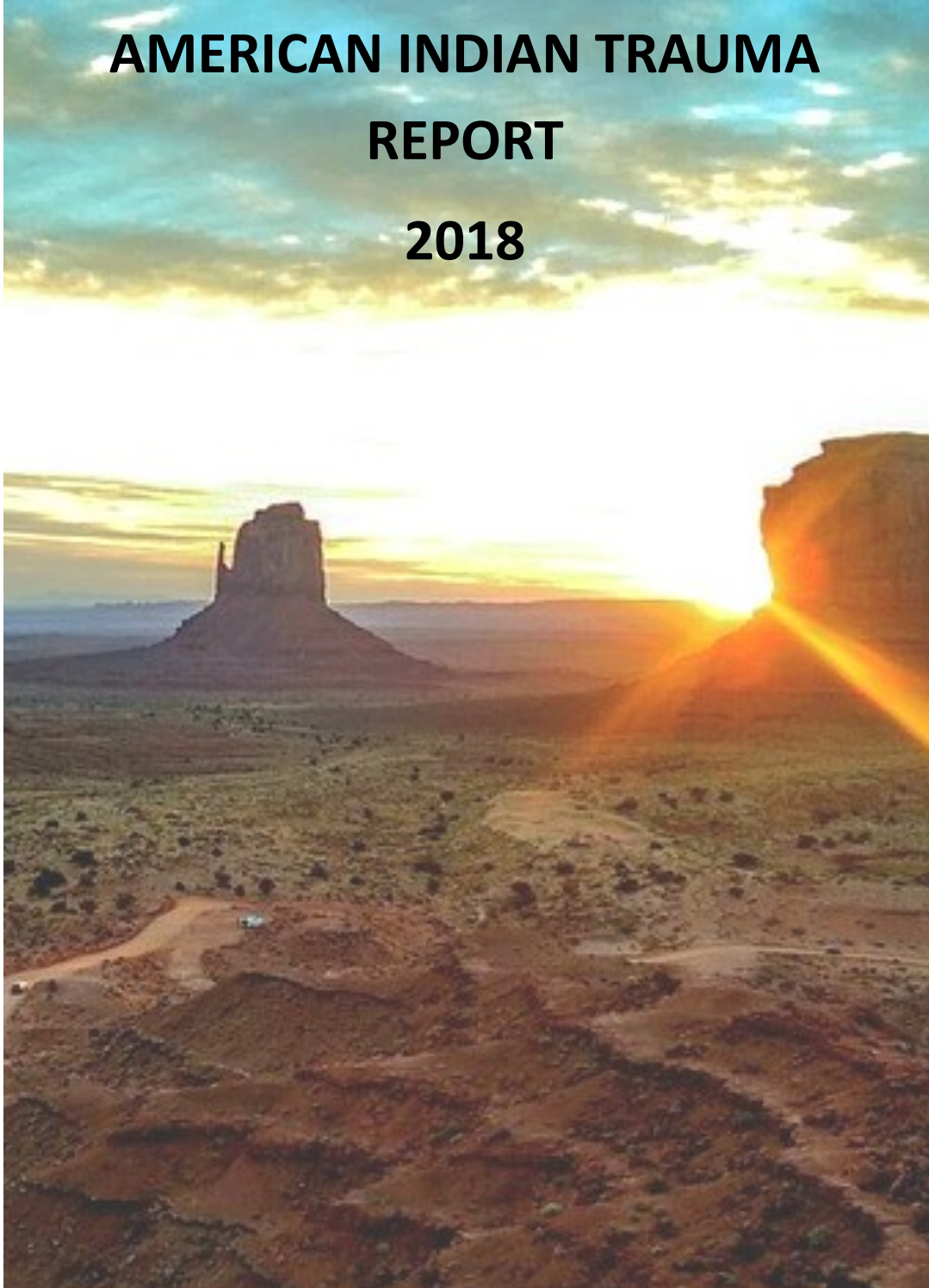




ARIZONA DEPARTMENT
OF HEALTH SERVICES

BUREAU OF EMERGENCY
MEDICAL SERVICES AND
TRAUMA SYSTEM

AMERICAN INDIAN TRAUMA REPORT 2018



August 1, 2018

The mission of the Arizona Department of Health Services (ADHS) is “to promote, protect and improve the health and wellness of individuals and communities in Arizona.” The ADHS Bureau of EMS and Trauma System prepared this document to highlight the disproportionate impact of injury on Arizona’s American Indian communities. Because many reservations in Arizona are rural, Arizona American Indians are doubly impacted by higher rates of traumatic injury and by delayed access to trauma care.

This presents both a great challenge and great opportunity to make a positive difference. As Arizona’s trauma system has matured, more hospitals that serve the rural parts of our state have become designated as trauma centers. Efforts by the tribal communities to increase ambulance service Medicaid reimbursement rates have been moving forward, and one tribal EMS agency has applied for a State Ambulance Certificate of Necessity.

Reducing the traumatic injury rate will take time, but we welcome the opportunity to partner with Arizona’s American Indian community to address this important public health problem.

Sincerely,

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In 2016, Arizona's trauma centers treated 46,842 people, with an all-trauma injury rate of 627 per 100,000. There were 3,732 traumatic injuries among American Indians in Arizona. Of those, 70 were fatal. As a result, American Indians had the highest trauma mortality rate in the state (24 deaths per 100,000) when compared to other racial/ethnic groups. Because some tribal lands border or overlap other states, an unknown number of members who suffer from trauma are treated outside of Arizona and are not included in this report. The Arizona State Trauma Registry (ASTR) is limited to injury and deaths that occurred within [healthcare facilities that submit data](#) to the ASTR; therefore, these rates only show a portion of the true trauma morbidity and mortality in Arizona.

American Indians made up approximately 4.7% of Arizona's population, but accounted for over 8% of traumatic injury cases. The rate of traumatic injury among American Indians was 1,287 per 100,000 Arizona residents, compared to 766 per 100,000 among Whites.

The trauma related Years of Potential Life Lost (YPLL) rate for Arizona American Indians (695 per 100,000) was second only to Blacks (729 per 100,000). Major factors that may be contributing to higher YPLL rates among these populations are the mechanism, severity, and age of injury.

Trauma related hospital trauma charges for Arizona American Indians totaled \$120,009,643. The majority of charges were billed to AHCCCS/Medicaid (67.4%).

American Indians had higher rates of traumatic injury across all gender and age categories. The highest rate was observed among the elderly American Indian population (4,076 per 100,000).

American Indians had higher rates of trauma across all five mechanisms when compared to other racial/ethnic groups. The greatest disparity in rate was observed among Cut/Pierce and Struck by/Against traumas. The rate of homicide among American Indians was seven times higher, and the rate of suicide was three times higher, than other racial/ethnic groups.

Alcohol use was suspected in 44% of traumatic injuries involving American Indians, compared to 11% of injuries involving other racial/ethnic groups. Among American Indians, the proportion of alcohol related trauma was highest for Cut/Pierce and Struck by/ Against.

Safety restraint use for motor vehicle occupants involved in a trauma was less common among American Indians (56%) than among other racial/ethnic groups (71%).

The rate of traumatic injury among American Indians was higher in rural areas of the state (958 per 100,000) than in urban areas (576 per 100,000).

The proportion of American Indians transported to Level I trauma centers was equal to that of other racial/ethnic groups.

BACKGROUND

The purpose of this report is to describe traumatic injury among the Arizona American Indian population using the Arizona State Trauma Registry (ASTR). The intent is to identify specific areas of need in order to develop and strengthen local injury prevention programs and target interventions that focus on preventing traumatic injuries among Arizona American Indian tribes.

The Bureau of Emergency Medical Services (EMS) and Trauma System is responsible for collecting, analyzing and reporting on data obtained from designated trauma centers and participating EMS agencies to enhance the EMS and Trauma System in Arizona. In 2016, there were 43 hospitals submitting data to the ASTR including ten (10) Level I trauma centers, seven (7) Level III trauma centers, twenty-four (24) Level IV trauma centers, and two (2) non-designated hospitals.¹

All trauma centers are required to report any injuries meeting the ASTR inclusion criteria (Appendix A). All the Level I trauma centers in Arizona are located in urban areas of the state, including eight in Maricopa County, one in Coconino County and one in Pima County.

METHODS

This report analyzed incidents of traumatic injury reported to the ASTR with an Emergency Department/Hospital Arrival Date between January 1, 2016 and December 31, 2016. The report gives an overview of trauma among American Indians describing patient demographics, injury characteristics, and trauma risk factors.

Descriptive statistics were used to show the distribution of traumatic injury in Arizona as well as differences over time. When appropriate, rates and 95% confidence intervals (CIs) were calculated per 100,000 Arizona residents using 2016 population denominators from the Arizona Health Status and Vital Statistics database.² If the CIs of two rates do not overlap, the difference between the rates is considered statistically significant (alpha 0.05).

Years of Potential Life Lost (YPLL) measures the societal impact of premature death by estimating the average number of years a person would have lived if he or she had not died prematurely. Here YPLL was calculated by subtracting the age at death from the predetermined endpoint of 75 years.

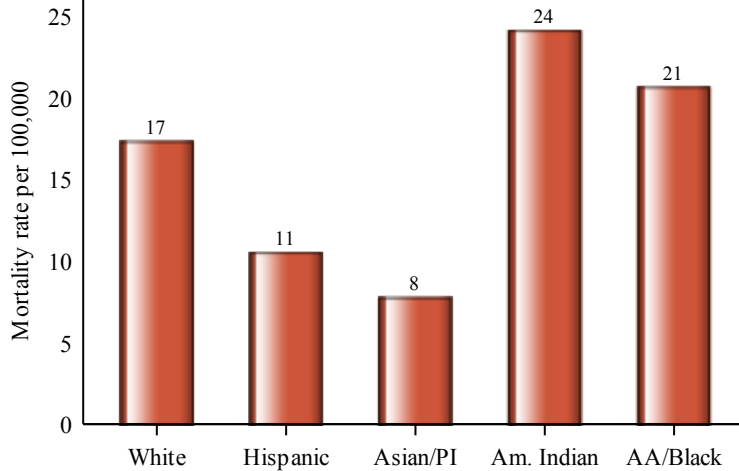
Race/ethnicity was missing in 0.61% (n = 285) of trauma cases which were excluded from this analysis.

1. Arizona Department of Health Services, Emergency Medical Services & Trauma System. Data & Quality Assurance—Arizona State Trauma Registry. <http://azdhs.gov/preparedness/emergency-medical-services-trauma-system/index.php#data-quality-assurance-ast>

2. Arizona Department of Health Services, Population Health and Vital Statistics. Population Denominators: 2016. <http://pub.azdhs.gov/health-stats/menu/info/pop/index.php>

TABLE 1: MORTALITY RATE

Figure 1: Race-specific trauma mortality rates per 100,000



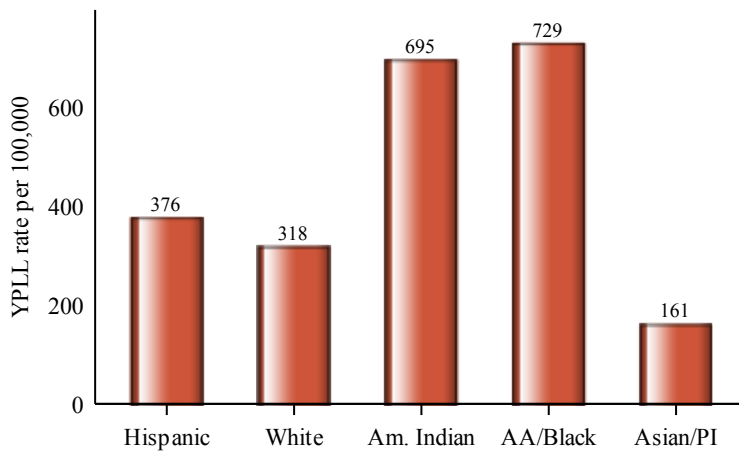
Data source: Arizona State Trauma Registry 2016

Race/Ethnicity	Total Trauma Deaths	Mortality Rate per 100,000 (95%CI)
AA/Black	66	21 [16, 26]
Am. Indian	70	24 [18, 30]
Asian/PI	19	8 [4, 11]
Hispanic	222	11 [9, 12]
White	673	17 [16, 19]

AA/Black: African American/Black
Am. Indian: American Indian/Alaska Native
Asian/PI: Asian/Pacific Islander

TABLE 2: YEARS OF POTENTIAL LIFE LOST

Figure 2: Race-specific Years of Potential Life Lost (YPLL) per 100,000



Data source: Arizona State Trauma Registry 2016

Race/Ethnicity	Total YPLL	YPLL Rate per 100,000 (95%CI)
Hispanic	7,783	376 [368, 385]
White	11,447	318 [312, 324]
Am. Indian	1,966	695 [665, 726]
AA/Black	2,276	729 [699, 759]
Asian/PI	381	161 [145, 177]

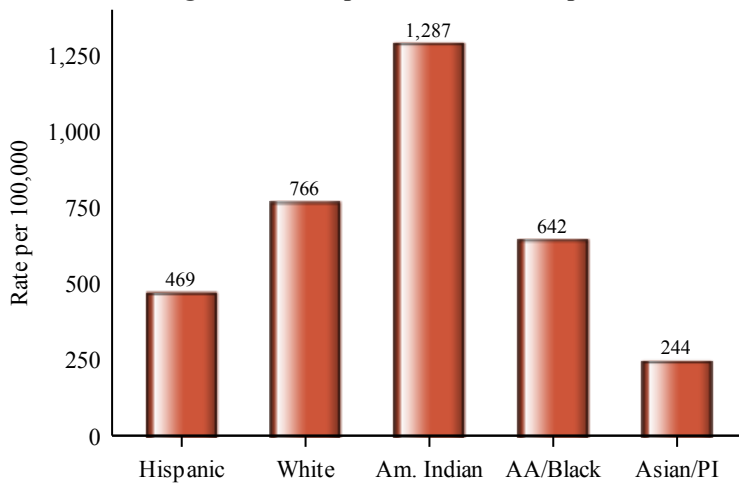
AA/Black: African American/Black
Am. Indian: American Indian/Alaska Native
Asian/PI: Asian/Pacific Islander

TABLE 3: TRAUMA CHARGES

Primary payment source	Total hospital charges	Percent of the charges
Self pay	\$2,587,738	3.7%
AHCCCS/Government	\$81,231,780	67.4%
Private	\$13,161,662	12.8%
Medicare	\$19,045,257	12.3%
Other	\$3,983,206	3.5%
	\$120,009,643	

TABLE 4: RACE-SPECIFIC TRAUMA RATES

Figure 3: Race-specific trauma rates per 100,000



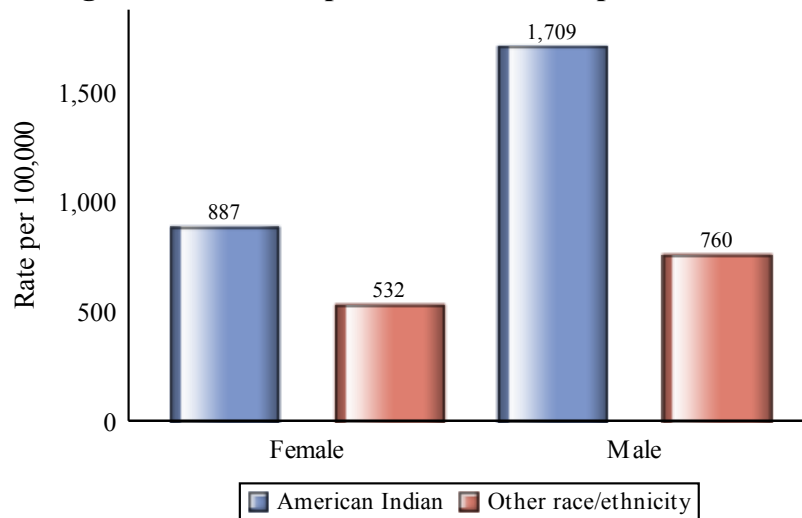
Data source: Arizona State Trauma Registry 2016

Race/Ethnicity	Total Trauma Cases	Rate per 100,000 (95%CI)
Hispanic	9,877	469 [460, 478]
White	29,695	766 [757, 775]
Am. Indian	3,732	1,287 [1,245, 1,328]
AA/Black	2,050	642 [615, 670]
Asian/PI	594	244 [224, 263]

AA/Black: African American/Black
 Am. Indian: American Indian/Alaska Native
 Asian/PI: Asian/Pacific Islander

GENDER SPECIFIC TRAUMA RATE

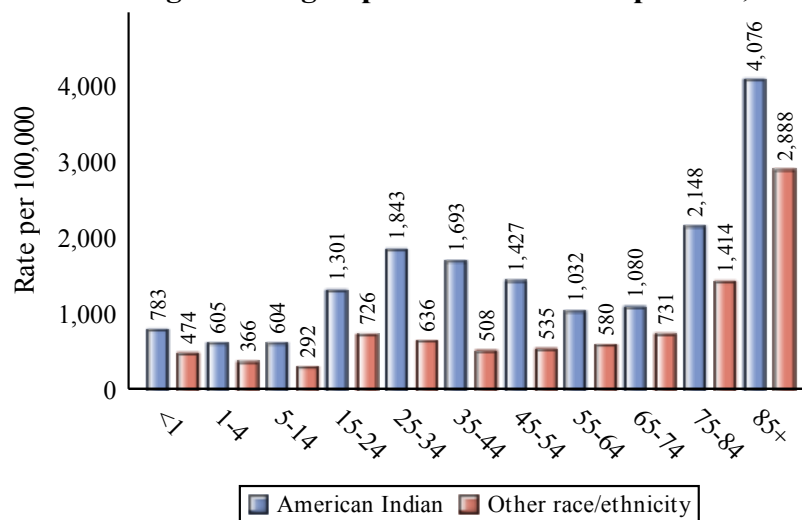
Figure 4: Gender-specific trauma rate per 100,000



Data source: Arizona State Trauma Registry 2016

AGE-SPECIFIC TRAUMA RATE

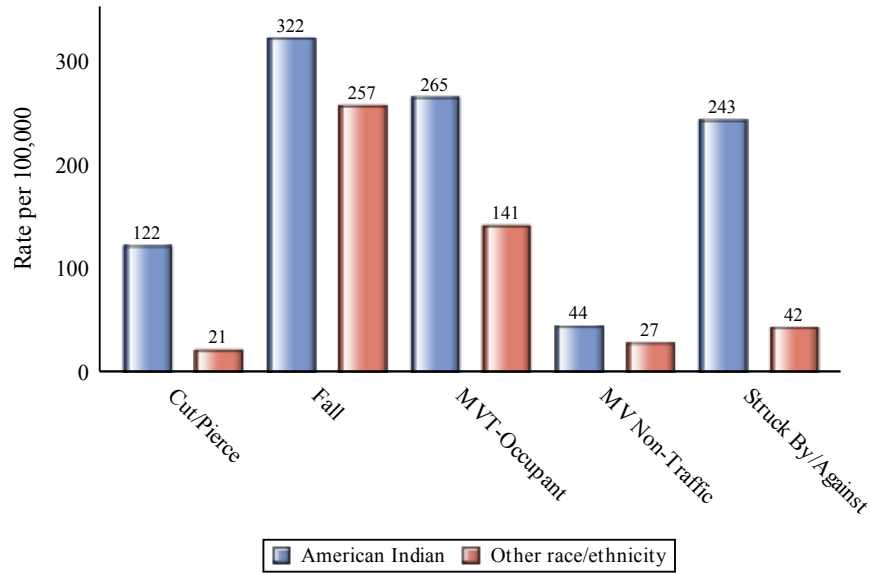
Figure 5: Age-specific trauma rate per 100,000



Data source: Arizona State Trauma Registry 2016

TOP FIVE MECHANISMS OF INJURY

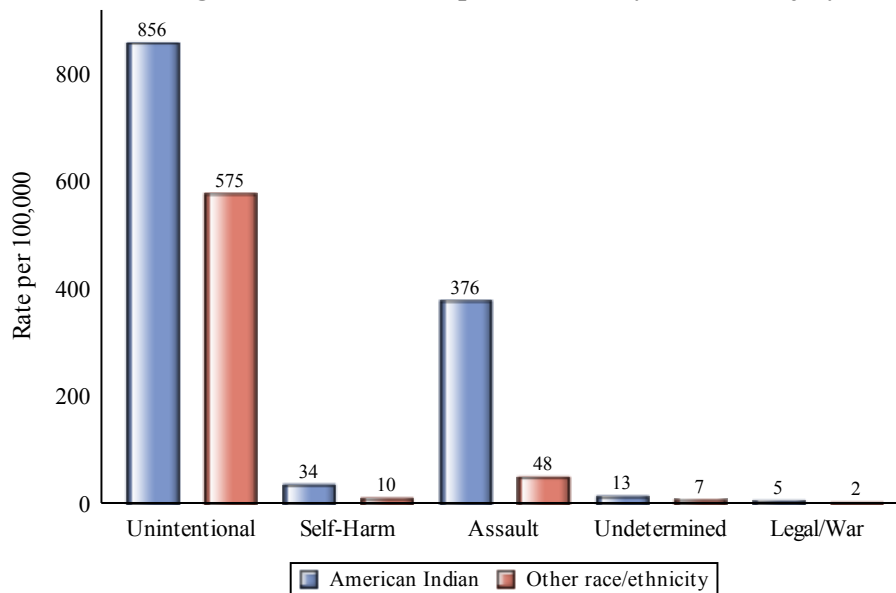
Figure 6: Trauma rate per 100,000 by Top 5 mechanisms



Data source: Arizona State Trauma Registry 2016

INTENT OF INJURY

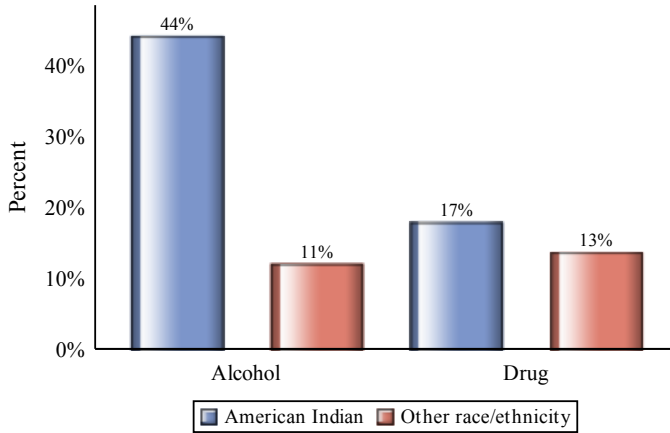
Figure 7: Trauma rate per 100,000 by intent of injury



Data source: Arizona State Trauma Registry 2016

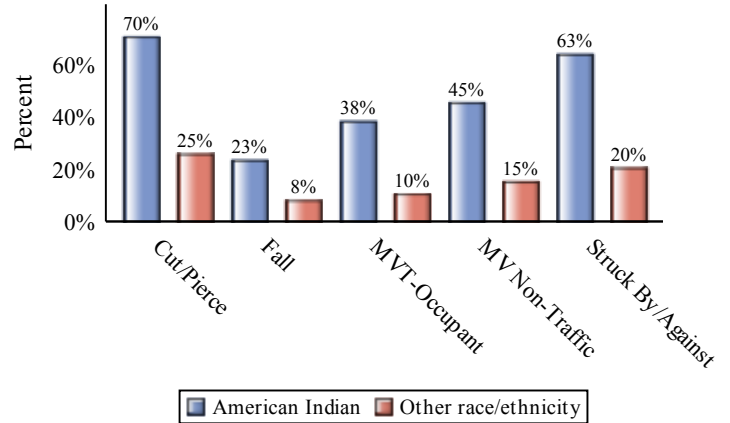
ALCOHOL AND DRUG USE

Figure 8: Alcohol and drug related trauma proportion



Data source: Arizona State Trauma Registry 2016

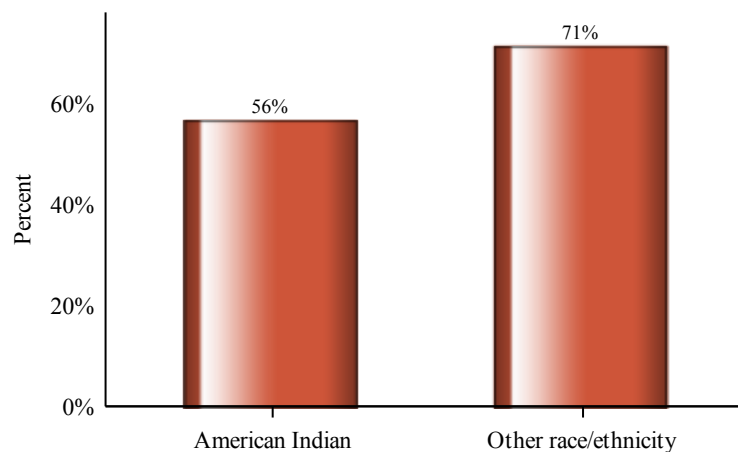
Figure 9: Proportion of suspected alcohol use among top five mechanisms of injury



Data source: Arizona State Trauma Registry 2016

SEAT-BELT USE AMONG MOTOR VEHICLE TRAFFIC OCCUPANTS

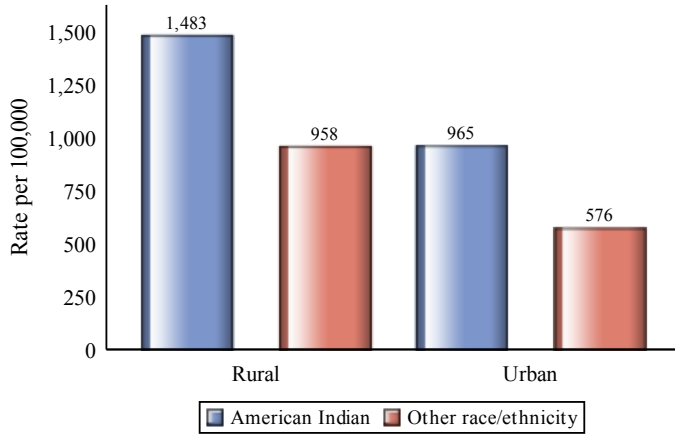
Figure 10: Seat belt use among occupants of motor vehicle trauma crashes



Data source: Arizona State Trauma Registry 2016

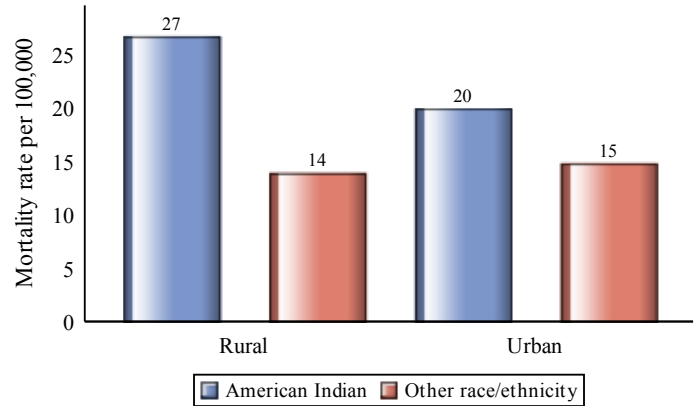
RURAL/URBAN LOCATION OF INJURY

Figure 11: Trauma rate per 100,000 by geography



Data source: Arizona State Trauma Registry 2016

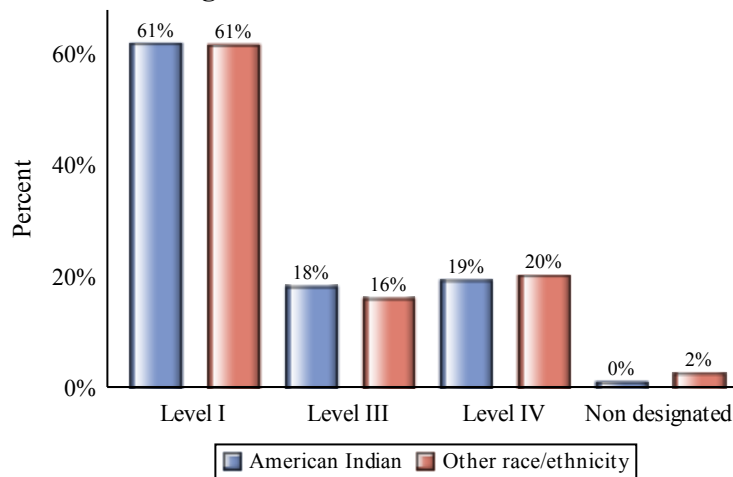
Figure 12: Trauma mortality rate per 100,000 by geography



Data source: Arizona State Trauma Registry 2016

TRAUMA CENTER DESIGNATION LEVEL

Figure 13: Trauma center level of care



Data source: Arizona State Trauma Registry 2016

PATIENT INCLUSION DEFINITION

ARIZONA STATE TRAUMA REGISTRY (ASTR)

Effective for records with ED/Hospital Arrival Dates October 1, 2015 – Current

❖ **1. EMS TRAUMA TRIAGE PROTOCOL**

A patient with injury or suspected injury who is triaged from a scene to a trauma center or ED based upon the responding EMS provider's trauma triage protocol;

OR

❖ **1B. INTER-FACILITY INJURY TRANSFERS BY EMS**

A patient with injury who is transported via EMS transport from one acute care hospital to another acute care hospital;

OR

❖ **2. HOSPITAL TRAUMA TEAM ACTIVATIONS**

A patient with injury or suspected injury for whom a trauma team activation occurs; **OR**

❖ **3. ADMITTED OR DIED BECAUSE OF INJURY & MEETS ASTR DIAGNOSIS CODES**

A patient with injury who:

Is admitted as a result of the injury **OR** who dies as a result of the injury

AND

Has an ICD-9-CM N-code (injury diagnosis code) within categories 800 through 959 or ICD-10-CM (injury diagnosis code) within categories S00 through S99 with 7th character modifiers of A, B, or C ONLY. (Injuries to specific body parts –initial encounter)

T07 (unspecified multiple injuries)

T14 (injury of unspecified body region)

T20 through T28 with 7th character modifier of A ONLY (burns by specific body parts –initial encounter)

T30 through T32 (burn by TBSA percentages)

T79.A1 through T79.A9 with 7th character modifier of A ONLY (Traumatic Compartment Syndrome –initial encounter):

(Except exclusions below):

EXCLUSIONS for admitted or died ICD-9-CM or ICD-10-CM patients:

❖ **Only has late effects of injury or another external cause:**

(ICD-9-CM N-code within categories 905 through 909)

(ICD-10-CM code within categories S00 through S99 (Injuries to specific body parts) with the 7th digit modifier code of D through S;

T20 through T28 (burns by specific body parts) with 7th character modifier of D through S;

T79.A1 through T79.A9 (Traumatic Compartment Syndrome) with 7th character modifier of D through S)

- ❖ **Only has a superficial injury or contusion:**
 (ICD-9-CM N-code within categories 910 through 924)
 (ICD-10-CM code within categories S00, S10, S20, S30, S40, S50, S60, S70, S80 or S90)
- ❖ **Only has effects of a foreign body entering through an orifice:**
 (ICD-9-CM N-code within categories 930 through 939)
 (ICD-10-CM code within T15 through T19)
- ❖ **Only has an isolated femoral neck fracture from a same-level fall:**
 (ICD-9-CM N-code within category 820 **AND** ICD-9-CM E-code within category E885 or E886)
 (ICD-10-CM code within S72.0XXX through S72.2XXX with **any one of** V00.111X, V00.112X, V00.118X, V00.121X, V00.122X, V00.128X, V00.131X, V00.132X, V00.138X, V00.141X, V00.142X, V00.148X, V00.151X, V00.152X, V00.158X, V00.181X, V00.182X, V00.188X, V00.211X, V00.212X, V00.218X, V00.221X, V00.222X, V00.228X, V00.281X, V00.282X, V00.288X, V00.311X, V00.312X, V00.318X, V00.321X, V00.322X, V00.328X, V00.381X, V00.382X V00.388X, W00.0XX, W00.9XX, W01.0XX, W03.XXX, W18.2XX, W18.40X, W18.41X, W18.42X, W18.43X, W18.49XX)
- ❖ **Only has an isolated distal extremity fracture from a same-level fall:**
 (ICD-9-CM N-code within categories 813 through 817 or 823 through 826 **AND** ICD-9-CM E-code within category E885 or E886)
 (ICD-10-CM code within S52.XXXX, S62.XXXX, S82.XXXX or S92.XXXX with **any one of** V00.111X, V00.112X, V00.118X, V00.121X, V00.122X, V00.128X, V00.131X, V00.132X, V00.138X, V00.141X, V00.142X, V00.148X, V00.151X, V00.152X, V00.158X, V00.181X, V00.182X, V00.188X, V00.211X, V00.212X, V00.218X, V00.221X, V00.222X, V00.228X, V00.281X, V00.282X, V00.288X, V00.311X, V00.312X, V00.318X, V00.321X, V00.322X, V00.328X, V00.381X, V00.382X V00.388X, W00.0XX, W00.9XX, W01.0XX, W03.XXX, W18.2XX, W18.40X, W18.41X, W18.42X, W18.43X, W18.49XX)
- ❖ **Only has an isolated burn:**
 (ICD-9-CM N-code within categories 940 through 949)
 (ICD-10-CM code within categories T20 through T32)