2017 NEVADA ANNUAL TRAUMA REPORT

Department of Health and Human Services
Division of Public and Behavioral Health
Public Health Preparedness Program

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PURPOSE OF REPORT

The purpose of this report is to provide a picture of trauma within the state of Nevada based upon data submitted by hospitals to the Nevada Trauma Registry. This report presents data in a usable form for local health authorities, healthcare providers, and the public. The Annual Trauma Report is to be completed by the Nevada Division of Public and Behavioral Health (DPBH) by July 1st of each year in accordance with Nevada Administrative Code (NAC) 450B.768. The data in this annual report is based upon calendar year.

It should be noted, that data depicted in this report reflects only data entered and reported to the NTR. If, for some reason access to or recording of data was not feasible, data may not have been captured in a facility's EMR, thus would not be recorded in the NTR and not be seen in this report.

INTRODUCTION

WHAT IS THE NEVADA TRAUMA REGISTRY (NTR)?

Per Nevada Revised Statutes (NRS) 450B.238, and Nevada Administrative Code (NAC) 450B.768, the NTR was established in 1987, to collect data on persons who sustain a physical (blunt or penetrating) injury caused by an accident or by violence. The NTR data is collected from all licensed acute care hospitals and trauma centers in Nevada.

For the 2017 Annual Trauma Report, ICD-10 codes were utilized. According to National Trauma Data Bank criteria, for an injury to be reported as a trauma, it must have at least one ICD-10 code from the following ranges: S00 -S99 (7th Character Modifier A, B, or C), T07, T14, T20-T28 (7th Character modifier A), T30-32, and T79.A1-T79.A9 (7th character modifier A) and the patient must have either:

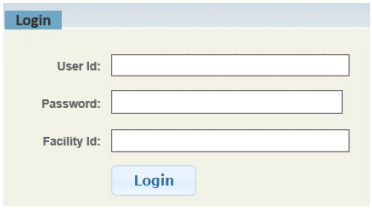
- been admitted to a facility for at least 24 hours;
- died following treatment or evaluation; **or**
- been transferred into or out of a facility.

The NTR currently collects the required data points from both the National Trauma Data Bank (NTDB) established by the American College of Surgeons and data points identified in NAC 450B.766 and 450B.768. Included (but not limited to) are data on the event causing the injury, severity of the injury, place of the injury, length of hospital stay, diagnosis(es) of the patient, discharge destination of the patient and payer source.

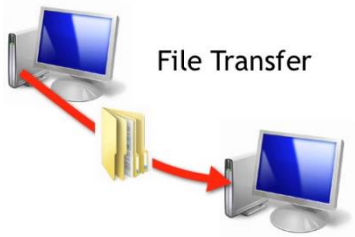
The NTR can provide information on the incidence, prevalence, morbidity, and mortality of injuries reported in Nevada. The data can be broken down to a specific county, specific hospital, specific race, or specific age group. These data are available for state, private or federal entities and can be used for grant applicants to measure the impact of trauma in Nevada, as well as initiate health education programs that address traumatic injuries.

The 2017 Annual Trauma Report is based upon data submitted to the NTR by Nevada's four designated trauma centers and 33 non-trauma center hospitals, for a total of 37 facilities that operated during the calendar year. To be considered compliant with NAC 450B.768, a hospital must enter all trauma records into the NTR, or notify the State NTR Manager that no records needed to be submitted, by the quarterly due date.

Non-trauma centers submit trauma data by logging into the NTR via a user name and password. Trauma centers utilize their in-house version of the NTR software and electronically transfer the data from their software to the state NTR.



OR



Per NAC 450B.768 – all trauma data (non-trauma centers & trauma centers) must be submitted to the Nevada Trauma Registry no later than 60 days after the calendar year quarter.

- Quarter 1 = January 1 – March 31 (due on June 1)
- Quarter 2 = April 1 – June 30 (due on Sept. 1)
- Quarter 3 = July 1 – September 30 (due on Dec. 1)
- Quarter 4 = October 1 – December 31 (due on March 1)

Below is a summary table that outlines per year the percentage of facilities that were compliant with submitting data to the NTR.

YEAR	% of Non-Trauma Centers Compliant	% of Trauma Centers Compliant
2014	41%	0%
2015	100%	0%
2016	100%	75%
2017	100%	96%*

* In 2017, the four trauma centers submitted all trauma data to the NTR. There were multiple changes in facilities throughout the year with facilities being newly opened or closed. This resulted in some variations in how many facilities were active throughout the 2017 year, and in turn the overall scoring of compliance. There was a total of six instances of non-compliance over the 12-month period. Two instances of non-compliance occurred at the same facility with the remaining four instances of non-compliance being a unique occurrence of one month out of the twelve for four unique facilities.

State NTR staff continue to train personnel at non-trauma center hospitals to improve data entry accuracy.

The vendor, Digital Innovation, Inc., is working with each designated trauma center to ensure at least 10 years' worth of historical data is transferred into the NTR. As of June 2017, only Sunrise Medical Center has submitted 10 years of historical data. The remaining three trauma centers are in the stages of mapping and testing. Below is the historical data process:

Preparation → Analysis (Mapping) → Development (Conversion) → Testing → Deployment

When analyzing data between 2015 and 2016, it is advised not to compare the data. The 2015 Annual Trauma Report only had data from the non-trauma centers. When analyzing data between 2016 and 2017, it is also advised to not compare the data, as facilities transitioned from the use of ICD-9 to ICD-10 diagnosis codes. There are significant changes in the diagnosis detail within the ICD-10 coding, making a comparison between the two years inaccurate.

In addition to continual training of non-trauma center hospital personnel on the NTR software, the NTR Manager utilizes quarterly facility report cards for each hospital to educate data entry staff. These report cards are tailored for each facility and include information about the facility's compliance and accuracy of data entry against the general accuracy reports of their peer facilities. Additionally, these quarterly report cards provide tips, hints, and notes for each facility about how to improve data entry. The quality and accuracy of data entered into the NTR has a direct impact on what can be analyzed for the Annual Trauma Report.

Finally, collaborative relationships have continued to be built with trauma personnel from various disciplines throughout the state. Some of the methods being utilized in these efforts include:

- Hosting quarterly conference calls with trauma center staff;
- When possible, meeting in person with hospital personnel responsible for NTR data entry;
- Participating in local healthcare coalitions;
- Quarterly NTR user group meetings.

Overall, through regular communication, offering NTR user trainings, delivering reminders about quarterly trauma data due dates, and revitalization and development of relationships across the state, hospital data entry compliance has dramatically increased from the 2014 submissions of data to 2017 years submissions. Additionally, the amount and quality of the data available for analyses within the NTR for subsequent annual reports will continue to improve, thereby strengthening the detail and depth of future annual trauma reports.

NEVADA TRAUMA REGISTRY BACKGROUND

The definition of a trauma incident and the requirements for trauma reporting are outlined in both the Nevada Revised Statutes and Nevada Administrative Code. These statutes and codes are outlined below.

NEVADA REVISED STATUTE (NRS)

NRS 450B.105 "Trauma" defined. "Trauma" means any acute injury which, according to standardized criteria for triage in the field, involves a significant risk of death or the precipitation of complications or disabilities.

NRS 450B.238 Regulations requiring hospital to record and maintain information. The State Board of Health shall adopt regulations which require each hospital to record and maintain information concerning the treatment of trauma in the hospital. The Board shall consider the guidelines adopted by the American College of Surgeons which concern the information which must be recorded.

NEVADA ADMINISTRATIVE CODE (NAC)

The NAC regarding the treatment of trauma in Nevada and the corresponding Trauma Registry reporting requirements, guidelines, and procedures can be found at **NAC 450B.760** through **NAC 450B.774**, inclusive.

In summary, the regulations state that the Division of Public and Behavioral Health shall develop a standardized system for the collection of information concerning the treatment of trauma and carry out a system for the management of that information. The system must provide for the recording of information concerning treatment received before and after admission to a hospital. This system is called the NTR.

Each hospital shall submit to the Division trauma data on a quarterly basis which complies with the criteria prescribed by the Division and contains at least the minimum data set required by the National Trauma Data Bank (NTDB) established by the American College of Surgeons and any other information required by the Division or the State Board of Health.

The Division shall prepare an annual report not later than July 1st for the preceding calendar year summarizing the data submitted by hospitals on patients with traumas.

METHODOLOGY

The NTR is a depository of trauma incident data from across the state. All hospitals within Nevada are required to submit data quarterly to the NTR. To be classified as a trauma, a series of criteria identified by the American College of Surgeons must be met. For an incident to be classified as a trauma, the patient must have:

- At least one diagnostic code for injury:
  - ICD-10 code from the following ranges: S00 -S99 (7th Character Modifier A, B, or C), T07, T14, T20-T28 (7th Character modifier A), T30-32, and T79.A1-T79.A9 (7th character modifier A) and the patient must have either:
- At least one of the following criteria:
  - Patient was in the hospital for at least 24 hours due to injuries;
  - Injury resulted in death; or
  - Patient was transferred between hospitals using EMS or air ambulance.

Each year the data within the NTR will be statistically analyzed to evaluate incident traumas in Nevada. This evaluation is presented in the Annual Trauma Report, written by the state, in accordance with **NAC 450B.768**.

In 2017, the NTR captured 9,768 trauma cases. This report includes cases for patients with an Emergency Department/Hospital Arrival Date between January 1, 2017 and December 31, 2017. All data was analyzed using SAS Version 9.4 (SAS Institute, Cary, NC).

All trauma rates were calculated per 100,000 Nevada residents using the Nevada State Demographer, age, sex, race, and Hispanic origin (ASRHO) estimates and projections, vintage 2015 population data. When appropriate, a 95% Confidence Interval (CI) was calculated for comparing rate estimates. CIs provide a range of values that describe the uncertainty surrounding an estimate and may be used to assess statistical significance. When comparing trauma rates within a table, if the range of the CIs for two rates do not overlap, the rates can be considered significantly different. If the CI ranges overlap, then the difference is not significant.

Example:

Group	Count [Confidence Interval]
A	392 [385, 398]
B	390 [380, 399]
C	826 [796, 857]

In the table, above, the CIs for groups A and B share a range of values (385-398), thus there is no statistically significant difference in these rates. However, there is a statically significant difference between group A and group C and between group B and group C as the ranges for their CIs do not overlap.

RESULTS

From January 1, 2017 through December 31, 2017, a total of 9,768 traumas were recorded in the NTR by the 38 facilities in Nevada. In 2016, 8,864 traumas were recorded. Please do not compare data between 2016 and 2017. In 2016, ICD-9 Diagnosis codes were being used to identify accurate data.

The following pages includes data analysis of:

- Trauma cases
- Demographics
- Place and mechanism of injury
- Injury characteristics
- Patient transportation
- Patient discharge and transfer
- Risk factors
- Safety equipment, and
- The breakdown of Falls data.

9,768
Traumas in 2017

Technical Notes: Throughout this report, trauma cases are presented in several different ways.

- Total trauma cases include all cases reported to the Nevada Trauma Registry, including transfers between facilities. Therefore, in the event that a trauma patient presents at one facility and is transferred to another facility, that case is represented twice.

- Unique trauma cases are calculated by matching trauma records based on birth date, injury date, patient zip code, and discharge/arrival date. Unique trauma cases include only the first presentation to a facility, and not transfers between facilities; except in Tables 4, 9, 11, 16, 17, 18 and Figure 8 where traumas are assigned to the last transfer facility. This logic was used to account for the following situations:
    - When considering traumas that result in deaths, it is important to analyze based on the facility at time of death. Therefore, throughout this report, when a table lists Mortality Proportion and 9,768 in Unique Traumas, the table is based upon last facility.
    - There were some instances where the mechanism of injury differed between facility of first presentation and facility at time of death. In this case the mechanism was assigned based on facility at time of death. Please note, the state of Nevada does not try and change/correct patient records at the first facility if it does not match information at the last facility.

- Patient Transfer trauma cases are determined by the following question reported by the facilities, “If transferred, facility?” This question is self-report by hospital staff and does not always align with the results of our match to calculate unique trauma cases.

TRAUMA CAUSES BY FACILITY

Table 1: Trauma Cases by Facility, 2017 (includes Nevada Residents and Non-Residents)

Trauma Cases by Facility, 2017					
County	Facility	Unique Traumas Trauma Patients #		Total Trauma Cases*	
Clark County	Boulder City Hospital	63	0.6%	63	0.6%
	Centennial Hills Hospital	312	3.2%	323	3.1%
	Desert Springs Hospital Center	11	0.1%	11	0.1%
	Henderson Hospital	126	1.3%	128	1.2%
	Mesa View Regional Hospital	93	1.0%	93	0.9%
	Mountain View Hospital	500	5.1%	503	4.8%
	North Vista Hospital	254	2.6%	254	2.4%
	Southern Hills Hospital Medical Center	60	0.6%	60	0.6%
	Spring Valley Hospital Medical Center	187	1.9%	193	1.8%
	St. Rose Dominican Hospital De Lima Campus	199	2.0%	204	1.9%
	St. Rose Dominican Hospital North Las Vegas	25	0.3%	25	0.2%
	St. Rose Dominican Hospital San Martin Campus	40	0.4%	41	0.4%
	St. Rose Dominican Hospital Siena Campus §	371	3.8%	373	3.6%
	Summerlin Hospital Medical Center	249	2.5%	258	2.5%
	Sunrise Hospital Medical Center §	1,127	11.5%	1,257	12.0%
	University Medical Center §	3,222	33.0%	3,555	33.9%
	Valley Hospital Medical Center	24	0.2%	24	0.2%
Washoe County	Incline Village Community Hospital	12	0.1%	12	0.1%
	Northern Nevada Medical Center	124	1.3%	127	1.2%
	Renown Regional Medical Center §	1,415	14.5%	1,609	15.4%
	Renown South Meadows Medical Center	4	0.0%	4	0.0%
	St. Mary's Regional Medical Center	242	2.5%	243	2.3%
All Other Counties	Banner Churchill Community Hospital	115	1.2%	115	1.1%
	Battle Mountain General Hospital	25	0.3%	25	0.2%
	Carson Tahoe Regional Medical Center	191	2.0%	192	1.8%
	Carson Valley Medical Center	143	1.5%	145	1.4%
	Desert View Hospital	377	3.9%	380	3.6%
	Grover C. Dils Medical Center	20	0.2%	20	0.2%
	Humboldt General Hospital	50	0.5%	51	0.5%
	Mt. Grant General Hospital	4	0.0%	4	0.0%
	Northeastern Nevada Regional Hospital	91	0.9%	91	0.9%
	Pershing General Hospital	14	0.1%	14	0.1%
	South Lyon Medical Center	33	0.3%	33	0.3%
	Williams Bee Ririe Hospital	45	0.5%	45	0.4%
Nevada (Total)		**9,768**	**100.0%**	**10,475**	**100.0%**

* Total trauma cases are all the cases reported to the Nevada Trauma Registry in 2017, including transfers between facilities.
# Unique trauma cases are calculated by matching trauma records based on birth date, injury date, patient zip code, and discharge/arrival date. Unique traumas cases include only the first presentation to a facility, and not transfers between facilities. § Designated Trauma Centers

Out of all the facilities listed in Table 1, the designated trauma centers had the highest number of trauma cases. University Medical Center had the highest number of unique trauma cases at 3,222 (33.0%), followed by Renown Regional Medical Center at 1,415 cases (14.5%), and finally, Sunrise Medical Center at 1,127 cases (11.5%).

Out of the non-trauma centers, the facility with the highest number of trauma cases was Mountain View Medical Center at 500 cases (5.1%), followed by Desert View Hospital at 377 cases (3.9%), and finally, Centennial Hills Hospital at 312 cases (3.2%).

DEMOGRAPHICS

Of 9,768 unique traumas recorded in the NTR between January 1, 2017 and December 31, 2017, 59.6% of them were in male patients, 40.3% were in female patients. (See Table 2).

Table 2: Nevada Trauma Cases by Sex (Unique Traumas), 2017

Sex	Count	Percent	Rate per 100,000 (95% CI)
Male	5,822	59.6%	388.7 (378.7-398.7)
Female	3,932	40.3%	264.3 (256.1-272.6)
Sex Not Reported	14	0.1%	-
Total	9,768	100%	327.2 (320.7-333.7)

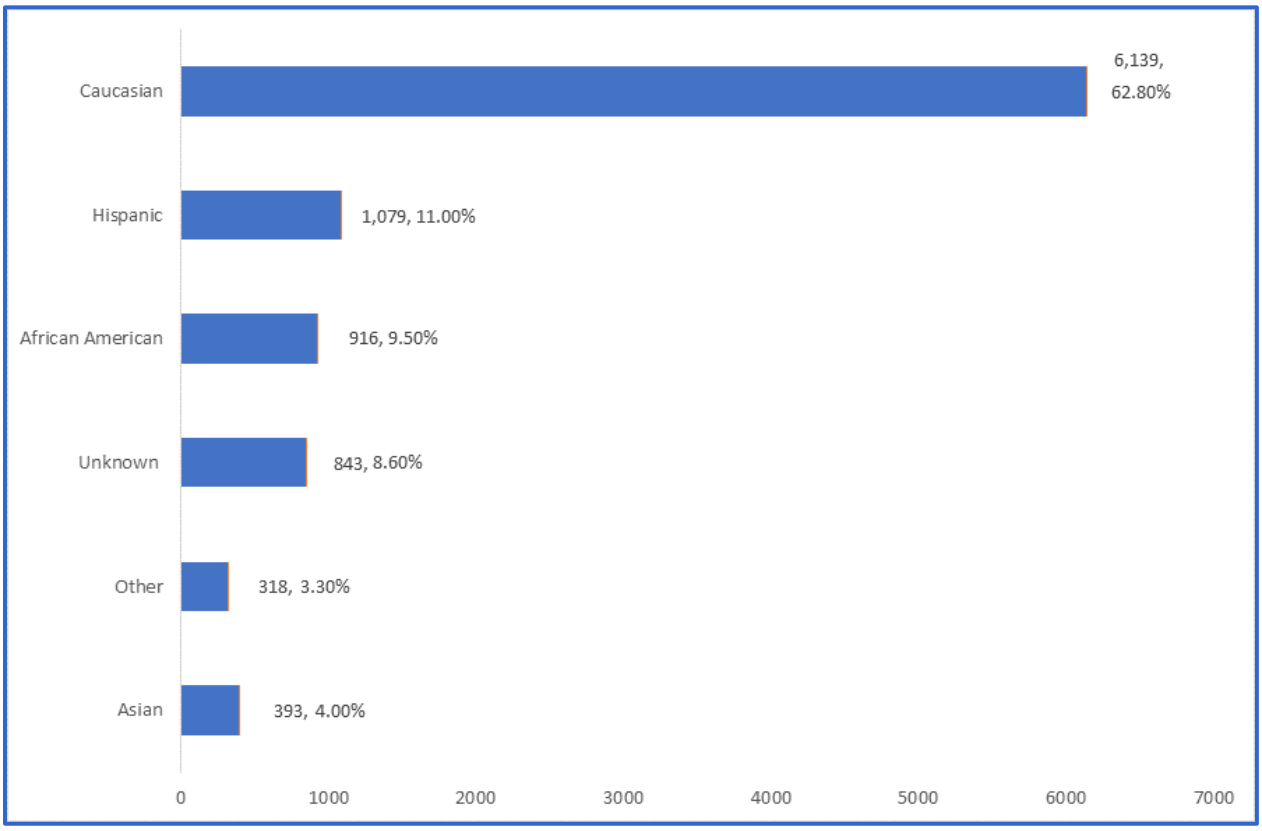
Table 3: Trauma Cases by Race/Ethnicity (Unique Traumas), 2017

Race/Ethnicity	Count	Percent	Rate per 100,000 (95% CI)
Caucasian*	6,139	62.8%	398.0 (388.0-407.9)
Hispanic	1,079	11.0%	124.5 (117.1-131.9)
Black	916	9.4%	353.3 (330.4-376.2)
Asian	393	4.0%	139.3 (125.6-153.1)
American Indian, Alaskan Native	80	0.8%	231.4 (180.7-282.1)
Other	318	3.3%	-
Unknown	843	8.6%	-
Total	9,768	100.0%	327.2 (320.7-333.7)

*The unique traumas per race/ethnicity are significantly higher due to the higher population of Caucasian individuals in the state of Nevada.

See **Figure 1** to see data listed in Table 3 as a chart.

Figure 1: Number and Percentage of Unique Trauma Cases by Race/Ethnicity, 2017 NTR, Nevada



Trauma affects people of all races and ethnicities. Per the 2015 Nevada Census, Nevada's highest populations by Race and Ethnicity were the following:

- Caucasian – 74.6%
- Hispanic – 28.8%
- African-American – 9.8%

Due to Nevada having higher percentages of Caucasian, Hispanic, and Black/African-American populations over other races/ethnicities, the data reflects that higher percentages of trauma cases also occur to Caucasian, Hispanic, and African-American people. Due to the unique traumas per race/ethnicity are significantly higher due to the higher population of Caucasian individuals in the state of Nevada.

Table 4: Age-Specific Trauma Incidence and Mortality Proportion (Unique Traumas)

Age Groups	Count	Column Percent	Deaths	Mortality Proportion (Row Percent)*
Total	9,768	100.0%	518	5.3%
<1	96	1.0%	7	7.3%
1-5	185	1.9%	9	4.9%
6-17	597	6.1%	23	3.9%
18-24	793	8.1%	48	6.1%
25-34	1,273	13.0%	81	6.4%
35-44	892	9.1%	49	5.5%
45-54	1,033	10.6%	62	6.0%
55-64	1,324	13.6%	71	5.4%
65-74	1,348	13.8%	63	4.7%
75-84	1,285	13.2%	67	5.2%
85+	929	9.5%	36	3.9%
Unknown	13	0.1%	2	15.4%

* By last transfer facility.
Please note, that throughout this report, when a table lists Mortality Proportion and 9,768 in Unique Traumas, the table is based upon last facility.

Table 4 breaks the number of trauma cases down by age, deaths, and the percentage of death per age group. Out of the 9,768 unique trauma cases in Nevada for 2017, the age group with the highest number/percentage of traumas was age 65-74 years old at 1,348 cases or 13.8%, second was 55-64 years old at 1,324 cases or 13.6%, and third was 75-84 years old at 1,285 cases or 13.2%. The age group of <1 years old has the highest percentage of death from their trauma at 7.3%, followed by 25-34 years old (6.4%), and 18-24 years old (6.1%).

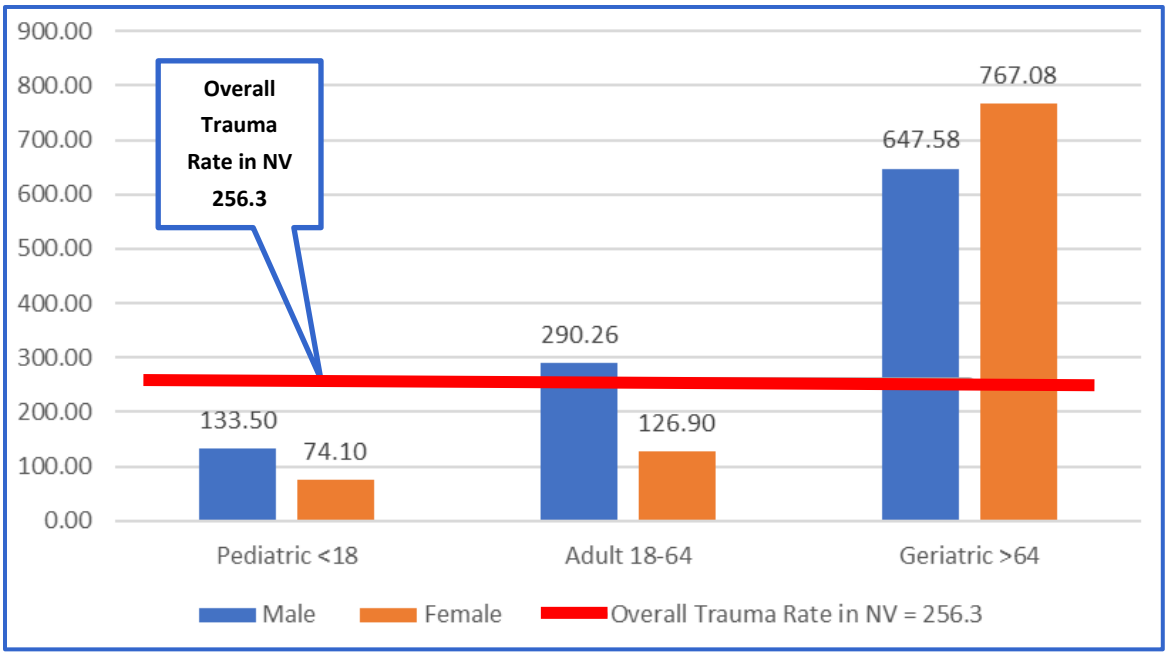
Table 5: Age and Sex-Specific Trauma Rates per 100,000 Nevada Residents (Unique Traumas)

Age Group	Male		Female		Total#	
	n	Rate per 100,000 (95% CI)	n	Rate per 100,000 (95% CI)	n	Rate per 100,000 (95% CI)
Pediatric <18	487	133.5 (121.6-145.4)	257	74.1 (65.0-83.2)	744	104.6 (97.0-112.1)
Adult 18-64	2,725	290.3 (279.4-301.2)	1,157	126.9 (119.6-134.2)	3,886	210.0 (203.4-216.6)
Geriatric >64	1,257	647.6 (611.8-683.4)	1,756	767.1 (731.2-803.0)	3,021	714.1 (688.7-739.6)
Total	4,469	298.4 (289.6-307.1)	3,170	213.1 (205.7-220.5)	7,651	256.3 (250.6-262.0)
	59%		41%			

* There were twelve cases where sex was not reported.
\# It should be noted that data depictured in this report is a reflection based solely on data points recorded within the NTR. It does not include patient history or examination.

To further breakdown the number of trauma cases in Nevada Residents only, males overall account for 59% of the trauma cases, whereas females account for 41%. The age and sex of the highest number of trauma cases in 2017 were males aged 18-64 years old at 36% of the total cases.

Figure 2: Age and Sex-Specific Trauma Rates per 100,000 Nevada Residents, 2017



Traumas per age, sex & 100,000 people in NV Residents

#1 - SENIORS are more likely to have a trauma with senior females even more likely than senior males.

Table 6: County-Specific Trauma Rates per 100,000 County Residents (Unique Traumas)

County #	Case Count	Trauma Rate per 100,000 (95% CI)
Carson City	150	270.2 (226.9-313.4)
Churchill	113	442.4 (360.9-524.0)
Clark	6,035	275.5 (268.5-282.4)
Douglas	144	296.3 (247.9-344.7)
Elko	93	170.6 (136.0-205.3)
Esmeralda	3	312.5 (0.0-666.1)
Eureka	2	105.7 (0.0-252.2)
Humboldt	65	385.2 (291.5-478.8)
Lander	29	467.1 (297.1-637.1)
Lincoln	23	461.7 (273.0-650.3)
Lyon	129	237.1 (196.2-278.0)
Mineral	9	199.5 (69.1-329.8)
Nye	420	912.0 (824.8-0,999.2)
Pershing	24	361.7 (217.0-506.4)
Storey	2	47.6 (0.0-113.6)
Washoe	821	181.1 (168.7-193.5)
White Pine	39	378.5 (259.7-497.3)
Out of State	893	-
Unknown	757	-

* Where trauma occurred according to Federal Information Processing Standard (FIPS) code.

it should be noted that Trauma Rates per county are based upon ICD-10 diagnosis coding recorded by the treating facilities, and does not include backgrounds, patient history, or examination.

Highest Trauma Cases

Utilizing FIPS codes of where an injury occurred:

#1) Clark County recorded the highest number of trauma cases at 6,035 cases.

#2) Washoe with 821 trauma cases.

#3) Nye County with 420 trauma cases.

However, there were 893 trauma cases that occurred out-of-state, and 757 were unknown.

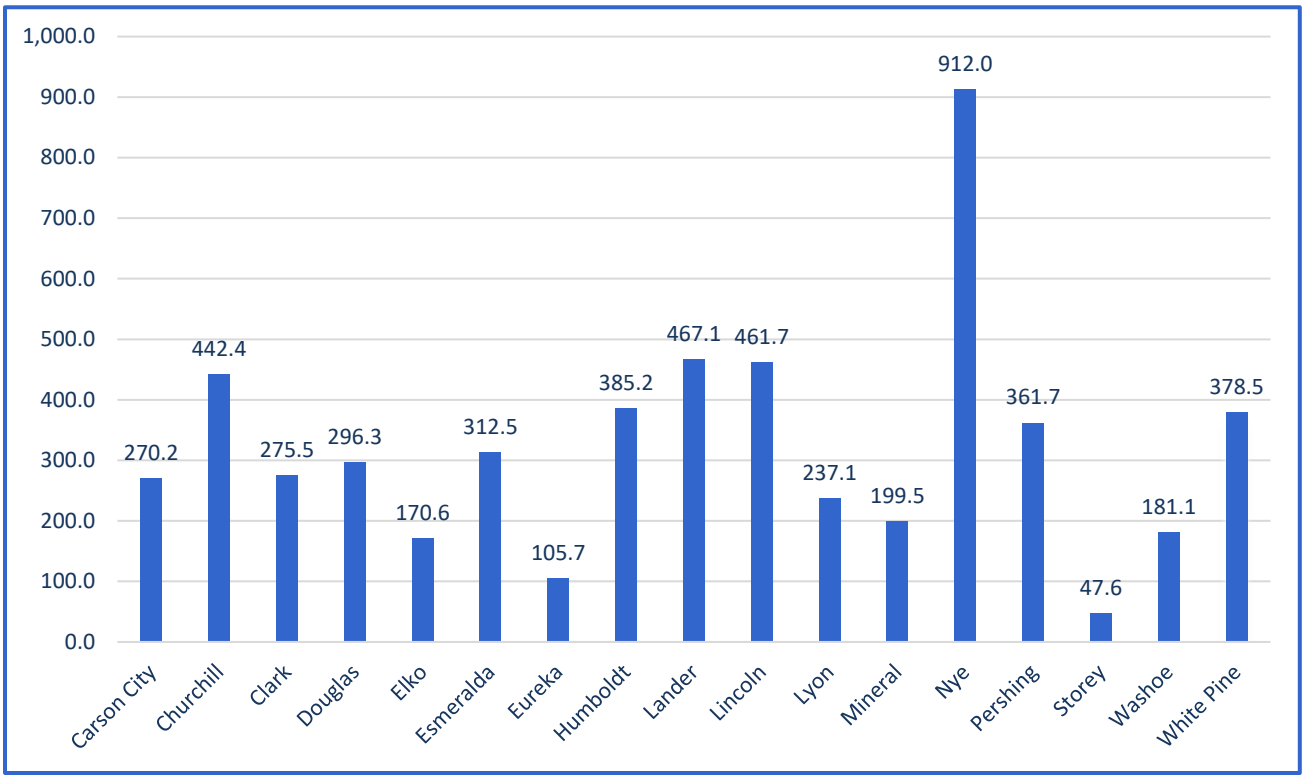
Highest Trauma Rate

When comparing the number of cases per 100,000 in each county, **rural counties had a higher rate of traumas than urban counties.**

#1 Nye County
#2 Lander County
#3 Lincoln County

See also Figure 3 - next page

Figure 3: County-Specific Trauma Rates per 100,000 County Residents



When analyzing the number of trauma cases per 100,000 people in Nevada, this analysis shows that Nye County had the highest rate at 912.0 cases per 100,000 people. This was then followed by Lander County with 467.1 cases per 100,000 people, and then Lincoln County at 461.7 cases per 100,000 people.

Traumas Rates / 100,000 People

#1 Nye County

#2 Lander County

#3 Lincoln County

Table 7: Primary Payment Source Proportion for 2015, 2016, 2017*

Primary Source of Payment	2015	2016	2017	Difference 2016-2017
Medicare	38.0%	26.2%	28.5%	+2.3%
Private Insurance	17.4%	22.9%	19.5%	-3.4%
Medicaid	12.5%	20.9%	19.7%	-1.2%
Self-Pay	8.3%	9.0%	7.9%	-1.1%
Other Commercial	8.1%	3.7%	4.3%	+.06%
No Fault Automobile	1.3%	3.3%	2.5%	-0.8%
Other Government	1.6%	2.9%	4.0%	+1.1%
Worker's Compensation	2.4%	1.5%	1.6%	+.1%
Other	2.5%	0.9%	1.4%	+.05%
Military	0.9%	0.4%	0.5%	+.1.0%
Charity	0.1%	0.3%	0.3%	0.0%
Unknown	6.9%	7.9%	9.9%	+2.0%
Total	100%	100%	100%	N/A

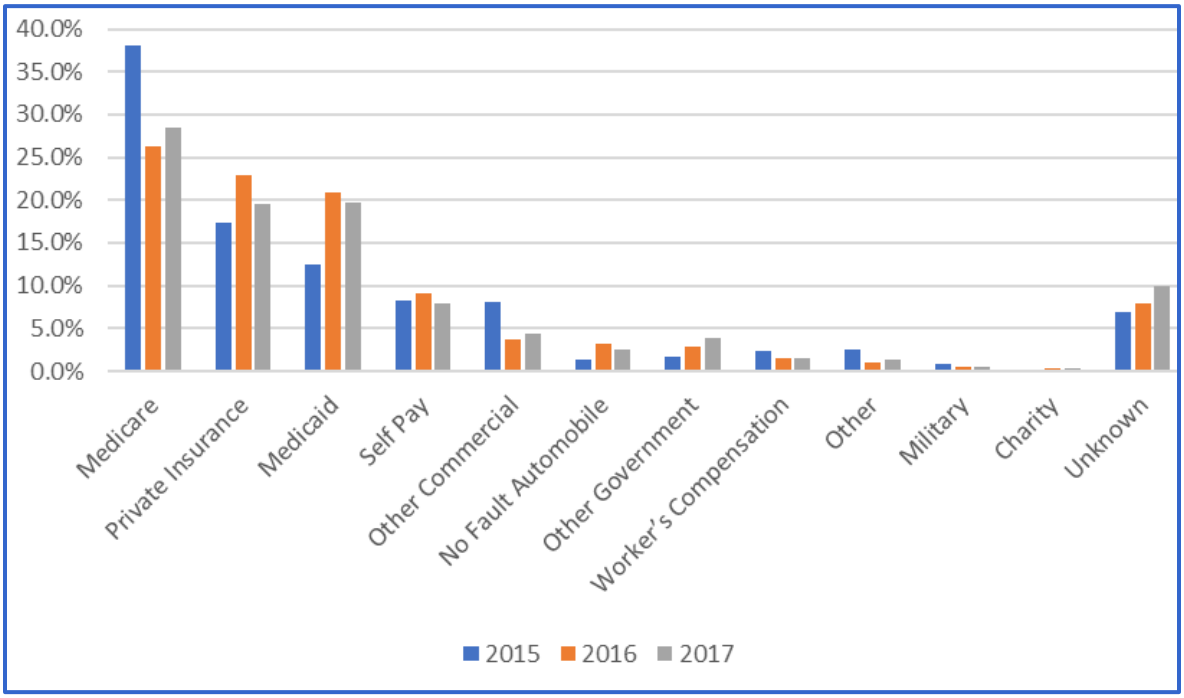
Of the 9,768 total traumas reported in Nevada in 2017, the majority were paid for through Medicare, followed by private health insurance, Medicaid, and then Self Pay. This order was the same in 2016.

From 2016 to 2017, the number of traumas covered by Medicaid increased by 67.2%, whereas Medicare decreased by 31.1%.

Figure 4 displays the difference in Primary Source of Payment between 2015, 2016, and 2017 in a column chart.

*On page 4 of this report, it is recommended to not compare 2015 and 2016 data or 2016 and 2017 data. However, prior years' data in Table 7 was included due to the data being from proportions.

Figure 4: Primary Payment Source Proportion for 2015, 2016, and 2017 Traumas in Nevada



PLACE AND MECHANISM OF INJURY

In 2017, the majority of traumas occurred in the home, followed by the street, and then via recreation (See Table 8).

Table 8: Trauma Incidence by Place of Injury (Unique Traumas)

Place of Injury	Trauma Count	Percent
Residential	4,038	41%
Street	3,063	31%
Trade and Service Area	548	6%
Recreation area	306	3%
Sports Area	204	2%
Wilderness	190	2%
Other Specified	162	2%
School or Public Area	141	1%
Industrial and Construction	97	1%
Farm	26	0%
Transport Vehicle as Place	25	0%
Military Training Ground	3	0%
Railroad Track	1	0%
Unknown/Unspecified	964	6%
Total	9,768	100%

#1 place of injury was in the **HOME**

Table 9: Trauma Incidence and Mortality Proportion by Mechanism of Injury (Unique Traumas)

Mechanism	Count	Column Percent	Deaths
Falls	4,497	46.0%	135
Motor Vehicle Traffic	2,086	21.4%	152
Struck by/Against	628	6.4%	12
Firearm	603	6.2%	147
Cut/Pierce	474	4.9%	13
Motor Vehicle Non-Traffic	320	3.3%	8
Other Transport (Land, Sea, Sky)	248	2.5%	4
Other Specified	216	2.2%	12
Pedal Cyclist, Other	172	1.8%	4
Natural/Environmental	133	1.4%	2
Pedestrian, Other	99	1.0%	16
Unspecified	92	0.9%	2
Fire/Burn	72	0.7%	2
Unknown	66	0.7%	4
Machinery	27	0.2%	1
Overexertion	23	0.2%	0
Drowning	7	0.1%	0
Suffocation	5	0.1%	4
Total	9,768	100.0%	518

Top 3 Deaths by Traumas

#1 Motor Vehicle Accident

#2 Firearms

#3 Falls

Top 3 Traumas

#1 Falls

#2 Motor Vehicle Traffic-Related

#3 Struck by/Against

*The reported Unique Traumas are analyzed by patients last transfer facility.

In 2017, out of the 9,768 total unique trauma cases, the top three mechanisms of traumatic injury in Nevada were Falls (46.0%), Motor Vehicle Traffic-Related (21.4%), and Struck by/Against (6.4%). Additionally, out of the total trauma cases, higher proportions of death were from Suffocation (80.0%), Firearm (24.4%), or Pedestrian, Other (16.2%).

Currently the NTR collects trauma data via ICD-10 codes. With ICD-10 codes, some trauma mechanisms are not available as a code. For example, in Table 9, a facility can choose one of the following ICD-10 codes if the cause of the trauma is not available as an ICD-9 choice: Pedestrian, Other; Other Specified, Unspecified, and Unknown.

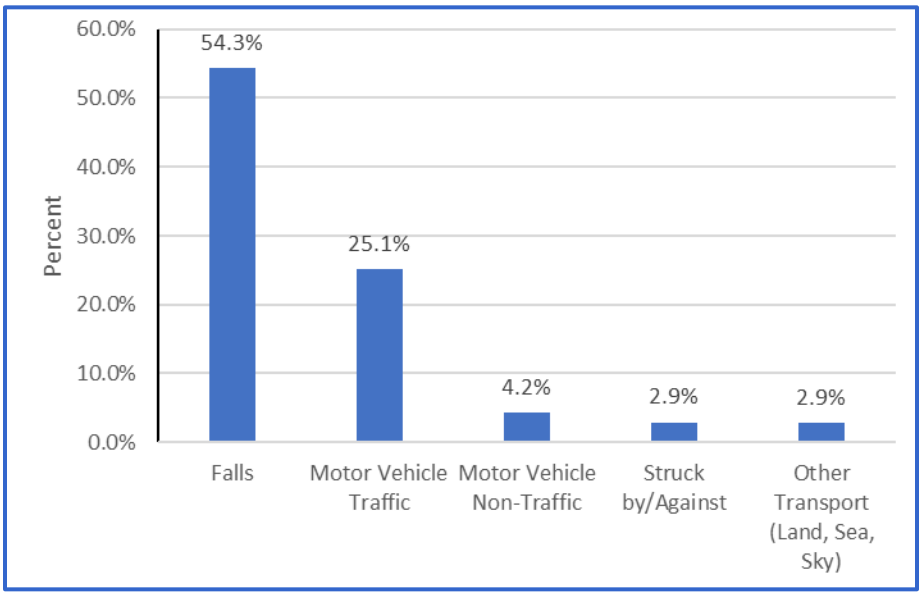
Table 10: Trauma Rates for Top Three Mechanisms of Injury by Age (Unique Traumas)

Age Group	Falls		Struck by/Against		Motor Vehicle Traffic	
	n	Rate per 100,000 (95% CI)	n	Rate per 100,000 (95% CI)	n	Rate per 100,000 (95% CI)
Pediatric <18	308	43.3 (38.4-48.1)	76	10.7 (8.3-13.1)	155	21.8 (18.4-25.2)
Adult 18-64	1,388	75.0 (71.1-79.0)	450	24.3 (22.1-26.6)	1,531	82.7 (78.6-86.9)
Geriatric >64	2,791	659.8 (635.3-684.2)	101	23.9 (19.2-28.5)	381	90.1 (81.0-99.1)
Total	4,487	150.3 (145.9-154.7)	627	21.0 (19.4-22.6)	2,067	69.2 (66.3-72.2)

Table 10 outlines the top three mechanism for injury by age. The number one trauma injury per age group are the following:

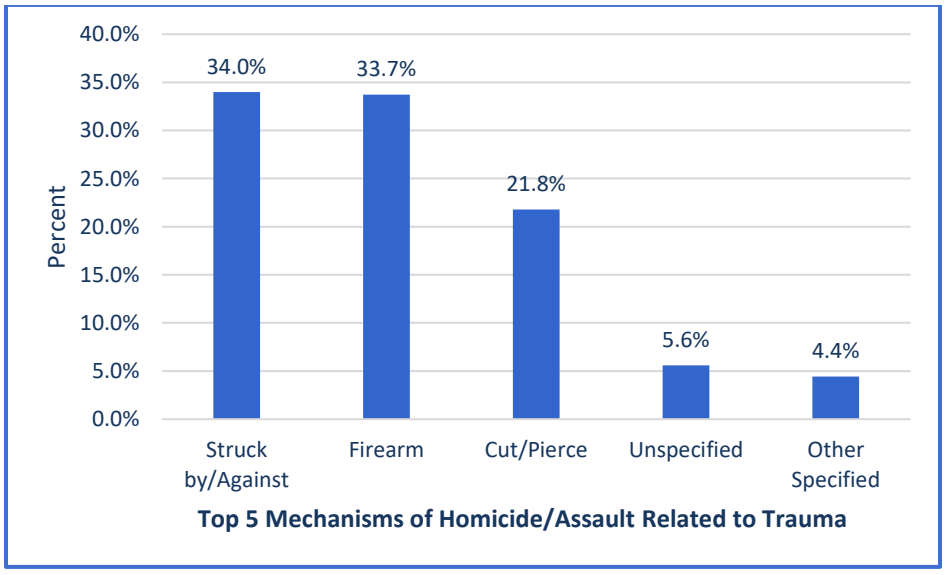
- Pediatrics ≤17 years old = Falls
- Adults 18-64 years old = Motor Vehicle Traffic-Related
- Geriatric 65+ years old = Falls

Figure 5: Top Five Mechanisms of Unintentional Trauma (n=8,192)



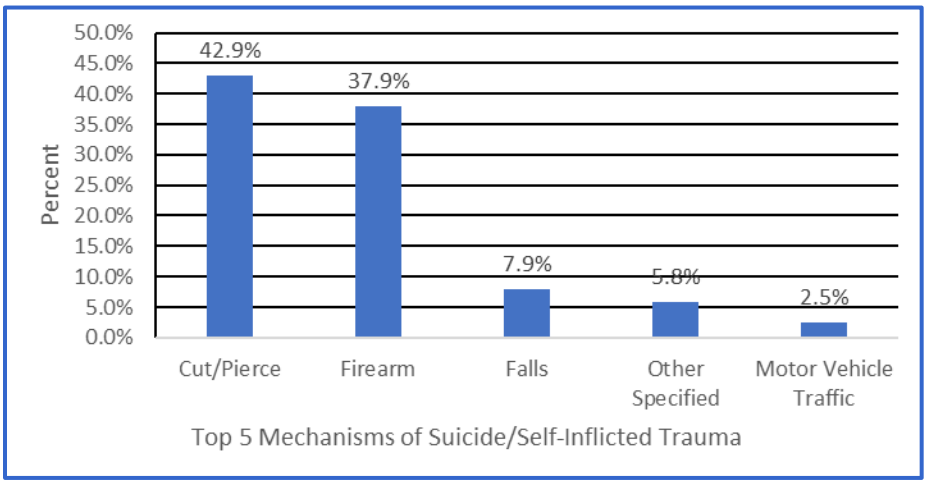
FALLS
#1 cause of unintentional

Figure 6: Top Five Mechanisms of Homicide/Assault-Related Trauma (n=1,106)



Homicide/Assault
#1 Struck by/Against
#2 Firearm
#3 Cut/Pierce

Figure 7: Top Five Mechanisms of Suicide/Self-Inflicted Trauma (n=240)



Suicide/Self-Inflicted

#1 Cut/Pierce

#2 Firearm

#3 Falls

INJURY CHARACTERISTICS: INJURY SEVERITY SCORE (ISS)

Injury Severity Score (ISS) is an anatomical scoring system that provides an overall score for patients with multiple injuries. The ISS has values from 1 to 75:

ISS score of 1-8 = Minor
ISS score of 9-15 = Moderate
ISS score of 16-24 = Serious
ISS score 25-75 = Severe

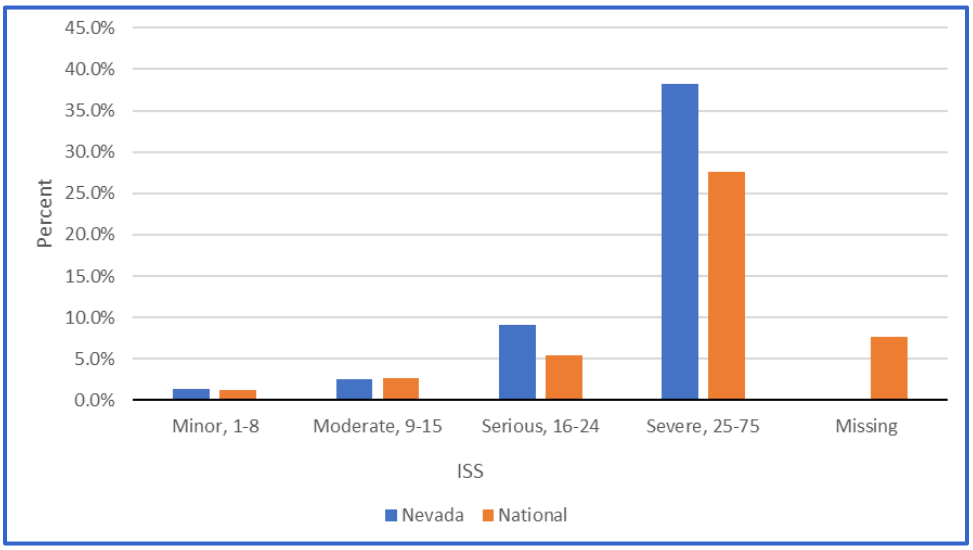
Table 11: Trauma Incidence and Mortality Proportion by Injury Severity Score (ISS) (Unique Traumas)

Injury Severity Score	Count	Column Percent	Deaths	Mortality Proportion* (Row Percent)
Minor, 1-8	4,534	46.4%	61	1.3%
Moderate, 9-15	3,498	35.8%	91	2.6%
Serious, 16-24	1,004	10.3%	91	9.1%
Severe, 25-75	719	7.4%	275	38.2%
Missing/NA/ND	13	0.1%	0	0.0%
Total	9,768	100%	518	N/A

* By last transfer facility.

In 2017, the majority of patients had a Minor ISS between a 1 and 8 and ultimately had the lowest mortality proportion rate. Correspondently, patients with a Severe ISS between a 25 and 75 had the highest mortality proportion rate. Therefore, the lower the ISS the less likely a patient was to die from their trauma. The higher the score, the more likely for a patient to die.

Figure 8: Trauma Mortality Proportion* by Injury Severity Score, Nevada vs. National



Nevada has **higher** proportions of **deaths** in the categories of Serious, and Severe than the National average

* By last transfer facility.

Data sources: Nevada Trauma Registry, 2017; American College of Surgeons, "**National** Trauma Data Bank 2016 Annual Report"

PATIENT TRANSPORTATION

Patients have many ways of getting to a hospital. In 2017, the majority of trauma patients in Nevada were transported to the hospital by ground ambulance followed by private vehicle or walk-ins. (See Table 12).

Table 12: Mode of Transport to Reporting Hospital (Unique Traumas)

Mode of Arrival	Trauma Count	Percent
Ground Ambulance	6,687	68%
Private Vehicle or Walk-in	2,130	22%
Helicopter Ambulance	811	8%
Fixed-Wing Ambulance	54	1%
Unknown	48	1%
Police	25	0%
Other	12	0%
Water Ambulance	1	0%
Total	9,768	100%

In addition to reviewing the data regarding mode of patient arrival, it may also be valuable for community stakeholders to review patient mode of arrival according to Injury Severity Score (ISS) ranges (See Table 13). In Table 13, people with the highest ISS were transported to the hospital via ground ambulance.

Table 13: Mode of Transport by Injury Severity Score (ISS) (Unique Traumas)

Mode of Arrival	Injury Severity Score Range									
	Minor 1-8		Moderate 9-15		Serious 16-24		Severe 25-75		Missing/NA ISS Scores	
Ground Ambulance	2,910	63%	2,585	74%	652	69%	531	74%	9	69%
Private Vehicle or Walk-in	1,405	31%	581	17%	89	9%	52	7%	3	23%
Helicopter Ambulance	201	4%	295	8%	198	21%	116	16%	1	8%
Fixed-Wing Ambulance	16	0%	20	1%	10	1%	8	1%	0	0%
Unknown	26	1%	15	0%	1	0%	6	1%	0	0%
Police	21	0%	4	0%	0	0%	0	0%	0	0%
Other	8	0%	3	0%	0	0%	1	0%	0	0%
Water Ambulance	0	0%	1	0%	0	0%	0	0%	0	0%
Total	4,587	100%	3,504	100%	950	100%	714	100%	13	100%

Multi-Level ISS Most Utilized Transport= Ground Ambulance

PATIENT DISCHARGE AND TRANSFER

Of the 9,768 total trauma cases in Nevada during 2017, 1,350 were transferred to a designated trauma center. University Medical Center received the highest number of transferred patients from other facilities, but St. Rose Dominican Hospital Siena Campus had the lowest average ISS out of the trauma centers. See Table 14.

Table 14: "Patient Transfer to" Nevada Trauma Centers by Injury Severity Score (ISS)

Facility Patient Transferred To*	Injury Severity Score Range			
	Trauma Cases	Mean ISS	Standard Deviation	ISS Range
Renown Regional Medical Center	345	7.0	4.4	1 - 27
St. Rose Dominican Hospital Siena Campus	24	4.0	1.9	1 - 9
Sunrise Hospital Medical Center	308	6.1	4.9	1 - 29
University Medical Center	673	6.6	8.2	1 - 75
Total	1,350			

"Patient Transfer to" is determined by the question, "Was Patient Transferred to Facility?" and not through the matching process that creates the Unique Traumas.

RISK FACTORS: DRUG/ALCOHOL USE

Of the 9,768 unique traumas recorded in the NTR in 2017, Drug/Alcohol Use was determined to be involved in 1,582 (16%) of the cases. 13% of Unintentional trauma injury involved drug or alcohol use, and 30% of Homicide/Assault involved drug or alcohol use.

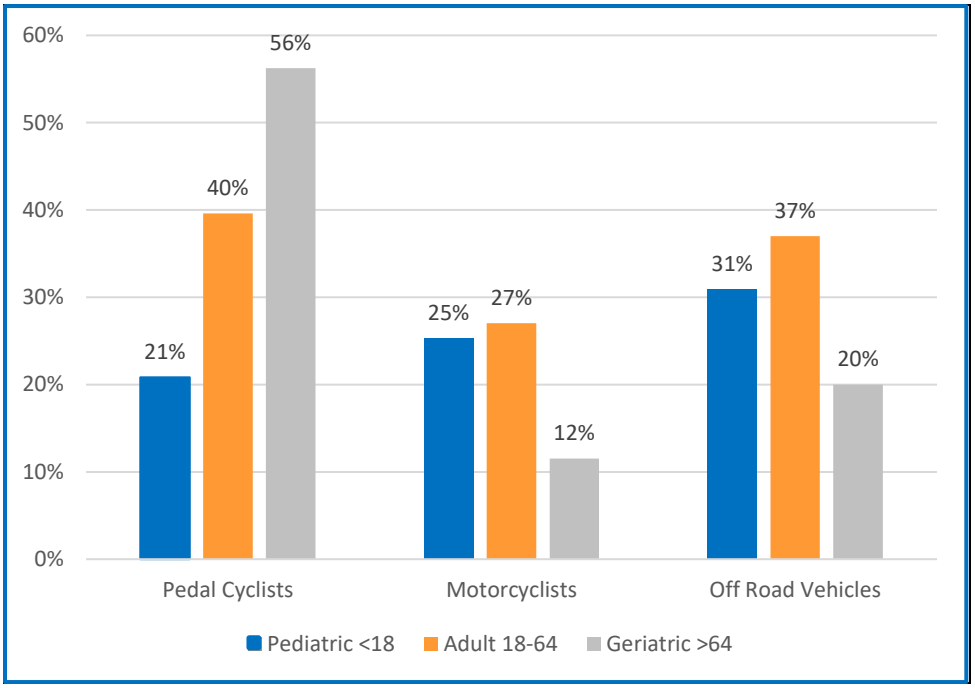
Table 15: Injury Intent and Drug/Alcohol Use (Unique Traumas)

Injury Intent	Trauma Cases	Drug/Alcohol Use	Percent Drug/Alcohol Use (Row Percent)
Unintentional	8,192	1,105	13%
Suicide	240	93	39%
Homicide/Assault	1,106	337	30%
Legal Intervention	20	5	25%
Undetermined (accidental/intentional)	130	30	23%
Missing	80	12	15%
Total	9,768	1,582	16%

SAFETY EQUIPMENT

Helmet use is an important safety measure especially when riding a bicycle, motorcycle, or an off-road vehicle. Unfortunately, even with helmet laws, not everyone wears one when participating in these activities. Overall, only 40% of the trauma cases wore helmets when on a bicycle, 66% while on a motorcycle, and 34% while on an off-road vehicle. See Figure 9.

Figure 9: Proportion of Helmet Use among Pedal Cyclists, Motorcyclists, and Off-Road Vehicle Users (Unique Traumas)



Among people with traumas, **SENIORS** are more likely to have worn a helmet

FALLS – BY LAST TRANSFER FACILITY

Falls were the leading mechanism of trauma in Nevada during 2017. Correspondingly, most traumas occur at home (See Table 8). When breaking down the falls by sex, the trauma rate was higher for females than males, but only by 97 cases or 2%. (See Table 16).

Table 17 is broken down further by the type of falls. This table outlines that the number one type of fall that caused a trauma injury was from Same Level, Slipping/Tripping/Stumbling at 53.3%. However, the number one type of fall that caused death was from suicide (such as jumping off a building).

Table 16: Trauma Rate for Falls by Sex (Unique Traumas) *

Sex	n	Rate per 100,000 (95% CI)
Female	2,434	163.6 (157.1-170.1)
Male	2,176	145.3 (139.2-151.4)
Unknown	6	-
Total	4,616	154.7 (150.2-159.1)

More fall traumas occur to females than males

* By last transfer facility.

Table 17: Incidence and Mortality Proportion by Type of Fall (Unique Traumas)

Type of Falls	Count	Percent of Falls (Column Percent)	Deaths	Mortality Proportion (Row Percent)
Same Level (Slipping, Tripping, Stumbling)	2,834	61.4%	84	3.0%
Unspecified	381	8.3%	17	4.5%
From Furniture	276	6.0%	6	2.2%
Steps	257	5.6%	7	2.7%
Multi-Level: Cliff, Tree, Water, Etc.	243	5.3%	5	2.1%
On or From Ladder/Scaffolding	164	3.6%	2	1.2%
Pedestrian Conveyance Accident	147	3.2%	2	1.4%
Out of Building or Structure	100	2.2%	6	6.0%
Fall Due to Environmental Factors	67	1.5%	0	0.0%
Collision, Push or Shove By, or Other Person	51	1.1%	1	2.0%
Playground Equipment	50	1.1%	0	0.0%
Suicide Related	26	0.6%	5	19.2%
Undetermined Fall from High Place	17	0.4%	3	17.6%
Assault Related	4	0.1%	0	0.0%
Total	4,617	100.0%	138	3.0%

* By last transfer facility.

Table 18: Trauma Rate by Age and Type of Fall (Unique Traumas) *

Age Group	Type of Fall					
	Unspecified		From Same Level (tripping, slipping, stumbling)		From Furniture (bed, chair, etc.)	
	n	Rate per 100,000 (95% CI)	n	Rate per 100,000 (95% CI)	n	Rate per 100,000 (95% CI)
Pediatric <18	13	1.8 (0.8-2.8)	88	12.4 (9.8-15.0)	53	7.4 (5.4-9.5)
Adult 18-64	95	5.1 (4.1-6.2)	676	36.5 (33.8-39.3)	44	2.4 (1.7-3.1)
Geriatric >64	273	64.5 (56.9-72.2)	2,070	489.3 (468.3-510.4)	179	42.3 (36.1-48.5)
Total	381	12.8 (11.5-14.0)	2,834	94.9 (91.4-98.4)	276	9.2 (8.2-10.3)

FINAL NOTE

With vast improvements in data entry compliance and accuracy, the quality of the data available in the Nevada Trauma Registry (NTR) has been enhanced. The NTR Manager and Coordinator thank all NTR users, at the various trauma and non-trauma centers in Nevada, for their patience and diligence in learning to accurately enter data into the NTR. Your dedication and efforts are recognized and valued.

In 2018, we are hopeful to fully complete the historical data upload from the three remaining trauma centers. Through collaborative partnerships to improve the amount and quality of information in the NTR, these data and subsequent reports become more valuable to the various NTR community stakeholders.

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ADDITIONAL INFORMATION

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