554,851	$54,771,824	$58,163,115
Illinois	$58,439,703	$83,318,855	$359,298,949	$507,468,639
Indiana	$39,785,624	$70,549,940	$244,693,396	$429,757,487
Iowa	$14,742,404	$23,003,598	$90,619,885	$140,058,381
Kansas	$23,817,857	$23,286,152	$146,476,312	$141,778,613
Kentucky	$27,955,675	$37,086,137	$171,840,367	$225,886,338
Louisiana	$85,225,197	$9,433,074	$523,938,102	$57,421,820
Maine	$9,293,476	$12,742,846	$57,193,191	$77,600,998
Maryland	$96,677,762	$10,767,731	$594,440,786	$65,618,306
Massachusetts	$68,913,152	$924,861	$423,601,336	$5,629,891
Michigan	$75,524,155	$47,622,166	$464,652,029	$290,069,839
Minnesota	$18,797,533	$29,470,173	$115,546,306	$179,521,569
Mississippi	$27,044,086	$5,078,889	$166,293,114	$30,916,650
Missouri	$101,692,401	$13,597,639	$625,554,300	$82,829,477
Montana	$8,636,935	$9,573,586	$53,090,258	$58,277,160
Nebraska	$29,301,985	$0	$180,397,120	$0
Nevada	$45,991,989	$5,846,903	$282,773,998	$35,591,773
New Hampshire	$8,322,507	$6,427,547	$51,157,507	$39,126,318
New Jersey	$109,354,345	$2,805,293	$672,548,865	$17,076,620
New Mexico	$13,942,173	$25,110,710	$85,700,959	$152,884,178
New York	$180,319,354	$8,906,704	$1,109,089,944	$54,262,583
North Carolina	$157,633,563	$9,604,437	$969,467,596	$58,493,731
North Dakota	$3,275,288	$6,439,797	$20,132,824	$39,200,887
Ohio	$45,655,900	$74,691,551	$280,901,671	$455,064,001
Oklahoma	$23,290,319	$46,105,388	$143,228,027	$280,934,969
Oregon	$55,863,031	$1,746,583	$343,651,557	$10,631,948
Pennsylvania	$108,558,767	$66,269,862	$667,725,303	$403,657,844
Rhode Island	$7,080,452	$4,056,849	$43,598,952	$24,695,199
South Carolina	$39,472,260	$66,818,121	$242,691,237	$406,907,991
South Dakota	$6,288,553	$7,068,861	$38,655,023	$43,030,178
Tennessee	$120,357,157	$5,263,503	$740,074,021	$32,040,450
Texas	$256,732,754	$171,879,782	$1,578,834,225	$1,046,851,823
Utah	$11,943,744	$16,389,659	$73,475,414	$99,849,092
Vermont	$14,164,529	$0	$87,067,754	$0
Virginia	$139,962,322	$756,879	$860,729,509	$4,607,336
Washington	$94,246,261	$0	$579,398,965	$0
West Virginia	$14,166,713	$6,348,284	$87,081,176	$38,643,819
Wisconsin	$33,236,374	$32,252,828	$204,437,903	$196,452,064
Wyoming	$5,105,082	$10,165,130	$31,380,362	$61,911,023
National	**$3,472,352,576**	**$1,458,458,383**	**$21,352,564,909**	**$8,883,274,558**
Puerto Rico	$15,612,206	$12,162,843	$95,966,463	$74,173,260

Sources: FARS 2017 ARF; Bureau of Labor Statistics; Blincoe et al., 2015.
*Economic costs include lost productivity, medical costs, legal and court costs, emergency service costs (EMS), insurance administration costs, congestion costs, property damage, and workplace losses.
**Comprehensive costs include economic costs plus valuation for lost quality of life.
Cost data from *The Economic and Societal Impact of Motor Vehicle Crashes, 2010 (Revised)*; DOT HS 812 013, May 2015.
State costs are adjusted for relative per-capita income; dollar amounts for the Nation will not equal the sum of the States.
Shaded States are those with laws requiring helmet use for all motorcyclists, at the time of publication.

https://www.med.wisc.edu/news-and-events/2018/march/study-destroys-myth-motorcycle-helmets-break-necks/

STUDY DESTROYS MYTH THAT MOTORCYCLE HELMETS BREAK NECKS

While some riders claim that motorcycle helmets can break necks during a crash, a University of Wisconsin-Madison study shows they have the opposite effect.

Nathaniel Brooks, MD, a UW Health neurosurgeon, looked at the outcomes of 1,061 motorcycle crash victims who arrived at University Hospital's Level One trauma center between January 1, 2010, and January 1, 2015. Wisconsin law doesn't require helmets for most motorcycle riders, and so fewer than a third of them, or 323, were wearing helmets at the time of their crashes.

The riders who did not wear helmets had twice as many injuries to the cervical spine, commonly known as the neck. The study found that 15.4 percent of riders without helmets received at least one cervical spine injury compared with 7.4 percent of those wearing helmets.

In addition, those without helmets had more than twice as many cervical spine fractures: 10.8 percent of the helmet-less riders broke a bone in their neck, compared with 4.6 percent of those with helmets. Ligament injuries to the neck were also more common without helmets.

While helmets have been documented to save lives, and decrease traumatic brain injury, some opponents of helmet laws have argued that they are more likely to cause neck fractures.

"Our study suggests that wearing a helmet would be a reasonable method to reduce the risk of cervical spine injury in a motorcycle crash,'' says Brooks, an associate professor of neurosurgery in the UW School of Medicine and Public Health.

His co-authors are neurosurgery residents Paul Page, MD, and Zhikui Wei, MD. The study is being published this month in the Journal of Neurosurgery: Spine.

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