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Injury in Nevada

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A Partnership between the UNLV School of Community Health Sciences and the Nevada State Health Division to improve the health of Nevadans.

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Executive Summary

- Injuries are the leading cause of death among Nevadans aged 1 to 44 years.
- During the study period of this report, Nevada's injury mortality rate exceeded the national rate. In 2006, Nevada's injury mortality rate ranked 15th highest in the nation.
- Nevada's injury mortality rate exceeds the national rates in several type of unintentional and intentional injury including: motor vehicle crashes, unintentional poisoning, unintentional drowning, homicide, and suicide.
- Motor vehicle crashes are the leading cause of death and injury for Nevadans aged 5 to 34 years. Nevada's motor vehicle crash rate ranks among the highest in the nation. Motorcyclists and pedestrians as well as heavy trucks in rural parts of the state are at particular risk. Per capita crash fatalities have shown improvement over the last five years.
- During the study period, Nevada experienced a steady increase in the age-adjusted unintentional fall mortality rate. Risk of fall injury increases with age. Nevadans who die from fall injury are most frequently over the age of 65.
- Nevada's unintentional drowning fatality rate per capita exceeds that of the United States. The youngest and oldest age categories (0-4 years and 85 years and older) are at the greatest risk. Nevada has made some significant strides towards reducing the per capita drowning fatality rates especially among children in recent years.
- Most poisonings in Nevada are classified as unintentional and primarily involve adults who overdose on drugs or alcohol. Nevada has one of the highest rates of unintentional poisoning fatality per capita in the nation. The highest rates of unintentional poisoning death are among men and women who are 40-54 years old.
- When compared to the national average, Nevada has particularly low rates of fire related death and injury. Groups at the greatest risk for fire related fatality include the elderly over 75 years of age and African American residents.
- During the study period, Nevada's rates of occupational injury fatality were only slightly higher than Rates observed in the United States. In Nevada, Hispanic males are at the highest risk of occupational injury fatality. Most occupational injury fatalities are related to transportation crashes, mining, and construction injury.
- Nevada has a lower rate of traumatic brain injury related hospitalizations than the United States but a higher traumatic brain injury fatality rate per capita. Falls, motor vehicle crashes, and assaults are among the leading causes of traumatic brain injury in Nevada.
- Alcohol is a major factor in injury related death in Nevada. Alcohol was cited as a contributing factor in almost one half of all injury fatalities tested. Alcohol was involved in 46% of motor vehicle deaths, 34% of homicides, and 36% of suicides. In Nevada, more people are unintentionally poisoned by alcohol than any other drug.

- Rates if injury mortality vary by race and ethnicity. In Nevada, African Americans are 1.5 times more likely to suffer a fatal gunshot wound than any other race. Suicide rates are highest among White residents while occupational injury fatality rates are highest among Hispanics.
- Professionals from public health, medicine, education, mental health, public safety, and other fields are working together to address the serious problem of injury in Nevada. Overall injury rates have recently declined. With continued efforts, we can anticipate further improvement.

Introduction

Injury is a major threat to health and safety. In a typical day in the US, 400 people will die as the result of an injury, 7,500 will be hospitalized due to an injury, and more than 150,000 will suffer an injury severe enough to restrict activities and seek medical attention. Many of these deaths, hospitalizations, and disabling events will be the result of motor vehicle crashes. Others will result from violence, falls, drowning, and poisoning – all of which are considered injuries.

The costs of injury are high. In the United States, the cost of injuries is estimated to be $200 billion a year. In addition to the rising costs of emergency care, hospitalization, rehabilitation and disability services there is also a high human cost for victims, families, and communities. Beyond the medical expenses, since a majority of injury victims are younger, there are the costs of lost wages and productivity, reduced quality of life, and the years of potential life lost for those who die from their injuries. It is impossible to calculate the emotional and social damage to individuals, families, and communities when lives are changed by injury.

Injuries are preventable. Injuries are not random, unavoidable occurrences; they can be understood and prevented. Injury prevention is now an important part of public health practice and strategies for prevention are prominent in the health goals for the nation. To achieve these goals and prevent injury, we need to understand when and where injuries occur, identify modifiable risk factors, and implement and evaluate intervention and prevention strategies. Our best strategies are education, technology and engineering, and enforcing what works. Good data and involvement from many sectors of the community are essential for success.

In Nevada, injury is a leading cause of death for children, teens and young adults. With high rates of motor vehicle crash rates, high suicide rates, and workplace injury rates, Nevada must be proactive in understanding and preventing injuries. The good news is, the available data and information can tell us a lot about injury in Nevada and there are people across the state working hard on prevention. This report presents the results of a statewide project to identify data, programs, and people working to keep Nevadans safe and healthy.

1 Understanding the Data

Introduction

This report summarizes injury in Nevada from 2000 - 2006. Injury data from national and local sources were collected, compiled and used to produce measures of the magnitude of injury in Nevada. These measures include percentages, injury rates, relative risk ratios, and years of potential life lost (YPLL). These measures are useful in comparing injury prevalence across years among communities, populations, and geographic areas in our state. These analytical tools primarily indicate the prevalence of injury in a specific community and are briefly described in the following paragraphs.

Data Sources

Injury information presented in this report was obtained from multiple sources. Fatal injuries in Nevada which involved motor vehicles were described using the National Highway and Transportation Safety Administration (NHTSA) Fatality Analysis and Reporting System (FARS). This national database represents a census of all traffic crashes involving a motor vehicle travelling on a road way customarily open to the public, which result in the death of a person (either an occupant of a vehicle or a non-motorist) within 30 days of the crash. The FARS data contain descriptions of each fatal crash as reported by local police. FARS includes data elements that characterize the crash, the vehicles, and the people involved.

Fatal injury data for Nevada involving all other manners of injury were collected from the Centers for Disease Control's National Center for Health Statistics (NCHS) Web Based Injury Statistics Query and Reporting System (WISQARS). This national injury mortality database contains information from death certificates filed in state vital-statistics offices and includes causes of death reported by attending physicians, medical examiners, and coroners. It also includes demographic information about decedents reported by funeral directors, who obtain that information from family members and other informants. While it is commonly accepted to use these data to establish patterns in injury fatality at the state level, it should be mentioned that using national data has inherent limitations which are discussed in the Data Limitations section of this document. Additional information on fatal injury in Nevada was obtained from the Nevada Occupational Safety and Health Administration's Census of Fatal Occupation Injury and the Nevada Department of Motorvehicles and Public Safety's Uniform Crime Reporting System.

Non-fatal injury was described using a number of local sources of data. Data provided by the Nevada Department of Transportation, Safety Department was used to describe non-fatal injuries resulting from motor vehicle crashes in Nevada. These data are based upon uniform police report information taken at the scene of each crash by investigating law enforcement officers. These data contain all crashes reported to law enforcement in the State. Data regarding police reported incidents of homicide, domestic violence, and assault were provided by the Nevada Department of Public Safety. While these reports contain some injury information, not every case of assault or domestic violence results in injury.

Injury events requiring hospitalization were investigated using the Nevada Hospital Inpatient Data. By state regulation, all hospitals and ambulatory surgical centers are required to submit both inpatient and outpatient billing information to the University of Las Vegas, Center for Health Information Analysis. These data encode hospital visit information using the International Classification of Diseases, Ninth Revision, Clinical Modification (ICD9CM) to describe specific diagnoses related to the visit. In particular, we used N (Nature of Injury) and E (External Cause of Injury) codes which are assigned by hospitals and represent specific mechanisms (e.g. handgun), and manners (e.g. suicide) of injury.

Percentages

Percentages were calculated by dividing the number of injuries or injury fatalities by an appropriate denominator. For example, 75.8% of all homicides in Nevada involved men (the number of male homicides divided by the total number of homicides).

Rates of Injury and Injury Mortality

Rates of injury and injury mortality were calculated per year and per 100,000 people in the population. For injury rates contained in this document, the denominator used to calculate each rate is a measure of exposure and is important for interpretation. Some mortality rates have been age adjusted employing the standard method and are based upon the 2000 Census Bureau population data for Nevada. Age-adjustment facilitates accurate comparisons when using mortality data. Other denominators used in this report for comparison include: million vehicle miles (MVM), a measure of total miles traveled by all motor vehicles in Nevada; and 100,000 licensed drivers, a measure of all licensed drivers in the Nevada.

Relative Rates of Injury

Relative rates of injury are calculations involving two rates, where one rate is divided by another (the reference rate). This is done to indicate the increased risk at which one group may be, with regards to another, in terms of the rate of a specific injury.

Years of Potential Life Lost

In this report, years of potential life lost (YPLL) is a measure of the number of years of life lost per injury fatality. YPLL is calculated by subtracting the age of each injury decedent from 65 years. Decedents who are 65 years or older are assigned an YPLL of zero. YPLL can be used to calculate the economic impact of injury mortality in Nevada.

Hospital Inpatient Data and E Codes

A major limitation present in the Nevada Hospital Inpatient Data is the assignment of N (Nature of Injury) and E (External Cause of Injury) codes by hospital coders. E code assignments can be somewhat labor intensive and are made based on information abstracted from the patient's medical chart. They are assessments of more esoteric conditions such as the cause of a poisoning being intentional or unintentional. Data published in the 2005 State Injury Indicators Report on unassigned E codes demonstrated that in 2004 56.3% of injury records had a corresponding E code assignment. This impacts any estimates performed with the Nevada Hospital Inpatient Data using E codes. However, all hospitals currently report to the Nevada Hospital Inpatient Discharge Data and the number of injuries which are not assigned an E code is reducing over time.

Data Limitations

Data definitions vary from one source of injury data to another. Since this report uses several sources of injury data from both local and national sources, rate comparisons and analysis can become complicated. Compari-

sons between different sources of data were avoided. For instance we do not compare NHTSA FARS reported traffic crash fatalities with Nevada Department of Transportation reported traffic crash fatalities. Instead, we have attempted to present the most comprehensive snapshot of injury data using a variety of different data sources based on their perceived accuracy. Specific limitations of each data set are reported in the appendices of this document.

Occasionally, there are discrepancies between different information sources with respect to reported rates of injury. In particular these discrepancies can be seen between national and local data sources. When such differences existed, we made an effort to determine which number was more accurate. In almost every case, these differences are linked to differences in case definition used by different data sources. To facilitate further investigation of these discrepancies, published information sources are referenced at the end of each injury section.

2 Cross-cutting Issues in Injury

Age

In Nevada, injury is the leading cause of death among children, adolescents, and young adults aged 1 to 44 years. Later in life, injury as cause of death gives way to other medical conditions such as heart disease and cancer. These high rates of injury across a broad range of ages reveal that unlike chronic health conditions such as diabetes, heart disease and cancer, which are more commonly associated with the elderly, the burden of injury in Nevada impacts young and old alike. While younger individuals are at greater risk of injury mortality compared to other causes of death, the elderly still have some of the highest rates of injury. Nationally, those aged greater than 75 years accounted for 6% of all injuries, yet represented 18% of injury attributable medical costs (CDC, 2007). Injuries among the elderly are typically more severe given the increased frailty observed among elderly and their inability to recover from an injury as quickly as their younger counterparts.

Sex

In Nevada, males have higher injury mortality rates than females for both unintentional and intentional injury. Males are almost three times more likely to be injured unintentionally than females. These injuries largely represent motor vehicle related crashes where risk taking behaviors, more often associated with males, play a major role. The gap between male and female injury rates narrows when observing Nevada's intentional injury death rates. In Nevada, males are only one and half times more likely to die from an intentional injury than females. The similarity in intentional injury mortality rates between males and females reflects the impact of violence perpetrated against women and the gender equality observed in suicide and self-harm.

Race and Ethnicity

In general, across the United States, minority populations tend to have higher injury mortality rates than White Non-Hispanic populations. In Nevada, during the study period, African American (65.9 per 100,000) and American Indian and Alaskan Native (74.7 per 100,000) populations had higher age adjusted injury mortality rates than their White non-Hispanic counterparts (55.5 per 100,000). Asians and Pacific Islanders (26.9 per 100,000), however, had lower rates of injury mortality than White non-Hispanics. In Nevada, White Hispanics had lower injury mortality rates (47.0 per 100,000), than White non-Hispanics (55.5 per 100,000). The reason for the differences between ethnic and racial groups is not clear. Empirical evidence suggests that race and ethnicity may be proxy measures for education level, socioeconomic status, and access to healthcare, all factors which affect injury mortality risk (CDC, 2007). Further, studies have shown that American Indians and Alaskan natives more frequently reside in rural locations where the risk of injury mortality is greater (Sklar et. al., 1996).

Geography

Nevada is a typical western state with a few population centers and miles of sparsely populated rural areas in between. In 2008, approximately 85% of Nevada's 2.6 million residents resided in the metropolitan centers of Reno and Las Vegas. The remainder of the

state is intensely rural with an average population density of 10 people per square mile. In Nevada, unintentional injury mortality rates in rural counties are almost twice that of metropolitan centers. This is most likely related to the increased age of the rural population, higher rates of speed on interstates and rural roadways, longer distances and times for emergency medical care, and reduced access to healthcare (CDC, 2007). Conversely, homicide mortality rates are highest in the urban centers of Reno and Las Vegas.

Socio-Economic Status

Nationally, socio-economic status and level of education are inversely related to injury mortality risk. Those living in communities with the least education and the lowest income strata are at highest risk for injury death. Empirical evidence seems to suggest that the relationship between lower socio-economic status and injury might be related to the unsafe built environment in poorer neighborhoods. Furthermore, poorer individuals may be less apt to provide the most modern and appropriate safety devices for their families. Poorer individuals have less access to healthcare, compounding the impact of injury on health. Interpersonal violence is more common in poorer neighborhoods adding to the danger of the environment. Conversely, suicide mortality rates are not impacted by socio-economic status.

Alcohol and Drugs

The consumption of alcohol increases the risk, severity, morbidity, and mortality of injury. For injury, there is no greater risk factor than alcohol consumption and this risk increases proportionately with frequency of consumption (drinking pattern) and the amount of alcohol consumed (Gentilello et al., 2005). A large body of empirical evidence exists which correlates alcohol intoxication and injury. From 2000 to 2004, the prevalence of binge drinkers in Nevada (greater than five alcohol beverages consumed in one sitting) was greater than the United States prevalence (18.0% versus 14.9%). Likewise, the prevalence of heavy drinkers (average alcohol consumption of more than two drinks per day) in Nevada was greater than the United States prevalence (6.9% versus 4.8%). Approximately 27% of males in Nevada report binge drinking in the last month. This is one of the highest reported prevalence of binge drinking in the nation (Nevada State Health Division, 2005). These high rates of hazardous alcohol consumption contribute to the increased risk for injury mortality in Nevada.

Drug use also impacts injury rates. The National Institute on Drug Abuse (NIDA) estimates that at least 10% of the homicides and assaults in the United States are drug related. Drug use is linked to intentional injury and death but also contributes to Nevada's elevated rates of unintentional poisoning.

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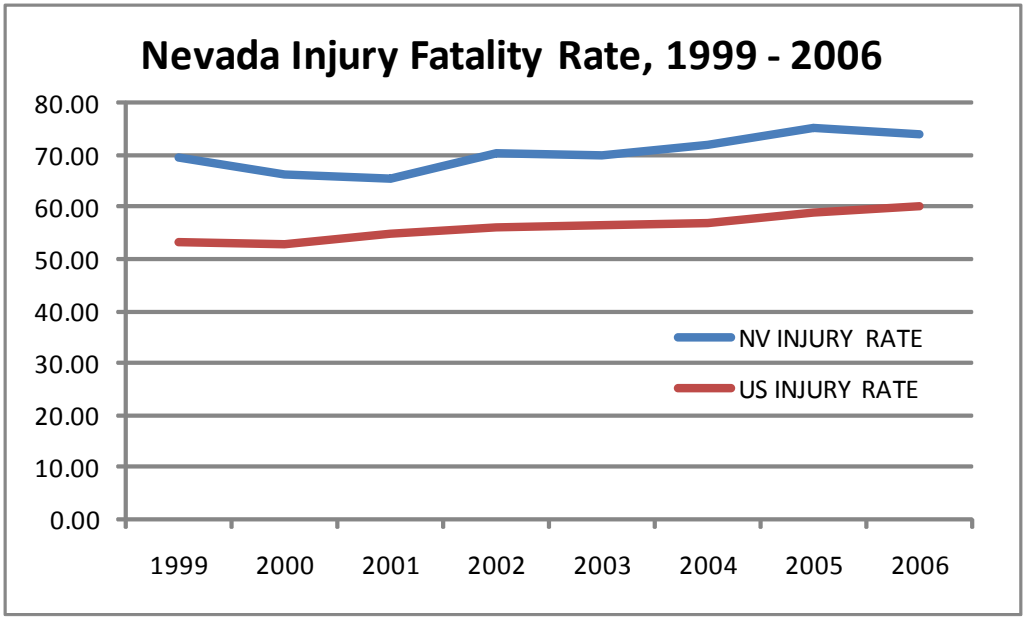
3 Unintentional and Intentional Injury

Introduction

Unintentional injury is defined as an injury that occurs without harm being intended. Intentional injury is an injury that is purposely inflicted, by oneself or another person. The seriousness of this social and public health problem is indicated in recent statistics released by the Centers for Disease Control and Prevention in 2004. For example, injury was responsible for over 7% of deaths in the United States annually.

The social and economic costs to society come primarily from medical costs, with approximately 2 million hospitalizations and 31 million emergency department visits. Further, the care and treatment of injuries accounted for 35 million outpatient visits to physician's offices and quick care clinics. Economically, the costs of injury have been estimated to exceed $80 billion in lifetime medical care treatment costs. Socially, the total direct and indirect costs are much more pervasive with an additional $326 billion in lost productivity. Therefore, in general, intentional and unintentional injuries have a broad impact on health and behavior with both immediate and long-term physical, psychological, and social consequences. The consequences in terms of lost productivity and negative health outcomes are particularly serious because these injuries and adverse health outcomes are persistent throughout the life span.

According to Nevada WISQARS (Web-based Injury Statistics Query and Reporting System) Fatal Injury data, the frequency rate of unintentional injury has increased from 710 incidents in 1999 to 1,104 cases in 2005, representing an almost 8.5% increase over 8 years. There was a slight decrease in uninten-



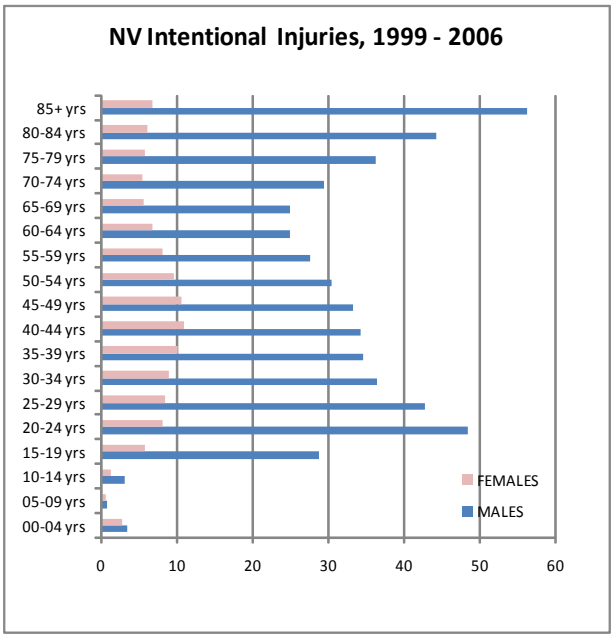
tional injury statistics in 2006 when percents dropped from 61% in 2005 to 59% in 2006. For intentional injuries, incidents increased from 580 cases in 1999 to 720 cases in 2006. The overall crude injury rate increased from 69.7 to 74.2 over the same 9 year period. Crude rates for injury in Nevada were above the national crude injury rate from 1999 to 2006 with 53.1 and 60.0, respectively. Further, there was a corresponding increase in unintentional injury rates (36.7 to 43.8) as intentional injury rates remained stable (~29.0).

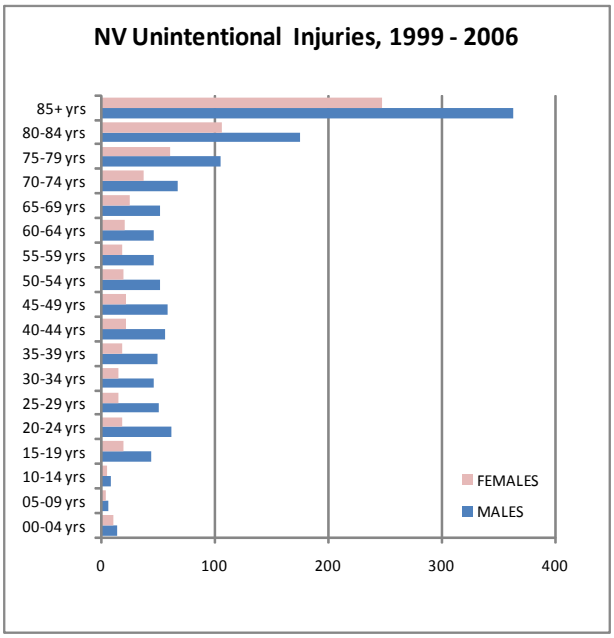
Demographics

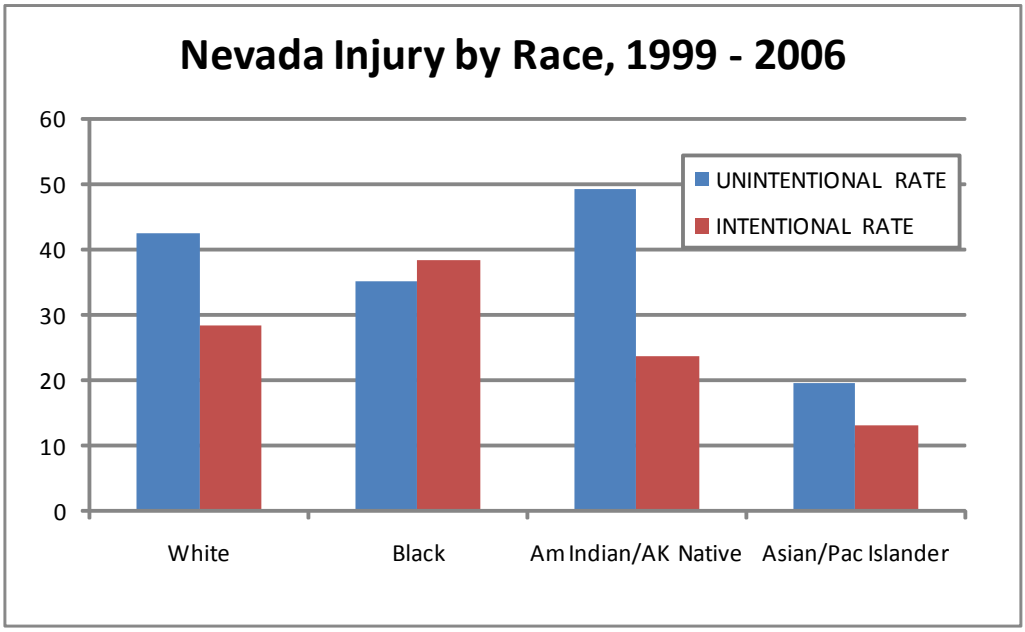
Age-adjusted intentional and unintentional injury rates correspond with crude injury rates reported above. Specifically, unintentional injury rates increased from 38.6 to 44.6 over the specified period while the intentional injury rate remained relatively constant (~30.0) over time. According to the WISQARS data, unintentional injury rates are higher than the national average for all age groups with the exception of 5-9 year olds and those older than 70 years. For intentional injuries, Nevada has some of the highest mortality rates in the nation across all age categories except 5-9 year olds. As age increases beyond 15 years, the gap between Nevada and the nation increases. By age 85, intentional injury rates are 3 times higher in Nevada than for the rest of the United States. This, in part, reflects Nevada's high suicide rate among seniors.

Age adjusted unintentional injury rates are higher than intentional injury rates among all racial and ethnic groups in Nevada. However, while Whites in Nevada are more likely to experience unintentional injury death, African Americans are equally as likely to experience an unintentional and intentional injury related death.

According to the data, both males and females are more likely to experience unintentional injury than intentional injury. The percent difference between unintentional and intentional injuries for males was 10.1%. The percent difference for females was much greater: 36.8%. As expected, the unintentional injury rate was greater than the intentional rate for males. The unintended injury rate for females was 27.3, over 2 times greater than the intended injury rate. Although the unintended injury rate for Nevada males was greater than the national rate (53.5 and 49.4,







respectively), the intended rate was lower (43.4 and 27.8, respectively). In fact, for males, the US intentional injury rate was just over 1.5 times greater than the rate for the state. The unintentional injury rate for Nevada females was slightly higher than the US rate for females (27.3 and 25.9, respectively). However, the intentional injury rate among females in Nevada was about 1.7 times greater than the US rate.

Age adjusted rates continue to show that both males and females had higher rates of unintentional injuries than intentional ones. For all age categories, males were more likely than females to experience unintentional injuries. Differences in unintended injuries become increasingly pronounced over the life span, beginning in adolescence (15-19 years of age) and continuing to the oldest age range (> 85 years of age). Likewise, males are more likely to suffer intentional injuries than are females across all age groups. There are significant differences between males and females in Nevada in injury from ages > 15 years of age. The figure below displays the dramatic differences between males and females for intended injuries in the state. A similar pattern is noted across gender for intentional injuries.

Cross-cutting Issues

Overall, the data show that Nevada injury rates are greater than US injury rates. Further, intentional injuries have remained constant over the last 7 years while the unintentional injury rate has increased. Most unintentional injuries/deaths occur at home. For this reason, preventative strategies should be centered on interventions specific to problem areas in the home (e.g., bathrooms), especially for the elderly.

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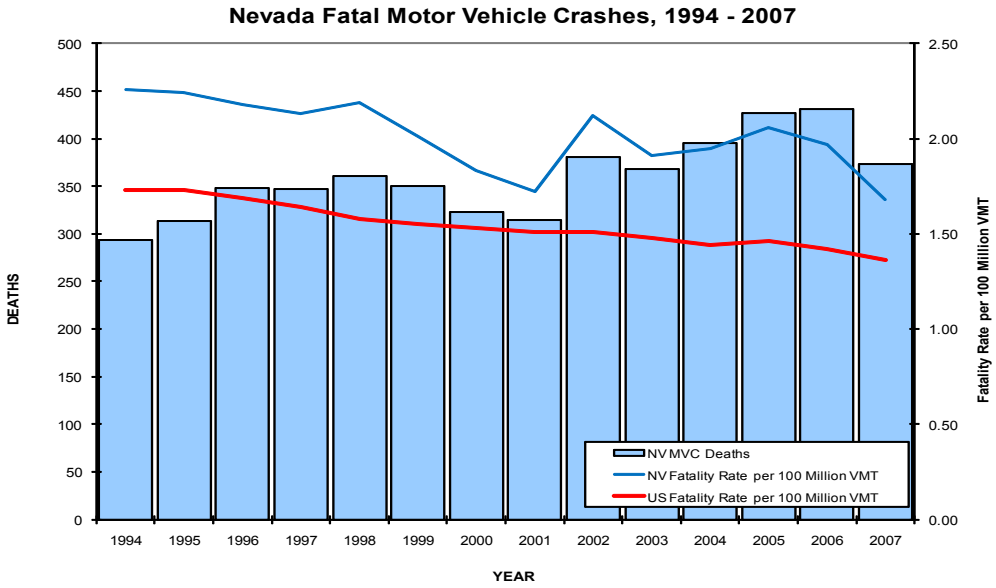
4 Motor Vehicle Injury

Introduction

Motor vehicle injuries are caused by crashes which involve automobiles, commercial trucks, buses, motorcycles, bicycles, pedestrians, and all other motorized vehicles which operate on public roadways. Motor vehicle crashes are the leading cause of death and injury for Nevadans aged 5 to 34 years. In 2006, some 62,225 motor vehicle crashes resulted in 32,669 injuries and 423 deaths. It is estimated that in Nevada, these fatal motor vehicle crashes result in 11,300 YPLL. While Nevada's traffic crash rate ranks among the highest in the nation, motor vehicle crash fatalities show significant signs of improvement over the last five years. From 2003 to 2008, the total number of motor vehicle fatalities has increased while fatality rates per 100 million vehicle miles (MVM) traveled and by licensed drivers have declined steadily. Likewise, non-fatal motor vehicle crashes per 100 MVM are also on the decline. In Nevada, the majority of injury crashes involve passenger vehicles (including light pickup trucks and sport-utility vehicles) while the majority of fatal crashes involve passenger vehicles, motorcycles, and commercial trucks respectively. In rural Nevada, large commercial truck crashes represent a significant proportion of injury and fatal crashes. However, these crashes are relatively rare and no trends over time were observed in a five year period.

Demographics

As with many types of injury, motor vehicle crashes disproportionately involve young drivers. In particular, younger male drivers aged 26 to 35 years represent 23% of all non-fatal injury motor vehicle crashes and 26% of all fatal motor vehicle crashes. Other popula-



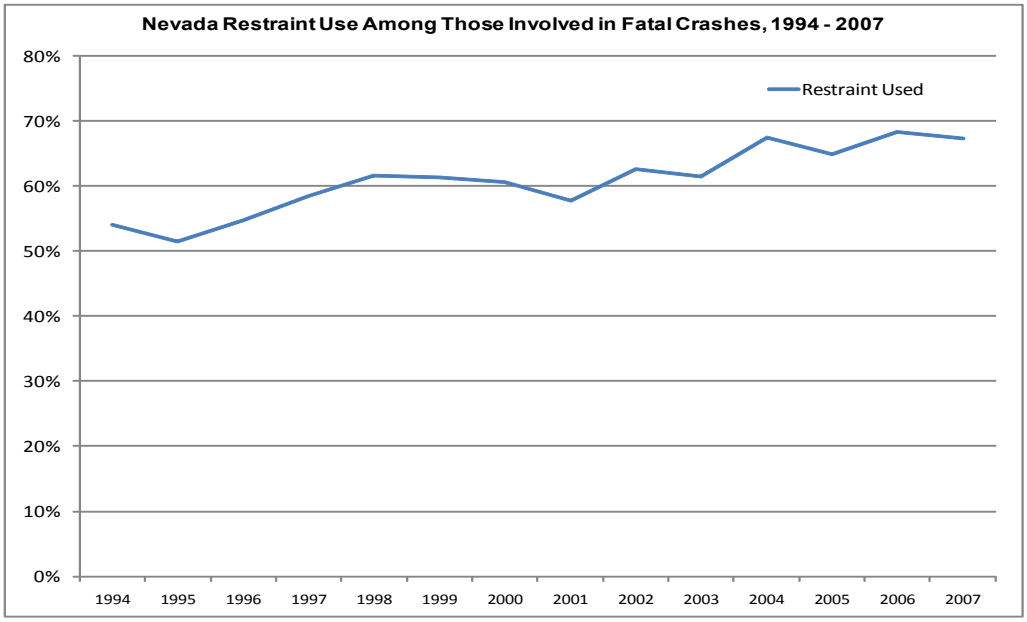
tions at increased risk of being injured in a motor vehicle crash include: males aged 26 to 45 years and males aged 46 to 55 years. Older male populations more frequently are associated with alcohol use which is described in detail in the cross cutting issues portion of this section.

Rural communities in Nevada are at a much higher risk for motor-vehicle injury and death. This may be due to higher vehicle speeds in rural areas, fewer traffic control devices, and longer distances to emergency medical care. Rural counties with greater than 4 times the average state rate of crash fatalities per 100,000 population included: Esmeralda, White Pine, Nye, Story, Humboldt, Mineral, Lander, and Elko.

Cross-cutting Issues

Driver behavior directly impacts risk of involvement in injury crashes as well as the severity of injuries sustained in a crash. In 2006, primary common contributing driver behaviors which were identified by the investigating officer responding to the scene of non-fatal traffic crashes in Nevada included: failure to yield right of way (24.1%), improper driving (14.9%), following too closely (10.5%), and failure to keep in lane (10.4%). Common contributing driver behaviors in fatal crashes included: excess speed (22.9%), failure to keep proper lane (17.8%), and failure to yield (12.2%).

Alcohol intoxication is a major contributing factor in the incidence and severity of crashes involving motor vehicles. Alcohol intoxication reduces driver response times and attention, increases crash lethality, and complicates medical treatment. According to uniform traffic crash police reports compiled by the Nevada Department of Transportation, in 2006, alcohol was involved in 10.3% of non-fatal and 29.5% of fatal motor vehicle crashes. The overall number of alcohol involved crashes has remained unchanged in the last five years, while the number of people in Nevada and the number of cars traveling the roads has increased. The proportion of alcohol related crash fatalities (decedents) has remained consistent from year to year over the last decade at approximately 38%. This proportion of alcohol involved traffic crash fatalities in Nevada is comparable with the US rate of alcohol involved crash deaths of 38% per year.



Consistent with national alcohol related motor vehicle crash patterns, 25% of all alcohol related fatalities in Nevada occur between the hours of 12:00 AM and 3:00 AM. In Nevada, approximately half of all alcohol related motor vehicle crashes occur on weekends (Saturdays and Sundays). Alcohol related motor vehicle crashes occur at a higher rate in rural counties in Nevada. In 2006, the proportion of counties with a higher average proportion of fatal crashes involving alcohol than the rest of the State included: Carson, White Pine, Nye, and Lyon.

A positive correlation exists between the availability of alcohol within a community and subsequent rates of alcohol involved motor vehicle crashes. Measures of community alcohol availability with demonstrated facilitation of fatal motor vehicle crashes include: community laws regarding alcohol and alcohol servers (such as alcohol serving limits, public intoxication laws, and driving while intoxicated penalties), liquor excise tax, and liquor outlet density. Liquor outlet density is defined in alcohol prevention literature as the amount of liquor licenses existing within an established geographic location. In several of these measures of alcohol availability, Nevada ranks high nationally as an easy place to purchase alcohol. Certain areas of Nevada have very high liquor outlet densities, particularly in southern Nevada. Compared to the rest of the US, Nevada has low liquor excise taxes, which contribute to the affordability and overall availability of alcohol in our state.

On September 23, 2003 the Nevada legislature changed the Driving While Intoxicated legal limit from 0.1 mg/DL to 0.08 mg/DL blood alcohol content. This action ensured that Nevada statutes regarding driving while intoxicated are equally as stringent as most other states. The reduction observed in Nevada's alcohol related motor vehicle crash rates can be attributed in part to this modification of the Nevada driving while intoxicated statute, prevention and treatment efforts, sobriety checkpoints, and saturation patrols as well as intense public awareness and education campaigns.

Safety restraint (seat-belt) use reduces the severity and subsequent lethality of injuries which result from motor vehicle crashes. In Nevada, a much larger proportion of crashes involving severe injury or death involve unrestrained motorists. Among all occupants of crashes (both deceased and survivors) in which a fatality occurred, restraint use is determined by law enforcement officers performing the traffic crash investigation. In Nevada in 2007, investigating law enforcement determined that 67.3% of all occupants in fatal crashes were wearing a safety restraint. Restraint use among occupants in fatal crashes has increased steadily from 54.05% in 1994 to 67.3% in 2007. The Nevada Department of Transportation conducts visual surveys of restraint use to provide estimates of overall restraint use in Nevada. Results of these surveys indicate that restraint use among occupants of motor vehicles in Nevada has increased from 87% in 2004 to 91% in 2008.

Increases in occupant safety restraint use correspond to when Nevada instituted a secondary safety restraint law. Secondary seat belt laws state that law enforcement officers may issue a ticket for not wearing a seat belt only when there is another citable traffic infraction. Primary laws allow law enforcement officers to stop and ticket drivers who they observe to be unbelted while operating motor vehicles. With elevated rates of observed restraint use but reduced restraint use in fatal crashes, the impact of implementing primary safety restraint legislation on crash injury in Nevada warrants further investigation.

In Nevada, most injury crashes occur during daylight hours in clear weather conditions. The higher the speed of the roadway in which the crash occurs, the greater the proportion of injury and fatal crashes were

observed. While crashes happen consistently throughout the year, certain holiday times demonstrate increases in fatal crashes. These holiday periods include Labor Day, Nevada Day, and the entire month of December.

Commercial Trucks, Buses, and Emergency Vehicles

Nevada's large or commercial truck fatality rates are the highest among the western states. In Nevada, large, transport-related truck fatalities and fatality rates fluctuate from year to year with no observable trend. Since 1994, large truck fatality rates per 100 MVMT average about 7 times higher than US rates for the same years. Nevada is a dangerous place to drive a large transport truck. These crashes are localized in rural areas of Nevada and correspond to certain truck routes which require further review.

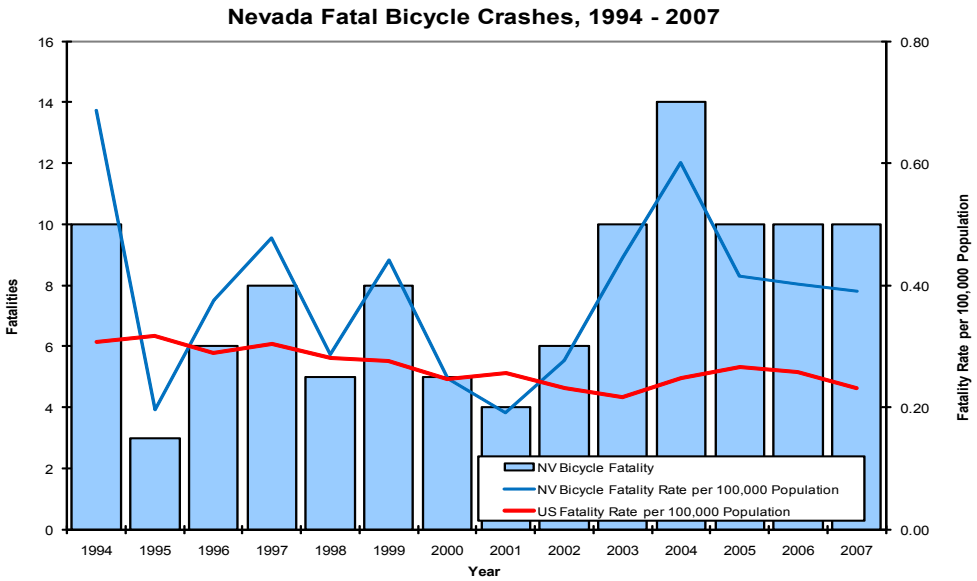
In the last five years, not one child has died as a result of a school bus crash. Two fatalities were reported as a result of being involved in a crash with a school bus, these were drivers of the other vehicles involved. Emergency vehicles including ambulances and fire trucks represent less than 1% of all injury crashes in Nevada and like bus crashes are extremely rare events.

Bicycle Related Injury

Bicycle or pedalcyclist fatalities remain a rare event in Nevada representing a small fraction of motor vehicle deaths each year (<3% annually). Because of the low rate of occurrence, bicycle fatality rates vary widely from year to year without an observable trend. For the last four years, Nevada bicycle fatality rates per 100,000 population have been slightly higher than US rates for the same years. Total annual bicycle injuries have trended upwards over the last decade and reduced slightly in recent years. Bicycle crashes are strictly urban phenomena in Nevada occurring primarily in Clark and Washoe Counties. Bicycle crashes most frequently occur at times associated with reduced visibility. The majority of bicycle crashes occur most frequently between the hours of 9 PM to 12 AM and between 3 PM and 6 PM.

Non-Traditional Motorized Vehicles

Only a small fraction of total motor vehicle injuries (1.8%), involve mopeds and



light motorcycles. The numbers of these crashes,however, have significantly increased over a five year period in urban areas probably in large part due to increasing numbers cyclists operating on roadways in metropolitan areas in Clark and Washoe Counties.

Prevention Strategies

Risktakingbehaviorisresponsibleforthe majority of severe injury and fatal motor vehicle crashes in Nevada. These risk behaviors include excessive speed, failure to use safety restraints, alcohol intoxication, and failure to yield. These behaviors give injury prevention professionals such as law enforcement and traffic engineers a place to begin focusing prevention efforts. Injury prevention interventions which focus on increasing safety restraint use and decreasing both access to alcohol and problem drinking are indicated. Secondary interventions which focus on younger drivers such as the graduated drivers licensing program, alcohol abuse treatment programs targeted at DWI offenders and chronically intoxicated pedestrians can also have a large impact on motor vehicle fatalities in Nevada.

Specific interventions are needed in rural areas where county rates of motor vehicle injury and death may be up to as much as 10 times higher than the state rate. Traffic crash mapping in rural areas may help to identify those highway segments with increased numbers of fatal crashes. Engineering countermeasures with measured success in preventing lane deviation type crashes might be applied to these segments once identified. Further, educational and enforcement campaigns which impact excessive speed would significantly reduce the number and severity of injuries in rural Nevada.

In 2005, traffic engineers, law enforcement, driver educators, and traffic safety professionals came together and drafted the NDOT Nevada Strategic Highway Safety Plan. This comprehensive plan sets safety goals for the state, prioritizes identified safety problems and recommends preventive measures which have demonstrated levels of success and address fatal and life changing injuries which occur as a result of traffic crashes in Nevada. The safety interventions outlined in this plan apply the four "E's" of traffic safety: engineering, enforcement, education, and encouragement. The interventions focus on a pool of observed crash types which represent the most common and severe motor vehicle crashes in Nevada. Specifically, they target driving while intoxicated, vehicle lane deviations, roadway safety hazards, and pedestrian issues.

Recommendations

- Conduct research to identify factors associated with the high rates of large commercial traffic crashes in Nevada.
- Combine local crash data and crash geographic information to investigate motor vehicle crashes of all types (bicycle, pedestrian, motorcycle, large truck).
- Conduct site visits and multi-disciplinary review of locations (highway segments) with high crash rates.
- Expand restraint use surveillance methods to include nighttime and early morning counts.
- Increase restraint use via focused public education and information campaigns combined with law enforcement operations.
- Reevaluate the cost-benefit of primary seatbelt legislation.
- Decrease speeding and speed related crashes through public education and information campaigns, targeted law enforcement, and application of traffic calming measures when indicated.

- Train all first responders in rural areas in basic level emergency medical technician skills to provide earlier critical care for victims of motor vehicle traffic crashes.
- Improve driver training for younger (new) drivers.
- Conduct regular highly publicized DUI checkpoints (coordinated throughout the state).
- Seize vehicles or vehicle license plates administratively upon arrest for driving under the influence of drugs and alcohol.
- Create a "zebra" plate that allows officers to identify drivers with history of DUI convictions.
- Clear sight triangles approaches to intersections, in the medians of divided highways near intersections and eliminate parking that limits sight distance.
- Install appropriate pavement markers, signs, delineation or other methods to delineate lanes in order to provide better day, night, and weather visibility (possible issues include local roads and finding the correct technique/materials to implement).

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5 Motorcycle Related Injury

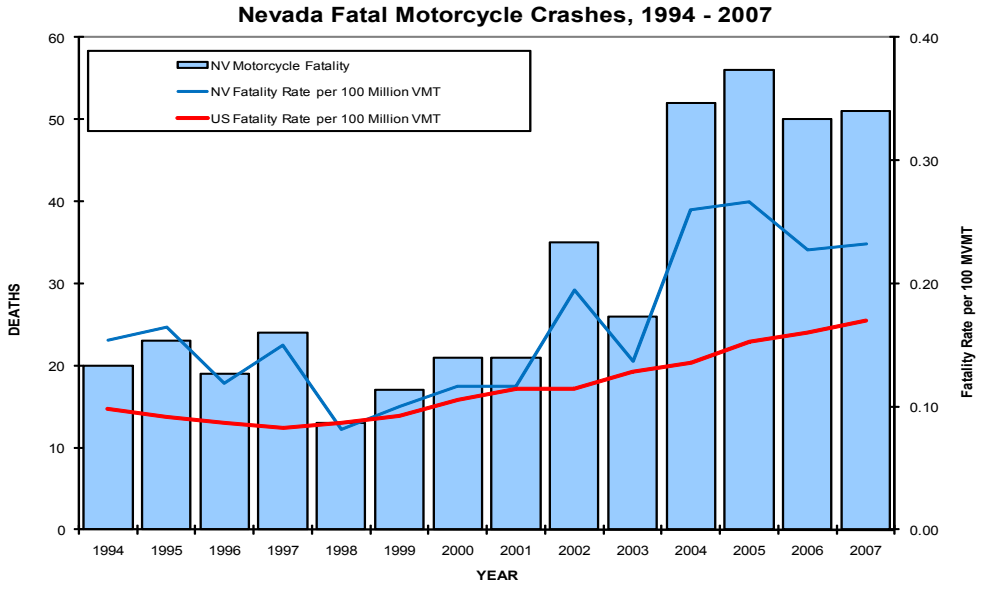
Introduction

For every mile traveled by a motor vehicle in the United States, motorcycle riders have a 34 times greater risk of death in a crash than people driving any other type of motor vehicles. They also are eight times more likely to be injured. Following a recent national trend, motorcycle crashes, motorcycle injuries, and motorcycle fatalities in Nevada all have steadily increased over the last ten years. Likewise, the total number of motorcycle crash fatalities has increased over the last five years. Motorcycle fatality rates per 100 MVMT have been on the increase since 1998, but have recently fallen. However in 2006, Nevada's motorcycle fatality rate remains higher than the US rate. In 2006 motorcycle crashes represented less than 2 percent of all motor vehicle crashes in Nevada but accounted for 18% of severe injuries and 20% of all traffic crash fatalities.

Demographics

Similar to nationally observed trends in the popularity of motorcycles among older populations, Nevada motorcycle crashes are more likely to involve older drivers than other types of motor vehicle injury. In particular, male drivers aged 35 to 45 years represent 29% of all non-fatal injury motor vehicle crashes and 26% of all fatal motor vehicle crashes. Other populations at increased risk of being injured in a motor vehicle crash include males aged 46 to 55 years.

Due to higher vehicle speeds in rural areas, fewer traffic control devices, and longer distances to emergency medical care, rural counties in Nevada typically have higher fatal motorcycle crash rates per million vehicle miles. Rural counties with greater than twice the average state rate of crash fatalities per



100,000 population included: Washoe, Douglas, Lyon, and Elko. Motorcycle ridership and miles traveled has increased most prominently in these communities.

Cross-cutting Issues

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 nationwide in 2008. There were 7.1 million motorcycles on United States roadways in 2007, according to the US Department of Transportation. At the same time motorcycle fatalities have also increased, 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. These older motorcyclists may have less experience riding a motorcycle, beginning to ride at a later age in life and typically riding motorcycles as recreation over daily transportation.

The major factors associated with the increased risk of injury and death related to riding a motorcycle are linked to lack of rider protection in a crash, inconsistent helmet use, and poor visibility of the rider and the ratio of vehicle to car operators sharing the same roadway. Behavioral factors such as alcohol and other drug use, motorcycle rider inexperience, and excessive speed have also been linked to contributing to the increased risk.

The majority of severe and fatal injuries caused by motorcycle crashes involve traumatic brain injuries and cervical spinal fractures. A large body of literature suggests that motor cycle helmet use has been demonstrated to be the most important protective factor in motorcycle injury and death. Helmets can reduce the incidence and severity of head injuries in motorcycle riders. The use of helmets and other common motor cycle safety equipments such as protective jackets and heavy duty boots have demonstrated significant reductions in facial and torso injuries, fractures of the lower extremities, ankles, and feet.

Similarly, significant reductions in head injury, likelihood of death, and medical costs due to helmet use have provided the basis for mandatory helmet use laws across the United States. Enactment of such laws has increased motorcycle helmet use from 20% to greater than 95% in Italy and Spain. However, the effectiveness of such legislative requirements has remained difficult to demonstrate among state enacting mandatory helmet use laws. Recently, Congress has reversed its position on mandatory helmet legislation and lifted federal sanctions against states without such laws, effectively removing incentives to require helmet use. In general, comprehensive helmet laws are significantly associated with an increase in helmet usage followed by declines in the total number of motorcycle deaths, head injuries, days of hospitalization, and medical costs. Helmet laws also had the least cost per year of lives saved among all major traffic safety programs for reducing motorcycle injury (Graham, 1993) and their benefit–cost ratios range from 2.3 to 5.07 (Hyder et al., 2007).

Alcohol use is most frequently associated with all kinds of motor vehicle injuries and death including motor cycle crashes. Motorcycle drivers are more likely to have consumed alcohol than are other motor vehicle operators involved in fatal and severe injury crashes. For example, 49% of motorcycle crash deaths in Nevada reported to NHTSA FARS involved alcohol in contrast to 28% of other motor vehicle crash deaths. Compared with multiple vehicle crashes, single vehicle motor cycle crashes (most frequently resulting from loss of control of the motorcycle) account for a greater proportion of motorcycle deaths with a blood alcohol concentra-

tion of greater than 0.1 g/dl. While the risk of being involved in a fatal crash increases with increased BAC levels for all age groups, more than 60% of motorcycle deaths among young riders aged 15–29 years involved alcohol (Holubowycz et al., 1994). However, in the US, the peak rate of deaths among motorcycle riders involving alcohol has recently shifted from this group to those aged 40–44 years (Paulozzi and Patel, 2004; NHTSA, 2006).

Prevention Strategies

Risk taking behaviors contribute greatly to motorcycle crashes. Similar to motor vehicle crashes these behaviors include excessive speed, alcohol intoxication, and failure to yield. Injury prevention interventions which focus on increasing the operators training which new motor cycle riders receive as well as limiting both access to alcohol and problem drinking are indicated.

Nationally it has been shown that riding a motorcycle without a valid license is associated with higher risks of crashing and serious motorcycle injury in the US and other countries (Dandona et al., 2006). Among fatally injured motorcycle operators, only 75% had a valid license (NHTSA, 2007), and the lowest licensure rate often occurs in younger drivers aged 20 years or younger (Dandona et al., 2006; Kraus et al., 1991). Through licensing, motorcycle riders can be compelled to learn important safety techniques with demonstrated success in preventing crashes including using low-beam headlights to increase visibility during the daytime, wearing helmets and body protection, and driving without drinking alcohol or using drugs.

Research has shown that in car-motorcycle collisions, two thirds of car drivers claimed not to have seen the motorcycle or claimed to have seen the motorcycle at a moment too late to have avoided collision. This suggests a need to improve the conspicuity of motorcycles and their riders. Literature suggests that use of low and high bean headlight during daylight hours is most effective in raising conspicuousness of motorcycle riders. Other countermeasures such as high-visibility clothing and bright colored helmets have also been found to reduce the risk of having a crash.

Nevada requires all drivers and passengers of motorcycles to wear protective headgear. Given the effectiveness of motorcycle helmet use in reducing injury severity, on-going education and continued support of enabling legislation and enforcement are national best practices.

Recommendations

- Require licensing and operator training for all motorcycle and related vehicles.
- Through mandatory operator training, instruct the importance of visibility, safety equipment, helmet use, compliance with speed regulations, and not drinking alcohol while driving.
- Apply car driver targeted public information and awareness campaigns which increase awareness of motorcycles and proper driver techniques for dealing with motorcycles operating on the roadway.
- Consider education and enforcement operations which increase compliance with Nevada's current helmet legislation
- Work with businesses who sell and rent motorcycles to require helmet use from riders and to offer safety training classes which underscore the importance of high visibility and the use of personal protective equipment while operating motorcycles.
- Conduct research to measure the current usage of helmets among motorcycle riders in Nevada and the potential usefulness of mandatory helmet legislation.

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6 Pedestrian Injury

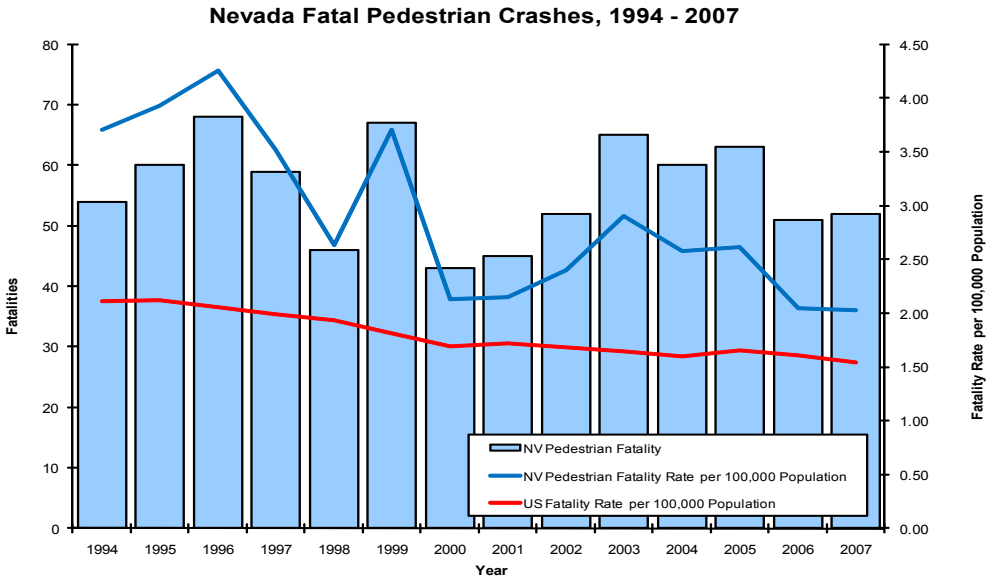
Introduction

At some point in their everyday lives, Nevadans of all ages are exposed to the risk of pedestrian injury. Whether walking from their parked car to their place of employment, walking to school, taking the bus, or jogging for exercise, Nevadans share public roadways with motor vehicles, placing themselves at direct risk for pedestrian injury. While pedestrian crashes represent only 0.2% of all traffic crashes in Nevada, they almost always result in injury. These disproportionately fatal crashes account for an average of 6.4% of severe injuries and 17.8% of all motor vehicle related fatalities in Nevada each year.

In the last decade, Nevada has made progress in improving safety for pedestrians. Total pedestrian crashes and crash fatalities have decreased over the last decade. Pedestrian fatality rates per 100,000 population have also declined since 1994, but remain consistently 25% - 30% higher than US rates per 100,000 population. Many of these decreases correspond to changes in street design, engineering consideration of the pedestrian and implementation of public awareness and education campaigns.

Demographics

Groups at greatest risk for pedestrian injury share common risk behaviors: inability to judge the distance or speed of approaching vehicles, risk taking behaviors such as running or darting out into intersections and streets, and inattention while crossing streets and intersections. Children, adult males aged 25 to 44 years who are intoxicated, and the elderly have more difficulty judging vehicle speed and distance are more apt to cross in



unsafe or impulsive manners, ignore traffic control devices such as crosswalks and traffic signals, and to lack sufficient attention while moving within traffic. In Nevada, these same groups are at greatest risk of being involved in a pedestrian crash. The age group with the highest rates of pedestrian injury and death is adult males aged 35-44 years followed by adult males aged 45 – 54 years. Pedestrian crashes among these particular age groups overwhelming involve alcohol.

Socioeconomic status also impacts risk of pedestrian injury. Certain groups of Nevadans are also at increased risk of pedestrian injury because of increased exposure. Populations who walk more, whose principal means of transportation is walking or public transit are at greater risk. Children, lower socioeconomic groups, and the elderly are more apt to rely on public transportation or walking as their primary means of transportation, increasing their exposure and subsequently their risk for pedestrian injury. Similarly, individuals who might have had their motor vehicle operator license suspended, revoked for driving while intoxicated might be at greater risk to be involved in a pedestrian crash.

While pedestrians in rural areas tend to be at greater risk for pedestrian injury and death, in Nevada, in 2006, the urban centers of Clark and Washoe Counties had the largest consistent numbers of pedestrian injury and death. Pedestrian injury in rural areas tends to be a rare event. Multiple years may go by in most rural counties before a pedestrian death occurs. When pedestrian crashes do occur in rural areas, however, they are disproportionately fatal in large part due to higher vehicle speeds in rural areas and greater distances to emergency medical care in rural parts of the state.

Cross-cutting Issues

Driver and pedestrian behavior contributes to the risk of pedestrian injury. Drivers often do not comply with pedestrian right of way. Driver non-compliance to pedestrian right of way most frequently occurs at un-signalized crossings and less frequently at signalized crossings. At intersections, conflicts between pedestrians and motor vehicles arise during free yield left (proceed on green) and right hand turns (right turn on red permitted). Motor-vehicles running red lights directly put pedestrians at risk of injury. Driver error is indicated by investigating law enforcement in 38% of all pedestrian fatalities in 2006. Improper crossing by pedestrians is most often associated with fatal pedestrian crashes. In Nevada, in 2006, 55% of all pedestrian fatalities involved improper crossing behavior on part of the pedestrian.

Alcohol intoxication (on the part of the pedestrian as well as the driver) is associated with increased risk of pedestrian injury. Alcohol intoxication reduces a pedestrians ability to judge the speed, distance and arrival times of motor vehicle, increases inattention and decreases dexterity. Intoxicated pedestrians are more likely to sustain more severe (fatal) injuries in crashes with motor vehicles. In Nevada, 43% of all pedestrian fatalities and 22% of all pedestrian injuries involved alcohol on either part of the pedestrian, driver, or both. In Nevada, in 2006, the majority of pedestrian injuries involved adult males aged 35 – 54 years. Among these crashes, 82% involved alcohol on part of the pedestrian indicating a clear association between alcohol consumption and pedestrian injury among this specific age group.

The blood alcohol concentrations (BAC) associated with decedents involved in fatal alcohol related pedestrian crashes in Nevada tend to be very high. The mean BAC for the alcohol involved pedestrian fatalities in 2006 was .1 mg/dL, significantly past the legal intoxication limit. Such high BACs could be associated with chronic alcohol abuse. Nationally, studies suggest that adult pedestrian

crashes with high BACs are associated with homeless and transient individuals or areas of increased liquor outlet density.

In rural and urban communities in Nevada, roadways have been primarily designed for motor vehicles and often neglect the comfort, accessibility, and safety of pedestrians. Public roadways designed primarily for cars translate to walking environments which are dangerous and discouraging to people who might otherwise walk. Common to these pedestrian unfriendly environments are wide, multi-lane arterial roads with high (45 miles per hour or above) speeds; lack of signalization; lack of pedestrian facilities and continuous sidewalks; large volumes of traffic and lack of sufficient lighting.

In Nevada's urban communities, pedestrian crashes are most prevalent in areas with high volumes of both pedestrian and motor vehicle traffic. Major roadways like Las Vegas Boulevard and Maryland Parkway have high levels of pedestrian and motor vehicle traffic. Compounding the risk of pedestrian crashes associated with these areas are frequent transit stops. At transfer transit stops, pedestrians cross roadways twice in order to catch transferring buses at adjacent transit stops. Frequently, pedestrians will cross dangerously or against traffic signals to catch connecting buses. These behaviors can lead to pedestrian crashes.

Another crash type common on urban arterial roadways is the 'trapped pedestrian'. Pedestrians frequently seek midblock crossings particularly on roadways with long distances between signalized intersections. If a pedestrian needs to cross a roadway, they often will cross at midblock rather than proceeding down to the next signalized intersection. Many pedestrians crossing at midblock will become trapped in the 'suicide lane' or two-way turn lane found in the middle of most urban arterials. This is a very dangerous situation for the pedestrian who must dash between platoons of oncoming motor vehicles in order to cross the roadway.

Pedestrian crashes are also linked to the visibility of pedestrian to drivers. In Nevada, most pedestrian crashes occur at night from 9:00 PM – Midnight (20.0%), 3:00 PM – 6:00 PM (19.2%), and 6:00 PM – 8:59 PM (18.5%). Pedestrian visibility is a function of roadway lighting. Poorly lit roads are a major contributing factor to pedestrian crashes.

Prevention Strategies

Many strategies to reduce pedestrian injury have been successfully applied in Nevada. Pedestrian safety activities in Nevada have focused on increasing driver awareness of and compliance with yielding right of way laws applicable to pedestrians. These activities have included media campaigns and pedestrian safety law enforcement operations which target non-compliant drivers who fail to yield to pedestrians in functioning signalized and mid-block crosswalks. Pedestrian issues have also been successfully incorporated into the drivers licensing curriculum and examination, increasing driver awareness of safe and legal interactions with pedestrians on roadways. Traffic engineers and community planners in Nevada communities have worked together to review and modify roadways making them safer for pedestrians when appropriate in terms of pedestrian volume and pedestrian risk. Programs which reduce traffic volumes and speed through neighborhoods and residential areas have employed traffic calming measures which reduce both the risk and severity of pedestrian injuries. The Nevada Department of Transportation currently reviews proposed roadway modifications and new roadway projects for pedestrian concerns and compliance with the American's With Disabilities Act accessibility guidelines.

In the last ten years, Nevada has excelled in the aggressive application of novel pedes-

trian crash engineering countermeasures which are designed to improve driver and pedestrian compliance with traffic laws, increase pedestrian visibility, and reduce vehicle speeds, and separate pedestrian and vehicle traffic in high traffic (conflict) areas. Particularly in urban areas, these engineering countermeasures have separated much of the pedestrian and vehicle traffic along high crash areas, significantly reducing the incidence of pedestrian crashes associated with these roadways.

The successful strategies employed in Nevada to reduce pedestrian injury should be continued. Programs which provide technical assistance such as law enforcement, education, and engineering solutions to neighborhoods and communities should be expanded.

Recommendations

- Merge pedestrian volume, traffic volume, and traffic crash data into a geographically based system to provide on-going surveillance of pedestrian crashes in Nevada.
- Through multi-disciplinary review, utilize the merged data to plan, design, and implement engineering countermeasures as indicated.
- Provide educational, enforcement, and engineering technical assistance to neighborhoods and communities across Nevada with increased rates of pedestrian injury and indications of community readiness for action.
- Continue to raise driver and pedestrian awareness of pedestrian laws and safety concerns via public information and educational campaigns.
- Work with transit officials to improve the safety for transit users walking to making bus connections and transfers.
- Review all proposed roadway modifications and new roadway construction for pedestrian considerations including assessment of current pedestrian crashes and pedestrian volumes at these locations.
- Continue to support targeted pedestrian enforcement operations in urban communities.
- Improve roadway lighting at areas with increased rates of nighttime alcohol involved pedestrian crashes.
- Use existing public intoxication laws and detoxification centers to remove severely intoxicated pedestrians from roadways particularly in high crash areas throughout the state.

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7 Unintentional Fall Injury

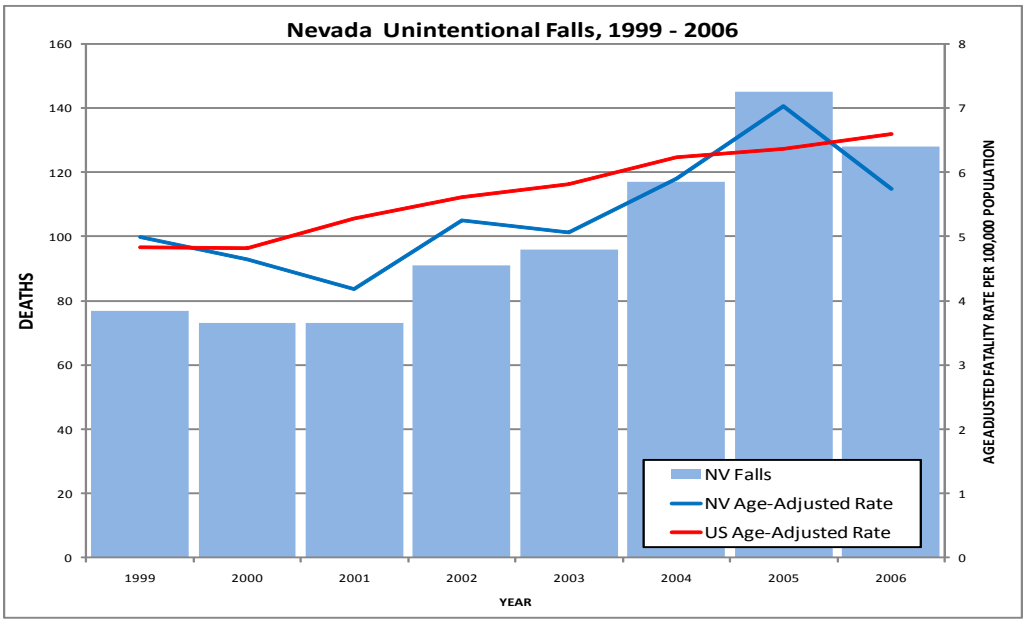
Introduction

Falls consistently rank among the most serious injuries facing the elderly and cause a tremendous amount of morbidity, mortality and disability (CDC, 2007). It has recently been estimated that at least one third of community dwelling people aged 65 years or older fall each year. Falls occur at a considerably greater frequency in nursing homes and hospitals. For the elderly, falls not only cause physical injury but falls can also have major psychological and social consequences. Fear from a fall and the resultant loss of self-confidence can cause older adults to limit their activity which in turn leads to reduced mobility, decreased physical fitness, and a resulting increased fall risk (Brown, 1989).

From 1999 to 2006, Nevada experienced a steady increase in age-adjusted unintentional fall mortality rates. Nevada's per capita age adjusted fatality rate for unintentional falls tracks just above or just below the United States fall rate from year to year during the study period. Counties with the highest unintentional fall death rates per capita included Esmeralda, Storey, Lincoln and Carson City (see Appendix 1: County Injury Mortality Maps).

Demographics

In Nevada during the study period, males were almost twice as likely to die from unintentional fall injuries as females. Age is strongly correlated with risk of fall mortality. As age increases so does the age adjusted fall mortality rate. Groups at greatest risk for fall death included those 60 years old or greater, with the highest rates of fall death among those who are 85 years or older.



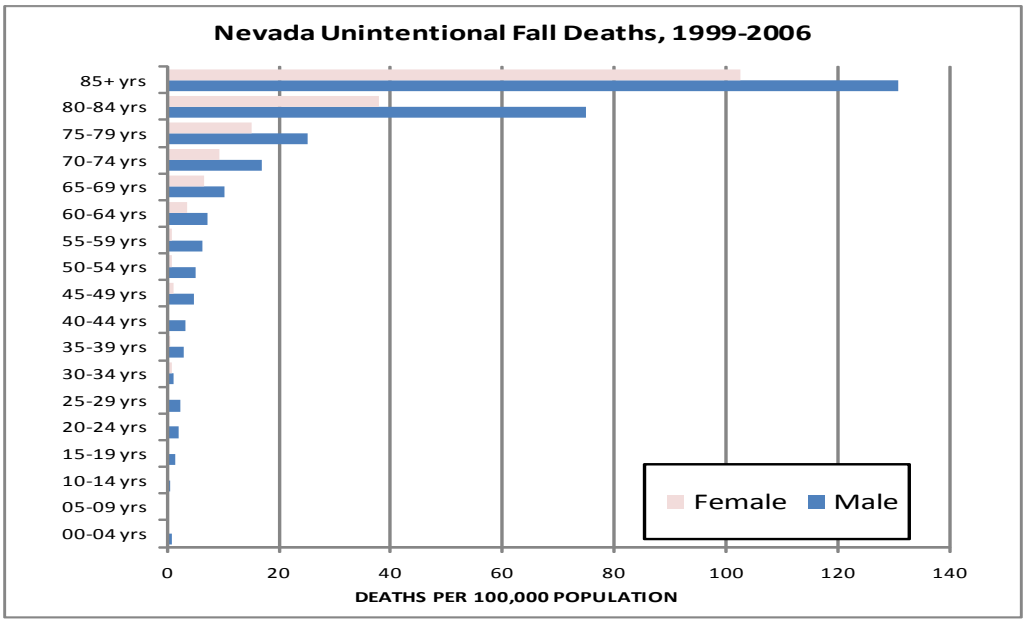
Rates of fall related mortality vary with racial and ethnic group. Racial groups at greatest risk in Nevada for fall injury included American Indians and Alaska Natives, and White Non-Hispanics.

Cross-cutting Issues

Epidemiological studies have identified many different risk factors associated with unintentional falls. These risk factors can be generally categorized into personal factors attributed to the individual and environmental factors. Falls rarely result from a single cause and are most often the result of interactions between a number of risk factors. While falls are most common among the elderly, they are frequently mild in nature but have devastating physiological effects. Older persons are highly susceptible to injuries from falls and have a high prevalence of chronic conditions (e.g., osteoporosis, congestive heart failure) which can make a relatively mild fall potentially life threatening.

Personal risk factors associated with falls include a person's age, the more advanced the age the greater the risk of falling. This is because of age-related physiological changes such as decreased balance, strength, and endurance combined with delayed reaction times and slower reflexes. Certain chronic medical conditions have been linked to an increased risk of unintentional fall injury. Chronic illness and disability from Parkinson disease, heart problems, diabetes, stroke, and incontinence have been linked to an increased risk of unintentional fall injury. Empirical evidence has shown that impaired touch and proprioreception, postural sway, and gait disorders linked to dementia and extremely advanced age also increase the risk of fall injury. Finally, reduced vision can compound the risk of unintentional fall injury.

A person's behavior can also impact risk for fall injury. The regular consumption of multiple medications which occurs as a person ages is linked to increased fall risk, particularly the use of tranquilizers and other psychotropic medications. Furthermore, persons over the age of 65 years are more apt to have improper nutrition and hydration which contribute to fall injury. These individuals often lack proper footwear, lack daily exercise and have other mobility impairments which contribute to the risk of falling. Furthermore,



many older individuals are institutionalized and are wheelchair or mobility aid dependent. Individuals who are mobility aid dependent have unintentional fall rates nearly 5 times higher than those who are not dependent on mobility aids.

Environmental risk factors which increase the likelihood of fall injury include poor building design and inadequate maintenance of buildings. Inadequate building codes and substandard dwellings which are not compliant with current Americans with Disability Act standards are frequently associated with fall injuries, particularly among the elderly. Slippery or uneven surfaces, poor lighting and sharp contrasts, and obstacles such as tripping hazards, small area rugs, all contribute to the risk of fall injury.

There are also social and economic factors which have been linked to an increased risk of fall injury. As with other injury, socio-economic factors such as low income, lack or education and illiteracy and language barriers are related to fall injuries. In large part, low socio-economic status contributes to poor living conditions, unsafe housing and poor social environment. Many elderly individuals who live alone and may lack support networks and positive social interaction are at increased risk of falls. Elderly individuals living in rural areas are at increased risk due to a more solitary lifestyle.

Prevention Strategies

A review of the literature describes successful community based strategies for fall prevention. Effective interventions generally focus on increasing physical activity and modification of the home for safety. Many interventions begin with a clinical assessment by a healthcare provider to assess the physical fitness of an individual, the presence of personal health risk factors (e.g., dementia) and the safety of the home. Based upon the results of the assessment, the clinician can provide a prescription for mobility aids and an exercise regime, manage medications, and propose safety modifications for the home. Exercises which focus on improving balance, strength, and flexibility have reduced the risk of fall in clinical trials by as much as 12%. Exercise programs which incorporate yoga, tai chi, and dance into an elderly person's daily routine have been successful in reducing the risk of falls (Rubenstein and Josephson, 2002).

Studies have shown that home modification reduces falls among the elderly. When done by trained professionals and focused on those at greatest risk, home modifications are very effective but also costly. The removals of barriers and home objects which commonly contribute to falls should be combined with the installation of hand rails, curb ramps, rest areas, and grab bars particularly in the bathroom (Chang et al., 2004).

Because of the prevalence of fall injuries in health care settings and institutions for the elderly, interventions which are aimed at these facilities would be a very effective way to reduce falls among the elderly. Staff training about falls and fall prevention at these institutions has been effective in reducing falls. Healthcare facility sponsored exercise programs for inpatients and reduced nurse to patient ratios particularly in nursing home facilities have also been effective at mitigating fall risk in this population.

Recommendations

- Research and evaluate the rates of elderly falls in community healthcare institutions, nursing homes, and assisted living facilities.
- When warranted, employ staff training, improved nurse to patient ratios, and clinical assessment at institutions who care for the elderly.
- Encourage physical activity and increased mobility for elderly persons in Nevada.

- For those at greatest risk (individuals with a prior history of fall injury), provide an avenue for home assessment and modification to improve environmental safety.
- Encourage and enforce compliance with the Americans with Disabilities Act as it relates to building codes and public areas such as sidewalks.
- Communicate with healthcare providers about potentially dangerous combinations of medications which increase falls among the elderly.
- Educate the elderly about the proper use of mobility aids such as bed alarms, canes, walkers, wheelchairs, and hip protectors when they are issues by healthcare providers.

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8 Unintentional Drowning

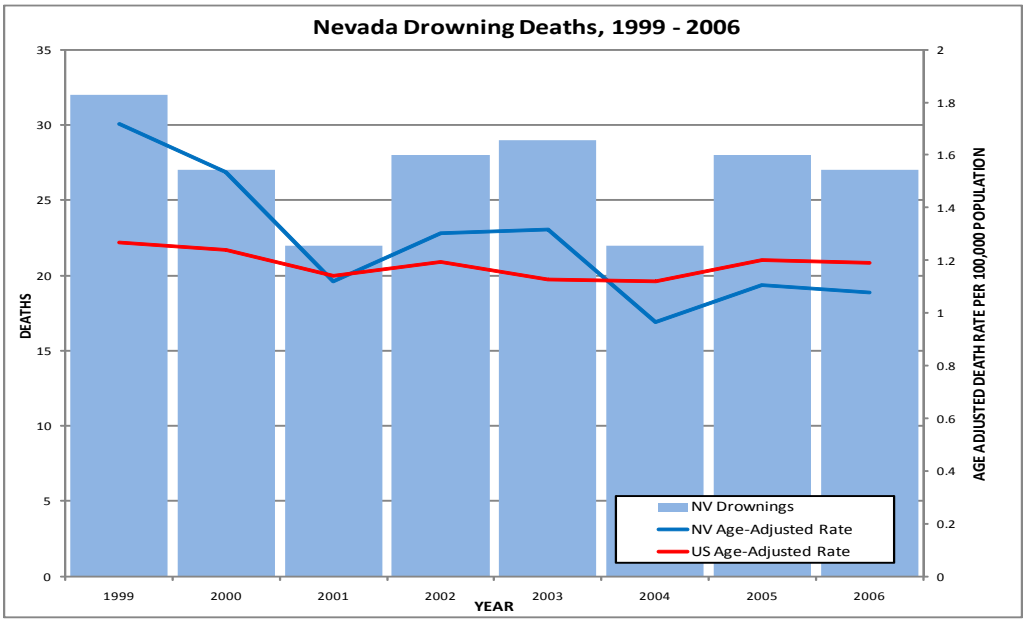
Introduction

According to the Southern Nevada Health District, a submersion incident is used to describe both fatal and nonfatal drowning events. In 2005, the CDC reported that, nationally, there were just over 3,500 fatal unintentional drownings. This averages to approximately ten deaths per day. About a quarter of fatal drowning victims are children 0 -14 years of age. For every one child who dies from drowning, four receive emergency department care for nonfatal submersion injuries. A nonfatal drowning can result in no impairment, some impairment, or significant impairment. It is estimated that 20 percent of hospitalized nonfatal drowning victims suffer severe, permanent neurologic disability that includes memory problems, learning disabilities, and permanent loss of basic functioning.

A comparison of Nevada and US age adjusted unintentional drowning rates reveal that the former had higher than national rates for 1999, 2000, 2002, and 2003. In 2001, the US and Nevada had similar rates (1.1 and 1.1 deaths per 100,000 population, respectively). Nevada's drowning age adjusted drowning rates were lower than the US during 2004-2006. The majority of Nevada's drowning take place in Clark County. Counties with the highest rates of drowning related death per capita include: Lincoln, Clark, Washoe, and Humboldt counties (see Appendix 1: County Injury Mortality Maps).

Demographics

Unintentional drowning by age group sadly show that the youngest and oldest age categories, 0-4 years and 85 years and older, had much higher rates than intermediate age groups. The elderly drowning rate is 1.2 times



greater than the pediatric age group (4.7 versus 3.7). The pediatric age group was anywhere from 1.8 to almost 8 times greater than the next highest age group rate (80-84 years) and lowest age group rate (65-69 years). Males are almost three times more likely to drown than females.

Racial and ethnic disparities in unintentional drowning are minimal with the exception of one group, American Indian/Alaska Natives. Specifically, White, African American, Asian and Pacific Islander, and Hispanic residents had similar age adjusted drowning rates. American Indians and Alaska Natives, however, had rates 3-4 times lower than the other racial and ethnic groups.

In Nevada, crude drowning rates by age and sex show that both males and females had similar rates in the 0-4 year age category. Males, however, were three times more likely to drown than female counterparts during adolescence (15-19 years) and young adulthood (20-24 years). In fact, males continue to have rates much greater than that of females during adulthood until age 60-64 years when they have identical rates and 65-69 years when females have higher rates.

Cross-cutting Issues

According to the CDC (2007), in the US, males are four times more likely than females to die from an unintentional drowning. Further, of all children-related fatalities (ages 1 to 4 years), 30% are from drowning, making drowning the 2nd leading cause of unintentional injury mortality for young children. Also, unintentional drowning mortality rates for African Americans were 1.3 times that of Whites. For American Indians and Alaskan Natives, this rate was 1.8 times that of Whites.

In urban counties such as Clark County, the primary site of the submersion incident is the residential swimming pool. Older homes, apartment and condominium complexes are more apt to have swimming pools which lack barriers such as gates which prevent child access to pools when they are unsupervised.

Prevention Strategies

The most common drowning victim is a young child aged 4 years old or younger. Most drowning fatalities happen in the family pool, with 70% of the incidents occurring mid-afternoon to early evening (2:00 p.m. - 8:00 p.m.). Lack of child supervision around swimming pools is a major risk factor for submersion incidents in Nevada. The designation of a responsible adult to watch young children in or around water (e.g., bathtubs, pools, lakes, etc.) can prevent these tragic events. Adults should not be involved in any other distracting activity (e.g., phone calls, reading, watching television, etc.) while supervising children in a swimming pool.

Another important prevention strategy for submersion incidents is the concept of 'layers of protection' which refers to the installation and proper use of barriers around swimming pools. The use of barriers such as perimeter and isolation fences, self-closing and self-latching fence gates, alarmed entrances to pools, and spa and pool safety covers which support the weight of an adult delay a child's access to the pool. Layers of protection allow more time for supervising adults to intervene in a submersion incident.

In 2001, a coalition of injury prevention partners in Southern Nevada worked towards changing existing building codes to help ensure the application of 'layers of protection' to newly built residential swimming pools. These building codes included the requirement of four sided, non-climbable perimeter fencing with a minimum height of four feet around residential swimming pools. Recently an attempt was made to make these building codes required for swimming pools built before the new requirements were implemented.

Recommendations

- Never leave a child alone near any body of water in which a child's nose and mouth can be submerged.
- Never use floaties or other inflatable toys as life jackets or substitutes for adult supervision.
- Never consider children to be 'drown-proof' despite swimming skills, previous swimming lessons or experience.
- Install a four-sided, isolation pool fence that completely separates the house and play area of the yard from the pool area. The fence should be at least four feet high. Use self-closing and self-latching gates that open outward with latches that are high up enough to be out of the reach of children. Also, consider additional barriers such as automatic door locks or alarms to prevent access or notify you if someone enters the pool area.
- Swimming pool gated must be closed and must never be propped open.
- Remove floats, balls and other toys from the pool and surrounding area immediately after use. The presence of these toys may encourage children to enter the pool area or lean over the pool and potentially fall in.

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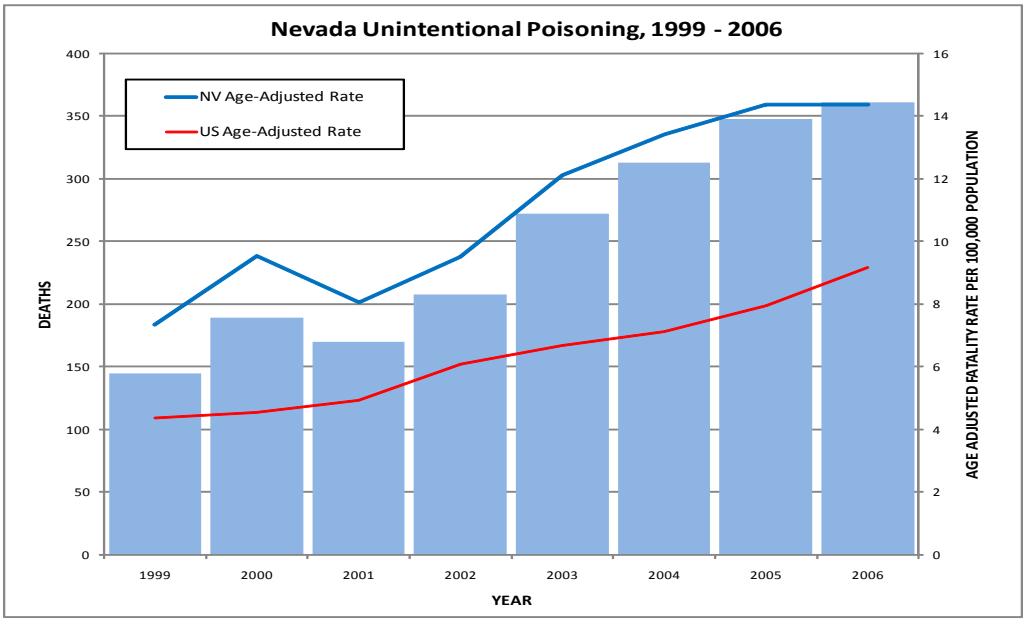
9 Unintentional Poisoning and Substance Abuse

Introduction

A poison is any substance that is harmful to your body when ingested, inhaled, injected, or absorbed through the skin (CDC, 2007). Poisonings are either intentional or unintentional. For the latter, the person taking or giving a substance did not mean to cause harm. Unintentional poisoning includes the use of drugs or chemicals for recreational purposes in excessive amounts (e.g., overdose) as well as the excessive use of drugs or chemicals for non-recreational purposes (e.g., medication taken by a young child) (Paulozzi and Budnitz, 2006).

In 2005, almost two-thirds of poisoning deaths were unintentional (CDC, 2008). During this same year, unintentional poisonings were 2nd only to motor vehicle accidents as causes of unintentional injury death (CDC, 2008). Using age-adjusted rates, it was determined that among people 35-54 years of age unintentional poisoning caused more deaths than motor vehicle accidents. In 2006, poison control centers in the United States reported approximately 2 million unintentional poisoning cases in 2006 (Bronstein et al. 2007).

From 1999 to 2006, Nevada experienced a steady increase in age-adjusted unintentional poisoning rates with the exception of a slight decrease in 2001. Nevada's unintentional poisoning rates are above those of the US In fact, Nevada's rates are approximately 1.5 times the national average. Counties with the highest per capita rates of unintentional poisoning deaths include: Clark and Nye counties.



Demographics

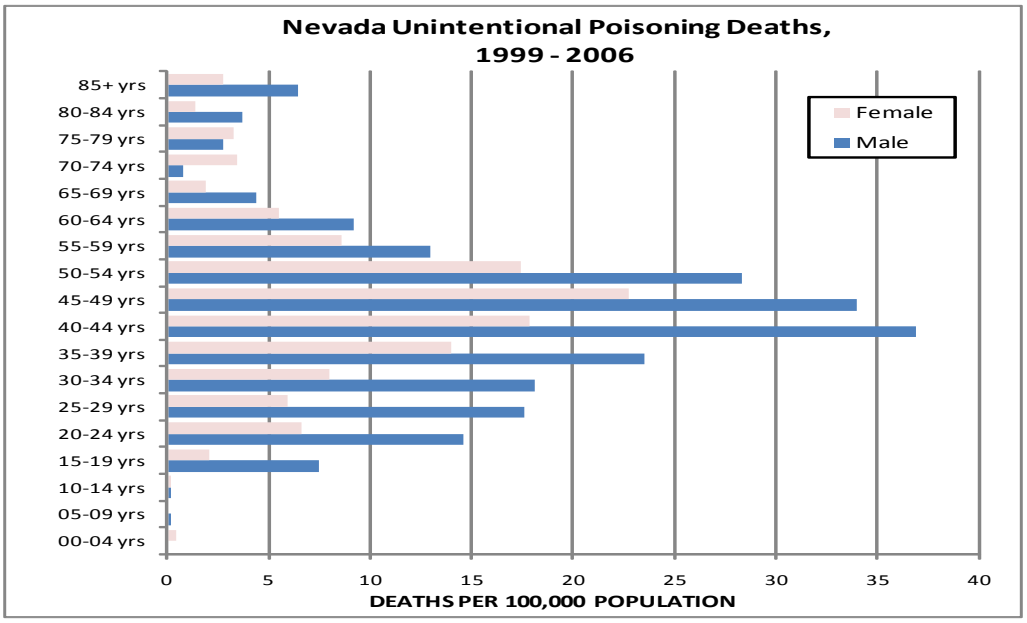
The unintentional poisoning data for Nevada indicates that the highest fatality rates occur in the 40-54 year age group. The fatality rate for children 14 years of age and younger is low compared to other age groups in this data set. Gender differences reveal that Nevada males are twice as likely to suffer unintentional poisoning as are females. The fatality rate for male residents is 14.5 per 100,000 population compared to 7.8 per 100,000 population for female residents.

With the exception of Asian and Pacific Islanders and Hispanics, relative rates for racial and ethnic categories are fairly even. American Indian and Native Alaskan rates (12.8 deaths per 100,000 population) were only slightly higher than those of African Americans (12.3 deaths per 100,000 population) and Whites (11.9 deaths per 100,000 population). These rates were approximately six times greater than rates for Asian and Pacific Islanders and four times greater than rates for Hispanics.

Unintentional poisoning rates by age and sex show that, with the exception of women in the 70-79 age groups, males are more likely to die from poisoning than are females. During adolescence (15-19 years of age), boys are 3.5 times more likely to be poisoned than girls. This trend continues through young and middle adulthood; however, both sexes experience significantly greater increases in poisoning from 35 to 54 years of age. Comparatively speaking, Nevada's crude unintentional poisoning rates mirror those of the US generally. The notable exception is that, nationally, females continue to have higher poisoning rates than males in the 70-79 age categories.

Cross-cutting Issues

The highest rates of unintentional poisoning death are observed in middle aged individuals from 45 – 54 years. These rates are reflective of a culmination of lifetime of substance abuse and are most frequently associated with heroin, cocaine, and opioid analgesics. These patterns of addiction begin young, often when teenagers are leaving home. Chronic addiction follows with a reduction in the social safety net (e.g. loss of family, job) and often concludes with death. Substance abuse is a difficult disease to treat hence, prevention is warranted. Early intervention



in the cycle of drug and alcohol abuse has better outcomes for substance abusers than intervention later in life when these behaviors become more permanent patterns often impacting permanently a person's ability to function without substances.

Recently, a survey of national emergency department visits has confirmed that legal drugs are as frequently the cause of unintentional poisoning as illegal drugs. In the last ten years, the US has seen a marked increase in overdose associated with prescription medications, principally opioid analgesics. The number of deaths from opioid analgesic overdose has recently surpassed the number of deaths from illegal drug overdose. This trend in the abuse of prescription medications has driven the national rates of unintentional injury death almost 500% from 1995 to 2005 (CDC, 2007).

Recommendations

- Individuals should be educated about the importance of following directions on the label when taking medicines: including reading all warning labels. Many medicines cannot be taken safely with other medicines, illicit drugs, and alcohol.
- Patients using opioid pain medications (e.g., hydrocodone, oxycodone) should keep them in a safe and secure place.
- The general publis should be encouraged to dispose of unused, unneeded, or expired prescription drugs.
- Health care providers should employ opioid medications for acute or chronic pain only after determining that alternative therapies do not deliver adequate pain relief. The lowest effective dose of opioids should be used.
- Health care providers should work to identify patients using opioids for non-cancer pain who 1) receive a total of 120 or more morphine milligram equivalents of opioids per day from two or more sources; 2) show inappropriate patterns of usage such as multiple prescriptions for the same medication from different providers; or 3) also use a sedative-hypnotic.
- For patients whose use of multiple providers cannot be justified on medical grounds, insurers should only reimburse opioid prescription claims from a single designated physician and a single designated pharmacy.
- To the extent permitted by applicable law, state prescription drug monitoring programs should routinely send reports to providers on patients less than 65 years old if they are being treated with opioids for more than six weeks by two or more providers or if there are signs of inappropriate use of controlled substances. (If legal authority to do so does not exist, work toward obtaining that authority.)
- In order to prevent household chemical related poisoning, educate the public about: reading product labels that might be poisonous or hazardous.
- Do not use food containers such as cups, bottles, or jars to store chemical products such as cleaning solutions or beauty products.
- Never mix household products together (e.g., mixing bleach and ammonia can result in toxic gases).
- Wear protective clothing (gloves, long sleeves, long pants, socks, shoes) when applying spray pesticides or other chemicals.
- Educate the public about the national poison control number (1-800-222-1222) and encourage individuals to keep it near every home telephone and save it on cell phones.

- Keep all drugs in medicine cabinets or other childproof cabinets that young children cannot reach.
- Avoid taking medicine in front of children because they often copy adults.
- When you take medicines yourself, do not put your next dose on the counter or table where children can reach them.
- Do not leave household products out after using them. Return the products to a childproof cabinet as soon as you are done with them.

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10 Occupational Injury

Introduction

The National Institute of Occupational Safety and Health (NIOSH) defines an occupational injury as an injury which occurs at work or as a result of an occupation. An occupational injury may represent a single event (e.g. fall from a building) or be a physical injury which results from repeated use or exposure (e.g. mesothelioma from asbestos exposure). In the United States, in 2007, 5,488 workers died from acute occupational injuries and an estimated 4 million private sector workers sustained a nonfatal occupation injury or illness. Among these non-fatal injuries, 3.4 million or 85% resulted in a visit to an emergency department and the majority of them caused missed days and work and reduced productivity (NIOSH, 2008). Occupational injuries are costly to employers. It is estimated that employers spent nearly $87.6 billion on workers compensation claims (Rivara and Thompson, 2000).

From 2003 until 2008, there were 324 occupational injury related death in Nevada. During this period Nevada's occupational injury fatality rate was 1.8 per 100,000 population, slightly higher than the United States occupational injury fatality rate of 1.4 per 100,000 population.

Demographics

In Nevada, occupational fatalities primarily involve males. Males are 5.5 times more likely to sustain a fatal occupational injury than females. Adults aged 35 – 54 have the highest per capita rates of fatal occupational injury. Adults aged 20-24 years old also have high rates of fatal occupational injury. Interestingly, White non-Hispanics, American Indian and Alaskan Native, and African Americans all have similar rates of occupational injury fatality per capita. However, Hispanics have occupational injury fatality rates which are approximately 30% greater than White non-Hispanics.

Cross-cutting Issues

Occupational injury related fatalities in Nevada primarily result from transportation related crashes which represent 41.7% of fatalities during the study period. The majority of these work related transportation deaths were the result of motor vehicle crashes during work activities. Construction and mining injuries involving falls (20.1% of fatalities) and contact with equipment (17.6% of fatalities) were also common. Occupational injury fatality resulting from violence (11.7%) and exposure to harmful substances or environments (8.0%) occur less frequently. In Nevada, occupational injury deaths involved employees of private companies (90.4%) or government employees (9.6%). There are differences between men and women with regards to the mechanism of occupational related injury. Among occupational fatalities, women more frequently are injured by violence and contact with equipment. Men more frequently are injured in transportation accidents or falls.

The Occupational Safety and Health Act of 1970 directs states to develop and operate their own job safety and health programs. The Occupational Safety and Health Admin-

istration (OSHA) approves and monitors state plans providing up to 50 percent of an approved plan's operating costs. Nevada is one of 27 states which is approved to operate its own safety and health enforcement program. Hence, Nevada is required to operate and enforce its own occupational and safety codes (NIOSH, 2007).

Recently, Nevada experienced 25 workplace fatalities which were investigated by the Nevada Occupational Safety and Health Administration. Based upon complaints regarding fatality investigations at two hotels in Las Vegas, OSHA conducted a special study to review critical elements of the Nevada OSHA program. The results of this special study identified numerous problems with the Nevada Occupational Safety and Health Administration in the issuance of willful violations to private companies found in noncompliance with Nevada Occupational Safety and Health Standards with citation for repeat violation and hazards not addressed in citation. In most cases, poor communication between involved entities was also a problem. (US Department of Labor, 2009). Further, in almost half of the fatality cases reviewed, the Nevada Occupational Safety and Health Office failed to notify the families of deceased workers that it was investigating the death. Thus, these family members were never given an opportunity to talk with investigators about the circumstances of the fatality. In many investigations, family members have provided information pertinent to the case. (US Department of Labor).

In response to the results of the federal OSHA special study, The Nevada Occupational Safety and Health Administration has created an action plan and programmatic changes that will allow it to implement the recommendations contained in the federal report. In this plan, Nevada OSHA's stated goals are to revitalize the staff, rebuild relationships with Federal OSHA, restore public confidence in the agency and perform thorough, legally sufficient inspections that will be sustained throughout the review process. Nevada OSHA continues to be committed to enhancing its operations so that it is better prepared to address the worker safety and health concerns in the State of Nevada (US Department of Labor, 2009).

Prevention Strategies

In Nevada, injury prevention efforts aimed at reducing occupational injury should focus on transportation safety and increasing awareness and use of industry standard safety devices for construction and mining operations. By improving the data collection surrounding reported incidents of occupation injury, future fatalities may be prevented. NIOSH recommends that injury prevention professionals and employers apply occupational injury research findings to real situations in the workplace, disseminate information and implement those activities which move research into practice, and involve the community, worker union, families of workers in the prevention of occupational related injury (Rivara and Thompson, 2000).

Recommendations

- Improve data collections and conduct studies of occupational injuries and fatalities due to falls from elevations at construction sites in Nevada.
- Develop interventions to improve ladder safety through research, communications, best practices and partnerships.
- Develop recommendations for attaching a safety harness by developing and evaluating engineering recommendations, and disseminate solutions and guidelines.
- Implement industry best practices to manage teams working without observation.

- Conduct risk assessments to improve information on factors that contribute to falls.
- Compile data to determine factors contributing to occupational related motor vehicle crashes and use these data to develop and evaluate interventions.
- Provide all safety training and occupational injury prevention materials in both English and Spanish at worksites around Nevada.
- Improve falls training at worksites throughout Nevada.
- Work with employers to educate employees about the risks of domestic violence at the workplace.
- Implement safety countermeasures such as video monitoring and security guards within business with increased incidence of violent robbery.

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11 Traumatic Brain Injury

Introduction

A traumatic brain injury (TBI) is defined as a blow or jolt to the head or a penetrating head injury that disrupts the function of the brain. (CDC, 2006). The severity of TBI ranges from mild with brief changes in mental status or consciousness to severe with extended periods of unconsciousness and persistent cognitive or movement and balance impairment. TBI frequently result in problems with independent function and result in an estimated $60 billion in direct and indirect costs such as lost productivity in the United States each year (Finkelstein et. al., 2006). The CDC estimates that of the 1.4 million persons who sustain a TBI every year, 50,000 (4%) die; 235,000 are hospitalized; and 1.1 million are treated and released from Emergency Departments (Langlois et. al., 2006).

Nevada is one of the 30 states funded by the Centers for Disease Control for required reporting of TBI events. A 2004 report identified 437 TBI deaths in Nevada in 2002. A report by the CDC in 2005, identified 460 TBI deaths in 2005. In 2005, the age adjusted death rate for TBI in Nevada was 19.0 per 100,000 population, slightly higher than the US TBI rate of 18.2 per 100,000. During 2005, there were 1,910 hospitalizations for TBI in the state of Nevada with a TBI hospitalization rate of 78.4 per 100,000 population which is significantly lower than the United States TBI hospitalization rate of 84.3 per 100,000. It should be noted that in this same year, only 56.3% of hospital records had external cause coding which may lead to bias and inaccuracy in these estimated rates.

Demographics

Males are more likely than females to die from a TBI. In 2005, 79.8% of all TBI death in Nevada involved males. In the United States, age groups most at risk include the very young (<4 years old), young adults (15 to 19 years old) and the elderly (>70 years old). In Nevada, age groups with the highest rates of TBI related mortality included those 45 – 64 years (20.4 per 100,000 population) and those 65 years or older (49.2 per 100,000 population).

Similarly, males were more likely to be hospitalized for a TBI then females. In 2005, 78.7% of all TBI related hospitalizations in Nevada involved males. In Nevada, age groups with the highest rates of hospitalization per capita included children aged 15 – 24 years (91.9 per 100,000), adults 65 – 74 years (92.4 per 100,000), and the elderly over 75 years (241.1 per 100,000). Unlike national statistics for TBI, Nevada's children under age 18 years had significantly lower rates of hospitalization for TBI.

African Americans have the highest death rates among different race designations for TBI in the US. The leading causes of TBI include: falls (28%), motor vehicle crashes (20%), unintentional struck by/against events (19%), and assault (11%) (Langlois et. al., 2006).

Cross-cutting Issues

Unfortunately, the impacts of TBI for those who are hospitalized after their injury are quite severe. The CDC estimates that at least 5.3 million Americans currently have a

long-term or lifelong need for some level of care in order to perform daily living activities as a result of a TBI. Almost 40% of those hospitalized with TBI had long-term problems with memory and problem solving, managing stress and emotional outbursts, controlling their temper, or maintaining employment. Sequelae associated with TBI include epilepsy, loss of cognitive function, dementia, Parkinsons's disease, and Alzheimer's disease.

Prevention Strategies

Strategies to prevent and reduce the severity of TBI focus on prevention strategies related to unintentional motor vehicle injury, falls, and sports related injuries. Prevention activities which reduce motor vehicle crash occurrence, protect occupants (e.g., seat belts and airbags), and reduce the severity of crashes (e.g., increased compliance with speed limits) address the most common cause of traumatic brain injury. Prevention efforts which increase the use of helmet among motorcycle, light motorcycle, all-terrain vehicle, and bicycle users also decrease the likelihood of a TBI. Similarly helmets are indicated for children and adult playing sports such as football, hockey, baseball, and the rodeo. Helmets should be encouraged for children who skateboard, snowboard, rollerskate, and ride horses.

Prevention activities which reduce the occurrence of falls among seniors also reduce TBI occurrence. Exercise programs which support muscle strength, endurance, and balance should be applied as preventive measures. Private homes and institutions who care for the elderly need to be compliant with the Americans with Disability Act guidelines building safety guidelines. Dwellings should be free of impediments, slippery conditions and fall hazards minimized with railings, safety bars, and other engineering countermeasures.

Recommendations

- Improve TBI surveillance in Nevada by utilizing hospital inpatient records, emergency department records, and coroner's reports to characterize the scope of the problem and risk factors associated with TBI.
- Ensure that all drivers and passengers wear safety restraints while operating motor vehicles.
- Ensure that children in motor vehicles are using a child safety seat, booster seat, or seat belt according to the child's height, weight, and age.
- Implementing strategies which reduce driving while under the influence of alcohol or drugs.
- Promote the wearing of helmets when riding a bicycle, motorcycle, snowmobile, scooter, or all-terrain vehicle; and while playing a contact sports, such as football, ice hockey, or boxing; using in-line skates or riding a skateboard; batting and running bases in baseball or softball; riding a horse; or skiing or snowboarding.
- Make living areas safer for seniors, by: removing tripping hazards such as throw rugs and clutter in walkways; using nonslip mats in the bathtub and on shower floors; installing grab bars next to the toilet and in the tub or shower; installing handrails on both sides of stairways; improving lighting throughout the home.
- Encouraging regular physical activity programs for the elderly.
- Ensure the surface on child playgrounds is made of shock-absorbing material, such as hardwood mulch or sand.

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12 Other Types of Unintentional Injury

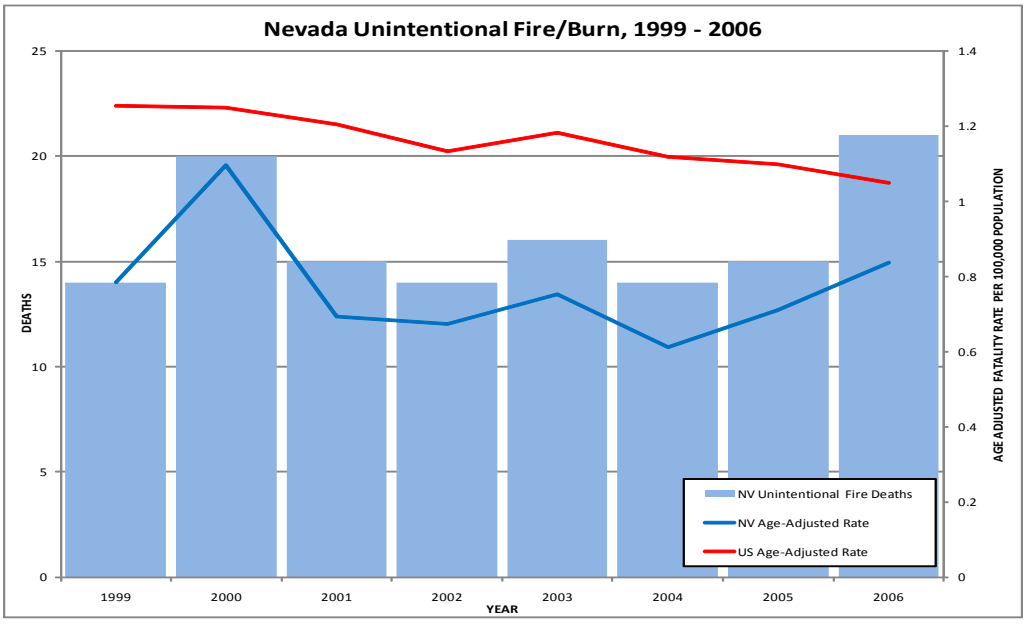
Introduction

Other types of unintentional injury which are less frequently seen across the state of Nevada include: residential fire injuries, dog bite injuries, and environmental injuries. These types of unintentional injuries are less frequently fatal but result in many injuries. The prevention strategies for these various types of other unintentional injury are diverse and discussed within each type.

Unintentional Fire Related Injury

According to the CDC (2008), unintentional fires are the 5th leading unintentional cause of injury and death in the US. About 80% of unintentional fire deaths occur where people sleep (e.g., houses, dormitories, or hotels). The majority of these victims die from exposure to smoke or the inhalation of toxic fumes associated with the fire (Hall, 2001). Negligent smoking and cooking (e.g., falling asleep, leaving cigarette or food in or on stove unattended) is the leading cause of unintentional fire deaths (Ahrens, 2009).

Fires are the 2nd leading cause of unintentional injury death among children. About 800 children ages 14 and under suffer an unintentional fire death annually. Over half of these children are under the age of five years. The CDC (2008) also reports that losses to society from childhood burn deaths and injuries total exceed $5.5 billion each year. Two-thirds of fire-related deaths and injuries among children under age 5 occur in homes without working smoke alarms. Nationally, African American, Hispanic, and American Indian and Alaskan Native children are at higher risk than White children for home fire deaths.



In Nevada, during the study period, data from the CDC WISQARS show that Nevada unintentional fire deaths are well below the United States rate. This trend of low fire death rates is consistent across all years (1999-2006) of reporting. Unlike national fire fatality rates, in Nevada, that unintentional fire deaths are most frequent among those 85+ years of age. The rate is also higher for 75-84 year age categories. The lowest rate was observed among the 10-14 year age group. Gender differences show that males are more likely to suffer an unintentional fire death than females (0.8 and 0.7, respectively). Inconsistent trends across age and sex are reported for unintentional fire deaths. For example, females are more likely than males to die from an unintentional fire injury in the following age categories: 10-14; 15-19; 30-34; 45-49; 50-54; 65-69; 80-84; 85+. For both males and females, fire deaths were greatest in the oldest age group: 85+ years. Race/ethnic differences for unintentional fire deaths indicate that African American Nevada residents had the highest mortality risk for this type of injury. American Indian and Alaska Natives follow closely. Asian and Pacific Islander had the lowest risk among the racial and ethnic groups for fire related fatality in Nevada. Persons living in rural areas of Nevada were at greatest risk for unintentional fire death. Nationally, risk of fire related injury is higher for those who live in older, substandard, and manufactured homes.

Recommendations

- Review and enforcement of fire codes and standards should be applied particularly in rural communities and communities with older, substandard, and manufactured homes.
- Educate and enforce the National Fire Alarm Code® (NFPA 72) which now requires hard-wired smoke alarms in new homes.
- Ensure that working smoke alarms are present in all public buildings, offices, and homes.
- Encourage agencies, businesses, and families to have an emergency plan which specifies a plan of action in case of fire. This plan should include building floor plan based escape routes, a safe outside meeting place, and the emergency numbers for the local fire department.
- Teach individuals especially the elderly and children the stop, drop, and roll technique. Require individuals to physically practice the technique.
- Teach individuals proper home escape techniques in the event of a fire.
- Increase the public awareness about smoking in bed, or when drowsy or medicated.
- Encourage parents to keep matches and lighters up high, away from children, preferably in a locked cabinet.
- Ensure the use of portable heaters in well-ventilated rooms only; keeping blankets, clothing, curtains, furniture, and anything that could get hot and catch fire at least three feet away from all heat sources.
- Encourage home owners to periodically check electrical wiring in the home, fixing or replacing frayed extension cords, exposed wires, or loose plugs and to avoid overloading outlets or extension cords.

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Environmental Exposure Injury

For the purposes of this report, an environmental exposure injury is defined as an injury which results from exposure to the natural environment including temperature extremes and solar exposure. Environmental injuries frequently are the result of exposure to heat (hyperthermia) which is magnified by physical exertion or location (e.g. being left in an automobile on a warm summer day). Environmental exposure injuries also result from exposure to the cold (hypothermia; e.g. stranded in a snowstorm). Much less frequently environmental exposure injuries can result from exposure to naturally occurring gases (e.g. Radon) or natural disasters (e.g. volcanic eruption, tornados, earthquakes). During the study period, Nevada was frequently above the national average for age-adjusted environmental exposure fatality rates. From 2001-2003, the environmental exposure injury fatality rate for the state of Nevada was 1.5 times that of the US Fatality from an environmental exposure is a relatively rare event. Hence, a large range of fatality rates were observed during the study period.

Trends in crude unintentional environmental fatality rates are inconsistent, rising and falling across age categories. The highest rates are seen in the youngest and oldest age categories. Age-adjusted sex differences reveal that males were almost two times as likely to suffer unintentional injury as females (0.9 and 0.5, respectively). Unintentional environmental relative rates of fatality across racial and ethnic groups indicate that African American Nevada residents are at greatest risk for injury of this type. The per capita fatality rate for African Americans is almost twice that of White Non-Hispanics and Hispanics. Further, the relative rate for African Americans is 3.5 times that of American Indian and Alaska Natives and almost five times that of Asian and Pacific Islanders.

Recommendations

- Increase public awareness of environmental exposure injuries such as hyperthermia and hypothermia.
- Educate the public, especially parents of children and the elderly, about the dangers of exercise in hot weather conditions and remind them to take proper precautions such as wearing sun protection, taking frequent rests, and drinking plenty of water.
- Maintain and encourage legislation and policies which allow first responders such as law enforcement, fire departments, and emergency medical service providers to remove children left unattended in cars during hot weather.

- Encourage motorists to be prepared to travel in winter weather conditions including maintenance of spare tires and snow chains.
- Encourage motorists to be prepared for travel in warm and cold weather conditions with an emergency kit which contains at a minimum, water, blankets, candles, and shovel.

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Dog Bite Injury

In the United States each year approximately 4 million Americans are bitten by dogs. About 800,000 of these individuals (44%) require medical treatment at an emergency department or hospital. In the US in 2007, 13 fatalities related to dog bites occurred, and most of these victims were children under the age of 14 years. With an estimated 34 million Americans owning at least one dog, and rising, the prevention of dog bites will continue to be a public health challenge. In the US, the most common victims of dog bites are children and involve an animal owned by the victim's family or neighbors. Studies suggest that at the time of the dog bite, most victims are involved in normal non-provoking activities. There are certain breeds of dogs which have been identified in the majority of fatal dog attacks. These at risk dog breeds include: Pit Bull breeds, Malamutes, Chows, Rottweilers, Huskies, German Shephards and wolf hybrids. From 1979 to 1988, Pit Bull breeds accounted for more than 41% of dog bite related fatalities (Presutti, 2001).

A recent study of dog bite injuries was undertaken by the State of Nevada Bureau of Health Planning and the Department of Agriculture. This study used Nevada Hospital Inpatient and Outpatient Discharge Records to generate statistics concerning dog and cat bite injuries. During the study period from 1999 – 2003, researchers identified 11,850 dog bit injuries in Nevada which resulted in a dog bite inpatient or outpatient hospitalization rate of 112.3 per 100,000 population. No trends in per capita dog bite injuries in Nevada were observed over the study period. In Nevada, age groups with the highest rates of dog bite injuries per capita included: 0 – 9 years old (213.1 per 100,000 population), 10 – 19 years old (154.9 per 100,000 population) and 20 – 29 years old (99.5 per 100,000 population). During the study period, the mean total charge for an inpatient hospital discharge for dog bite was $19,222 (Nevada Bureau of Health Planning and Statistics and Department of Agriculture, 2005).

Recommendations

- Enhance surveillance of dog bite injuries by requiring the reporting of a dog bite incident to the proper authorities.
- Train EMS providers on contemporary techniques on preventing dog bite infection including timely and copious irrigation with normal saline.
- Educate children and adults to remain calm when threatened by a dog. Behaviors which have been shown to decrease injury when threatened by a dog include: avoid running away or screaming, stand still 'like a tree' with feet together, fists folded under the neck with arms placed against the chest.
- Educate the public to not approach unfamiliar dogs or dogs that are sleeping, eating, or nursing young.

- Educate the public to report dogs which are behaving strangely or aggressively to the community's animal control department immediately.
- Work with dog adoption agencies and pet stores to educate potential dog owners about appropriate breeds for children and the dangers of neglectful dog ownership.

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13 Firearm Deaths

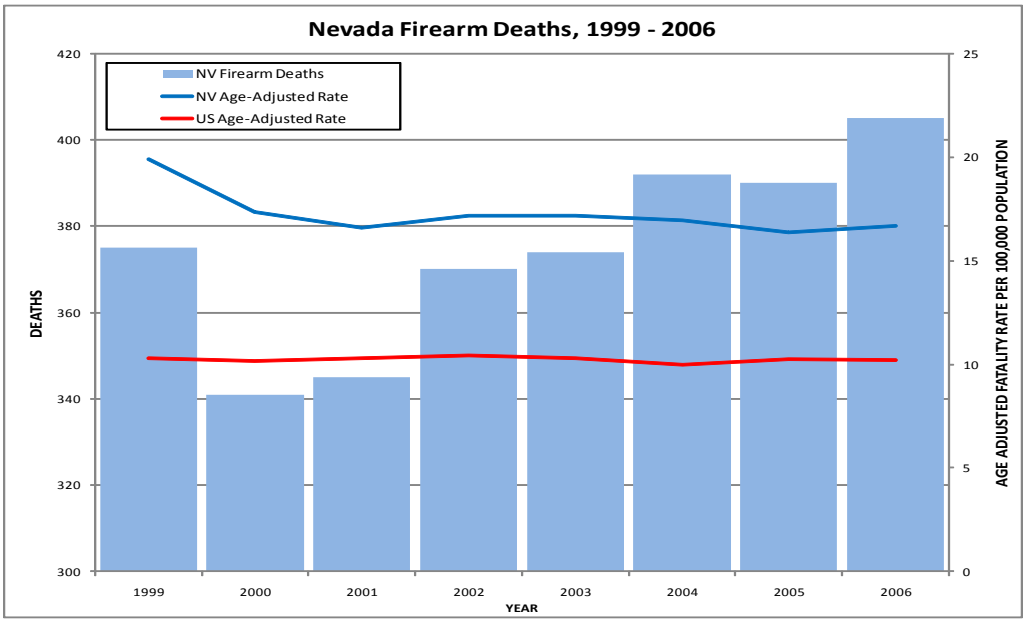
Introduction

Firearm injuries represent a persistent public health problem that crosses several disciplines, particularly public health, mental health, emergency medical services, criminal justice and law enforcement. In the United States, firearms consistently rank second only to motor vehicle crashes as a cause of fatal injury. Firearms are the most lethal means and most frequently result in death when used in suicide, homicide, and legal intervention. More than 95% of fatal firearm injuries are the result of self-directed or interpersonal violence which are discussed in more detail later in this report. The remainder (5%) are collectively referred to as unintentional firearm injuries and are related to the accidental discharge of a firearm.

Unintentional firearm death results from a penetrating injury or wound from a weapon that uses a powder charge to fire a projectile and for which a preponderance of evidence indicates that the shooting was not directed intentionally at the decedent. Causes of death attributable to firearm mortality include:

- ICD-10 Codes W32-W34, Accidental discharge of firearm
- Codes X72-X74, Intentional self-harm by firearm
- X93-X95, Assault by firearm
- Y22-Y24, Firearm discharge, undetermined intent
- Y35, Legal intervention involving firearm discharge

According to recent statistics, the number of deaths due to injury by firearms (per 100,000 population) was 16.5 in 2006 (Cen-



ters for Disease Control and Prevention, 2006). The number of firearm deaths nationally during this year was 10.2. Per the map below, among intermountain states, both Nevada and New Mexico had frequencies for firearm fatality between 14.0 and 20.6 per 100,000 population, well above the national figure.

Both crude and age adjusted rates for firearm deaths indicate that Nevada was above the national average between 1999 and 2006. The crude firearm death rate, nationally, has remained around 10 per 100,000 population over this time period. Nevada's crude rate has dropped from 19.4 in 1996 to 16.3 in 2006. Both national and state age adjusted rates mirror those of the crude rates.

From 1999 to 2006, Nevada age-adjusted firearm mortality rate was higher than the national age-adjusted rate. During some years, the Nevada rate was almost twice as high as the rate in the US.

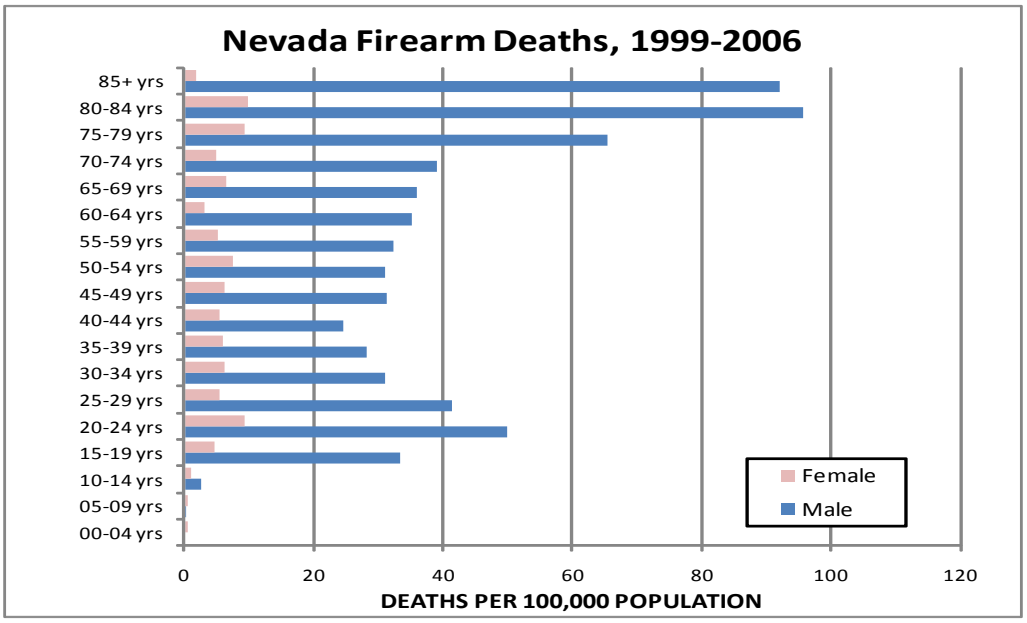
Demographics

Age adjusted firearm death rates across race suggest that African American residents are over 1.5 times more likely to suffer a fatal gunshot wound than are White Nevada residents. Further, this racial group is just over two times more likely to suffer a firearm fatality than American Indian/Alaska Native residents and 4.5 times more likely to suffer a mortal gunshot would than Asian/Pacific Islander residents. Sex differences for firearm deaths indicate that age adjusted rates are almost six greater for males than females.

Crude mortality rates across age and sex show that males are significantly more likely than females to suffer a fatal gunshot wound. During adolescence, males are 7 times more likely than females to die from a firearm. This trend continues throughout adulthood with males at 4.5-11.0 times at greater risk for firearm fatality than females. In the oldest age group (85+ years), males are 50 times more likely to die by firearm than females.

Cross-cutting Issues

According to National SAFE KIDS (2004), unintentional shootings account for nearly 20% of all firearm-related deaths among young children (14 of age and under). The economic costs of unintentional firearm-related injuries/deaths among children exceed



$1.2 billion. Unintentional firearm-related injuries for children represent half of the total cost of all firearm injuries. About 33% of families with children have at least one gun in the home. Also, guns that are kept for home protection are more likely to be handguns, found in a home with children, and stored loaded and unlocked.

Prevention Strategies

Parents of young children should consider the possible risks of keeping a firearm, especially a hand gun, in the home. If parents decide to keep a gun, firearms should be stored out of the reach of children. Further, they should be stored unloaded and securely locked. To this end, bullets (ammunition) should be stored separately in a loca is secure and out of the reach of children.

Recommendations

- Keep firearm lock box keys and lock combinations secure and in a location away from the weapon.
- Talk to children about the firearm safety and hazards.
- Instruct children to never to touch or play with guns or allow their friends to do so (seek an adult).
- Check with neighbors, friends, relatives, or any other adults whose homes your children may visit to see if their firearms are safely stored and secured.

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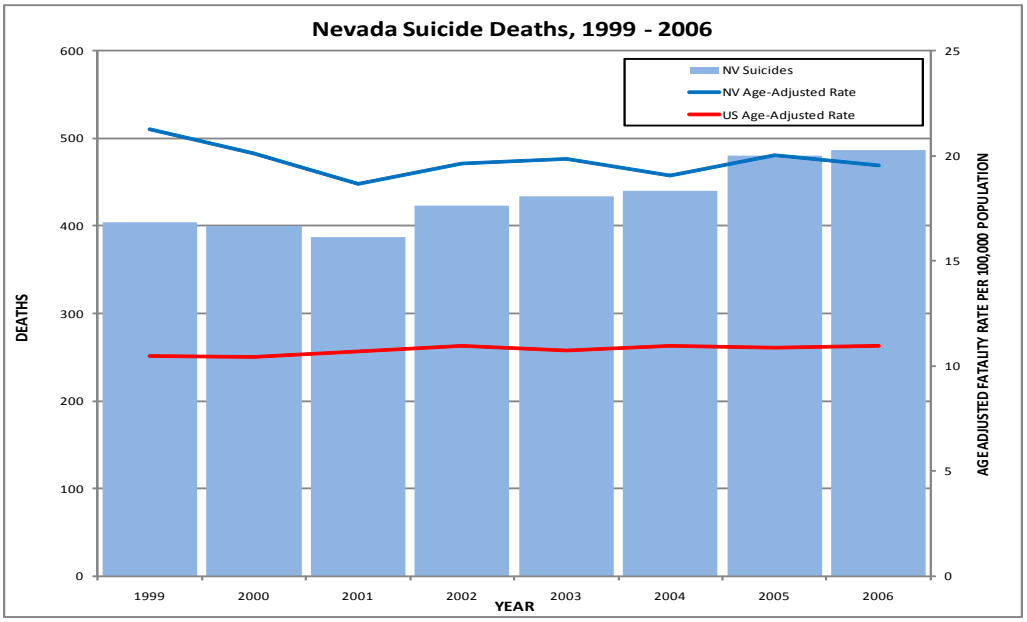
14 Suicide and Self-Harm

Introduction

Suicidal behavior exists along a continuum from thinking about ending one's life (ideation), to non-fatal suicidal behavior (suicide attempt), and, finally, to ending one's life. According to the Institute of Medicine (2002), suicide is defined as a fatal self-inflicted destructive act with explicit or inferred intent to die. Suicide is difficult to predict and prevent and therefore is a major public health problem in the United States. The CDC reports that, in 2006, suicide was the 11th leading cause of death for all ages. During this year, over 33,000 suicides occurred in the U.S, which averages to 91 suicides per day. The total lifetime cost of self-inflicted injuries is about $33 billion, which includes $1 billion for medical treatment and $32 billion for lost productivity (Corso et al. 2007).

The Office of Suicide Prevention (OSP) (2006), a division of the Department of Health and Human Services, reports that Nevada has the 2nd highest rate in the nation at 19.2/100,000, which is nearly double the US average (10.9/100,000). In Nevada, residents are more likely to die from suicide than from homicide, or HIV AIDS and almost as likely to die from suicide as motor vehicle related crashes (OSP, 2006). According to the WISQARS data, the age-adjusted suicide rate for Nevada from 1999 to 2006 has remained stable (between 19.04 and 21.27). This state trend in suicide rate is twice the national average. Nye county in particular has a high age adjusted suicide rate (34.3/100,000), a rate almost twice that of Clark county (17.9/100,000) and 1.5 times that of the state average.



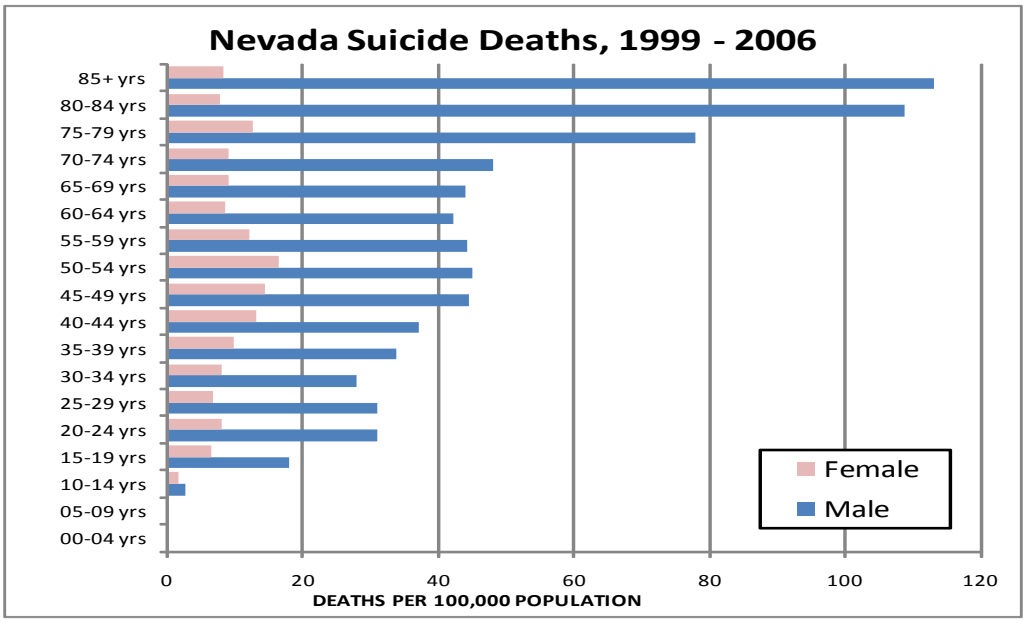
Demographics

Suicide rates across age groups show that the rate is highest during middle (45-54 years) and old (70+ years) ages. The CDC reports that the suicide rate for adults aged 75 years and older is almost 16 per 100,000, a rate below that reported in Nevada for the same age category. In Nevada, suicide fatality rates per capital are inversely proportional with age. Suicide fatalities are most common among elderly individuals. Studies of suicide attempts using hospital and emergency department records in Nevada have shown that while suicide fatality rates are highest among the elderly, suicide attempt rates are highest among younger adult age groups including: 15-19 years, 20-24 years and 35-39 years. Suicide attempt and fatality rates have been increasing among younger populations since the 1950s, having tripled over the last 20 years (CDC, 2004).

Nationally, suicide is the 7th leading cause of death for males and the 16th leading cause of death for females (CDC, 2007). In the United States, males are four times more likely to commit suicide than are females. In fact, males represent 79% of all suicides. Consistent with national trends, in Nevada, males are almost 4 times more likely to commit suicide than females. The age-adjusted rate for male residents is 31.94 and 8.17 for female residents during the study period.

Suicide statistics nationally reveal that American Indians are at greater risk for suicide behavior than other groups. For example, among American Indians/Alaska Natives (15-34 years), suicide is the 2nd leading cause of death (CDC, 2007). Nevada suicide age-adjusted rates reveal a different pattern, with White Non-Hispanic residents having a suicide rate 1.5 times that of American Indians or Alaskan Natives, 2 times that of African Americans and Hispanics, and 3 times that of Asian or Pacific Islanders. Similarly recent studies of Nevada suicides which utilized Nevada death certificate and Hospital Inpatient Discharge Data demonstrated that White Non-Hispanics had the highest suicide rates of any racial or ethnic group in Nevada.

Suicide rates for males are highest among in the oldest age categories (75+ years), with a rate of 35.7 per 100,000 (CDC, 2007). Suicide rates for females are highest in the middle age groups (45-54 years), with a rate of 8.4 per 100,000. In Nevada, the pattern for suicide risk for males is similar to national



profiles, with males at significant suicide risk in the older age categories (80+ years). Likewise, Nevadan females are at greatest risk for suicide in the middle age range (45-54 years). Suicide rates for females drop slightly from ages 60-74 years and then increase in the 75-79 age category. In the oldest age categories, the male suicide rate is 14 times that of the female rate.

Cross-cutting Issues

In Nevada, there has been a long standing misconception that suicide rates are associated with visitors and non-residents who come to Nevada and ultimately commit suicide. To the contrary, a recent study of Nevada suicide has shown that suicide fatalities are 2 times more likely to be Nevada residents than non-residents (SPRC, 2005).

In Nevada and the United States, firearms are used in almost 60% of all suicide deaths. In Nevada, firearms were implicated as the primary mechanism of suicide among suicide fatalities. However, intentional self-poisoning was implicated among 84.1% of all suicide attempts (SPRC, 2005). Younger suicide attempters are associated with intentional self-poisoning primarily with prescription medications and drugs of abuse; whereas, older suicide completers are associated with the use of firearms (SPRC, 2005).

According to the CDC (2007), a combination of individual, relational, community, and societal factors contribute to suicide risk. Suicide decedents in Nevada were more likely to be employed, married or widowed. In Nevada, suicide fatality rates are relatively equal among zip codes and across a continuum of socioeconomic strata. However, suicide fatality rates are highest in rural areas. Suicide is linked to isolation which may explain its prevalence in rural communities. Major risk factors associated with suicide fatality include previous attempts at suicide, a family history of suicide, a history of mental disorders (particularly depression), a history of alcohol and substance abuse, and barriers to accessing mental health treatment. Suicide risk is increased in individuals who have recently lost a spouse, family member, or friend to suicide or who have recently suffered a relational, work, or financial loss. One explanation for the high rates of suicide among the elderly is the increased suicide risk of being diagnosed with a chronic debilitating or fatal illness (CDC, 2007).

Recommendations

- Promote public awareness that suicide is a public health problem that is preventable.
- Develop and implement strategies to reduce the stigma associated with mental health, substance abuse, and suicide prevention services.
- Promote efforts to reduce access to lethal means and methods of self-harm such as prescription drugs and firearms, especially among those with identified mental health conditions.
- Implement and evaluate school-based suicide preventions awareness and prevention programs.
- Train health professionals to identify and treat persons who present with clinical indicators and risk factors associated suicide including past suicide attempts, depression, and recent diagnosis with a chronic, debilitating, or fatal disease.

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15 Homicide and Interpersonal Violence

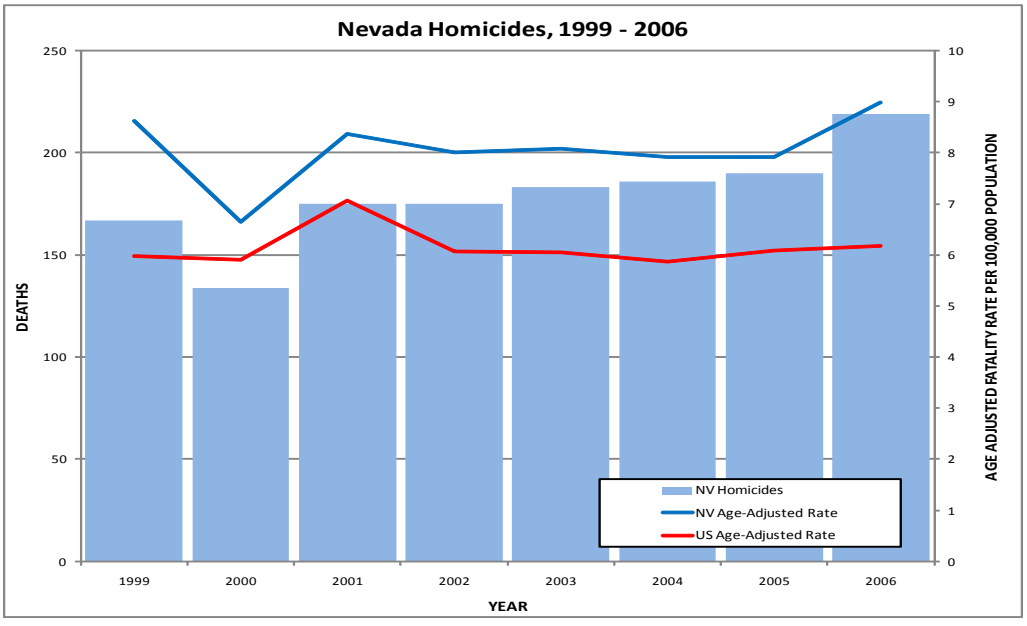
Introduction

The World Health Organization describes interpersonal violence as violence between individuals which can be further subdivided into family and intimate partner violence and community violence. The former category includes child maltreatment; intimate partner violence; and elder abuse, while the latter is broken down into acquaintance and stranger violence and includes youth violence; assault by strangers; violence related to property crimes; and violence in workplaces and other institutions.

In terms of injury surveillance, interpersonal violence is categorized most frequently by the age of the victim (e.g. child or elder abuse), type of assault (e.g. sexual assault), and the relationship between victim and perpetrator (e.g intimate partner violence, family violence). While different agencies collect different kinds of injury related statistics, considerable overlap among sources of data is evident. In Nevada data on homicide can be found most consistently in death certificate information reported to the Centers for Disease Control and Prevention as well as the State of Nevada Department of Public Safety Uniform Crime Reports.

Homicide can be defined as the willful killing of one human being by another and includes in most definitions both murder and non-negligent manslaughter. Justifiable homicides sometimes referred to as legal intervention deaths based on the reports of law enforcement agencies are analyzed separately in this report.

Homicide rates in the United States in the last decade have shown decline. Per capita rates of homicide in Nevada have remained relatively unchanged from 2000 to 2006



with the exception of a small drop in 2000 and a small spike in 2006. Nevada rates of homicide per capita remain slightly higher than US rates. For the purposes of this report, counts of homicide deaths reported to the Centers for Disease Control and Prevention were used in place of data obtained from the Uniform Crime Reporting System maintained by the Nevada Department of Public Safety. In almost every year there were 2-3% more homicides investigated by police than death certificated received by the CDC. The reasons for this discrepancy between homicide deaths reported via death certificates and homicide investigations conducted by police are unknown. Researchers chose to use the more conservative numbers provided by the Centers for Disease Control and Prevention.

Demographics

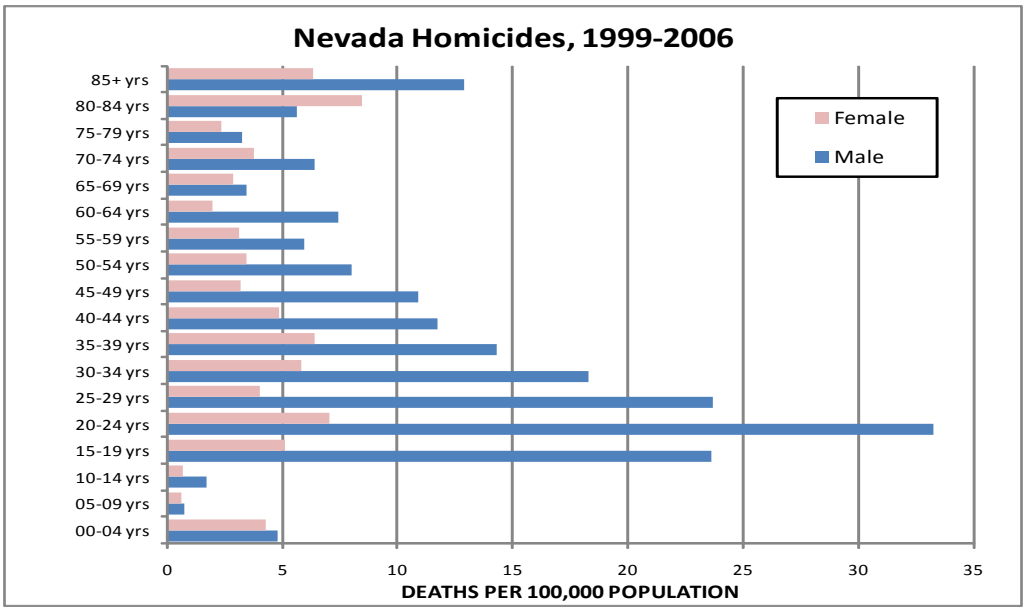
Males are most frequently the victims as well as the perpetrators of homicide. In the US, males were more than nine times more likely than females to commit murder. In Nevada, males are three times more likely than females to be murdered. In Nevada, female rates of homicide are much higher than United States female homicide rates (4.0 per 100,000 population versus 1.2 per 100,000 population).

Homicide victims tend to be young adult males. In Nevada during the study period, among males, age groups with highest rates of homicide per capita included adults aged 20-24 years (insert rate), 25 – 29 years (insert rate), followed by young adults 15 – 19 years (insert rate). Female victims of homicide were principally 20-24 years old (insert rate), 35 – 39 years old (insert rate), and 80 – 85 years old (insert rate).

Homicide rates per capita vary among racial and ethnic groups. In Nevada as in the United States, African Americans have the highest rates of homicide death, followed by American Indians and Alaskan Natives. In the United States, Hispanics tend to have lower homicide rates than White Non-Hispanics. In Nevada, however, the opposite is evident. Hispanics in Nevada have higher homicide rates than White Non-Hispanics (10.1 per 100,000 versus 7.4 per 100,000).

Cross Cutting Issues

There are many factors which increase the risk of homicide. Uniform crime reports



compiled by the Nevada Department of Motor Vehicles and Public Safety were used to investigate some of the circumstances surrounding homicides reported to and investigated by law enforcement officers in the state of Nevada. In the United States as in Nevada, the most frequently reported circumstances related to homicides during the study period included: argument (25%), domestic conflict (15%), unknown circumstances (27%), and robbery (10%). Similar to national homicide statistics, in Nevada, victims most frequently knew the perpetrator of their murder. The perpetrator was a family member in 11.5% of all homicides cleared by arrest. Strangers perpetrated homicides in 16.2% of cases investigated. The majority of homicides in Nevada were completed using a firearm (70% of all cases cleared by arrest). Other weapons commonly used in Nevada to commit murder include knives and cutting devices (13%), and hands, fists, and feet (11%).

Not all murders that occur are cleared by police investigation. Nationally, the number of cases cleared by the arrest of the perpetrator has declined from 69% in 1997 to 56% in 2002. Clearance rates for homicides investigated by Nevada law enforcement have increased from 51% in 2000 to 67% in 2006. The reason for the increased proportion of homicides which are investigated and subsequently cleared by the arrest of perpetrator in Nevada is unknown.

Intimate Partner Violence

Intimate partner violence (IPV), also sometimes referred to as domestic violence, can be broadly defined as a pattern of abusive behaviors by one or both partners in an intimate relationship such as marriage, dating, family, friends or cohabitation. These abusive behaviors could consist of but are not limited to physical violence, sexual violence, and threats of physical or sexual violence when it occurs in the context of previous physical or sexual violence. Some researches expand this definition to include emotional and psychological abuse which has been demonstrated to have many of the same negative consequences for victims as physical abuse. Similarly child maltreatment (child abuse) can consist of physical or sexual violence but also encompasses verbal and emotional abuse as well as neglect. All of these violent behaviors towards children encompass child maltreatment and have been shown to have vast negative effects on physical and emotional health. IPV can result in fatal and non-fatal injuries and a wide range of adverse health outcomes. Research on causes and risk factors has implicated a range of individual psychological factors, relationship and family factors and contextual or sociocultural factors all of which contribute to the risk and severity of IPV.

Intimate partner violence rates for Nevada were obtained from the Nevada Department of Motor Vehicles and Public Safety Uniform Crime Reporting System. Reports of intimate partner violence to Nevada law enforcement which include assault, sexual assault, as well as rape and homicide have increased during the study period. The rate of intimate partner violence reported to police per capita in Nevada increased from 1,032 reports per 100,000 population in 2000 to 1,316 reports per 100,000 population in 2006. Similarly, the court issuance of temporary orders of protection has increased during this same time period. It should be noted that injuries are not present in all reports of intimate partner violence, only in cases where charges were filed by the responding officer. In 2007, a new method of tracking domestic violence was enacted by the state legislature. This legislation changed the data definitions and format accepted by the Nevada DPS Records and Technology Division for the required reporting of domestic violence. Since some county and municipal law enforcement agencies were unable or slow to comply with the changes, data for 2007 and 2008 omit many

key law enforcement agencies across Nevada. Hence, for the purposes of this report these 'transitional' years have been omitted completely. Empirical evidence demonstrates that actual rates of intimate partner violence are often 15 times higher than rates of reporting to law enforcement.

Child Abuse and Maltreatment

Child abuse is a serious problem in Nevada. As the number of children in Nevada has grown, so has the number of child abuse reports. The Nevada Division of Child and Family Services (DCFS) reports that there were 22,491 children who were the subject of a report referred for investigation and assessment in 2002. In 2005, the DCFS reports that there were 27,738 children who were referred for investigation, a 23% increase. Among these children referred for investigation by DCFS, approximately 28% of reports annually are substantiated. In Nevada in 2007, the Executive Committee to Review the Death of Children identified five children who were beaten to death by their parents and another five children who died of abusive head injury or shaken baby syndrome. In addition to homicide deaths where abuse and neglect were the primary cause, there are other deaths where abuse and neglect were directly related to the cause of death. Neglect was identified secondarily in 25 child deaths in Nevada in 2007. These neglect related deaths primarily involved lack of child safety restraint use in motor vehicle crashes (15/25), parental pre-natal drug use (6/25), drowning or asphyxiation events (3/25), and improper gun storage (1/25).

Elder Abuse

Elder abuse is a major injury issue in Nevada. The State of Nevada Division for Aging Services Elder Abuse Reporting System (EARS) collects elder abuse report statistics from their regional offices and combines them with elder abuse reports from local law enforcement. During the 2009 state fiscal year (07/01/2008 – 06/30/2009), EARS reported that 4,436 allegations of elder abuse were reported to the state. Categories of abuse in Nevada during this reporting period included: neglect (57.9%), exploitation (22.6%), abuse (17.6%), and isolation (1.9%). Counties who represent the largest proportions of elder abuse reports in Nevada include: Clark County (40.1%), Washoe County (34.3%), Carson City (7.1%), and Lyon County (4.5%). No historical data was elder abuse available for trend analysis. It should be noted that not all elder abuse reported to EARS result in injury.

Sexual Assault

Sexual assault is a serious public health problem in the United States. Nationally, one in four women will be a victim of sexual assault at some point in their lifetime. Sexual assault is associated with many other problems besides physical injury, including lingterm physical and emotional distress as well as post-traumatic stress disorder (Campbell and Wasco, 2005). Nationally research has demonstrated that most sexual assault is perpetrated by family members or intimate partners. Sexual assault is probably one of the most underreported types of interpersonal violence.

The incidence of sexual assault in Nevada has been computed based on the Nevada Department of Motor Vehicles and Public Safety's Uniform Crime Reports and grossly underepresents actual sexual assaults occurring throughout the state. Nevada's rate of sexual assault reports per 100,000 population is slightly higher than the United States rate for the same period. Rates of sexual assault have remained relatively stable from 2000 to 2006 increasing slightly from 43.0 cases per 100,000 population in 2000 to 43.3 cases per 100,000 in 20006. Nevada continues to have high rates of sexual assault when compared with other western states. In 2007, about 40% of forcible sexual assault (rape) in the United

States and only about 21% in Nevada were cleared by arrest. This suggests a significant gap in the reporting and ultimate identification of the perpetrators of the sexual assault (Ruggieri et. al., 2007).

Legal Intervention

Legal Intervention includes injuries inflicted by the police or other law-enforcing agents, including military on duty, in the course of arresting or attempting to arrest lawbreakers, suppressing disturbances, maintaining order, and other legal actions (CDC, 2007). Legal intervention is used to denote the International Classification of Diseases, Ninth Revision (ICD-9) which describes deaths due to law enforcement actions, regardless of their legality (Sikora & Mulvihill, 2002, p. 841).

The WISQARS data indicates that, except for the year 2000, Nevada had higher age adjusted legal intervention death rates than the US Except for 2000, Nevada's rate was 1.8 to 4 times greater than the national average. Crude rates by age group show that Nevada residents aged 20-24 years had the greatest risk of death by legal intervention. Further, residents aged 30-34 years had the 2nd highest legal intervention mortality rate. Individuals aged 65+ had no incidences of death via this type of injury.

Age adjusted legal intervention rates by sex show that males are 72% more likely to be involved in this type of fatal injury than females (.75 and .01 per 100,000 population), respectively. Examining death rates by age and sex show that Nevada females only reported a legal intervention fatality in the 30-34 age category. Males, conversely, had rates recorded between the ages of 15-64 years of age. Legal intervention deaths by race reveal that African American Nevada residents were more likely to die from this type of injury than other racial/ethnic categories. American Indian/Alaska Natives had the 2nd highest legal intervention mortality rates.

Prevention Strategies

Strategies for preventing homicide and violence require integration of approaches from multiple disciplines, including criminal justice, education, social services, community advocacy, and public health. For example, public health approaches to prevent violence have focused on changing individual knowledge, skills, and/or attitudes; changing the social and physical environments; and increasing community awareness of the causes and prevention of violence. The public health community also has recognized the influence of socioeconomic status and poverty on violence. Communities increasingly are adopting programs emphasizing strategies to enhance the skills of youth and parents to reduce violence. These strategies include, for example, school-based curricula that teach coping, communication, and mediation skills; family-intervention programs that focus on parental training to positively alter parental practices and family cohesion; and preschool efforts to develop intellectual and social skills.

Recommendations

- Interpersonal violence data collection should be expanded to include emergency department records, ambulance transports in order to improve surveillance.
- National best practices such as those proposed by the National Violent Death Reporting System should be applied in Nevada. Linkages between data sets such as death certificated information and Uniform Crime Reports will provide more information and accuracy for surveillance as well as prevention efforts.
- More research is required to investigate the factors which contribute to the elevated female homicide and sexual assault rates observed in Nevada.

- School based dating violence prevention awareness campaigns for young men and women should be applied where indicated.
- The clearance of sexual assault investigations by law enforcement would be aided by the continuation and expansion of sexual assault nurse examiner programs throughout the state. These programs assist in the court compliant collection of evidence which aids both identification and prosecution of perpetrators of sexual assault.
- Community services for victims of violence should be provided and expanded. These programs provide shelters for temporary housing of victims, advocacy, and support groups.
- Court based interventions such as mandatory arrest policies and 'no-drop' required prosecution of arrested intimate partner violence offenders regardless of victims' wishes have measured success in reducing rates of domestic violence.

References

Centers for Disease Control and Prevention, National Center for Injury Prevention and Control. Web-based Injury Statistics Query and Reporting System (WISQARS) [online]. (2008) [cited 2008 March 23]. Available from: URL: www.cdc.gov/ncipc/wisqars.

Sikora AG, Mulvihill M. Trends in mortality due to legal intervention in the United States, 1979 through 1997. American Journal of Public Health 2002: 92: 841-843.

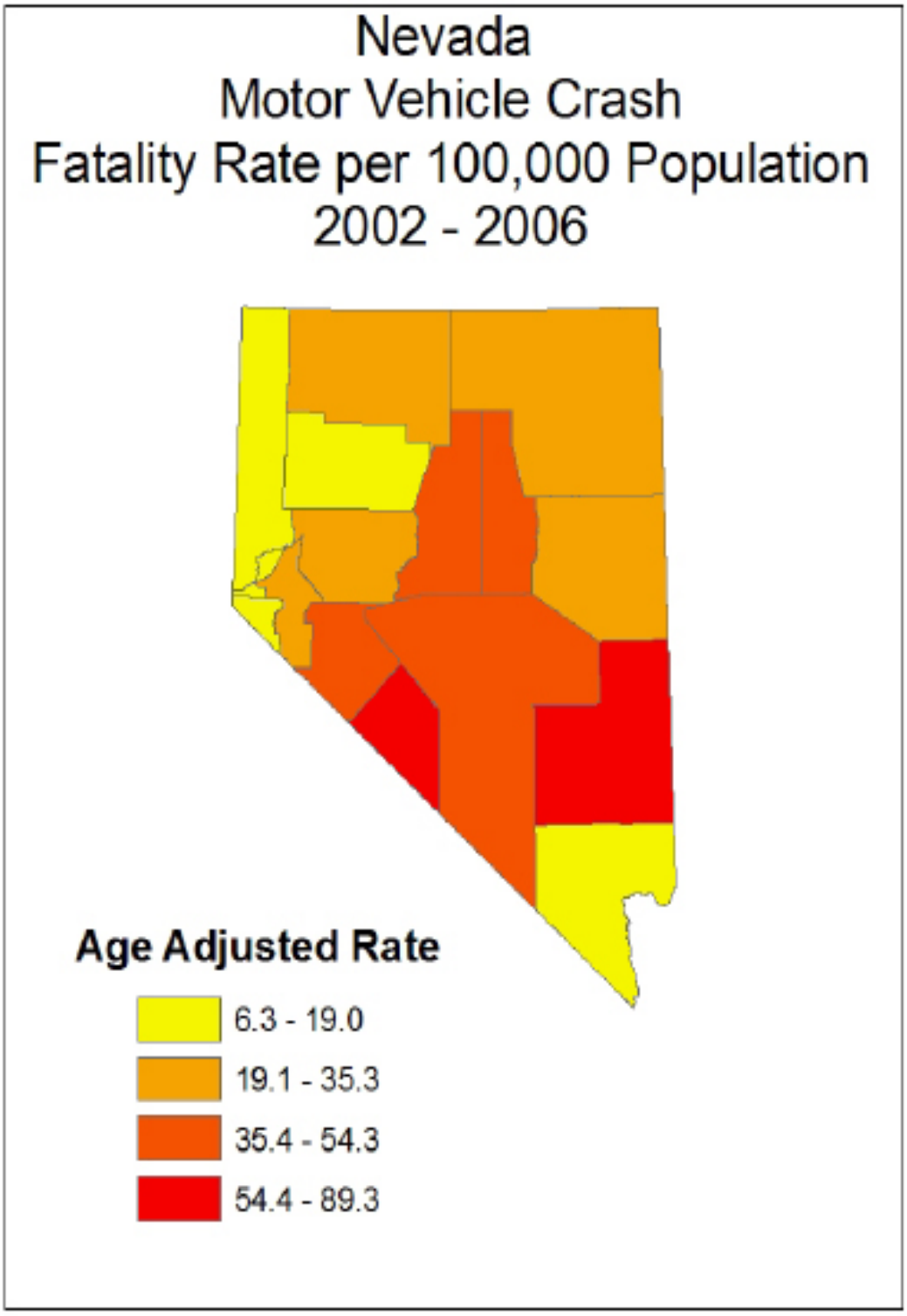
16 Conclusion

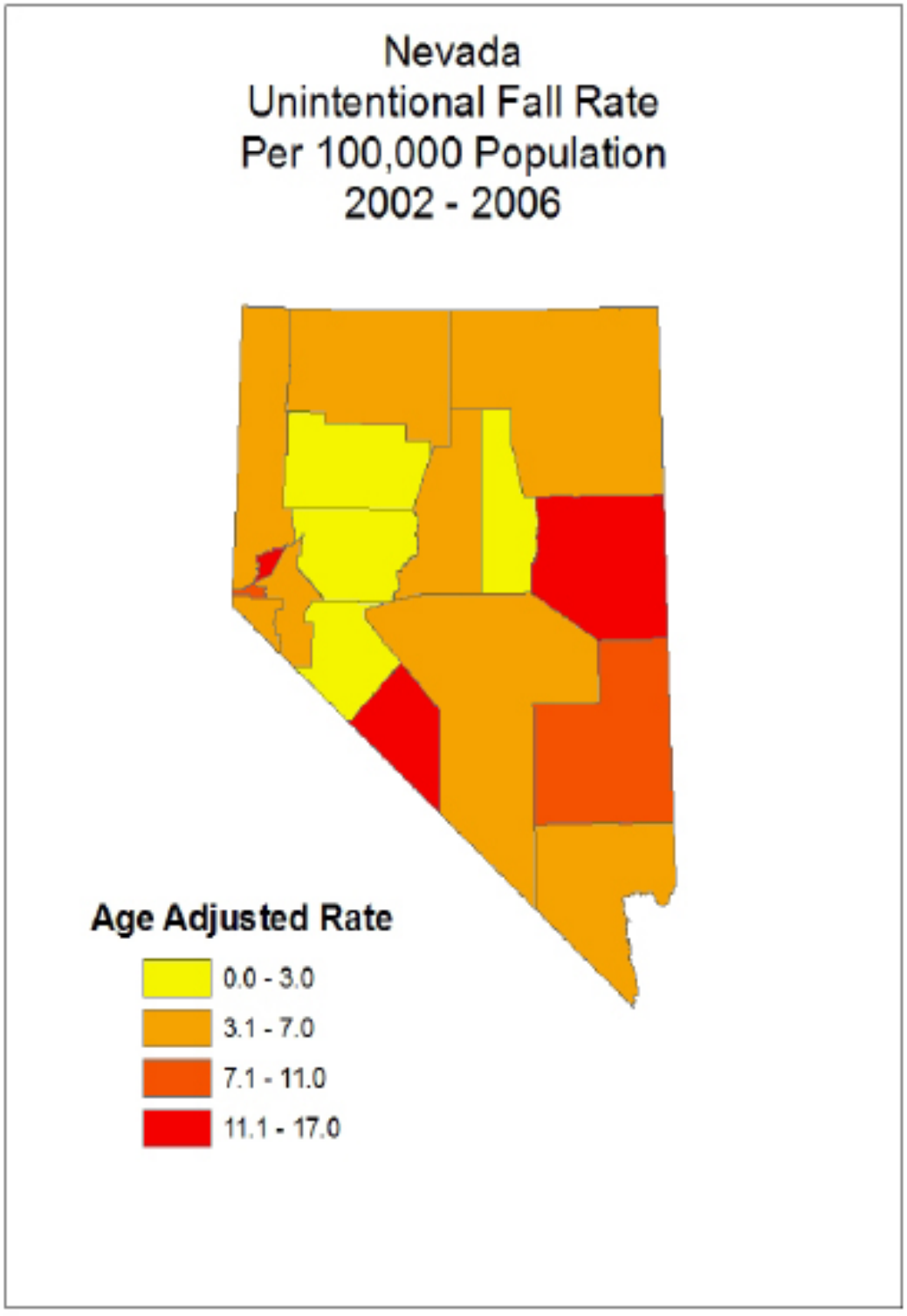
Nevada experiences high rates of injury related mortality and morbidity in nearly every category of injury both intentional and unintentional. A review of the academic literature has outlined some clear and effective strategies to reduce these injuries and their severity but certain barriers exist to implementing many of these strategies.

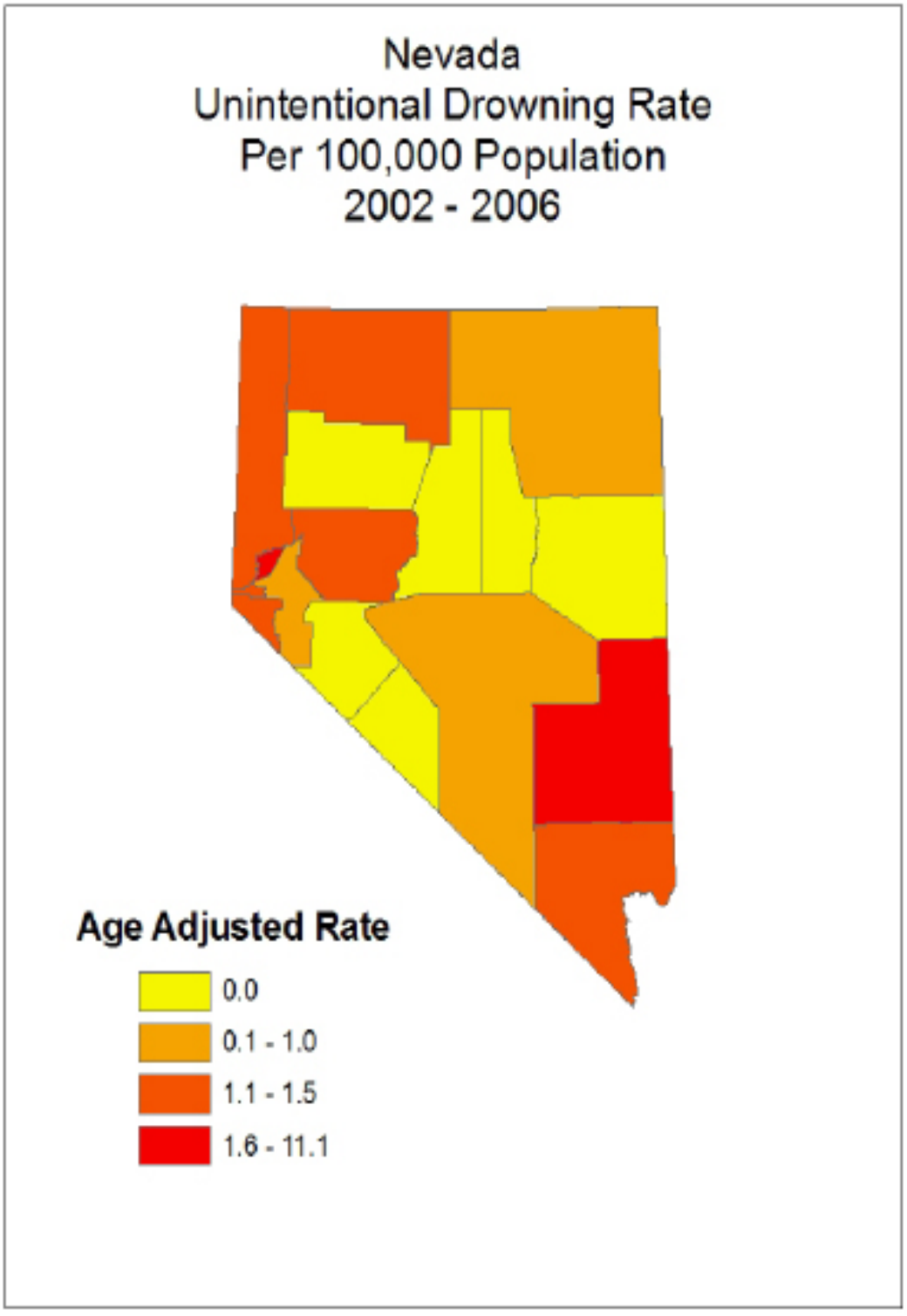
The first such barrier to the implementation of effective strategies to reduce injury in Nevada is financial. The cost of injury prevention programs is often prohibitive and usually targets lower income groups and groups with behaviors which contribute to the injury in question. For example, motorcycle helmets would greatly reduce both the incidence and severity of traumatic brain injury in Nevada, but not all motorcyclists can afford them and neither could any private or public organization provide them for free.

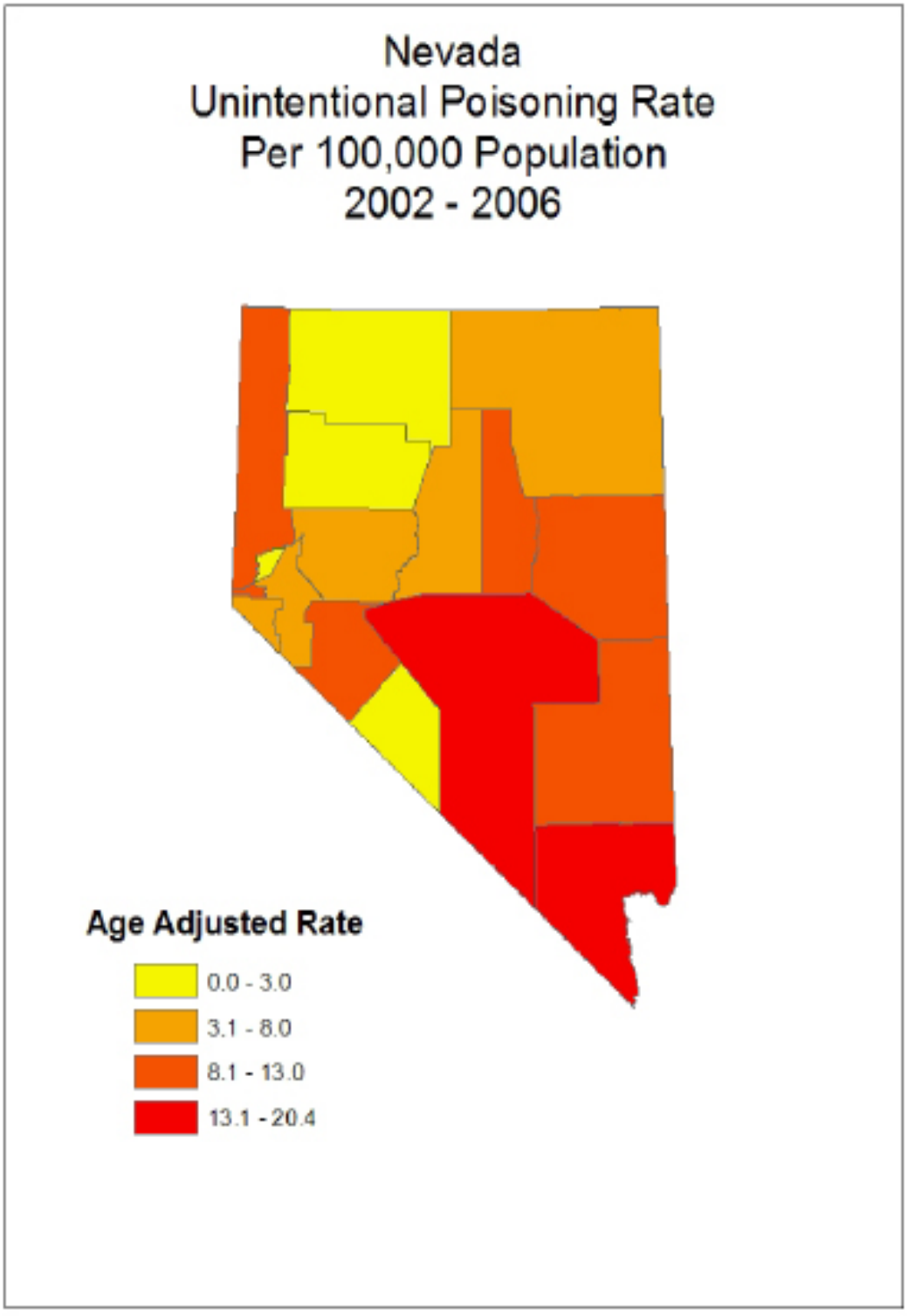
The second barrier to the implementation of injury prevention acitivities is social. In most cases, injuries result from behaviors that many might fell convey a sense of fault to the injured. For example, motorcyclists who do not wear helmets are seen to be at fault for their traumatic brain injury as they chose not to wear a critical safety device which may have prevented their injury. The public may wonder why spend money helping people make correct choices such as wearing a helmet when riding a motorcycle. Further, wearing a motorcycle helmet may be socially unacceptable to some. Social barriers such as peer norms often inhibit the use of safety devices. Young adults may consider wearing motorcycle helmets as not 'cool' or they may detract from the freedom mystique of riding a motorcycle.

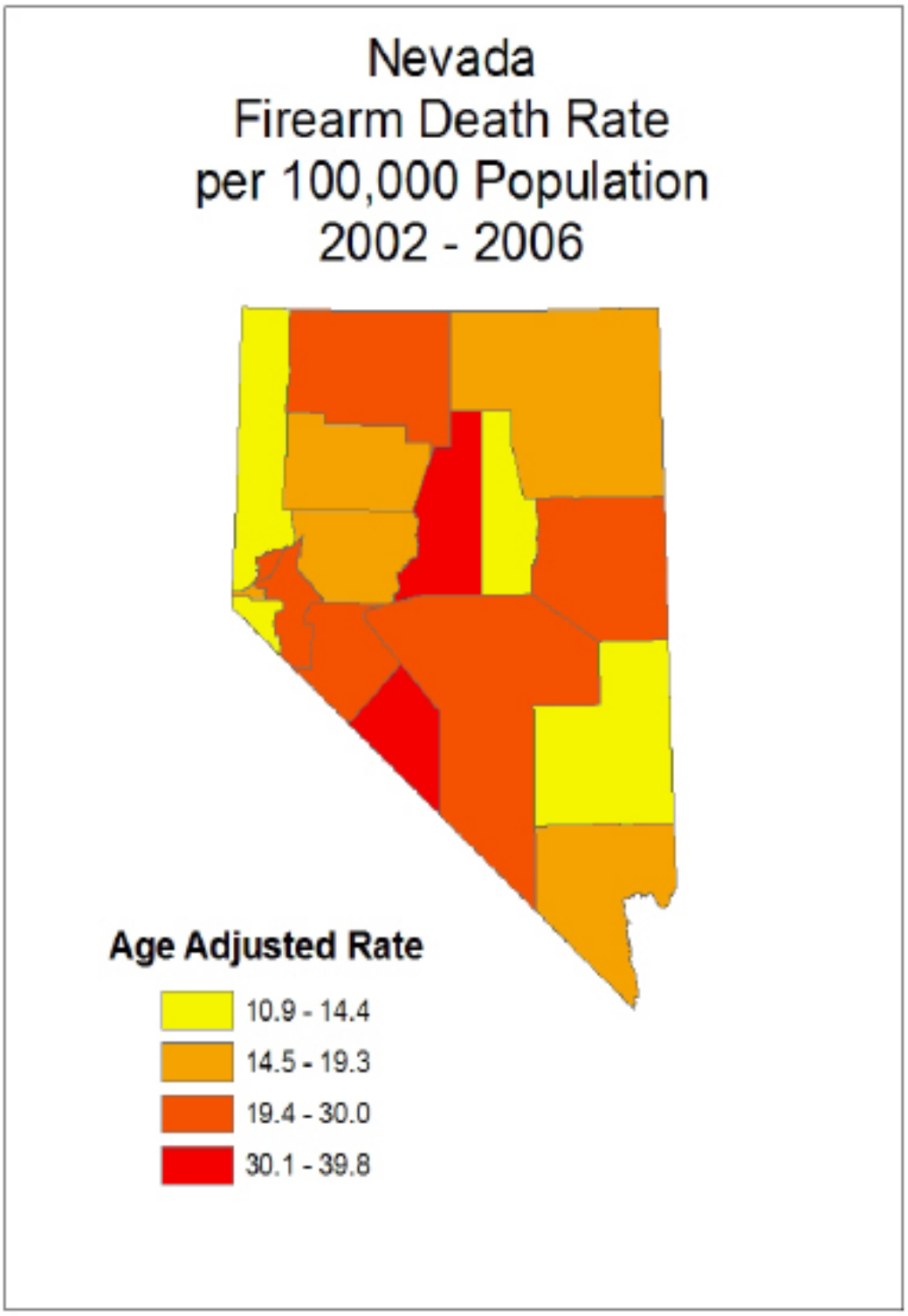
Legal requirements to use safety devices and to alter dangerous or at risk behaviors are often vary effective in reducing and preventing injury. Nationally, requiring sealt belt use has increased seat belt use rates dramatically and also are responsible for s a significant reduction in motor vehicle related fatalities in the last decade. However, communities frequently offer political resistance to passing restrictive laws. This resistance stems from a concept of personal freedom and choice. Balancing the high cost of injury to individuals and the community with reductions in personal freedoms should be a community decision which involved broad input. Reducing injury in Nevada will require a combined effort from communities, individuals, health and legal professionals, federal, state, and local governments and other public and private organizations. Working together, we have and can make a difference in the serious problem of injury in Nevada.

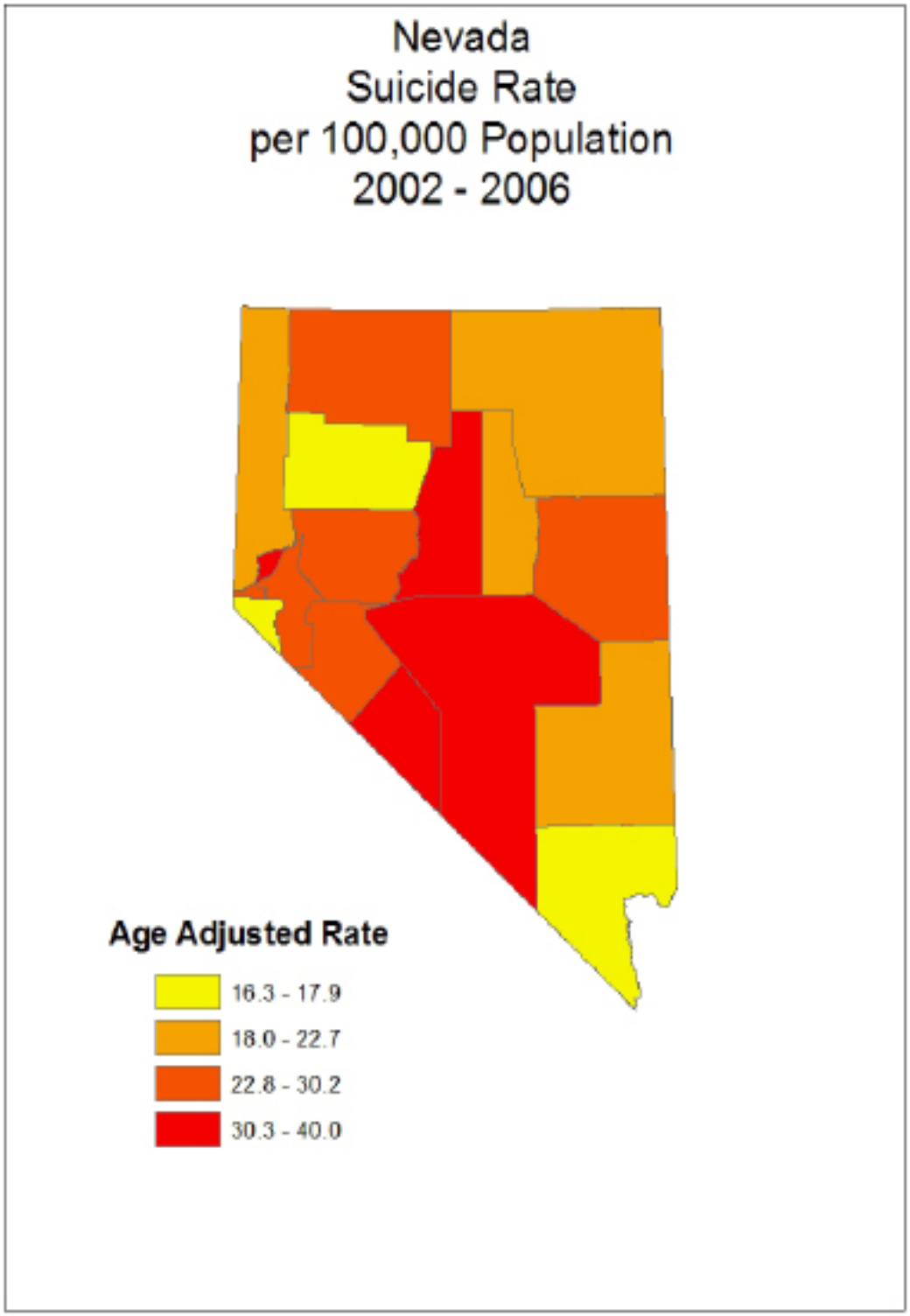

Nevada
Motor Vehicle Crash
Fatality Rate per 100,000 Population
2002 - 2006
Age Adjusted Rate
6.3 - 19.0
19.1 - 35.3
35.4 - 54.3
54.4 - 89.3

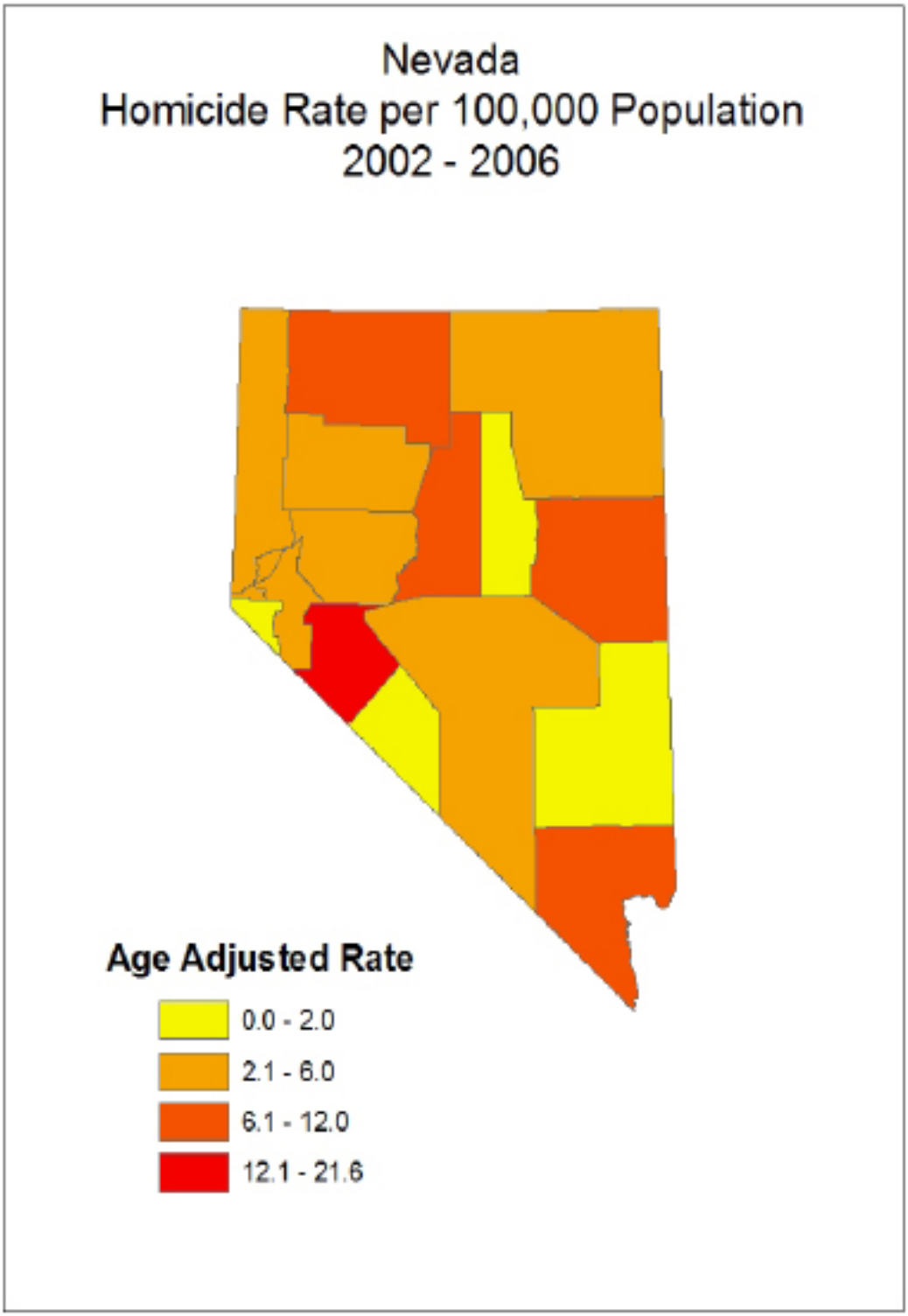

Nevada
Unintentional Fall Rate
Per 100,000 Population
2002 - 2006
Age Adjusted Rate
0.0 - 3.0
3.1 - 7.0
7.1 - 11.0
11.1 - 17.0


Nevada
Unintentional Drowning Rate
Per 100,000 Population
2002 - 2006
Age Adjusted Rate
0.0
0.1 - 1.0
1.1 - 1.5
1.6 - 11.1


Nevada
Unintentional Poisoning Rate
Per 100,000 Population
2002 - 2006
Age Adjusted Rate
0.0 - 3.0
3.1 - 8.0
8.1 - 13.0
13.1 - 20.4


Nevada
Firearm Death Rate
per 100,000 Population
2002 - 2006
Age Adjusted Rate
10.9 - 14.4
14.5 - 19.3
19.4 - 30.0
30.1 - 39.8


Nevada
Suicide Rate
per 100,000 Population
2002 - 2006
Age Adjusted Rate
16.3 - 17.9
18.0 - 22.7
22.8 - 30.2
30.3 - 40.0


Nevada
Homicide Rate per 100,000 Population
2002 - 2006
Age Adjusted Rate
0.0 - 2.0
2.1 - 6.0
6.1 - 12.0
12.1 - 21.6

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