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Motorcycle Crashes

THE TOPIC

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Motorcycle riding has become more popular in recent years, appealing to a new group of enthusiasts consisting of older and more affluent riders. Sales of all types of two-wheelers were about 1,087,000 in 2008. There were 7.1 million motorcycles on the road in 2007, according to the U.S. Department of Transportation. At the same time motorcycle fatalities have also been climbing, reaching 5,154 in 2007, the highest level since the Department of Transportation began collecting data in 1975. There has also been a dramatic jump in the number of deaths among motorcyclists age 40 and older in recent years.

Motorcycles are by their nature far less crashworthy than closed vehicles. They are also less visible to other drivers and pedestrians and less stable than four-wheel vehicles. Operating a motorcycle requires a different combination of physical and mental skills than those used in driving four-wheel vehicles. Motorcyclists and their passengers are more vulnerable to the hazards of weather and road conditions than drivers in closed vehicles.

Motorcycle insurance is widely available. As motorcycles became more popular, more insurers entered the market. Now, most of the top ten auto insurers offer motorcycle insurance, either as an endorsement to a personal automobile policy or as a separate policy, in most of the states in which they operate. Many have recently expanded into new states. For more information see Motorcycle Insurance in the Specialty Insurance section of the I.I.I. Web site.

KEY FACTS

- According to the U.S. Department of Transportation's National Highway Traffic Safety Administration (NHTSA), in 2007, 5,154 people died in motorcycle crashes, the highest level since NHTSA began collecting data in 1975. The 2007 figure represents a 6.6 percent from 4,837 the previous year.
- Motorcycle crash fatalities have increased every year for the past 10 years.
- According to the latest data available from the Federal Highway Administration, there were 7.1 million motorcycles on U.S. roads in 2007, compared with 137.8 million passenger cars. Motorcycles accounted for nearly 3 percent of all registered motor vehicles and 0.4 percent of vehicle miles traveled in 2007, according to the NHTSA.
- Some 123,000 motorcycles were involved in crashes in 2007, including property damage-only crashes, according to latest data from the NHTSA.
- Motorcyclists were 35 times more likely than passenger car occupants to die in a crash per vehicle mile traveled in 2006 and eight times more likely to be injured, according to NHTSA.
- The fatality rate per registered vehicle for motorcyclists in 2007 was 6 times the fatality rate for passenger car occupants, according to NHTSA.

FATALITIES AND INJURIES

Overall: According to the U.S. Department of Transportation's National Highway Traffic Safety Administration (NHTSA, <http://www.nhtsa.dot.gov>), the following new terms are now being used to define motorcycle occupants: a motorcycle rider is the operator only; a passenger is any person seated on the motorcycle but not in control of the motorcycle; and any combined reference to the motorcycle rider (operator) as well as the passenger will be referred to as motorcyclists.

NHTSA says that in 2007, 5,154 motorcyclists died in crashes, up 6.6 percent from 4,837 in 2006, marking the tenth consecutive year of higher motorcycle deaths. Motorcycle fatalities are at their highest level since NHTSA began collecting data in 1975. From 1997, a historic low, to 2007 motorcycle fatalities rose 144 percent. In 2007, 103,000 motorcyclists were injured in accidents, 15,000 more than in 2006 and up 94 percent from 53,000 in 1997.

In 2007 motorcyclists accounted for 13 percent of all traffic fatalities, 14 percent of all occupant fatalities and 4 percent of all occupants injured.

By Age: Older motorcyclists now account for half of all motorcyclist fatalities. NHTSA data show that in 2007, 49 percent of motorcyclists killed in crashes were age 40 or over, compared with 33 percent 10 years earlier. In contrast, fatalities among young motorcyclists have declined in the past 10 years, relative to other age groups. In 2007 fatalities in the under 30-year-old group dropped to 31 percent of total motorcyclists killed in crashes from 41 percent in 1997. Fatalities among motorcyclists in the 30-to 39-year-old group fell to 20 percent in 2007 from 26 percent ten years earlier.

By Driver Behavior:

Alcohol use: NHTSA says that in 2007, 27 percent of motorcycle riders involved in fatal crashes had a blood alcohol concentration (BAC) over 0.08 percent (the national definition of drunk driving), compared with 23 percent of drivers of passenger cars, 23 percent of light truck drivers and 1 percent of large truck drivers in fatal crashes.

Of all fatally injured motorcycle riders, 28 percent had BACs of 0.08 percent or higher in 2007. Another 8 percent had lower alcohol levels (0.01 to 0.07 percent BAC.). Fatally injured motorcycle riders between the ages of 45 to 49 had the highest percentage of BACs 0.08 percent and above (41 percent), compared with 37 percent for those ages 40 to 44. Of fatally injured motorcycle riders age 35 to 39, 35 percent had BACs of 0.08 percent and above. Forty-one percent of the 2,182 fatally injured motorcycle riders who died in single-vehicle crashes in 2007 (for example, those in which the motorcycle crashed into a stationary object) had BACs of 0.08 percent or higher. On weekend nights, the proportion was higher: 65 percent of motorcycle riders who died in single-vehicle crashes had BACs of 0.08 percent or higher.

Speeding: In 2007, 36 percent of all motorcycle riders involved in fatal crashes were speeding, compared with 24 percent for drivers of passenger cars, 19 percent for light truck drivers and 8 percent for large truck drivers, according to NHTSA.

Licensing: Twenty-six percent of motorcycle riders who were involved in fatal crashes were riding without a valid license in 2007, compared with 13 percent of passenger vehicle drivers. NHTSA says that motorcycle operators were also 1.3 times more likely than passenger vehicle drivers to have a prior license suspension or revocation.

By Type of Motorcycle:

According to the Insurance Institute for Highway Safety (IIHS), riders of "supersports" motorcycles have driver death rates per 10,000 registered vehicles nearly four times higher than for drivers of other types of motorcycles. Supersports have more horsepower than conventional motorcycles and can reach speeds of up to 190 mph. They are built on racing platforms and are modified for street use. The bikes are popular with riders under the age of 30. The bikes are light-weight and aerodynamically styled. In 2005, these bikes registered 22.5 driver deaths per 10,000 registered vehicles compared with 10.7 deaths for other sport models (related to supersports but do not have the acceleration, stability and handling of supersports). Standards and cruisers and touring bikes, with upright handlebars, have rates of 5.7 and 6.5 per 10,000 vehicles. In 2005, supersports accounted for 9 percent

of registrations, and standards and cruisers made up 51 percent of registrations. Among fatally injured drivers, the IIHS says that drivers of supersports were the youngest—with an average age of 27. Touring motorcycle drivers were the oldest, 51 years old. Fatally injured drivers of other sports models were 34, on average; standard and cruiser drivers were 44 years old. Speeding and driver error were bigger factors in supersport and sport fatal crashes. Speed was cited in 57 percent of supersport riders' fatal crashes in 2005 and in 46 percent for sport model riders. Speed was a factor in 27 of fatal crashes of riders of cruisers and standards, and for 22 percent of riders of touring models.

Collision Losses by Type: The IIHS says that supersports have the overall highest insurance losses under collision coverage among the motorcycle classes, almost four times higher than for touring models and more than six times higher than for cruisers. Nine of the ten motorcycles with the highest losses were supersports. Claim frequency is driving the high losses for supersports, meaning that they are involved in more collisions than other types of motorcycles—there were 9 claims per 100 insured vehicle years for supersports models, compared with 2.3 for all models. The models surveyed were all 2002-2006 models. Touring motorcycles had the most expensive claims because they are the most expensive to purchase. Supersport models are the most popular with thieves—with average loss payments for theft losses per insured vehicle years of \$246 for 2002-2006 models, seven times higher than the average for all motorcycles. Supersport models had the highest frequency of thefts—31.8 per insured vehicle year, compared with cruisers and touring models which had the lowest at 1.1 claims per insured vehicle year. However, touring models had the highest average loss payments—\$15,696, reflecting their high purchase price and upgrades.

Thefts: The National Insurance Crime Bureau (NICB) and LoJack Corporation, a manufacturer of electronic vehicle tracking and recovery systems, found that 67 percent of motorcycle owners who participated in an online survey are at high risk for motorcycle theft. The survey, which was conducted in July and August 2007, found that the high risk resulted from owners not taking precautions such as securing their motorcycles to an immovable object when parked, or arming their bikes with alarms, kill switches and recovery systems. Respondents scored better by applying common sense theft protection measures such as parking in a concealed area at home or in a well-lit area in a parking lot and never leaving the keys on a parked bike. According to the NICB, 71,523 motorcycles were stolen in 2006, a 137 percent rise since 2000.

SAFETY ISSUES

The Motorcycle Safety Foundation (MSF, <http://www.msf-usa.org>), sponsored by motorcycle manufacturers and distributors, works with the National Highway Traffic Safety Administration, state governments and other organizations to improve motorcycle safety through education, training and licensing. Since 1973 about 3.2 million motorcyclists have taken MSF training courses. The organization also works with the states to integrate rider safety and skills in licensing tests. It also promotes safety by recommending motorcycle operators wear protective gear, especially helmets, ride sober and ride within their skill limits.

Antilock Brakes: The Insurance Institute for Highway Safety (IIHS) released two studies in late 2008 that show that antilock brakes help reduce crashes. Stopping a motorcycle is more complex than stopping a car. Motorcycles have separate brakes for the front and rear wheels, and braking hard can lock the wheels and cause the bike to overturn. Not braking hard enough can put the rider into harm's way. One IIHS study compared collision insurance losses for 12 motorcycle models with antilock brakes, which are optional equipment, with the same models without the brakes. After accounting for other factors, the researchers found that insurance losses were 21 percent lower for bikes with antilock brakes, mainly because there were 19 percent fewer claims. However, they found that while having antilock brakes prevented some crashes, they did not decrease the cost of the crashes that did occur. In the second study, rates of fatal crashes for eight models were studied. There were 6.6 fatal crashes per 100,000 registered bikes without antilock brakes, and 4.1 for bikes with the brakes, a 38 percent difference.

Airbags: Honda Motorcycle Company is the first company to offer the option of an airbag, which is available on one of the most expensive models. The option became available in 2006. A handful of companies have recently developed wearable airbags, which are worn either inside a jacket or strapped on outside. No data on the effectiveness of these new items has been published.

Motorcycle Helmets: In 2007 motorcycle helmets saved 1,784 lives. NHTSA says that if all motorcyclists had worn helmets, 800 more lives would have been saved. Helmets are estimated to be 37 percent effective in preventing fatal injuries and 67 percent effective in preventing brain injuries.

A NHTSA study covering 10 states found that when universal helmet laws, which pertain to all riders, were repealed, helmet use rates dropped from 99 percent to 50 percent. In states where the universal law was reinstated, helmet use rates rose to above 95 percent.

Motorcycle Helmet Use Laws: According to the Insurance Institute for Highway Safety, 20 states and the District of Columbia had laws on the books requiring all motorcyclists to wear helmets as of March 2009 (See chart below). In another 27 states only people under a specific age (mostly between 17 and 20 years of age) were required to wear helmets. Three states (Illinois, Iowa and New Hampshire) had no helmet use laws.

According to NHTSA's National Occupant Protection Use Survey, a nationally representative observational survey, motorcycle helmet use rose to 63 percent in June 2008 from 58 percent in June 2007. Helmet use reached a high of 71 percent in October 2000. Use rates remain lower in states that do not require all riders to use helmets. In June 2008, 78 percent of motorcyclists in states requiring helmet use wore them, compared with 50 percent of motorcyclists in states that do not. Motorcycle helmet use was highest in the West, at 71 percent, and was 67 percent in the Midwest, 61 percent in the South and 45 percent in the Northeast. The survey counts only helmets that comply with Department of Transportation standards.

STATE MOTORCYCLE HELMET USE LAWS

As of March 2009

State	Universal law (1)	Partial law (1)
Alabama	X	
Alaska		17 and younger (2)
Arizona		17 and younger
Arkansas		20 and younger
California	X	
Colorado		17 and younger and their passengers 17 and younger
Connecticut		17 and younger
Delaware		18 and younger
District of Columbia	X	
Florida		20 and younger (3)
Georgia	X	
Hawaii		17 and younger

Idaho		17 and younger
Illinois		
Indiana		17 and younger
Iowa		
Kansas		17 and younger
Kentucky		20 and younger (3), (4)
Louisiana	X	
Maine		14 and younger (4)
Maryland	X	
Massachusetts	X	
Michigan	X	
Minnesota		17 and younger (4)
Mississippi	X	
Missouri	X	
Montana		17 and younger
Nebraska	X	
Nevada	X	
New Hampshire		
New Jersey	X	
New Mexico		17 and younger
New York	X	
North Carolina	X	
North Dakota		17 and younger (5)
Ohio		17 and younger (6)
Oklahoma		17 and younger
Oregon	X	
Pennsylvania		20 and younger (7)

Rhode Island		20 and younger (7)
South Carolina		20 and younger
South Dakota		17 and younger
Tennessee	X	
Texas		20 and younger (3)
Utah		17 and younger
Vermont	X	
Virginia	X	
Washington	X	
West Virginia	X	
Wisconsin		17 and younger (4)
Wyoming		17 and younger

(1) Universal laws cover all riders; partial laws cover young riders or some adult riders.

(2) Alaska's motorcycle helmet use law covers passengers of all ages, operators younger than 18, and operators with instructional permits.

(3) In Florida and Kentucky, the law requires that all riders younger than 21 years wear helmets, without exception. Those 21 years and older may ride without helmets only if they can show proof that they are covered by a medical insurance policy. Texas exempts riders 21 years or older if they either 1) can show proof of successfully completing a motorcycle operator training and safety course or 2) can show proof of having a medical insurance policy.

(4) Motorcycle helmet laws in Kentucky, Maine, Minnesota, and Wisconsin also cover operators with instructional/learner's permits. Maine's motorcycle helmet use law also covers passengers 14 years and younger and passengers if their operators are required to wear a helmet.

(5) North Dakota's motorcycle helmet use law covers all passengers traveling with operators who are covered by the law.

(6) Ohio's motorcycle helmet use law covers all operators during the first year of licensure and all passengers of operators who are covered by the law.

(7) Rhode Island's motorcycle helmet use law covers all operators during the first year of licensure and all passengers. Pennsylvania's motorcycle helmet use law covers all operators during the first two years of licensure unless the operator has completed the safety course approved by the Department of Transportation or the Motorcycle Safety Foundation.

Source: Insurance Institute for Highway Safety, Highway Loss Data Institute.

MOTORCYCLE HELMET USE, 1994-2008 (1)

<u>Year</u>	<u>Percent</u>	<u>Year</u>	<u>Percent</u>
1994	63%	2004	58%
1996	64	2005	48
1998	67	2006	51
2000	71	2007	58
2002	58	2008	63

(1) Based on surveys of motorcyclists using helmets meeting Department of Transportation standards. Surveys conducted in October for 1994-2000 and in June thereafter.

Source: U.S. Department of Transportation, National Occupant Protection Use Survey, National Highway Traffic Safety Administration's National Center for Statistics and Analysis.

MOTORCYCLIST FATALITIES AND FATALITY RATES, 1997-2007

Year	Fatalities	Registered motorcycles	Fatality rate per 100,000 registered vehicles	Vehicle miles traveled (millions)	Fatality rate per 100 million vehicle miles traveled
1997	2,116	3,826,373	55.30	10,081	20.99
1998	2,294	3,879,450	59.13	10,283	22.31
1999	2,483	4,152,433	59.80	10,584	23.46
2000	2,897	4,346,068	66.66	10,469	27.67
2001	3,197	4,903,056	65.20	9,639	33.17
2002	3,270	5,004,156	65.35	9,552	34.23
2003	3,714	5,370,035	68.16	9,577	38.78
2004	4,028	5,767,934	69.83	10,122	39.79
2005	4,576	6,227,146	73.48	10,454	43.77
2006	4,837	6,678,958	72.42	12,049	40.14
2007	5,154	7,138,476	72.20	13,612	37.86

Source: U.S. Department of Transportation, National Highway Traffic Safety Administration; Federal Highway Administration.

MOTORCYCLIST INJURIES AND INJURY RATES, 1997-2007

<u>Year</u>	<u>Injuries</u>	<u>Registered motorcycles</u>	<u>Injury rate per 100,000 registered motorcycles</u>	<u>Vehicle miles traveled (millions)</u>	<u>Injury rate per 100 million vehicle miles traveled</u>
1997	53,000	3,826,373	1,374	10,081	522
1998	49,000	3,879,450	1,262	10,283	476
1999	50,000	4,152,433	1,204	10,584	472
2000	58,000	4,346,068	1,328	10,469	551
2001	60,000	4,903,056	1,229	9,639	625
2002	65,000	5,004,156	1,293	9,552	677
2003	67,000	5,370,035	1,250	9,577	701
2004	76,000	5,767,934	1,324	10,122	755
2005	87,000	6,227,146	1,402	10,454	835
2006	88,000	6,678,958	1,312	12,049	727
2007	103,000	7,138,476	1,443	13,612	757

Source: U.S. Department of Transportation, National Highway Traffic Safety Administration; Federal Highway Administration.

OCCUPANT FATALITY RATES BY VEHICLE TYPE, 1997 AND 2007

<u>Fatality rate</u>	<u>Motorcycles</u>	<u>Passenger cars</u>	<u>Light trucks</u>
1997			
Per 100,000 registered vehicles	55.30	17.81	15.23
Per 100 million vehicle miles traveled	20.99	1.45	1.24
2007			
Per 100,000 registered vehicles	72.20	11.99	12.29

Per 100 million vehicle miles traveled	37.86	1.03	1.05
Percent Change, 1997-2007			
Per 100,000 registered vehicles	30.6%	-32.7%	-
Per 100 million vehicle miles traveled	80.4	-29.0	-15.3
Source: U.S. Department of Transportation, National Highway Traffic Safety Administration.			

MOTORCYCLE RIDERS KILLED OR INJURED BY TIME OF DAY AND DAY OF WEEK, 2007

	Day of week				Total	
	Weekday		Weekend			
Time of day	Number	Percent	Number	Percent	Number	Percent
Motorcycle riders killed						
Midnight to 3 am	188	7.3%	297	11.5%	485	9.4%
3 am to 6 am	82	3.2	108	4.2	190	3.7
6 am to 9 am	191	7.4	61	2.4	252	4.9
9 am to Noon	199	7.8	213	8.3	412	8.0
Noon to 3 pm	361	14.1	417	16.2	778	15.1
3 pm to 6 pm	645	25.2	514	20.0	1,159	22.5
6 pm to 9 pm	534	20.8	578	22.4	1,112	21.6
9 pm to Midnight	350	13.7	366	14.2	716	13.9

Unknown	14	0.5	22	0.9	50.0	1.0
Total	2,564	100.0	2,576	100.0	5,154 (1)	100.0
Motorcycle riders injured						
Midnight to 3 am	2,000	2.8	3,000	6.5	5,000	4.4
3 am to 6 am	1,000	1.7	(2)	1.1	1,000	1.4
6 am to 9 am	5,000	8.7	1,000	3.0	6,000	6.1
9 am to Noon	6,000	10.0	7,000	14.3	12,000	11.9
Noon to 3 pm	10,000	17.6	9,000	19.5	19,000	18.4
3 pm to 6 pm	18,000	31.2	11,000	24.8	29,000	28.4
6 pm to 9 pm	10,000	18.0	9,000	19.6	19,000	18.8
9 pm to Midnight	6,000	10.0	5,000	11.2	11,000	10.5
Total	57,000	100.0	46,000	100.0	103,000	100.0
<p>(1) Includes 14 motorcycle riders killed on unknown day of week. (2) Less than 500.</p> <p>Source: U.S. Department of Transportation, National Highway Traffic Safety Administration.</p>						

VEHICLES INVOLVED IN CRASHES BY VEHICLE TYPE AND CRASH SEVERITY, 2007

Vehicle type	Crash severity						Total	
	Fatal		Injury		Property damage only			
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Passenger car	22,716	40.6%	1,708,000	55.8%	4,014,000	54.0%	5,745,000	54.5%
Light truck	21,686	38.8	1,163,000	37.9	3,007,000	40.5	4,192,000	39.7
Large truck	4,584	8.2	76,000	2.5	333,000	4.5	413,000	3.9
Motorcycle	5,286	9.5	98,000	3.2	20,000	0.3	123,000	1.2
Bus	278	0.5	11,000	0.3	46,000	0.6	57,000	0.5
Other	661	1.2	9,000	0.3	11,000	0.1	20,000	0.2
Total	55,926 (1)	100.0	3,064,000	100.0	7,431,000	100.0	10,551,000	100.0

(1) Includes 715 vehicles of unknown type involved in fatal crashes.
Source: U.S. Department of Transportation, National Highway Traffic Safety Administration.

PERSONS KILLED IN TOTAL AND ALCOHOL-IMPAIRED CRASHES BY PERSON TYPE, 2007

Person type	Total killed	Alcohol-impaired-driving fatalities (1)	
		Number	Percent
Vehicle occupants			
Driver	21,647	8,073	37%
Passenger	8,657	2,529	29
Unknown occupant	97	5	5
Total	30,401	10,606	35
Motorcyclists	5,154	1,620	31
Nonoccupants			
Pedestrian	4,654	660	14
Pedalcyclist	698	87	12

Other/unknown	152	27	17
Total	5,504	773	14
Total	41,059	12,998	32%

(1) Alcohol-impaired driving crashes are crashes that involve at least one driver or a motorcycle operator with a blood alcohol concentration (BAC) of 0.08 percent or above, the legal definition of drunk driving.

Source: U.S. Department of Transportation, National Highway Traffic Safety Administration.

DRIVERS IN FATAL CRASHES BY BLOOD ALCOHOL CONCENTRATION (BAC) AND VEHICLE TYPE, 1997-2007 (1)

Year	Passenger car			Light truck			Large truck			Motorcycles		
	Total	Percent		Total	Percent		Total	Percent		Total	Percent	
		BAC = 0.01+	BAC = 0.08+		BAC = 0.01+	BAC = 0.08+		BAC = 0.01+	BAC = 0.08+		BAC = 0.01+	BAC = 0.08+
1997	29,896	26%	22%	18,502	26%	23%	4,859	3%	2%	2,159	41%	32%
1998	28,907	26	21	19,247	26	22	4,905	2	1	2,333	41	34
1999	27,878	25	21	19,865	26	22	4,868	3	1	2,528	40	33
2000	27,661	28	24	20,393	26	22	4,948	3	1	2,971	40	32
2001	27,444	27	23	20,704	27	23	4,779	2	1	3,261	37	29
2002	27,236	27	22	21,562	27	23	4,550	3	2	3,363	39	31
2003	26,422	26	22	22,172	25	22	4,658	2	1	3,800	36	29
2004	25,568	27	23	22,367	25	21	4,837	2	1	4,116	34	27
2005	25,046	28	24	22,879	25	22	4,900	3	1	4,679	34	27
2006	24,162	27	23	22,307	28	24	4,729	2	1	4,961	34	26
2007	22,621	27	23	21,591	27	23	4,551	2	1	5,286	35	27

(1) NHTSA estimates alcohol involvement when alcohol test results are unknown.

Source: U.S. Department of Transportation, National Highway Traffic Safety Administration.

KEY SOURCES OF ADDITIONAL INFORMATION

Insurance Institute for Highway Safety: <http://www.highwaysafety.org>

U.S. Department of Transportation, National Highway Traffic Safety Administration: <http://www.nhtsa.dot.gov>

The Motorcycle Safety Foundation: <http://www.msf-usa.org>

The Motorcycle Industry Council: <http://www.mic.org>

Advocates for Highway and Auto Safety: <http://www.saferoads.org>

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