

Motorcycle Crashes and Injuries, Data Supplement

MINNESOTA

Motorcycle Injuries

There were 17,569 total motorcycle injuries (2001-2010):ⁱ

Motorcycle injuries, 2001: 1467
Motorcycle injuries, 2002: 1359
Motorcycle injuries, 2003: 1658
Motorcycle injuries, 2004: 1642
Motorcycle injuries, 2005: 1739
Motorcycle injuries, 2006: 1839
Motorcycle injuries, 2007: 1899
Motorcycle injuries, 2008: 2054
Motorcycle injuries, 2009: 1941
Motorcycle injuries, 2010: 1971

There were 2,877 motorcycle injuries that included a traumatic brain injury (2001-2010):ⁱ

Motorcycle injuries including a TBI, 2001: 175
Motorcycle injuries including a TBI, 2002: 169
Motorcycle injuries including a TBI, 2003: 258
Motorcycle injuries including a TBI, 2004: 280
Motorcycle injuries including a TBI, 2005: 292
Motorcycle injuries including a TBI, 2006: 323
Motorcycle injuries including a TBI, 2007: 358
Motorcycle injuries including a TBI, 2008: 357
Motorcycle injuries including a TBI, 2009: 333
Motorcycle injuries including a TBI, 2010: 332

In a ten-year period, 16.4% of motorcycle injuries included a TBI (2001-2010).ⁱ

Percent of motorcycle injuries that included a TBI, 2001: 11.9%
Percent of motorcycle injuries that included a TBI, 2002: 12.4%
Percent of motorcycle injuries that included a TBI, 2003: 15.6%
Percent of motorcycle injuries that included a TBI, 2004: 17.1%
Percent of motorcycle injuries that included a TBI, 2005: 16.8%
Percent of motorcycle injuries that included a TBI, 2006: 17.6%
Percent of motorcycle injuries that included a TBI, 2007: 18.9%
Percent of motorcycle injuries that included a TBI, 2008: 17.4%
Percent of motorcycle injuries that included a TBI, 2009: 17.2%
Percent of motorcycle injuries that included a TBI, 2010: 16.8%

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Motorcycle injuries by age group over a ten-year period (2001-2010):ⁱ

Ages 0-10: 254
Ages 11-20: 2350
Ages 21-30: 4110
Ages 31-40: 3361
Ages 41-50: 3893
Ages 51-60: 2671
Ages 61-70: 760
Ages 71-80: 133
Ages 81-90: 29

The number of motorcycle injuries increased for most age groups in Minnesota between 2001-2010.ⁱ

Ages 0-10, percent change: -28%
Ages 11-20, percent change: -16%
Ages 21-30, percent change: 20%
Ages 31-40, percent change: -30%
Ages 41-50, percent change: 47%
Ages 51-60, percent change: 139%
Ages 61-70, percent change: 384%
Ages 71-80, percent change: 200%
Ages 81-90, percent change: 150%

Motorcycle crashes, compared to crashes involving other types of vehicles, have higher injury and fatality rates (2010).ⁱⁱ

Fatal injuries:

For every 100 crashes in Minnesota, 0.5 are fatal.

For every 100 motorcycle crashes in Minnesota, 3.2 are fatal.

Nonfatal injuries:

Less than a fifth (17.6%) of automobile operators/passengers were injured.

The majority (83.8%) of motorcyclists were injured.

Hospital Treatment for Motorcycle Injuries

In a two-year period, 1793 motorcyclists received hospital treatment for injuries sustained in a motorcycle crash (2004-2005).ⁱⁱⁱ

Of those receiving hospital treatment:

56% were bareheaded

18% were speeding

13% were alcohol or drug impaired

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Hospital Charges for Motorcycle Injuries

In a two-year period, total hospital charges for motorcycle injury were \$39.6 million (2004-2005).ⁱⁱⁱ

If all riders had worn a helmet, the projected savings is \$986,000.

If no rider had been speeding, the projected savings is \$780,000.

If no rider had been alcohol or drug impaired, the projected savings is \$629,000.

| Hospital Charges: All Injuries vs. Injuries Including TBIⁱ | | |
|--|----------------------|----------------------|
| Year | Dollars | TBI Dollars |
| 2001 | 13,521,930 | 6,139,155 |
| 2002 | 12,112,160 | 5,107,803 |
| 2003 | 17,691,050 | 8,519,498 |
| 2004 | 19,491,896 | 10,319,785 |
| 2005 | 23,992,380 | 11,202,902 |
| 2006 | 26,949,943 | 12,822,591 |
| 2007 | 39,267,829 | 25,584,137 |
| 2008 | 39,526,963 | 22,382,055 |
| 2009 | 36,222,079 | 18,973,917 |
| 2010 | 37,563,929 | 17,433,315 |
| TOTAL | \$266,340,159 | \$138,485,158 |

Hospital Charges by Payer

Dollars paid by private sources (2001 – 2010):ⁱ

All injuries: \$180,806,722

Injuries including a TBI: \$93,195,685

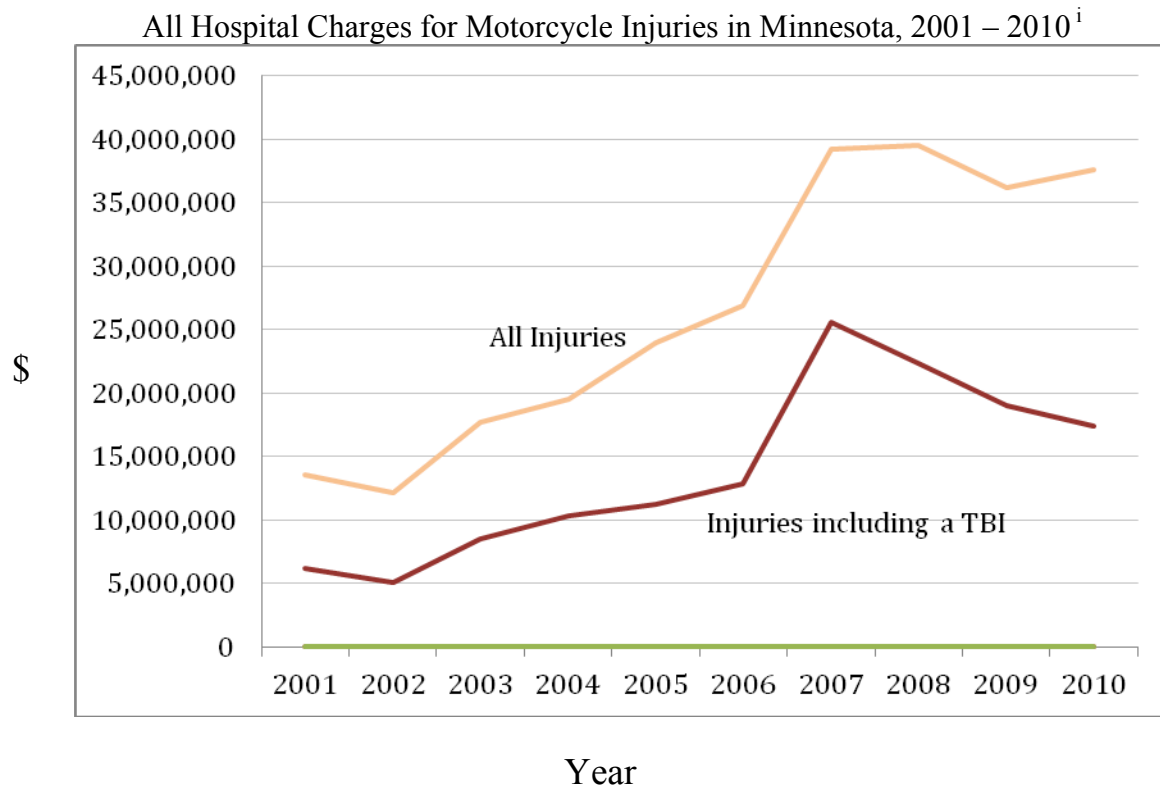
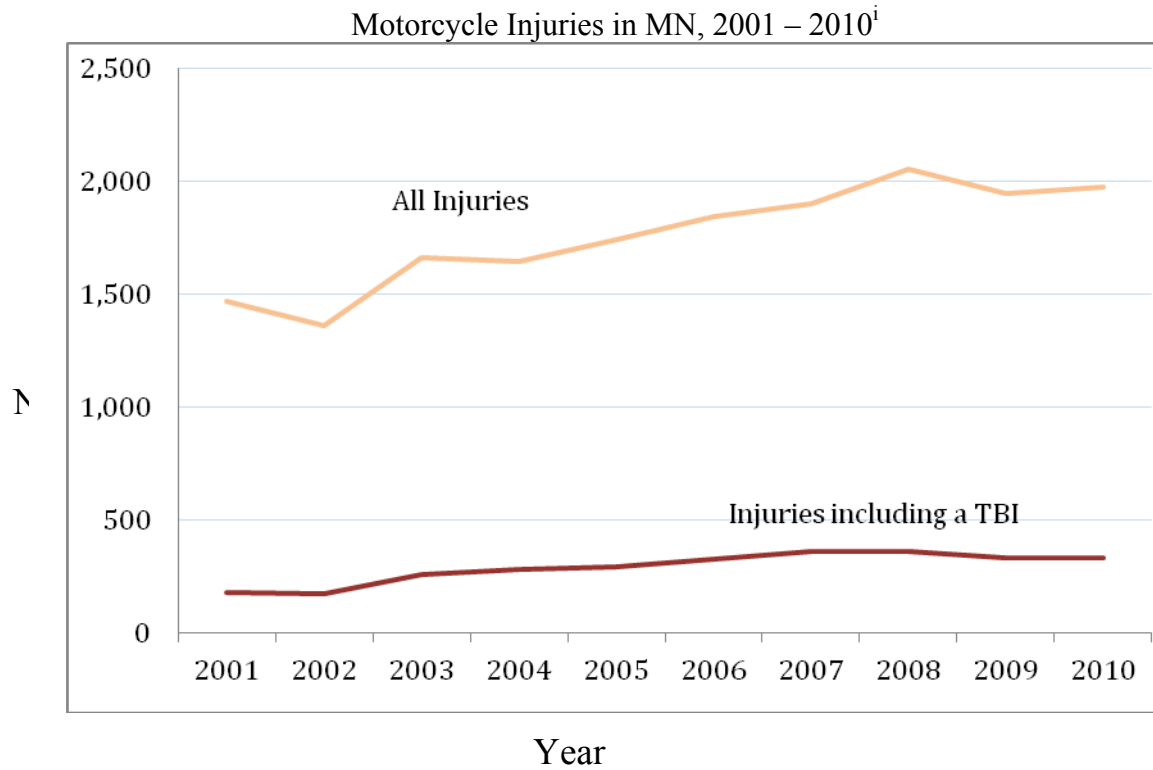
Dollars paid by state health insurance sources (2001 – 2010):ⁱ

All injuries: \$59,462,078

Injuries including a TBI: \$40,032,659

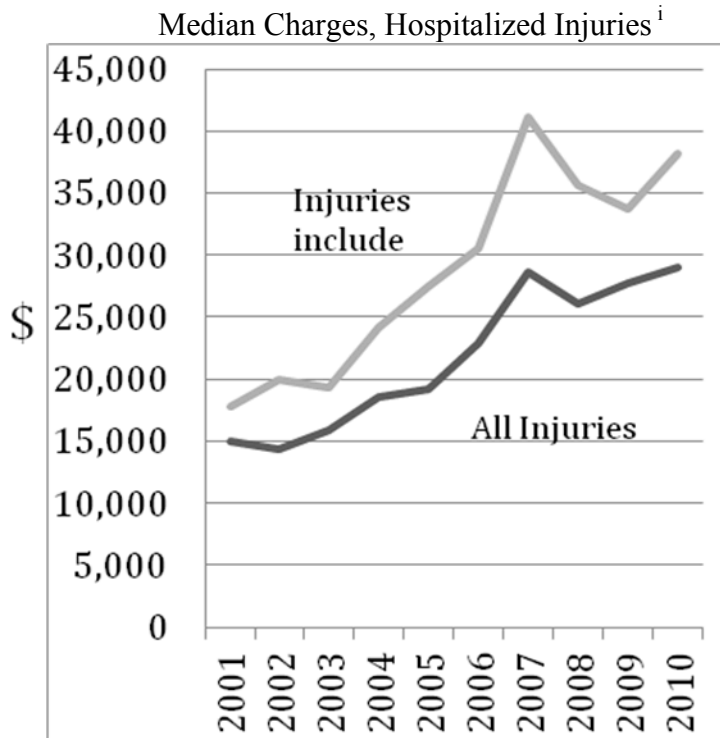
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TBI injuries compared to TBI hospital costs

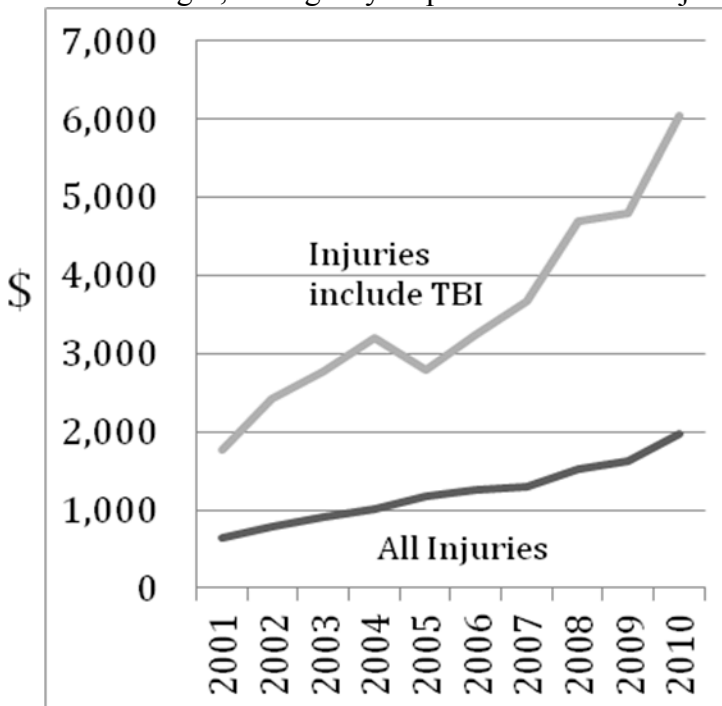


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Median charges for injuries including TBI compared to median charges for all injuries

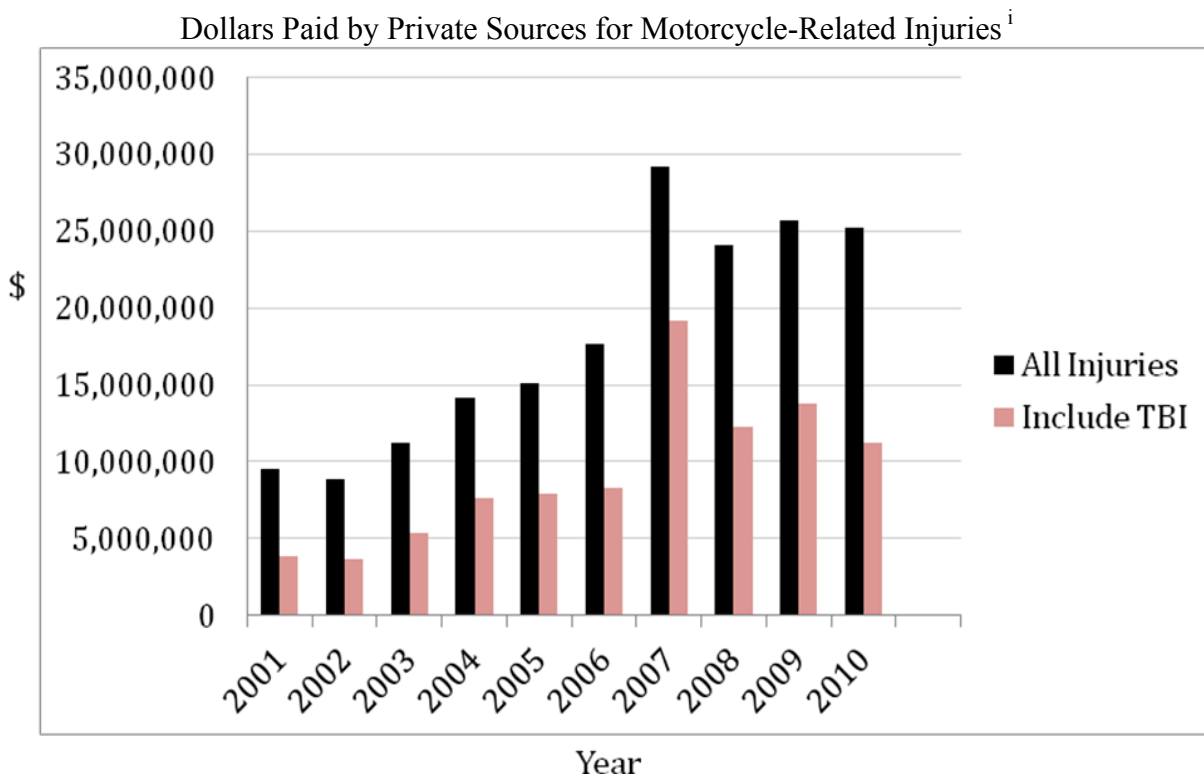
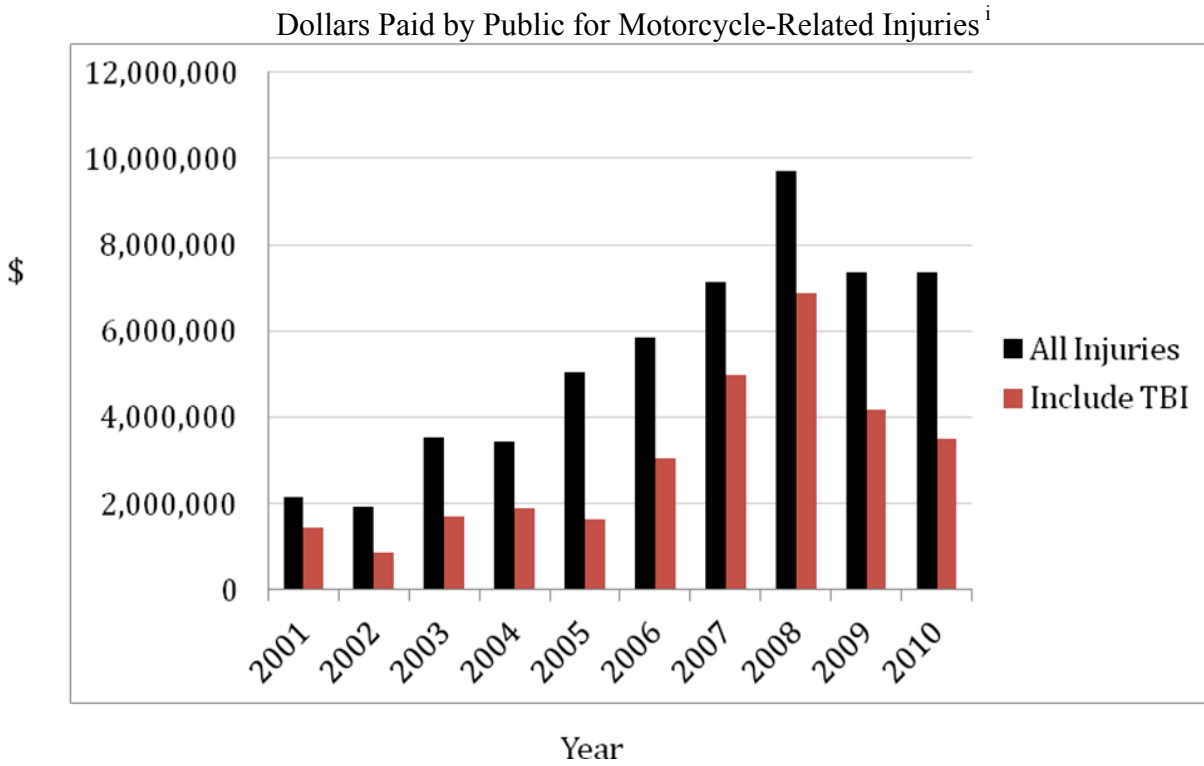


Median Charges, Emergency Department Treated Injuriesⁱ



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Private pay for hospital costs compared to public pay for hospital costs



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NATIONAL & OTHER STATES

Crash Statistics:

Total number of motorcycle crashes, 2009:^{iv} 106,000

Total number of motorcycle crashes, 2008:^v 114,000

Total number of motorcycle crashes, 2007:^{vi} 123,000

Injury Statistics:

Higher likelihood of injuries (fatal and nonfatal) in a crash, compared to other vehicles (2009).^{vii}

2009 fatality rates by vehicle type:^{vii}

- Motorcycles, per 100 million vehicle miles traveled (2009): 21.45
- Passenger cars, per 100 million vehicle miles traveled (2009): 0.87

2009 injury rate by vehicle type:^{vii}

- Motorcycles, per 100 million vehicle miles traveled (2009): 431
- Passenger cars, per 100 million vehicle miles traveled (2009): 81

2003-2005 injury status and treatment after crash:^{viii}

Not injured: 15.8%

Injured, but no hospital record: 40.3%

Injured, treated at Emergency Department: 26.2%

Injured, hospitalized: 14.1%

Killed: 3.6%

Of motorcyclists receiving hospital treatment for their injuries, 26.4% had a head/face injury, 13.6% had a TBI, and 3.7% had a potential TBI (2003-2005).^{viii}

Motorcyclists with a TBI, compared to those without, were more likely to be discharged dead or to a long-term care or rehabilitation facility. (2003-2005).^{viii}

- Motorcyclists without TBI discharged home: 85%
- Motorcyclists with severe TBI discharged home: 56%

Hospital Charges

TBI and hospital charges at time of crash (2003-2005):^{viii}

Median hospital cost of a motorcyclist without TBI: \$2,461

Median hospital cost of a motorcyclist with a mild/moderate TBI: \$9,792

Median hospital cost of a motorcyclist with a severe TBI: \$31,979

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Head/Facial injury and hospital charges at time of crash (2003-2005):^{viii}

- Median hospital cost of a motorcyclist without head/facial injury: \$2,285
- Median hospital cost of a motorcyclist with minor head/facial injuries: \$3,786
- Median hospital cost of a motorcyclist with moderate head/facial injuries: \$10,205
- Median hospital cost of a motorcyclist with serious head/facial injuries: \$25,430
- Median hospital cost of a motorcyclist with severe head/facial injuries: \$32,954
- Median hospital cost of a motorcyclist with critical-maximum head/facial injuries: \$73,179

Cost of Motorcycle Injury

Lifetime Cost of Motorcycle Injury (2005):^{ix}

- Fatal injuries: \$6.908 billion
- Nonfatal, hospitalized injuries: \$3.992 billion
- Nonfatal, Emergency Department-treated and released injuries: \$1.046 billion
- Total cost: \$11.946 billion

Injury Prevention

Bareheaded Riding:

Motorcyclists who ride bareheaded are more likely to sustain a head injury, traumatic brain injury, or facial injury than those riders who to wear helmets.

National, 2003-2005^{viii}

- Head injury, bareheaded riders: 20%
- Head injury, helmeted riders: 12%

National, 2003-2005^{viii}

- Severe TBI, bareheaded riders: 7.3%
- Severe TBI, helmeted riders: 4.7%

National, 2003-2005^{viii}

- Face injury, bareheaded riders: 22%
- Face injury, helmeted riders: 13%

Meta-analysis, 2008^x

- Head injury¹: Helmet use reduced head injury by 69% (combined adjusted estimate, OR=0.31; 95% CI 0.25 to 0.38)

¹ Includes ICD-9 codes for TBI, skull fracture, or head injury; brain injury, cerebral concussion, skull fracture, clinically proven unconsciousness, amnesia, or neurologic sequelae; and head injury defined by AIS codes.

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Wisconsin, 2002^{xi}

- Head injury², bareheaded riders: Bareheaded riders had 2.3x the odds of head injury than those wearing helmets (adjusted estimate, OR=2.3; 95% CI 1.5 to 3.3)
- Face Injury², bareheaded riders: Bareheaded riders had 2.9x the odds of face injury compared to riders wearing helmets (adjusted estimate, OR=2.9; 95% CI 2.1 to 4.2).

Washington, 1989^{xii}

- Head injury³, all riders: Bareheaded riders had 3.1x the odds of head injury after a crash compared to riders wearing helmets (adjusted estimate, OR=3.1; 95% CI 2.0 to 4.8).
- Head injury³, hospitalized riders: Bareheaded riders hospitalized after a crash were almost three times as likely to have had a head injury (RR = 2.9; 95% CI 2.0 to 4.4) and almost four times as likely to have a severe head injury (RR = 3.7; 95% CI 1.9 to 7.3).

Head injury³, hospitalized bareheaded riders: 8.4%

Head injury³, hospitalized helmeted riders: 2.8%

Severe head injury³, hospitalized bareheaded riders: 3.6%

Severe head injury³, hospitalized helmeted riders: 1.0%

Effectiveness of wearing a helmet in a single-vehicle crash (adjusted; National, 2003-2005):^{viii}

- Helmet use decreased the risk of moderate to severe head or facial injury by 40%
- Helmet use decreased the risk of TBI by 41%

Effectiveness of wearing a helmet in a multiple-vehicle crash (adjusted; National, 2003-2005):^{viii}

- Helmet use decreased the risk of moderate to severe head or facial injury by 22%
- Helmet use decreased the risk of TBI by 25%

Speeding (adjusted; National, 2003-2005):^{viii}

- An estimated 16.1% of crashes were speed-related (e.g. vehicle was speeding at time of crash).
- Speeding increased the risk of moderate to severe head or facial injury by 60%.
- Speeding increased the risk of TBI by about 47%.

² Injury classification based on AIS scores.

³ ICD-9 codes for head injury mapped to AIS scores.

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Impaired Driving (adjusted; National, 2003-2005):^{viii}

- An estimated 7.6% of crashes were related to drug or alcohol impairment of the driver.
- Impaired driving increased the risk of moderate to severe head or facial injury by 115%.
- Impaired driving increased the risk of TBI by 104%.

ⁱ Minnesota Department of Health, Injury and Violence Prevention Unit (April 2012).

ⁱⁱ Department of Public Safety, Office of Traffic Safety (2011). Minnesota Motor Vehicle Crash Facts. Retrieved 12 March 2012 from: <https://dps.mn.gov/divisions/ots/educational-materials/Documents/CRASH-FACTS-2010.pdf>

ⁱⁱⁱ Minnesota Department of Health, Injury and Violence Prevention Unit (2010).

^{iv} U.S. Department of Transportation, National Highway Traffic Safety Administration (2011). FARS/GES 2009 Data Summary. Retrieved 25 March 2012 from: <http://www-nrd.nhtsa.dot.gov/Pubs/811401.pdf>

^v U.S. Department of Transportation, National Highway Traffic Safety Administration (2010). FARS/GES 2008 Data Summary. Retrieved 25 March 2012 from: <http://www-nrd.nhtsa.dot.gov/Pubs/811171.pdf>

^{vi} U.S. Department of Transportation, National Highway Traffic Safety Administration (2009). FARS/GES 2007 Data Summary. Retrieved 25 March 2012 from: <http://www-nrd.nhtsa.dot.gov/Pubs/811003.pdf>

^{vii} U.S. Department of Transportation, National Highway Traffic Safety Administration (2011). Traffic Safety Facts: 2009 Data. Retrieved 19 March 2012 from: <http://www-nrd.nhtsa.dot.gov/Pubs/811389.pdf>

^{viii} National Highway Traffic Safety Administration (2009). Motorcycle Helmet Use and Head and Facial Injuries; Crash Outcomes in CODES-Linked Data. Retrieved 12 March 2012 from: <http://www-nrd.nhtsa.dot.gov/Pubs/811208.pdf>

^{ix} Naumann R, Dellinger A, Zaloshnja, E, et al. (2010). Incidence and Total Lifetime Costs of Motor Vehicle-Related Fatal and Nonfatal Injury by Road User Type, US, 2005. *Traffic Injury Prevention, 11*, 353-360.

^x Liu, BC, Ivers, R, Norton, R, et al. (2008). Helmets for preventing injury in motorcycle riders (Review). The Cochrane Collaboration, Issue 1.

^{xi} Sauter, C, Zhu, S, Allen, S, et al. (2005). Increased Risk of Death or Disability in Unhelmeted Wisconsin Motorcyclists. *Wisconsin Medical Journal, 104*(2), p.39-44.

^{xii} Rowland, J, Rivara, F, Salzberg, P. (1996). Motorcycle Helmet Use and Injury Outcome and Hospitalization Costs from Crashes in Washington State. *American Journal of Public Health, 86*, p.41-45