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): ¹

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Injuries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ages 0-10</td>
<td>254</td>
</tr>
<tr>
<td>Ages 11-20</td>
<td>2350</td>
</tr>
<tr>
<td>Ages 21-30</td>
<td>4110</td>
</tr>
<tr>
<td>Ages 31-40</td>
<td>3361</td>
</tr>
<tr>
<td>Ages 41-50</td>
<td>3893</td>
</tr>
<tr>
<td>Ages 51-60</td>
<td>2671</td>
</tr>
<tr>
<td>Ages 61-70</td>
<td>760</td>
</tr>
<tr>
<td>Ages 71-80</td>
<td>133</td>
</tr>
<tr>
<td>Ages 81-90</td>
<td>29</td>
</tr>
</tbody>
</table>

The number of motorcycle injuries increased for most age groups in Minnesota between 2001-2010. ¹

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Percent Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ages 0-10</td>
<td>-28%</td>
</tr>
<tr>
<td>Ages 11-20</td>
<td>-16%</td>
</tr>
<tr>
<td>Ages 21-30</td>
<td>20%</td>
</tr>
<tr>
<td>Ages 31-40</td>
<td>-30%</td>
</tr>
<tr>
<td>Ages 41-50</td>
<td>47%</td>
</tr>
<tr>
<td>Ages 51-60</td>
<td>139%</td>
</tr>
<tr>
<td>Ages 61-70</td>
<td>384%</td>
</tr>
<tr>
<td>Ages 71-80</td>
<td>200%</td>
</tr>
<tr>
<td>Ages 81-90</td>
<td>150%</td>
</tr>
</tbody>
</table>

Motorcycle crashes, compared to crashes involving other types of vehicles, have higher injury and fatality rates (2010). ²

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). ³

Of those receiving hospital treatment:
56% were bareheaded
18% were speeding
13% were alcohol or drug impaired
Motorcycle Crashes and Injuries, Data Supplement

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.

<table>
<thead>
<tr>
<th>Year</th>
<th>Dollars</th>
<th>TBI Dollars</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>13,521,930</td>
<td>6,139,155</td>
</tr>
<tr>
<td>2002</td>
<td>12,112,160</td>
<td>5,107,803</td>
</tr>
<tr>
<td>2003</td>
<td>17,691,050</td>
<td>8,519,498</td>
</tr>
<tr>
<td>2004</td>
<td>19,491,896</td>
<td>10,319,785</td>
</tr>
<tr>
<td>2005</td>
<td>23,992,380</td>
<td>11,202,902</td>
</tr>
<tr>
<td>2006</td>
<td>26,949,943</td>
<td>12,822,591</td>
</tr>
<tr>
<td>2007</td>
<td>39,267,829</td>
<td>25,584,137</td>
</tr>
<tr>
<td>2008</td>
<td>39,526,963</td>
<td>22,382,055</td>
</tr>
<tr>
<td>2009</td>
<td>36,222,079</td>
<td>18,973,917</td>
</tr>
<tr>
<td>2010</td>
<td>37,563,929</td>
<td>17,433,315</td>
</tr>
<tr>
<td>TOTAL</td>
<td>$266,340,159</td>
<td>$138,485,158</td>
</tr>
</tbody>
</table>

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

Motorcycle Injuries in MN, 2001 – 2010

All Hospital Charges for Motorcycle Injuries in Minnesota, 2001 – 2010
Median charges for injuries including TBI compared to median charges for all injuries

Median Charges, Hospitalized Injuries

Median Charges, Emergency Department Treated Injuries
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Private pay for hospital costs compared to public pay for hospital costs

Dollars Paid by Public for Motorcycle-Related Injuries

![Graph showing dollars paid by public for motorcycle-related injuries from 2001 to 2010.]

Dollars Paid by Private Sources for Motorcycle-Related Injuries

![Graph showing dollars paid by private sources for motorcycle-related injuries from 2001 to 2010.]

\(^1\) Data includes TBI.
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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)

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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\textsuperscript{xi}

- Head injury\textsuperscript{2}, 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 Injury\textsuperscript{2}, 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\textsuperscript{xii}

- Head injury\textsuperscript{3}, 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 injury\textsuperscript{3}, 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).

<table>
<thead>
<tr>
<th>Injuries</th>
<th>Bareheaded</th>
<th>Helmeted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Head injury\textsuperscript{3}, hospitalized bareheaded riders</td>
<td>8.4%</td>
<td>2.8%</td>
</tr>
<tr>
<td>Severe head injury\textsuperscript{3}, hospitalized bareheaded riders</td>
<td>3.6%</td>
<td>1.0%</td>
</tr>
</tbody>
</table>

Effectiveness of wearing a helmet in a single-vehicle crash (adjusted; National, 2003-2005): \textsuperscript{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): \textsuperscript{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): \textsuperscript{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%.

\textsuperscript{2} Injury classification based on AIS scores.
\textsuperscript{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%.

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i Minnesota Department of Health, Injury and Violence Prevention Unit (April 2012).
iii Minnesota Department of Health, Injury and Violence Prevention Unit (2010).