



Data Linkage Results

Motorcycle Crashes, Oklahoma, 2009

According to National Highway Traffic Safety Administration data, motorcyclist fatalities have decreased nationally from over 5,000 in 2007 and 2008 to 4,462 in 2009. However, in Oklahoma, the number of motorcyclist deaths has increased each year from 65 in 2006 to 106 in 2009. The Oklahoma Traffic Data Linkage Project (TDLP) is a joint effort between the Oklahoma State Department of Health and the Oklahoma Highway Safety Office to link statewide traffic crash and health outcome databases. This report describes the circumstances, costs, and outcomes of persons involved in motorcycle crashes.

Inclusion of Cases

Motorcycle-related crashes were identified from the traffic crash database as all incidents involving a motorcycle. Motorcycle occupants included all drivers and any injured passengers.

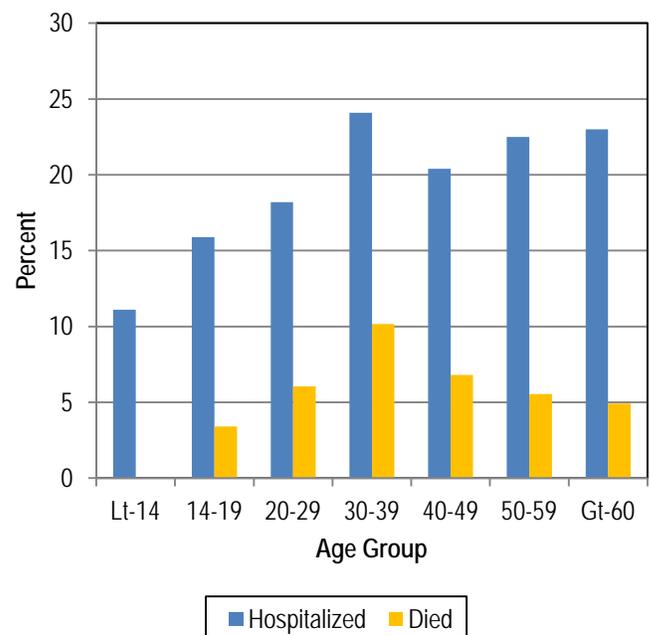
Introduction and Demographics

- Of a total of 71,218 traffic crashes reported in 2009, 1,406 (2%) were motorcycle-related and involved 1601 individuals that were either drivers [1,437 (90%)] or passengers [164 (10%)] of a motorcycle.
- Though only 2% of crashes were motorcycle-related, motorcyclists accounted for 14% of persons identified as having an inpatient hospitalization and 14% of persons who died.
- 420 motorcyclists were hospitalized [334 (21%)] or died [106 (6.6%)] as a result of the crash compared to 1.7% hospitalized and 0.4% died among persons in a car or pick-up truck crash. Additionally, a record of emergency medical services (EMS) response was found for 1,092 (68%) individuals in motorcycle crashes.
- The mean age of motorcycle drivers and passengers was 39 years with a range of 4-85 years. 86% were male. Among males, 98.6% were the driver of the motorcycle, whereas among females, only 35% were the driver.
- The 30-39 year old group had the highest percentage of persons who were hospitalized or died – **Figure 1**.

Crash Circumstances

- There were 649 (46%) single vehicle crashes, 700 (50%) involving multiple vehicles, and 57 (4%) involving animals or pedestrians.
- More motorcyclists injured in single vehicle crashes were hospitalized or died (31%) as compared to those involved in multi-vehicle crashes (22%).
- 75% of the crashes occurred between noon and midnight with the peak number [364 (26%)] of crashes occurring between 3pm and 6pm. 37% of the crashes occurred on a Friday (18%) or Saturday (19%).
- 59% of the crashes occurred in an urban area and two-thirds of these crashes involved multiple vehicles – 21% of motorcyclists involved in urban crashes were either hospitalized or died. 29% of the crashes occurred on a rural highway or county road – 35% of motorcyclists in this group were hospitalized or died. The remaining 12% were injured on another interstate or turnpike – 32% were hospitalized or died among this group.
- 68% of the crashes occurred in daylight, 15% in the dark with no roadway lighting, 13% in the dark with roadway lighting, and the remainder occurred at dawn/dusk or an unknown time.

Figure 1. Proportion of Motorcyclists Hospitalized or Died by Age Group



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- Among crashes occurring in daylight, 23% of the motorcyclists were either hospitalized or died. For those in a crash occurring in the dark but with roadway lighting 25% were hospitalized or died. For those involved in crashes occurring in the dark with no roadway lighting, 43% were hospitalized or died – crude mortality for this group was 13% (17% for un-helmeted riders) as compared to 5% and 7% for the daylight and lighted roadway groups, respectively – **Figure 2**.

Helmet Use

- Information regarding helmet use was available for 1,307 (82%) of the motorcycle drivers and passengers. Among those with known helmet status, 524 (40%) were wearing a helmet; 783 (60%) were not wearing a helmet.
- Among those wearing a helmet at the time of the crash, 111 (21%) were either hospitalized or died. Among those not wearing a helmet, 272 (35%) were either hospitalized or died. Of the 294 persons with missing helmet status, 37 (13%) were either hospitalized or died.
- Crude mortality among helmeted motorcyclists was 5%. Crude mortality for those not wearing a helmet was 9%, and among those with unknown helmet status, 2%.
- Among those with an EMS record available, 87% of persons not wearing a helmet required treatment and transfer by EMS or were dead on scene, compared to 75% of helmeted individuals.

Hospital Charges and Primary Payer Source

- Median total charge for the 334 hospitalized individuals was \$42,071 with a range of \$2,100-\$1,400,000. Median length of stay was 4 days with a range of 1 to 81 days.
- The median hospital charge for persons not wearing a helmet was \$46,535; for those who were wearing a helmet, it was \$33,135.
- Although helmet use was lower among passengers (30%) than drivers (41%), the proportions of hospitalizations and deaths were the same for drivers and passengers of the motorcycle. However, median hospital charges and median length of stay for hospitalized passengers were \$44,000 (\$10,200-\$1,400,000) and 5 days (1-81), respectively, and for hospitalized drivers \$41,700 (\$2,100-\$970,200) and 4 days (1-73).
- Self-pay was indicated as the payer for 23% of the hospitalized patients and another 6% were listed as Medicaid. The remainder was listed as health insurance, Medicare, or 'liability'.
- Commercial insurance had the highest sum of total charges with \$15,478,100, followed by self-pay \$5,780,788, and Medicaid \$2,459,628 – **Figure 3**.

Figure 2. Proportion Hospitalized or Died by Lighting Conditions

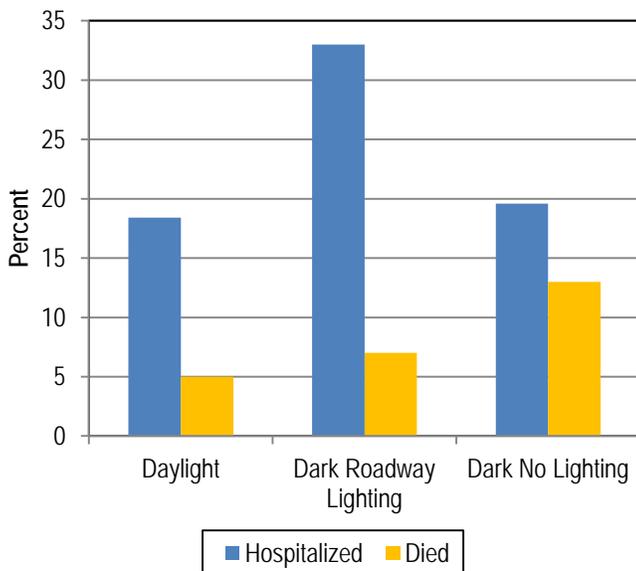
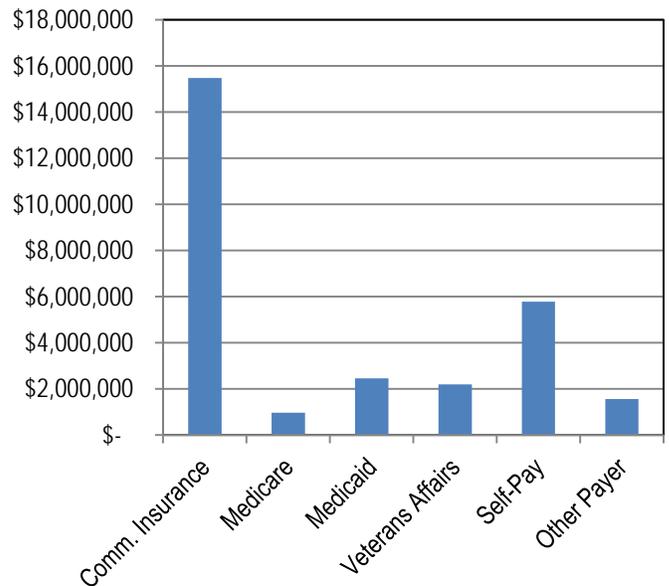


Figure 3. Sum of Hospital Charges by Payer Source



- Among the hospitalized motorcyclists with known helmet status, payer source varied. For those not wearing a helmet, 25% were listed as self-pay and another 7% Medicaid. Among those wearing a helmet, 17% were listed as self-pay and 3% Medicaid – **Figure 4**.

Alcohol Involvement

- 179 (12%) of the motorcycle drivers were reportedly alcohol-impaired. Alcohol-impaired drivers and passengers had much lower rates (14%) of helmet use as compared to those not impaired by alcohol (44%). Members of the alcohol-impaired group were more likely injured in a motorcycle only crash (63%), whereas the non-impaired motorcyclists were more frequently involved in multi-vehicle crashes (56%).
- The alcohol-impaired group was also more likely to be hospitalized or die (46%) as a result of the crash than the non-impaired group (23%). In addition, more of the alcohol-impaired group (82%) required treatment and transfer by EMS than the non-impaired group (76%). 34% of the drivers that died were reportedly alcohol impaired.

Type and Site of Injuries for Hospitalized Persons

- For hospitalized persons, the most frequently injured body regions were the extremities (36%), with a slightly higher proportion of upper extremities (20%) than lower

extremities (16%). The head/face/neck region accounted for 28% of injuries, of which, 9% were classified as a traumatic brain injury (TBI). The torso was the next most frequent site with 24%.

- The most frequent type of injury was fractures, accounting for 45% of the reported injuries. This was followed by superficial injuries (17%), internal organ injury (16%), and open wounds (14%).
- The distribution of injuries by body region varied according to whether the person was wearing a helmet or not. For those not wearing a helmet, 32% of the reported injuries involved the head/face/neck (10% TBI). Among persons wearing a helmet, 16% of the injuries involved the head/face/neck (7% TBI). For helmeted riders, torso (30%) and extremity (40%) injuries made up a greater proportion of the reported injuries – **Figure 5**.
- The distribution of injuries by body region also varied by whether the crash involved only the motorcycle or involved another vehicle. Lower extremity injuries, in particular fractures, made up a greater proportion of injuries among persons injured in a multi-vehicle crash (22%) as compared to those involving only the motorcycle (12%). Torso injuries were more frequently reported for motorcycle only crashes (27%) versus multi-vehicle crashes (20%). The proportions involving the head/face/neck and upper extremities were essentially the same for both types of crashes.

Figure 4. Payer Source Overall and by Helmet Status

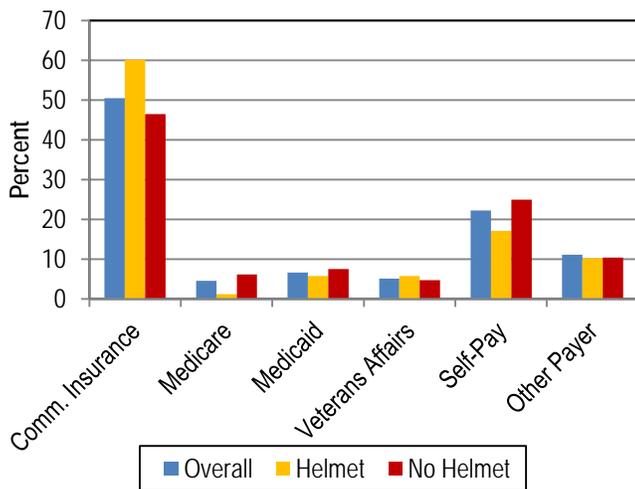
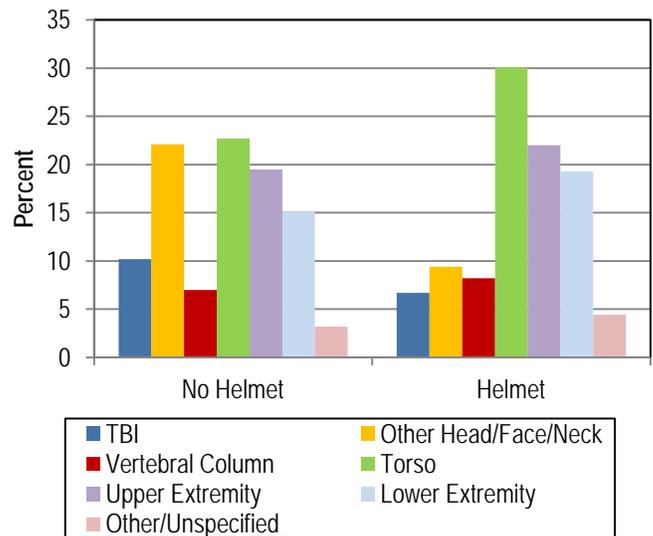


Figure 5. Injury Site by Helmet Status



TDLP Data Linkage Results is a publication of the Injury Prevention Service, Oklahoma State Department of Health and the Oklahoma Highway Safety Office. This and other reports may be obtained from the Injury Prevention Service, Oklahoma State Department of Health, 1000 N.E. 10th Street, Oklahoma City, OK 73117, 405-271-3430. IPS publications are also available at <http://ips.health.ok.gov>.