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Pedestrian and Pedal Cycle Deaths and Injuries in New Mexico

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Pedestrian travel accounts for up to 10.5% of all trips, from one address to another, taken in the United States.[1] Pedestrians are 1.5 times more likely than passenger vehicle occupants to be killed in a car crash on each trip.[2] Riding a bicycle accounts for 1% of all trips taken in the U.S. However, bicyclists face a higher risk of crash-related injury and death than do motor vehicle occupants.[1] Most pedal cyclist deaths occur in urban areas (69%) and at non-intersection locations (60%).[3.]

In 2013, a total of 52 pedestrians were killed in motor vehicle traffic (MVT) collisions in New Mexico (NM). Another 109 were hospitalized and 499 were treated and released from an emergency department (ED) due to injuries from a MVT collision. NM had the highest MVT pedestrian death rate in the U.S. in 2012 which was 1.9 times higher than the U.S. rate.[4]

In 2013, a total of 7 pedal cyclists were killed in NM. Another 89 were hospitalized and 1,684 were treated and released from an ED due to injuries from riding a pedal cycle. A pedal cycle is any land transport vehicle operated only by pedals, including bicycles, tricycles, pedal cars and trailers or sidecars attached to these vehicles. During 2010-2012, the pedal cycle death rate in NM was 1.5 times higher than the U.S. rate.[4] NM had the second highest pedal cycle death rate in the nation in 2010-2012 after Florida.[4]

Methods

The data on pedestrian and pedal cycle deaths were obtained from the NM Bureau of Vital Records and Health Statistics. All NM residents with an ICD-10 underlying cause of death code in the range V01-V19 were included in the analysis. Hospital Inpatient Discharge Data (HIDD), which contains data from non-federal hospitals in NM, and emergency department (ED) data were utilized. Hospital discharge records included in this analysis were limited to NM residents with a principal diagnosis of injury and an external cause of injury code for pedestrian and pedal cycle hospitalizations. A similar method was used to select ED records with the exception being that the principal diagnosis did not need to be an injury. Information on the blood alcohol level of pedestrians who died and the hour of the day that the pedestrian died in NM was obtained from the Fatal Analysis Reporting System of the National Highway Traffic Safety Administration (NHTSA).

Death rates by county were age-adjusted to the 2000 standard U.S. population. The number and rate of pedestrian and pedal cycle-related injury deaths, hospitalizations and ED visits per 100,000 population among NM residents were calculated for this report.

Results

Pedestrians. During 2009-2013, 83% of the 279 pedestrian deaths among NM residents were MVT-related. Motor vehicle non-traffic (MVNT) pedestrian deaths accounted for 7% of the pedestrian deaths and 10% of the deaths were due to collisions with trains. MVNT crashes are crashes that occur on private property, including driveways and parking lots.

The MVT pedestrian death rate in NM reached its highest point in 2006 (4.3, number = 83) and then declined 56% from 2006 through 2011 (Figure 1). The rate increased in 2012 (2.9), with 63 MVT pedestrian deaths occurring that year. In 2013 the MVT pedestrian death rate was 2.5). During 2009-2013, a total of 231 pedestrian deaths from MVT injuries occurred among NM residents, accounting for 15% of MVT deaths in the state. One in every five children 0 to 17 years of age in NM who died in MVT collisions were pedestrians. The MVT pedestrian death rate was 2.2/100,000.

Males accounted for 67% of the MVT pedestrian deaths during 2009-2013. The MVT pedestrian death rate among males (3.0) was 2.1 times higher than the rate for females (1.4). Persons aged 45-54 years had the highest MVT pedestrian death rate (3.3) and children aged 0-17 years had the lowest rate (1.0).

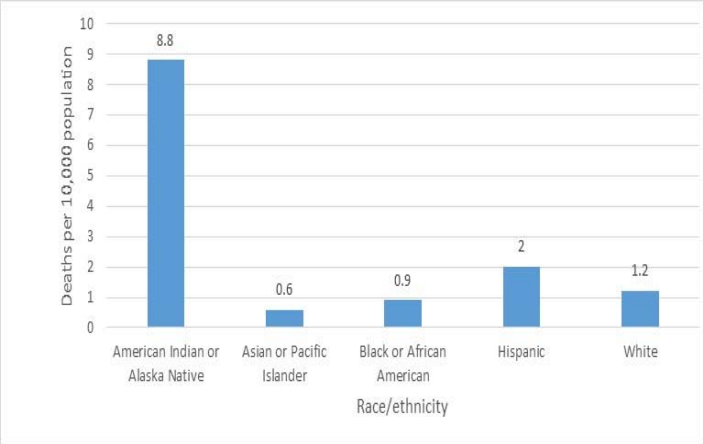
American Indians or Alaska Natives (AIAN) had the highest MVT pedestrian death rate (8.8) during 2009-2013 (Figure 2). They had the highest MVT pedestrian death rate among all age groups except those aged ≥65 years. Hispanics had a MVT pedestrian death rate of 2.0 and the White rate was 1.2/100,000.

The MVT pedestrian death rate for rural counties (2.4) was 10% higher than the rate (2.1) for urban counties (Bernalillo, Dona Ana, Sandoval, San Juan, Santa Fe, Torrance and Valencia) during 2009-2013. McKinley County (8.4) had the highest MVT pedestrian death rate.

During 2008-2012 an average of 44% of pedestrians who were killed in a MVT collision had a blood alcohol level of 0.0., and an average of 36% of pedestrians who were killed in a MVT collision had a blood alcohol level of ≥ to 0.08g/dl. The remaining pedestrians that were killed either did not have a BAC test, the BAC results were unknown, or they had a BAC in the range of 0.01 to 0.07. During 2008-2012, an average of 50% of MVT pedestrian fatalities occurred between 6:00 pm and 11:59 pm.

During 2011-2013, 86.5% of the 409 pedestrian-related hospitalizations among NM residents were MVT-related. MVNT-related pedestrian hospitalizations accounted for 11.7% of the hospitalizations and railway, pedal cycle and other road vehicle accidents accounted for 1.7% of the pedestrian-related injury hospitalizations.

Figure 2. Motor Vehicle Traffic Pedestrian Death Rates by Race/ethnicity, NM, 2009-2013



During 2011-2013, a total of 354 hospitalizations for MVT pedestrian injuries occurred. The MVT pedestrian hospitalization rate was 5.6/100,000. The male MVT pedestrian hospitalization rate (7.7) was 2.1 times higher than the rate for females (3.6).

The MVT pedestrian hospitalization rate for urban counties (6.6) was 1.8 times higher than the rate (3.6) for rural counties during 2011-2013.

In 2013, 88% of the 570 pedestrian-related ED visits among NM residents were MVT-related. MV non-traffic-related pedestrian ED visits accounted for 9% of the pedestrian ED visits and railway, pedal cycle and other road vehicle accidents accounted for 3% of the pedestrian-related injury ED visits.

In 2013, a total of 499 pedestrian ED visits from MVT injuries occurred in NM, accounting for 3% of MVT ED visits in the state. The MVT pedestrian ED visit rate was 23.8/100,000. The male MVT pedestrian ED visit rate (29.8) was 1.7 times higher than the rate for females (18.0). Persons aged 18-24 years had the highest MVT pedestrian ED visit rate (44.9) and persons aged 65+ years had the lowest rate (13.6).

The MVT pedestrian ED visit rate for rural counties (26.2) was 20% higher than the rate (22.6) for urban counties in 2013.

Pedal Cyclists. During 2009-2013, two-thirds of the 36 pedal cycle deaths among NM residents were MVT-related. A total of 24 pedal cycle deaths from MVT injuries occurred among NM residents, accounting for 1.5% of MVT deaths in the state. The MVT pedal cycle death rate was 0.2 and the pedal cycle death rate overall was 0.4/100,000. The pedal cycle death rate during the past 10 year period ranged from 0.2/100,000 to 0.5/100,000.

During 2009-2013, males (34) accounted for 94% of the 36 pedal cycle deaths and their pedal cycle death rate (0.7) was eighteen times higher than the female

rate (0.04). Persons aged 45-64 years had the highest pedal cycle death rate (0.8) and persons aged 0-17 years had the lowest pedal cycle death rate (0.04).

During 2011-2013, a total of 324 pedal cycle hospitalizations occurred among NM residents. MVT pedal cycle hospitalizations accounted for 20% of the hospitalizations due to pedal cycle injuries. The pedal cycle hospitalization rate was 5.2/100,000 population. The male pedal cycle hospitalization rate (8.4) was 4.1 times higher than the rate for females (2.0). Persons aged 55-64 years had the highest pedal cycle hospitalization rate (8.4). Persons aged 18-24 years had the lowest pedal cycle hospitalization rate (3.6) followed by those aged 0-17 years (3.7). The pedal cycle hospitalization rate for urban counties (6.1) was 1.8 times higher than the rate (3.3) for rural counties during 2011-2013. Pedal cycle injuries resulting in hospitalization included TBI (19%), upper extremity fracture (19%), upper extremity fracture (18%) and hip fracture (15%). Most (83%) of the hip fractures due to a pedal cycle injury occurred among people aged ≥45 years.

During 2013, a total of 1,684 pedal cycle ED visits occurred among NM residents. MVT pedal cycle ED visits accounted for 9% of the ED visits due to pedal cycle injuries. The pedal cycle ED visit rate was 80.3/100,000 population. The male pedal cycle ED visit rate (122.0) was 3.1 times higher than the rate for females (39.7). Persons aged 0-17 years had the highest pedal cycle ED visit rate (143.2). Persons aged ≥65 years had the lowest pedal cycle ED visit rate. The pedal cycle ED visit rate for urban counties (81.1) was similar to the rate (79.0) for rural counties in 2013. 49% of the pedal cyclists who were treated in the ED sustained a contusion, 21% sustained an upper extremity fracture and 13% sustained a TBI.

Discussion

Nationally, approximately 75% of all pedestrian deaths occur in urban areas.[5] However, in NM, the MVT pedestrian death rate was higher in rural counties than in urban counties. McKinley County, a rural county, had the highest MVT pedestrian death rate and the rate was two times higher than the NM rate. The counties in NM that are designated as urban have large tracts of land within their borders that are rural in nature. AIANs have the highest MVT pedestrian death rate, both in NM and nationally. The majority of residents of McKinley County (74%) are AIAN. A greater proportion of American Indians live in rural counties than other races/ethnicities in NM. Nationally, the death rate among AIANs was higher in non-metro areas.[5] A NHTSA report stated that a higher percentage of AIAN pedestrians who died in MVT crashes had a BAC of ≥0.8g/dl compared to other races/ethnicities.[6]

Pedestrians can prevent injuries and deaths from motor vehicle crashes by 1) increasing their visibility at night by carrying a flashlight when walking and by wearing reflective clothing, 2) crossing the street at a designated crosswalk or intersection, and 3) walking on the shoulder and facing traffic when a sidewalk is not available.

American Indian communities in New Mexico should develop pedestrian safety interventions that are tailored specifically to their community, including education and traffic engineering improvements.

Bicyclists can prevent injuries and deaths by wearing a properly fitted helmet. NM has a helmet law that requires all children ≤17 years of age to wear a helmet while riding a bicycle. Other prevention methods include lights on the bicycle and wearing retro-reflective clothing.

References

1. Pucher J, et al. Walking and cycling in the United States, 2001-2009; evidence from the National Household Travel Surveys. Am J Public Health, 2011;101(Suppl 1):S310-7.
2. Beck LF, Dellinger AM, O'Neil ME. MV crash injury rates by mode of travel, US: Using exposure-based methods to quantify differences. AM J Epidemiol 2007;166:212–218.
3. NHTSA. Traffic Safety Facts, 2012 data – bicyclists and other cyclists. Washington, DC: US DOT; April 2014. (Pub no. DOT HS 812 018).
4. CDC. Web-based Injury Statistics Query and Reporting System (WISQARS).
5. CDC. Motor vehicle traffic-related pedestrian deaths-United States, 2001-2010, MMWR. April 19, 2013, 62(15);277-282.
6. National Highway Traffic Safety Administration. Traffic Safety Facts, 2006 data – race and ethnicity. Washington, DC: US Department of Transportation; 2009.

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Figure 1. Pedestrian Motor Vehicle Traffic Death Rates, NM and U.S., 1999-2013