ARIZONA DEPARTMENT OF HEALTH SERVICES

Don Herrington, Interim Director

BUREAU OF EMERGENCY MEDICAL SERVICES AND TRAUMA SYSTEM

STATE TRAUMA ADVISORY BOARD

2022 ANNUAL REPORT

This Report is Provided as Required by A.R.S. § 36-2222(E)(4)

Bureau of Emergency Medical Services and Trauma System

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The Arizona Department of Health Services' Bureau of Emergency Medical Services and Trauma System (BEMSTS) wishes to acknowledge the continued hard work and dedication of all the individuals involved in working to understand, prevent, and treat traumatic injury.

Special thanks are extended to the members of the State Trauma Advisory Board, Trauma and EMS Performance Improvement Committee, participating trauma centers, medical directors, program managers, and registrars. Their dedication to continuously improving data collection makes it possible to fully evaluate and advance Arizona's trauma system.

STATE TRAUMA ADVISORY BOARD MEMBERSHIP

Listed below are the dedicated professionals and citizens who serve the State of Arizona as members of the State Trauma Advisory Board and the Trauma and EMS Performance Improvement Standing Committee by giving their time, expertise, and invaluable guidance to the Arizona trauma system. On behalf of the Arizona Department of Health Services and the citizens of Arizona, we thank them for their many contributions.

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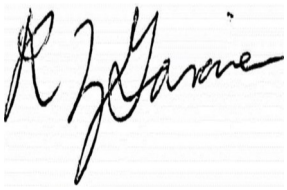
Despite the unique challenges of the pandemic over the last couple years, traumatic injury remains the leading cause of death among young people and a significant health threat as Arizona's population continues to grow. The 2022 annual report highlights future resource needs for maintaining Arizona trauma system preparedness and emphasizes that injury prevention efforts are critical for mitigating increasing trauma burden in our state. At the request of the State Trauma Advisory Board, this year's report also features a section on trauma center designation by level. To protect Arizona's nearly eight million residents and visitors each year and mitigate preventable injuries and premature deaths, it will be important that the Board continues to provide guidance on public health policies, such as driver safety and helmet use, targeted community safety messaging, and continuing education for healthcare providers. Ultimately, this annual trauma report illustrates the importance of building a trained healthcare and EMS workforce to maintain Arizona trauma system readiness to respond to new emerging threats.

In the year ahead, the State Trauma Advisory Board will play an important role providing oversight of implementation and training on the ACS Field Triage Guidelines, new trauma registry and data modernization efforts, and EMS and healthcare system coordination to prepare for large scale events such as Super Bowl LVII and WM Phoenix Open 2023. These important public health initiatives will require additional state resources, including funding for local EMS coordinating systems to ensure appropriate workforce training and education to prepare for the new challenges ahead for Arizona's trauma system.

The Bureau remains focused on supporting Arizona's trauma centers to ensure that the population has access to timely, high quality trauma care. There are many talented and dedicated professionals that contribute to Arizona's trauma system in addition to the multi-disciplinary leadership of the State Trauma Advisory Board and Trauma and EMS Performance Improvement Committee. Moving forward, it will be important to continue to engage the trauma and EMS community to further evaluate trends and outcomes, identify resource needs, and develop recommendations to improve the trauma system. Furthermore, the State Trauma Advisory Board acknowledges that Arizona will require additional resources and support to prepare for upcoming changes to the state trauma registry to continue to monitor and improve the Arizona trauma system to align with national standards and state statutory requirements.

Sincerely



Gail Bradley, MD FACEP FAEMS, Medical Director

Rachel Zenuk Garcia, MPH, MCHES Bureau Chief

2022 STAB Executive Summary

The 2022 State Trauma Advisory Board Report illustrates how Arizona's trauma system continues to evolve and respond to new challenges as the burden of traumatic injury increases in our state. As Arizona's population continues to expand each year, the rise of traumatic injuries and deaths represents a significant health and economic threat to the state. It is critical that growing states like Arizona plan and project EMS and trauma resources that are necessary to achieve a constant of readiness to respond to and mitigate the increasing number of preventable injuries and premature deaths due to trauma as our population expands rapidly. Consequently, Arizona's annual trauma report summarizes the importance of continuing to build trauma system preparedness, understanding trauma reimbursement trends and financial stability, and reinforcing injury prevention efforts to improve Arizona's capacity to respond to increases in violence and large-scale events. Furthermore, the State Trauma Advisory Board acknowledges that Arizona will require additional resources and support to prepare for upcoming changes to the state trauma registry to continue to monitor and improve the Arizona trauma system to align with national standards and state statutory requirements.

ARIZONA TRAUMA SYSTEM HAS DEVELOPED TO INCLUDE A NETWORK OF URBAN AND RURAL TRAUMA CENTERS TO INCREASE TIMELY ACCESS TO TRAUMA CARE

Geographically, Arizona's trauma system has evolved to include level I trauma centers in three large urban counties as well as critical access hospitals designated as level IV trauma centers that have played an important role in building and maintaining trauma system preparedness in rural communities. Arizona's trauma system developed significantly over the last twenty years and has seen dramatic increases in population and the number of traumatic injuries and deaths during that time. Since the 2000 Census, Arizona's population grew by more than two million and now exceeds seven million residents and over one million winter visitors each year. In 2002 Arizona established the Trauma and Emergency Services Fund through Proposition 202, and the trauma system rapidly developed from a few self-designated (provisional) trauma centers to nineteen state-designated trauma centers in 2010. By 2020, there were forty-seven trauma centers in Arizona, including thirteen level I/II, one pediatric level I, and thirty-three level III/IV trauma centers that have improved timely access to trauma care in rural areas. The development of the trauma system to include trauma centers that span Arizona's large and geographically diverse landscape has helped to improve access to care by ensuring that more patients have access to trauma care within the golden hour (injury-to-ED arrival time < 60 minutes). Arizona's network of rural and urban trauma centers mainly rely on ground ambulance transportation, however for patients with a higher injury severity score that require level I trauma care air transport is utilized 15-19% of the time, with an overall injury-to-ED median time of 50 minutes. In 2021, there were 474,239 injury-related hospital visits (6,509 per 100,000 Arizona population), including 65,396 people (898 per 100,000 Arizona population) treated for traumatic injury at Arizona trauma centers. According to the CDC, Arizona's age-adjusted injury mortality rate increased significantly from 70 to 83 per 100,000 (18.5% increase), while the national rate increased from 56 to 70 per 100,000 (24% increase) from 2009-2018.[1,2] These data demonstrate a rapid increase in the number of traumatic injuries that are contributing to costly preventable injuries and premature deaths that place a constant strain on Arizona's overburdened healthcare system. It is important to continue to understand how population growth and a large influx of winter visitors each year impacts Arizona's geographically diverse trauma system, which must continue to develop and respond to new challenges.

1. Rhee P, Joseph B, Pandit V, et al. Increasing Trauma Deaths in the United States. *Ann Surg*. 2014;00(00):1-9. doi:10.1097/SLA.0000000000000600.
2. Centers for Disease Control and Prevention, National Center for Injury Prevention and Control. Web-based Injury Statistics Query and Reporting System (WISQARS) [online]. (2005) [cited 2017 Sep.]. Available from URL: www.cdc.gov/injury/wisqars

BUILDING ARIZONA TRAUMA SYSTEM READINESS REQUIRES PREPARING FOR NEW EMERGING THREATS

Arizona's trauma system faces unique challenges today, including a changing landscape due to rapid population growth, vast geographic diversity, limited resource availability, and emerging threats due to increases in community violence. As Arizona's population and trauma centers have increased over the last ten years, the predominant mechanism of injury reported to the Arizona State Trauma Registry transitioned from motor vehicle traffic (MVT) to falls, and we have seen struck by/against, cut/pierce, and firearms emerge among the top mechanisms of injury. In 2010, 41% (11,487) of trauma cases reported were due to MVT, whereas in 2020 only 17% (9,891) of trauma cases were reportedly due to MVT. By 2021, the top mechanisms of injury were 30,788 Falls (47.07%), 12,247 MVT-Occupant (18.72%), 3,942 Struck By/Against (6.02%), 2,897 Motor Vehicle Non-Traffic (4.42%), 2,198 Cut/Pierce (3.36%), and 2,105 Firearm (3.21%). For 7,069 pediatric traumatic injuries, the top mechanisms of injury for children ages 0-17 years included Falls (30.13%), MVT-Occupant (22.04%), Motor Vehicle Non-Traffic (8.52%), Struck By/Against (7.60%), Child Abuse (3.92%), and Bites/Stings (3.31%). Among the most concerning trends, the highest proportions of trauma mortality include deaths due to firearms (15.5% of firearm injuries resulted in death) and motor vehicle trauma (2.5% of MVT injuries resulted in death) for all ages in 2021. For pediatric traumas, nearly one third of deaths were due to firearms (29.5%) and MVT (27.0%) for children ages 0-17 years. The 2021 ASTR data suggest continued increases in population mobility, community violence, and severity of injuries compared to previous years. Ultimately, these trends illustrate a need for more training and education to prepare EMS and healthcare providers to respond to new challenges, including but not limited to pediatric trauma care, child abuse, and violence prevention.

UNDERSTANDING TRAUMA SYSTEM REIMBURSEMENT TRENDS AND FINANCIAL STABILITY IS KEY TO MAINTAINING ARIZONA'S TRAUMA SYSTEM CAPACITY

As Arizona's Trauma System evolves it continues to exact a significant financial burden on the state. For those who survive, trauma can lead to lifelong physical suffering and places a substantial economic burden on the health system. In 2021, Arizona trauma centers reported a total of $3.9 billion in charges, with a median charge per patient of $31,537. Falls resulted in over 1.8 billion dollars in charges in 2021. Hospital reimbursement has remained consistently low, around 12%. Although it is difficult to compare years due to changes in ASTR reporting over time, it's important to highlight the significant increase in trauma charges and decrease in reimbursement percentage over the last decade. In 2010, trauma centers charges totaled $1,203,824,903 and the total reimbursement was $264,438,956, resulting in ~22% reimbursement percentage, which is 10% greater than 2021. It is noteworthy that the Trauma and Emergency Services Fund established through Proposition 202 distributes funding to support state-designated level I trauma centers only. On a related note, since January 1, 2022 the No Surprises Billing Act has indirectly impacted trauma centers by directly impacting provider reimbursement, and it will be important to understand how decreased reimbursement affects trauma care moving forward. While charges and reimbursement have a complex relationship and the amount of financial data collected in ASTR is limited, these trends illustrate that further significant financial burden on the state may increase over time. The State Trauma Advisory Board report will continue to monitor reimbursement trends and funding sources on an annual basis, which are important to offset the increasing trauma burden in Arizona.

INJURY PREVENTION EFFORTS ARE CRITICAL TO MITIGATE INCREASES IN TRAUMA SEVERITY THAT OVERBURDEN ARIZONA'S HEALTHCARE SYSTEM

It is important to consider risk factors and protective measures that can save lives and reduce the impact of traumatic injuries. Arizona trauma system data provide an opportunity to better understand high risk populations and develop more community safety and injury prevention programming, including targeted campaigns and messaging that promote the use of child safety car seats, helmet use, and other safety strategies to protect children and adults from unnecessary injuries. While trauma affects everyone, Arizona's trauma system responds to over 7,000 pediatric injuries for ages 0-17 each year, with the highest rates of childhood trauma deaths attributed to motor vehicle accidents and firearms. Adults aged 65 years and older have the highest trauma rates due to falls, however, younger males have the highest mortality rates associated with more risky behaviors such as drug or alcohol use and not wearing a seat belt or helmet. For over 15,000 patients treated for injuries due to motor vehicles at Arizona trauma centers each year, the use of helmets and passenger restraints (e.g. seat belts or child safety car seats) are a significant protective factor that are proven to increase survival. Overall in the ASTR, nearly one third of motor vehicle occupants were not using a passenger restraint when involved in an accident, and nearly two-thirds of motorcyclists, pedal-cyclists, and off-road vehicle occupants were not wearing a helmet when involved in an accident. As a result, the thousands of patients not wearing a seatbelt were four times as likely to die from a motor vehicle accident compared to patients wearing a seatbelt. Furthermore, patients not wearing a helmet were two times as likely to die from a motorcycle accident compared to patients wearing a helmet. Additionally, 30% of patients in ASTR suffered from a traumatic brain injury (TBI) and 12% died. Incidence of TBI was highest in infants < 1 year of age (56%), and prevalent among trauma patients whose mechanism of injury was indicated Child/Adult abuse (46%), MVT-Pedestrian (47%) and MVT-Pedal cyclist (40%). The most significant risk factor associated with traumatic injuries is drug and alcohol use. In Arizona, one in four patients (25%) overall are suspected or confirmed of being under the influence of drugs or alcohol when involved in a trauma. Drug and alcohol use are a more prevalent risk factor in assaults and intentional injuries, including trauma due to community violence or self-harm that are coded as struck by/against, cut/pierce, firearms, or child abuse. These concerning trends require more training and education as well as targeted injury prevention efforts to mitigate the increasing trauma burden in Arizona.

FUTURE RESOURCE NEEDS TO SUSTAIN A STRONG AND PREPARED ARIZONA TRAUMA SYSTEM

In summary, traumatic injury is the leading cause of death among young people and a significant health threat as Arizona's population continues to grow. In order to improve trauma care and outcomes for Arizona's millions of residents and visitors each year, voters approved Proposition 202 to distribute funding to level I trauma centers and Arizona's trauma system developed to include a network of forty-seven trauma centers to increase access to trauma care in rural and urban communities across the state. This annual trauma report emphasizes the importance of building a trained healthcare and EMS workforce to maintain Arizona trauma system readiness to respond to new emerging threats, including community violence, child abuse, and other risk factors. The Arizona State Trauma Registry data demonstrate that community safety and injury prevention efforts are critical for mitigating trauma burden, including targeted community prevention messaging, continuing education for healthcare providers, and supporting policies aimed at injury and violence prevention.

To protect Arizona residents and visitors and mitigate preventable injuries and premature deaths due to trauma, it will be critical that the State Trauma Advisory Board continues to provide guidance on public health policies, such as driver safety, helmet use and violence prevention. In the year ahead, the State Trauma Advisory Board will play an important role providing oversight of implementation and training on the ACS Field Triage Guidelines, new trauma registry and data modernization efforts, and EMS and healthcare system coordination to prepare for large scale events such as Super Bowl LVII and WM Phoenix Open 2023.

In preparation for this year's annual report, the State Trauma Advisory Board and Trauma Program Manager workgroup discussed the state of our trauma registry system and acknowledged the proactive approach the state is taking to determine next steps related to the future of the Arizona state trauma registry. The Arizona state trauma registry is a statutory requirement for state designated trauma centers and is also a requirement of American College of Surgeon verified centers. Data from the trauma registry is the driving force for Performance Improvement, Injury Prevention efforts, community programs, trauma research, and state driven projects. The State Trauma Advisory Board recognizes that these important public health initiatives will require additional state resources and support, including funding to ensure appropriate workforce training and education to prepare for the new challenges and upcoming changes to Arizona's trauma system and state registry to align with national standards and state statutory requirements.

NOTE: To better understand injury and mortality trends for populations that are not treated at a trauma center, additional analysis of the Hospital Discharge Database (HDD), Database Application for Vital Events (DAVE), and Arizona Department of Transportation (ADOT) crash database systems are recommended.

BACKGROUND

The Bureau of Emergency Medical Services and Trauma System (BEMSTS) 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 2021, there were 47 hospitals submitting data to the Arizona State Trauma Registry (ASTR) including thirteen (13) Level I trauma centers, six (6) Level III trauma centers, twenty-seven (27) Level IV trauma centers, and one (1) Level 1 Pediatric trauma center. Appendix A contains a list of trauma centers reporting to ASTR as of 12/30/2021.

All trauma centers are required to report any injuries meeting the ASTR inclusion criteria (Appendix B). Level I , II and III trauma centers are required to submit the full ASTR data set while Level IV trauma centers and non-designated facilities have the option to submit either the full or reduced data set. The data in the ASTR is validated to meet more than 800 state and national rules. Validation is run at both the hospital and state levels. Any inconsistencies are flagged and returned to the hospitals for review or correction before the data is accepted.

All the Level I trauma centers in Arizona are located in urban areas of the state, including 10 in Maricopa County, one in Coconino County and one in Pima County. Due to Arizona's unique geography, the BEMSTS has divided the system into four distinct regions based on Arizona's 15 counties: Western (Mohave, La Paz and Yuma Counties), Northern (Yavapai, Coconino, Navajo and Apache Counties), Southeastern (Pima, Santa Cruz, Graham, Cochise and Greenlee Counties) and Central (Maricopa, Gila and Pinal Counties). Each region has its own community-based, non-profit organization dedicated to improving EMS and trauma care in the state.

Regional EMS Coordinating Systems

- Arizona Emergency Medical Services, Inc. (AEMS) - https://www.aems.org/
- Northern Arizona Emergency Medical Services (NAEMS) - http://www.naems.org/
- Southeastern Arizona EMS Council (SAEMS) - http://saemscouncil.com/
- Western Arizona Council of EMS (WACEMS) - https://wacems.org/

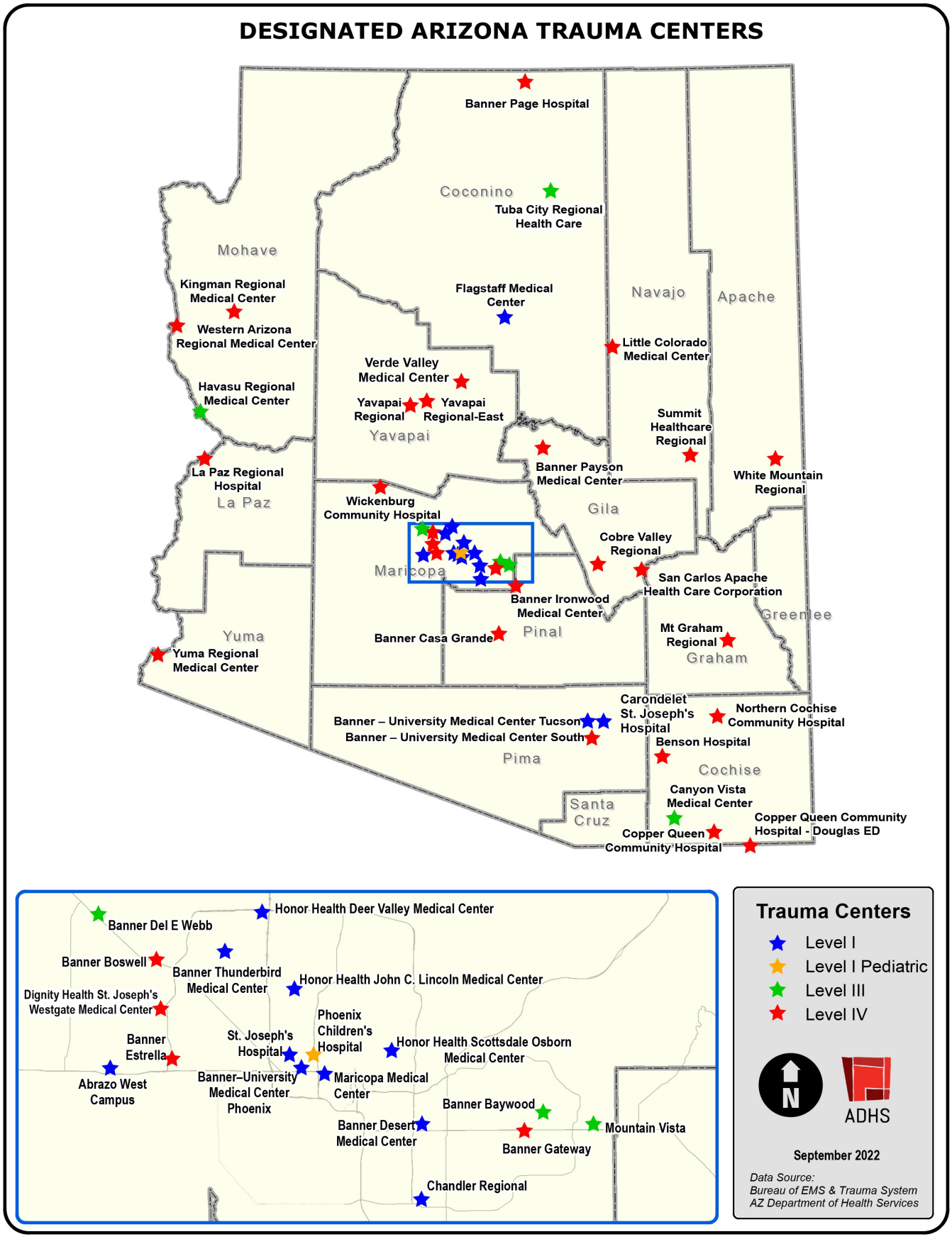
METHODS

This report analyzed incidents of traumatic injury reported to the ASTR with an Emergency Department Hospital Arrival Date between January 1, 2021 and December 31, 2021. The report gives an overview of trauma in the state by describing patient demographics, injury characteristics, trauma risk factors, regional differences and comparisons with national trauma data.

Descriptive statistics were used to depict 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. Due to the unavailability of 2021 population denominators from the Arizona Health Status and Vital Statistics database at the time of the report development, 2021 Census data and Arizona Office of Economic Opportunity data were used to calculate denominators for rates. [4, 5] If the CIs of two rates do not overlap, the difference between the rates is considered statistically significant (alpha 0.05). The 2021 data was compared with the 2019 and 2020 two-year median. The Vital Statistics Information Management System's Database Applications for Vital Events (DAVE) was used in order to show the complete picture of trauma mortality, including deaths that occurred outside of designated trauma centers. As the DAVE database was not available for the year 2021 at the time of the report development, the year 2020 was used.

4. chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.azcommerce.com/media/gmtnexac/july1_2021_arizona_population_estimates.pdf
5. https://www.census.gov/data/datasets/time-series/demo/popest/2020s-state-detail.html

DESIGNATED ARIZONA TRAUMA CENTERS



Trauma Centers

- Level I
- Level I Pediatric
- Level III
- Level IV

ADHS

September 2022

Data Source:
Bureau of EMS & Trauma System
AZ Department of Health Services

2021 Arizona Trauma System Snapshot

ADHS PREPAREDNESS

Trauma Incidents Reported

65,396
Total Trauma Incidents Reported in Arizona State Trauma Registry*

474,239
Number of Injury-Related Discharges in Hospital Discharge Database*

Trauma Centers - 47 Total

13	1	6	27
Level I Trauma Centers	Level I Pediatric Trauma Center	Level III Trauma Centers	Level IV Trauma Centers

Mortality

1,716
Total Deaths Reported in Arizona State Trauma Registry*
(2.62% of total trauma incidents)

Deaths by Mechanism of Injury

- Fall - 611 Deaths
- Firearm - 327 Deaths
- MVT - Occupant - 304 Deaths
- MVT - Pedestrian - 137 Deaths
- MVT - Motorcyclist - 95 Deaths

Of the top 6 Mechanisms of Injury, **Firearms** had the highest mortality proportion **(15.53%)**, followed by **Motor Vehicle Trauma - Occupant (2.48%)**.

Arizona Trauma Centers

13 Arizona Counties have at least 1 Trauma Center

Median Injury to Emergency Department Arrival Time

Urban
47 Minutes

Rural
90 Minutes

Top 6 Mechanisms of Injury

1. **Fall** 30,788 (47.07%)
2. **Motor Vehicle Trauma - Occupant** 12,247 (18.72%)
3. **Struck By/Against** 3,942 (6.02%)
4. **Motor Vehicle Non-Traffic** 2,897 (4.42%)
5. **Cut/Pierce** 2,198 (3.36%)
6. **Firearm** 2,105 (3.21%)

Nearly **1 in 10** Injuries were due to **Assault or Self-Harm**

Pediatrics (0-17)

7,069
Pediatric Trauma Patients

78
Pediatric Deaths

Firearms accounted for **nearly 1/3 of** Pediatric Deaths

MVT-Occupant accounted for **over 1/4** of Pediatric Deaths

Top 6 Mechanisms of Injury

1. **Fall** 2,130 (30.13%)
2. **MVT - Occupant** 1,558 (22.04%)
3. **MV Non-Traffic** 602 (8.52%)
4. **Struck By/Against** 537 (7.60%)
5. **Child Abuse** 277 (3.92%)
6. **Bites/stings, non-venomous** 234 (3.31%)

Risk and Protective Factors - Opportunities for Injury Prevention

29.67%
of motor vehicle occupants were NOT using a passenger restraint

Passengers were **4x** more likely to die in a car accident if not wearing a seatbelt

57.2% of motorcyclists
36.5% of pedalcyclists
Less than 1/3 of off-road vehicle occupants
wore helmets

Motorcyclists **without helmets** were:

2x more likely to die

2x more likely to suffer a Traumatic Brain Injury

25%
of trauma patients were suspected or confirmed of being under the influence of drugs or alcohol

Males had a mortality rate over **2x** higher than females

Adults 65 years and older had the **highest trauma rate** compared to all other age groups

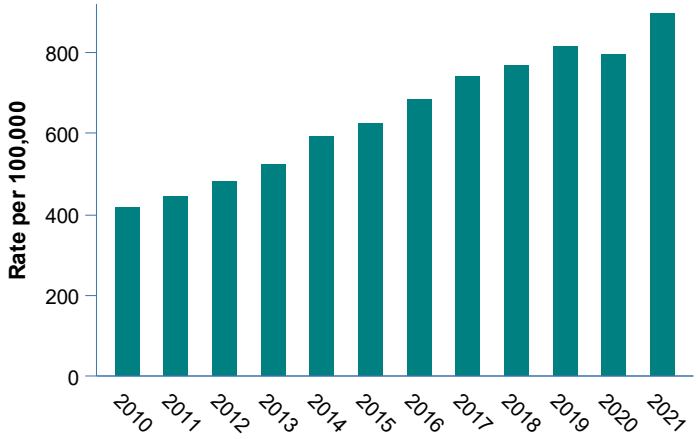
The most significant risk factor associated with traumatic injuries is **drug and alcohol use**

*The data included in this report includes incidents of traumatic injury with an Emergency Department Hospital Arrival Date between January 1, 2021 and December 31, 2021 reported from facilities participating in the Arizona State Trauma Registry (ASTR) only. Trauma injury and mortality reported in ASTR are compared to the Hospital Discharge Database (HDD) and Vital Statistics Information Management System's Database Applications for Vital Events (DAVE) to demonstrate the total impact of trauma injuries and deaths that occurred outside of designated trauma centers.

TRAUMA DEMOGRAPHICS (N = 58,041)

INCIDENCE & RATE

Figure 1: Trauma rate per 100,000 by year



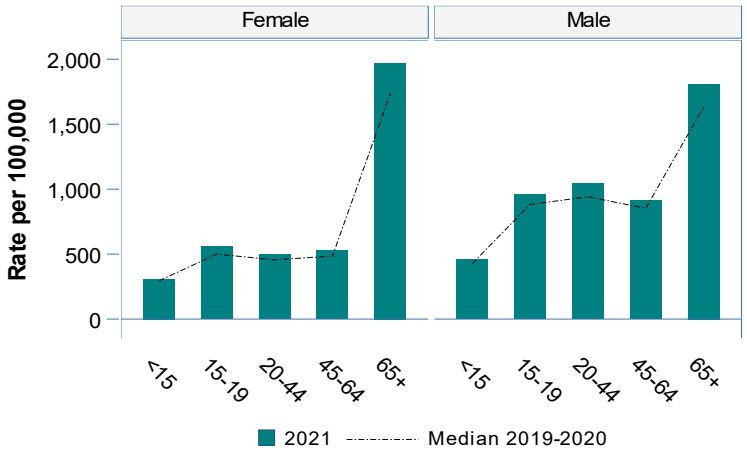
Data source: Arizona State Trauma Registry 2010-2021

Table 1: Trauma incidence and rate per 100,000 by year

Year	Total Trauma cases	Rate per 100,000 (95%CI)
2010	26,688	418 [413, 423]
2011	28,721	446 [441, 451]
2012	31,246	481 [475, 486]
2013	34,275	521 [515, 526]
2014	39,373	591 [585, 596]
2015	42,351	627 [621, 633]
2016	46,842	685 [679, 691]
2017	51,666	742 [735, 748]
2018	54,273	767 [761, 773]
2019	58,604	815 [809, 822]
2020	58,041	796 [789, 802]
2021	65,396	898 [891, 905]

AGE & GENDER

Figure 2: Age and gender-specific trauma rate per 100,000



Data source: Arizona State Trauma Registry 2019-2021

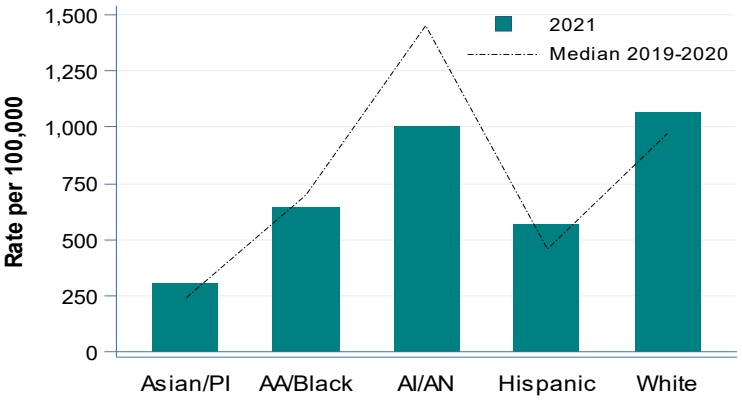
Table 2: Age and gender-specific trauma rate per 100,000

Gender	Age	Total Trauma Cases	Rate per 100,000 (95%CI)
Female	Total	28,012	769 [760, 778]
	<15	2,046	316 [302, 329]
	15-19	1,303	553 [523, 583]
	20-44	5,872	502 [489, 515]
	45-64	4,670	533 [518, 549]
	65+	14,121	1,977 [1,944, 2,010]
Male	Total	37,338	1,028 [1,017, 1,038]
	<15	3,101	458 [442, 474]
	15-19	2,365	955 [917, 994]
	20-44	12,855	1,037 [1,020, 1,055]
	45-64	7,824	919 [898, 939]
	65+	11,193	1,809 [1,775, 1,842]

CI = Confidence interval

RACE & ETHNICITY

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



Data source: Arizona State Trauma Registry 2019-2021 PI=Pacific Islander, AI/AN=American Indian/Alaska Native, AA=African American

Table 3: Race-specific trauma rate per 100,000

Race/ethnicity	Total Trauma Cases	Rate per 100,000 (95%CI)
Asian/PI	1,219	303 [286, 320]
AA/Black	3,148	644 [621, 666]
AI/AN	4,618	1,005 [976, 1,034]
Hispanic	12,281	570 [560, 580]
White	42,776	1,064 [1,054, 1,074]

CI= Confidence interval, PI=Pacific Islander, AI/AN=American Indian/Alaska

Table 4: Trauma incidence and mortality proportion by mechanism of injury

Mechanism	Count	Percent	Deaths	Mortality Proportion
Overall	65,396	100.00%	1,716	2.62%
Fall	30,788	47.07%	611	1.98%
MVT-Occupant	12,247	18.72%	304	2.48%
Struck By/Against	3,942	6.02%	21	0.53%
MV Non-Traffic	2,897	4.42%	31	1.07%
Cut/Pierce	2,198	3.36%	41	1.86%
Firearm	2,105	3.21%	327	15.53%
MVT-Motorcyclist	2,093	3.20%	95	4.53%
MVT-Pedestrian	1,221	1.86%	137	11.22%
Pedalcyclist, Other	1,139	1.74%	2	0.17%
Not Documented	1,063	1.62%	15	1.44%
Other Land Transport	1,013	1.54%	3	0.29%
Other Specified, Classifiable	754	1.15%	5	0.66%
MVT-Pedalcyclist	512	0.78%	26	5.07%
Bite And Stings-Nonvenomous	504	0.77%	2	0.39%
Pedestrian, Other	382	0.58%	14	3.66%
Other Specified, Not Elsewhere Classifiable	367	0.56%	26	7.08%
Unspecified	354	0.54%	9	2.54%
Other Specified, Child/Adult Abuse	334	0.51%	6	1.79%
Other Transport	286	0.43%	6	2.09%
Natural/Environmental, Other	276	0.42%	1	0.36%
Machinery	242	0.37%	0	0.00%
Overexertion	194	0.29%	0	0.00%
Hot Object/Substance	155	0.23%	1	0.64%
Fire/Flame	134	0.20%	3	2.23%
Suffocation	81	0.12%	18	22.22%
MVT-Other	36	0.05%	5	13.88%
Drowning/Submersion	27	0.04%	3	11.11%
Bite And Stings-Venomous	19	0.02%	0	0.00%
Poisoning: Non-Drug	17	0.02%	3	17.64%
MVT-Unspecified	6	0.00%	1	16.66%
Poisoning: Drug	6	0.00%	0	0.00%
Other Specified, Foreign Body	4	0.00%	0	0.00%

Mechanisms of Injury are classified into various categories based on the tool provided by the Centers for Disease Control and Prevention categorizing injuries using ICD 10 codes . https://www.cdc.gov/nchs/injury/injury_tools.htm . MVT = Motor Vehicle Traffic

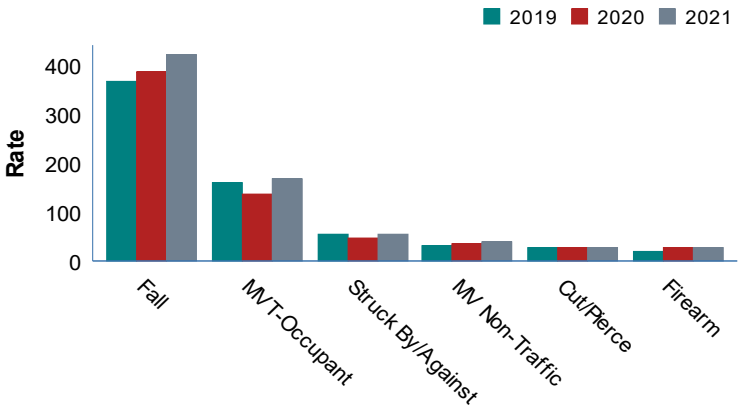
INCIDENCE & MORTALITY: INJURY SEVERITY SCORE (ISS) > 15

Table 5: Trauma incidence and mortality proportion by mechanism of injury among severely injured patients (ISS>15)

Mechanism	Count	Percent	Deaths	Mortality Proportion
Overall	5,910	100.00%	897	15.17%
Fall	2,481	41.97%	220	8.86%
MVT-Occupant	1,233	20.86%	194	15.73%
MVT-Motorcyclist	387	6.54%	75	19.37%
Firearm	360	6.09%	191	53.05%
MVT-Pedestrian	337	5.70%	101	29.97%
Struck By/Against	209	3.53%	9	4.30%
MV Non-Traffic	201	3.40%	15	7.46%
MVT-Pedalcyclist	100	1.69%	17	17.00%
Pedalcyclist, Other	88	1.48%	1	1.13%
Other Land Transport	83	1.40%	2	2.40%
Other Specified, Child/Adult Abuse	74	1.25%	4	5.40%
Cut/Pierce	59	0.99%	17	28.81%
Not Documented	58	0.98%	7	12.06%
Unspecified	48	0.81%	6	12.50%
Pedestrian, Other	45	0.76%	7	15.55%
Other Transport	33	0.55%	4	12.12%
Other Specified, Not Elsewhere Classifiable	32	0.54%	7	21.87%
Other Specified, Classifiable	31	0.52%	4	12.90%
Natural/Environmental, Other	13	0.21%	1	7.69%
MVT-Other	12	0.20%	5	41.66%
Suffocation	6	0.10%	5	83.33%
Drowning/Submersion	5	0.08%	1	20.00%
Fire/Flame	5	0.08%	1	20.00%
Machinery	3	0.05%	0	0.00%
Overexertion	2	0.03%	0	0.00%
Poisoning: Non-Drug	2	0.03%	2	100.00%
MVT-Unspecified	1	0.01%	1	100.00%
Bite And Stings-Nonvenomous	1	0.01%	0	0.00%
Other Specified, Foreign Body	1	0.01%	0	0.00%

RATE BY YEAR

Figure 4: Trauma rate per 100,000 by top 6 mechanisms of injury



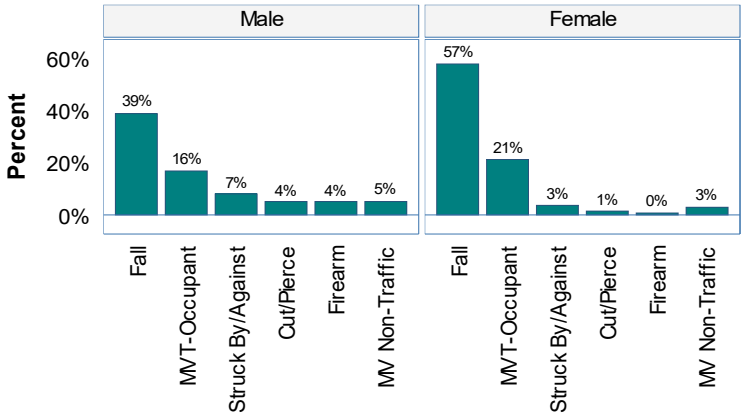
Data source: Arizona State Trauma Registry 2019-2021

Table 6: Trauma rate per 100,000 by top 6 mechanisms and year

Year	Mechanism of injury	Total Trauma Cases	Rate per 100,000 (95%CI)
2019	Fall	26,386	367 [363, 371]
	MVT-Occupant	11,653	162 [159, 165]
	Struck By/Against	4,066	57 [55, 58]
	MV Non-Traffic	2,285	32 [30, 33]
	Cut/Pierce	2,066	29 [27, 30]
	Firearm	1,499	21 [20, 22]
2020	Fall	27,649	385 [381, 390]
	MVT-Occupant	9,891	138 [135, 141]
	Struck By/Against	3,584	50 [48, 52]
	MV Non-Traffic	2,608	36 [35, 38]
	Cut/Pierce	2,127	30 [28, 31]
	Firearm	1,991	28 [27, 29]
2021	Fall	30,788	423 [418, 427]
	MVT-Occupant	12,247	168 [165, 171]
	Struck By/Against	3,942	54 [52, 56]
	MV Non-Traffic	2,897	40 [38, 41]
	Cut/Pierce	2,198	30 [29, 31]
	Firearm	2,105	29 [28, 30]

GENDER

Figure 5: Gender-specific trauma proportion by top 6 mechanisms of injury



Data source: Arizona State Trauma Registry 2021

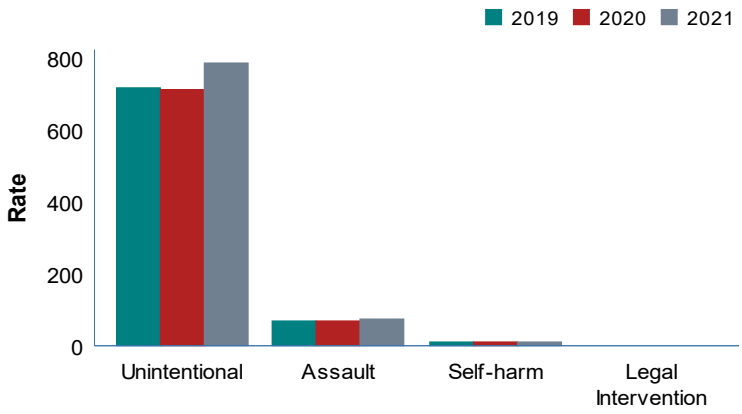
INCIDENCE & MORTALITY

Table 7: Trauma incidence and mortality proportion by intent of injury

Intent	Count	Percent	Deaths	Mortality Proportion
Overall	65,396	100.00%	1,716	2.62%
Unintentional	57,560	88.01%	1,259	2.18%
Assault	5,371	8.21%	228	4.24%
Not documented	1,063	1.62%	15	1.41%
Self-harm	850	1.29%	160	18.82%
Undetermined	421	0.64%	35	8.31%
Legal/war	131	0.20%	19	14.50%

INTENT RATE BY YEAR

Figure 6: Trauma rate per 100,000 by intent of injury and year



Data source: Arizona State Trauma Registry 2019-2021

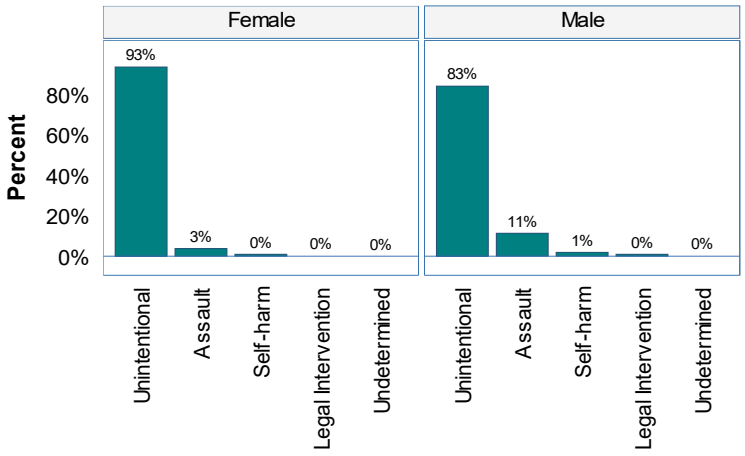
Table 8: Trauma rate per 100,000 by intent and year

Year	Intent of injury	Total Trauma Cases	Rate per 100,000 (95%CI)
2019	Unintentional	51,628	718 [712, 724]
	Assault	5,004	70 [68, 72]
	Self-harm	744	10 [10, 11]
	Legal Intervention	134	2 [2, 2]
2020	Unintentional	51,227	714 [708, 720]
	Assault	5,037	70 [68, 72]
	Self-harm	740	10 [10, 11]
	Legal Intervention	118	2 [1, 2]
2021	Unintentional	57,560	790 [784, 797]
	Assault	5,371	74 [72, 76]
	Self-harm	850	12 [11, 12]
	Legal Intervention	131	2 [1, 2]

CI= Confidence Interval

INTENT RATE BY GENDER

Figure 7: Gender-specific trauma proportion by intent



Data source: Arizona State Trauma Registry 2021

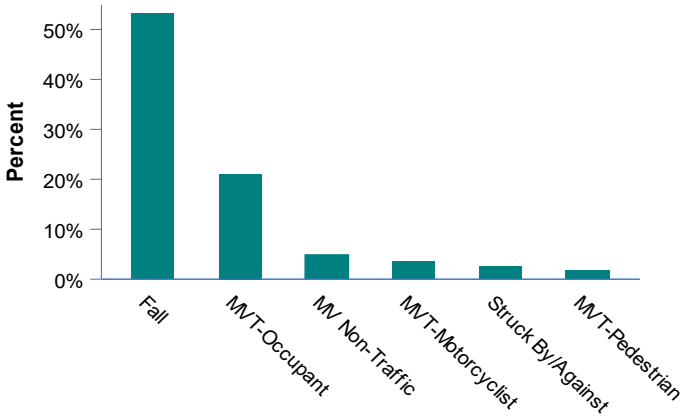
*Intent of Injury: Whether an injury was caused by an act carried out on purpose by oneself (Self-Harm) or by another person(s) (Assault), with the goal of injuring or killing; the injury was not inflicted by deliberate means (Unintentional) or; the injury was inflicted by the police or other legal authorities during law enforcement activities (Legal/War).

Centers for Disease Control and Prevention. Definitions for WISQARS Nonfatal. https://www.cdc.gov/ncipc/wisqars/nonfatal/definitions.htm#nonfatalnjury

INTENT OF INJURY

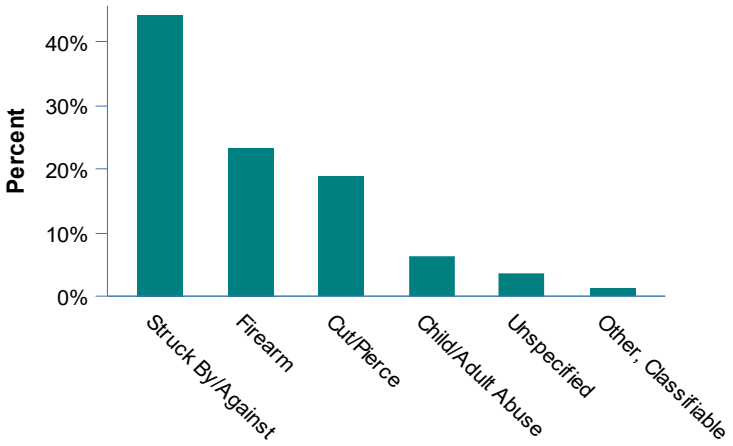
INTENT BY MECHANISM

Figure 8: Top six mechanisms of Unintentional trauma



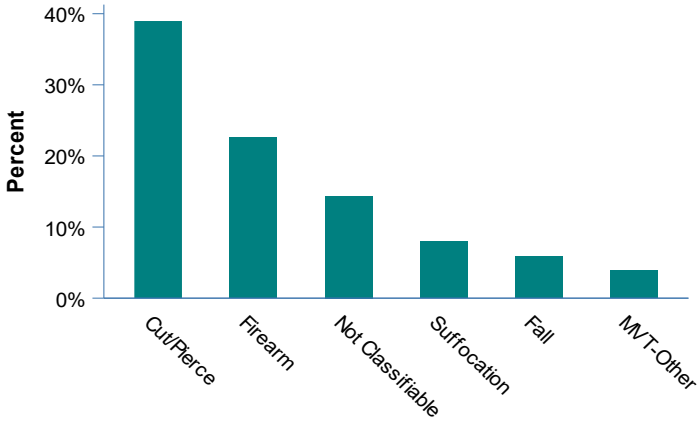
Data source: Arizona State Trauma Registry 2021

Figure 9: Top six mechanisms of Assault trauma



Data source: Arizona State Trauma Registry 2021

Figure 10: Top six mechanisms of Self-harm trauma

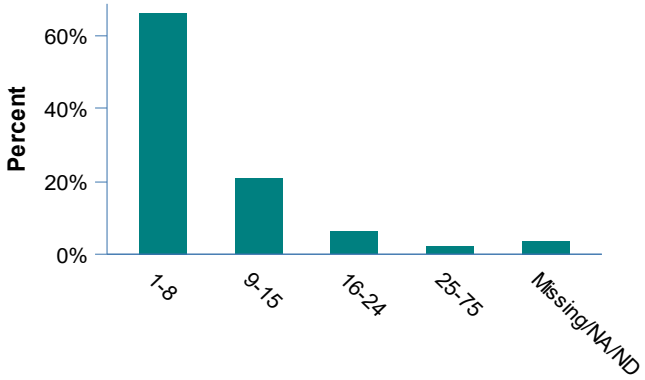


Data source: Arizona State Trauma Registry 2021

INJURY SEVERITY SCORE

INCIDENCE & MORTALITY

Figure 11: Trauma proportion by injury severity score



Data source: Arizona State Trauma Registry 2021

Table 9: Trauma incidence and mortality proportion by injury severity score

Injury Severity Score	Count	Percent	Deaths	Mortality Proportion
1-8	43,160	65.99%	386	0.89%
9-15	13,678	20.91%	365	2.66%
16-24	4,325	6.61%	262	6.05%
25-75	1,585	2.42%	635	40.06%
Missing/NA/ND	2,648	4.04%	68	2.56%

AGE-SPECIFIC MORTALITY

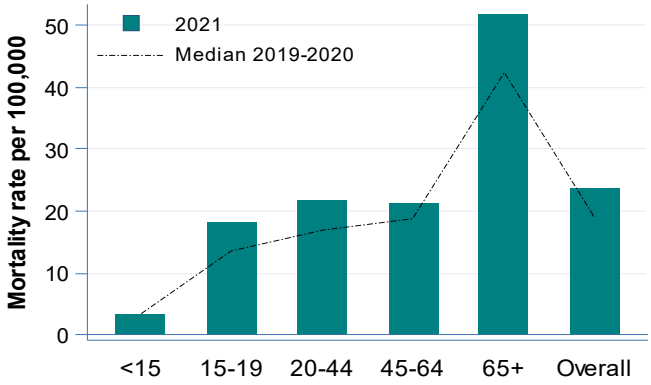
Table 10: Age-specific trauma incidence and mortality proportion

Age	Trauma Count	Trauma Percent	Percent of Arizona Population (n=7,294,587)*	Trauma Deaths	Trauma Mortality Proportion
Total	65,396	100.00%	100.00%	1,716	2.62%
<1	570	0.87%	1.13%	15	2.63%
1-4	1,358	2.07%	4.78%	10	0.73%
5-9	1,433	2.19%	6.23%	6	0.41%
10-14	1,789	2.73%	6.55%	13	0.72%
15-19	3,670	5.61%	6.57%	88	2.39%
20-24	4,164	6.36%	6.81%	117	2.80%
25-34	8,168	12.49%	13.82%	225	2.75%
35-44	6,412	9.80%	12.29%	184	2.87%
45-54	5,482	8.38%	11.69%	166	3.02%
55-64	7,020	10.73%	12.10%	200	2.85%
65-74	8,875	13.57%	10.35%	256	2.88%
75-84	9,471	14.48%	5.67%	250	2.64%
85+	6,984	10.67%	2.01%	186	2.66%

* Source: Arizona Department of Health Services, Population Health and Vital Statistics. Population Denominators: 2019. http://pub.azdhs.gov/health-stats/menu/info/pop/index.php . Due to unavailability of denominators, Population proportions are calculated using the year 2020.

AGE-SPECIFIC MORTALITY RATE

Figure 12: Age-specific trauma mortality rate per 100,000



Data source: Arizona State Trauma Registry 2019-2021

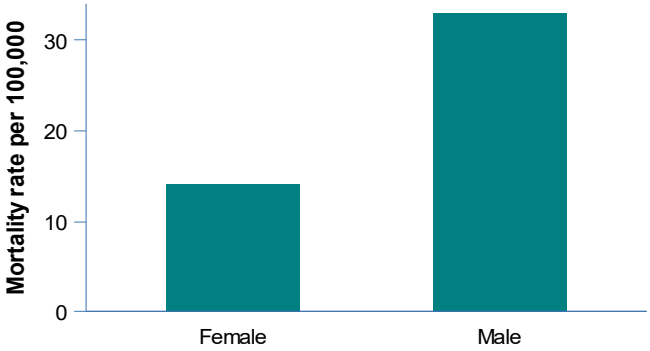
Table 11: Age-specific trauma mortality rate

Age	Total Trauma Deaths	Rate per 100,000 (95%CI)
<15	44	3 [2, 4]
15-19	88	18 [14, 22]
20-44	526	22 [20, 24]
45-64	366	21 [19, 23]
65+	692	52 [48, 56]
Overall	1,716	24 [22, 25]

CI= Confidence interval

GENDER-SPECIFIC MORTALITY RATE

Figure 13: Gender-specific trauma mortality rate per 100,000



Data source: Arizona State Trauma Registry 2021

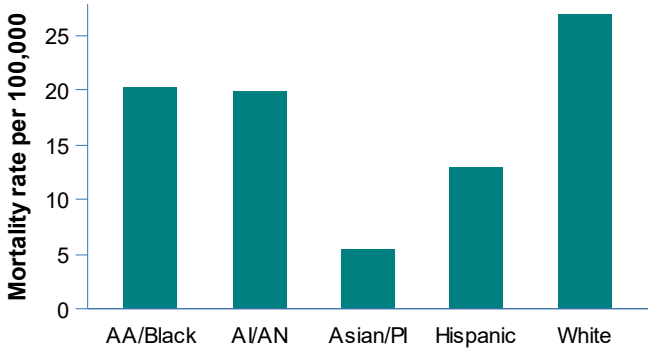
Table 12: Gender-specific trauma mortality rate per 100,000

Gender	Total trauma deaths	Rate per 100,000 (95%CI)
Female	515	14 [13, 15]
Male	1,200	33 [31, 35]

CI= Confidence interval

RACE-SPECIFIC MORTALITY RATE

Figure 14: Race-specific trauma mortality rate per 100,000



Data source: Arizona State Trauma Registry 2021 PI=Pacific Islander, AI/AN=American Indian/Alaska Native, AA=African American

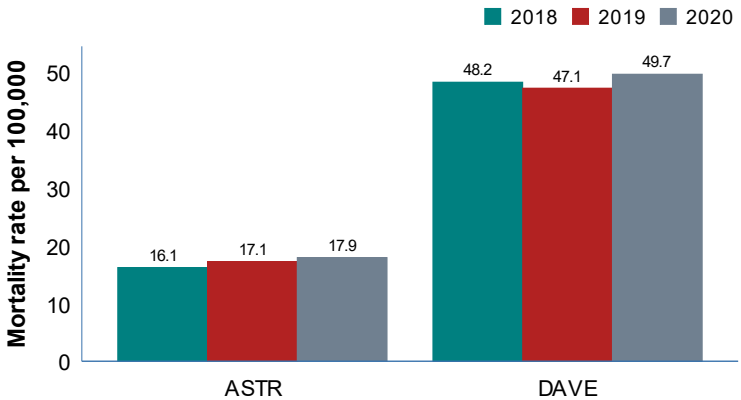
Table 13: Race-specific trauma mortality rate per 100,000

Race/ethnicity	Total trauma deaths	Rate per 100,000 (95%CI)
AA/Black	99	20 [16, 24]
AI/AN	91	20 [16, 24]
Asian/PI	22	5 [3, 8]
Hispanic	279	13 [11, 14]
White	1,083	27 [25, 29]

CI= Confidence interval

ASTR VS. STATEWIDE

Figure 15: Age-adjusted trauma mortality rate per 100,000: Trauma center deaths vs. Statewide trauma deaths



Data sources: Arizona State Trauma Registry 2018-2020 Database Application for Vital Events, 2018-2020

Table 14: Age-adjusted trauma mortality rate per 100,000 by year: Trauma Center vs. Statewide*

Data source	Year	Total Trauma Deaths	Rate per 100,000 (95%CI)
ASTR	2018	1,227	16.1 [15.2, 17.0]
	2019	1,335	17.1 [16.2, 18.0]
	2020	1,442	17.9 [17.0, 18.8]
DAVE	2018	3,723	48.2 [46.7, 49.8]
	2019	3,708	47.1 [45.6, 48.7]
	2020	3,952	49.7 [48.1, 51.2]

CI= Confidence interval

***Statewide data obtained from the Database Application for Vital Events (DAVE). Includes all trauma deaths including those that occurred outside of trauma centers.**

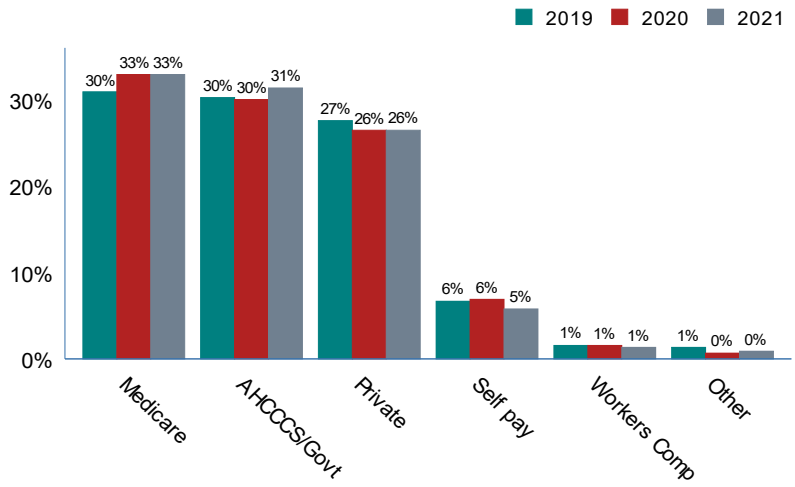
CHARGES & REIMBURSEMENT

Table 15: Total trauma charges and reimbursement by year

Year	Total Charges	Median Charges	Total Reimbursement	Reimbursement Percent
2019	$3,031,698,529	$28,931	$404,109,995	13.3%
2020	$3,060,770,081	$29,742	$360,522,125	11.7%
2021	*$3,939,697,669*	*$31,537*	*$484,126,416*	*12.2%*

PRIMARY PAYER BY YEAR

Figure 16: Primary payment source of traumatic injuries by year



Data source: Arizona State Trauma Registry 2019-2021 Other includes: No fault auto, Not billed, and Other insurance

CHARGES & REIMBURSEMENT BY PAYER

Table 16: Total trauma charges and reimbursement by primary payer

Primary payer	Total Charges	Median Charges	Total Reimbursement	Reimbursement Percent
AHCCCS/Govt	$1,244,033,090	$31,711	$111,765,303	8.9%
Medicare	$1,154,659,340	$33,386	$147,826,597	12.8%
Not documented	$337,903,522	$16,457	$8,560,423	2.5%
Other	$17,892,174	$18,608	$2,044,748	11.4%
Private	$979,739,459	$31,063	$195,988,576	20.0%
Self pay	$152,999,028	$28,720	$6,152,804	4.0%
Workers Comp	$52,471,055	$31,626	$11,787,964	22.4%
Total	*$3,939,697,669*	*$31,537*	*$484,126,416*	*12.2%*

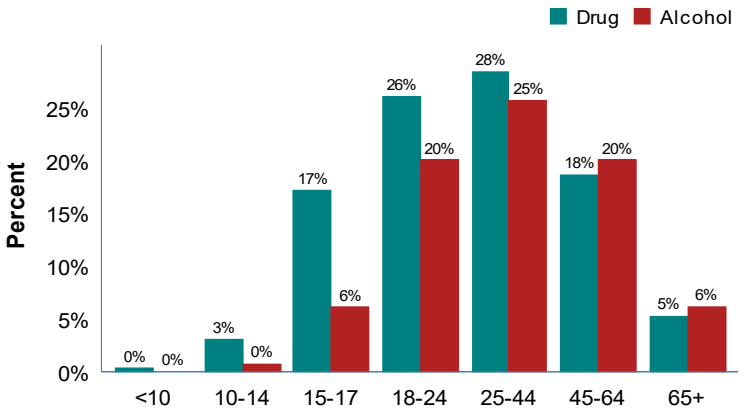
CHARGES & REIMBURSEMENT BY MECHANISM

Table 17: Total trauma charges and reimbursement by mechanism of injury

Mechanism	Total Charges	Median Charges	Total Reimbursement	Reimbursement Percent
Bite And Stings-Nonvenomous	$15,246,382	$23,478	$2,179,763	14.2%
Bite And Stings-Venomous	$1,027,027	$53,258	$272,409	26.5%
Cut/Pierce	$94,890,657	$31,491	$11,911,220	12.5%
Drowning/Submersion	$1,788,420	$40,788	$788,290	44.0%
Fall	$1,858,785,818	$31,929	$222,249,425	11.9%
Fire/Flame	$6,670,463	$13,558	$1,914,470	28.7%
Firearm	$198,591,699	$38,695	$23,350,478	11.7%
Hot Object/Substance	$2,530,455	$5,977	$333,611	13.1%
MV Non-Traffic	$151,025,678	$26,039	$20,104,953	13.3%
MVT-Motorcyclist	$221,779,421	$45,550	$30,979,356	13.9%
MVT-Occupant	$748,355,282	$32,451	$86,703,887	11.5%
MVT-Other	$7,076,921	$77,611	$655,958	9.2%
MVT-Pedalcyclist	$44,005,764	$42,674	$5,178,842	11.7%
MVT-Pedestrian	$148,899,063	$54,213	$15,373,872	10.3%
MVT-Unspecified	$26,584	$4,477	$2,344	8.8%
Machinery	$10,018,159	$28,689	$2,119,033	21.1%
Natural/Environmental, Other	$9,825,773	$16,967	$1,766,168	17.9%
Not Documented	$32,381,441	$21,930	$4,758,174	14.6%
Other Land Transport	$40,109,919	$23,483	$7,009,013	17.4%
Other Specified,Child/Adult Abuse	$17,761,760	$25,843	$2,000,857	11.2%
Other Specified,Classifiable	$38,839,170	$27,608	$4,659,445	11.9%
Other Specified,Foreign Body	$53,828	$12,103	$4,280	7.9%
Other Specified,Not Elsewhere Classifiable	$24,406,837	$35,053	$2,895,988	11.8%
Other Transport	$20,447,598	$36,211	$3,412,636	16.6%
Overexertion	$8,643,612	$30,637	$1,735,484	20.0%
Pedalcyclist,Other	$48,779,362	$29,658	$8,584,091	17.5%
Pedestrian,Other	$28,517,051	$32,665	$3,030,000	10.6%
Poisoning:Drug	$198,516	$29,250	$54,450	27.4%
Poisoning:Non-Drug	$858,142	$21,498	$96,047	11.1%
Struck By/Against	$135,522,706	$22,953	$17,754,928	13.1%
Suffocation	$5,410,390	$33,224	$613,415	11.3%
Unspecified	$17,223,767	$33,682	$1,633,529	9.4%
Total	*$3,939,697,669*	*$31,537*	*$484,126,416*	*12.2%*

AGE-SPECIFIC

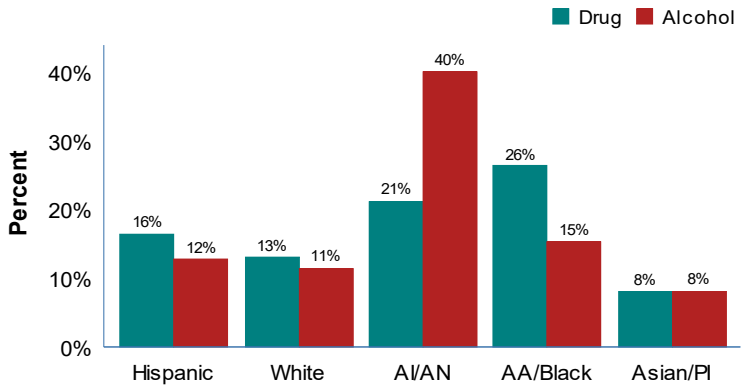
Figure 17: Age-specific trauma proportion by alcohol and drug use



Data source: Arizona State Trauma Registry 2021

RACE-SPECIFIC

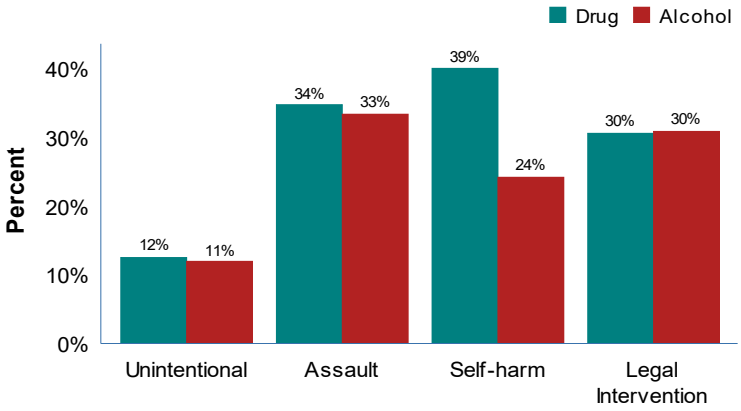
Figure 18: Race-specific trauma proportion by alcohol and drug use



Data source: Arizona State Trauma Registry 2021, PI=Pacific Islander, AI/AN=American Indian/Alaska Native, AA=African American

INTENT-SPECIFIC

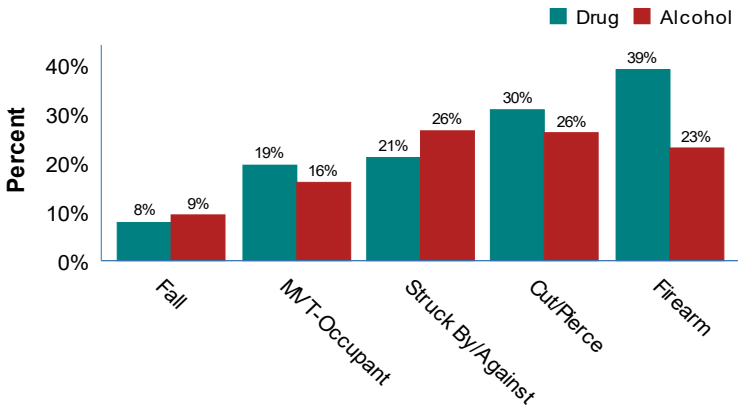
Figure 19: Intent-specific trauma proportion by alcohol and drug use



Data source: Arizona State Trauma Registry 2021

MECHANISM-SPECIFIC

Figure 20: Mechanism-specific trauma proportion by alcohol and drug use

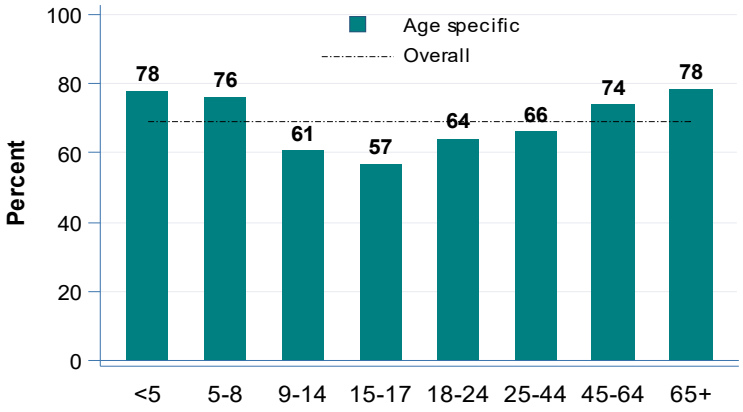


Data source: Arizona State Trauma Registry 2021

MVT-OCCUPANT (N = 12,247)

CAR RESTRAINT USE— 68.9%

Figure 21: Age-specific proportion of restraint use among Motor Vehicle Traffic occupants

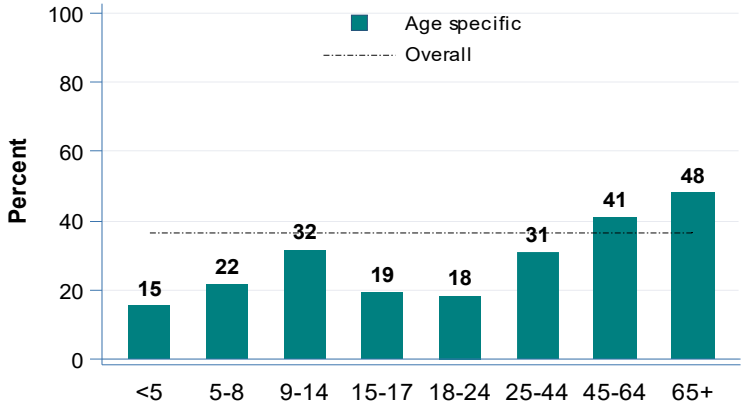


Data source: Arizona State Trauma Registry 2021

PEDAL CYCLIST (N = 1,651)

HELMET USE—36.5%

Figure 22: Age-specific proportion of helmet use among pedal-cyclists

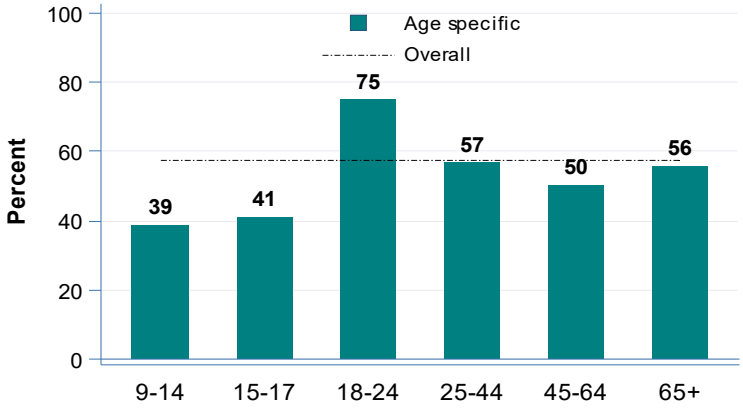


Data source: Arizona State Trauma Registry 2021

MOTORCYCLIST (N = 2,093)

HELMET USE—57.2%

Figure 23: Age-specific proportion of helmet use among Motorcyclists

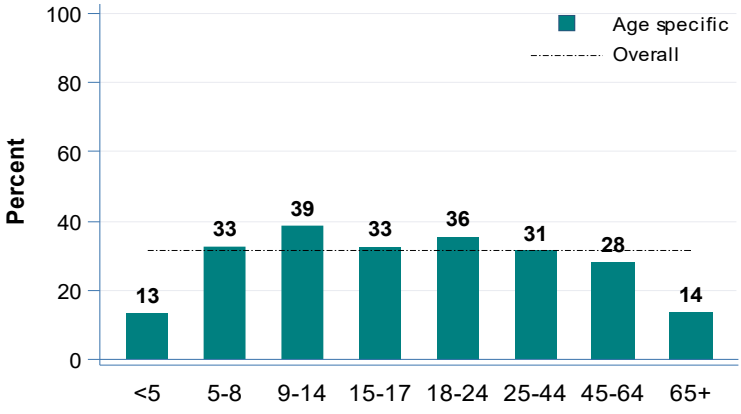


Data source: Arizona State Trauma Registry 2021

OFF-ROAD VEHICLE OCCUPANT (N = 2,311)

HELMET USE—31.4%

Figure 24: Age-specific proportion of helmet use among off-road vehicle occupants



Data source: Arizona State Trauma Registry 2021

* An age category may be missing in a graph if there are no cases available in that category.

INJURY TO ED ARRIVAL TIME

Table 18: Injury to ED arrival time for patient with an injury severity score > 15 by injury location

Injury location	ISS>15: Injury to ED Arrival Time (Minutes)				
	N	Median time	25th percentile*	75th percentile**	Injury time missing (n)
Rural	408	90	52	134	118
Urban	2,397	47	34	72	1,409
Statewide	2,805	50	35	83	1,527

*25% of the cohort had a median transport time at or below this value
** 75% of the cohort had a median transport time at or below this value

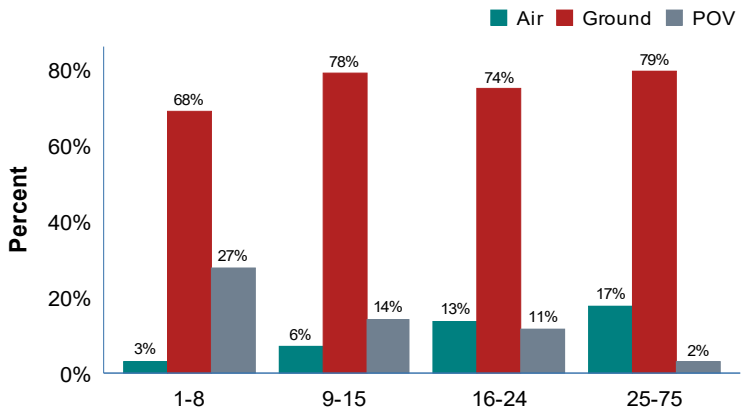
Table 19: Injury to ED arrival time for transferred patients with an injury severity score > 15 by injury location

Injury location	ISS>15 and transferred to Level 1: Injury to Final ED Arrival Time (Minutes)				
	N	Median time	25th percentile*	75th percentile**	Injury time missing (n)
Rural	256	360	252	578	121
Urban	552	365	257	653	470
Statewide	808	363	257	634	591

*25% of the cohort had a median transport time at or below this value
** 75% of the cohort had a median transport time at or below this value

MODE OF TRANSPORT

Figure 25: Mode of transport to trauma center by Injury Severity Score

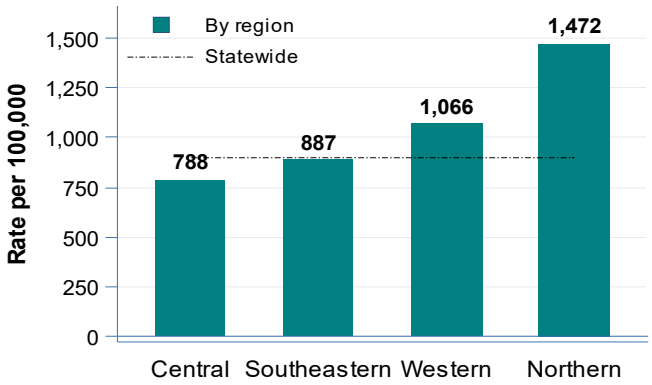


Data source: Arizona State Trauma Registry 2021

POV - Privately owned vehicle

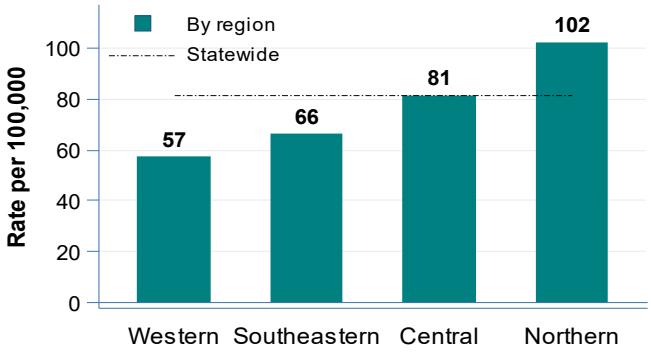
TRAUMA RATE

Figure 26a: Region-specific trauma rate per 100,000



Data source: Arizona State Trauma Registry 2021

Figure 26b: Region-specific severe trauma (ISS>15) rate per 100,000



Data source: Arizona State Trauma Registry 2021

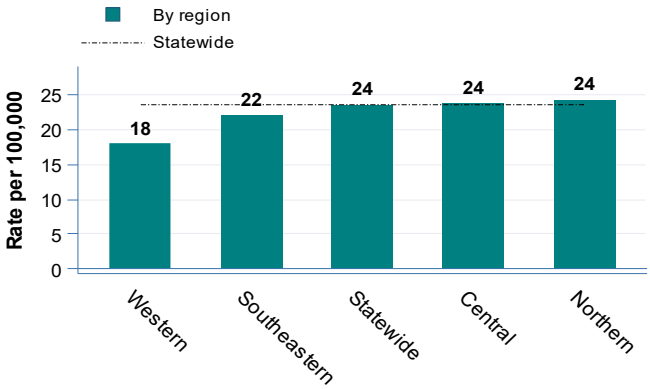
Table 20: Region-specific trauma rate per 100,000

Injury Region	All Trauma Patients		Severe Trauma Patients (ISS >15)		Injury Cases *	
	Total Trauma Cases	Rate per 100,000 (95%CI)	Total Trauma Cases	Rate per 100,000 (95%CI)	Total Injury Cases	Rate per 100,000 (95%CI)
Western	4,698	1,066 [1,036, 1,097]	252	57 [50, 64]	29,975	6,278 [6,207, 6,349]
Northern	8,285	1,472 [1,440, 1,504]	575	102 [94, 111]	79,887	6,207 [6,164, 6,250]
Southeastern	11,364	887 [870, 903]	846	66 [62, 70]	38,752	6,826 [6,759, 6,894]
Central	39,403	788 [780, 796]	4,065	81 [79, 84]	297,590	5,997 [5,975, 6,018]

CI= Confidence interval

MORTALITY RATE

Figure 27: Region-specific trauma mortality rate per 100,000



Data source: Arizona State Trauma Registry 2021

Table 21: Region-specific trauma mortality rate per 100,000

Injury Region	Total Trauma deaths	Rate per 100,000 (95%CI)
Western	79	18 [14, 22]
Northern	137	24 [20, 28]
Southeastern	282	22 [19, 25]
Central	1,187	24 [22, 25]

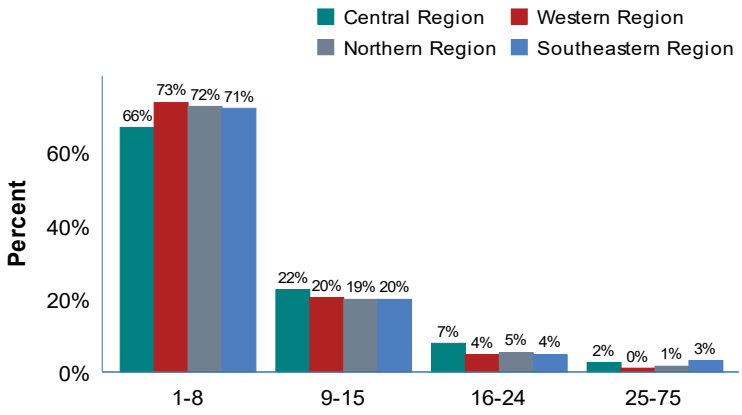
CI= Confidence interval

*The Arizona Hospital Discharge Database (HDD) 2020 was queried to calculate the injury rate by region (In HDD, region is defined based on the county of residence; while in ASTR, region is defined based on the county of injury).

** In the year 2020, there was a new Level 1 Trauma center in this region hence we see a increase in trauma rates and numbers for this region.

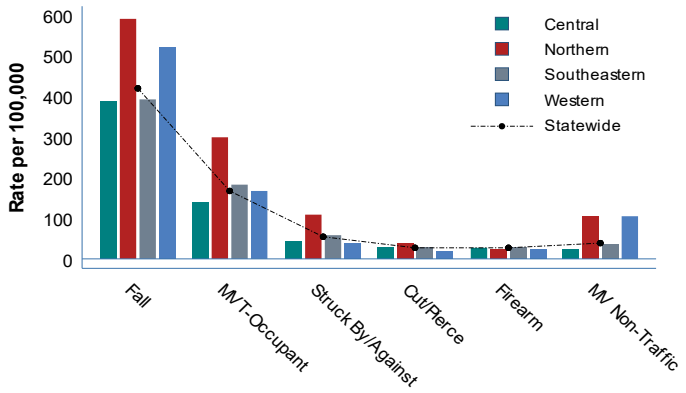
MORTALITY BY ISS

Figure 28: Region-specific trauma proportion by Injury Severity Score



Data source: Arizona State Trauma Registry 2021

Figure 29: Region-specific trauma rate per 100,000 by top 6 mechanisms

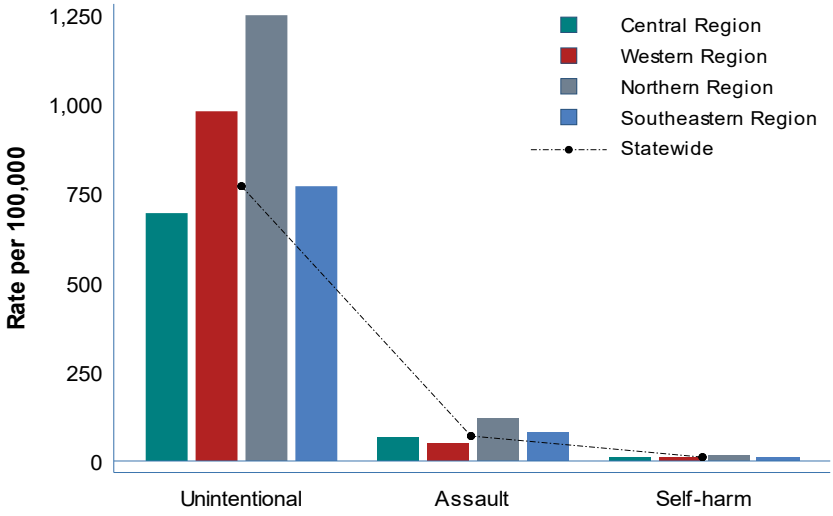


Data source: Arizona State Trauma Registry 2021

Table 22: Region-specific trauma rate per 100,000 by the top 6 mechanism of injury

Region	Mechanisms	Total Trauma Cases	Rate per 100,000 (95%CI)
Central	Fall	19,566	391 [386, 397]
	MVT-Occupant	7,133	143 [139, 146]
	Struck By/Against	2,255	45 [43, 47]
	Cut/Pierce	1,437	29 [27, 30]
	Firearm	1,421	28 [27, 30]
	MV Non-Traffic	1,197	24 [23, 25]
Northern	Fall	3,330	592 [572, 612]
	MVT-Occupant	1,701	302 [288, 317]
	Struck By/Against	631	112 [103, 121]
	Cut/Pierce	235	42 [36, 47]
	Firearm	129	23 [19, 27]
	MV Non-Traffic	604	107 [99, 116]
Southeastern	Fall	5,026	392 [381, 403]
	MVT-Occupant	2,376	185 [178, 193]
	Struck By/Against	756	59 [55, 63]
	Cut/Pierce	377	29 [26, 32]
	Firearm	384	30 [27, 33]
	MV Non-Traffic	454	35 [32, 39]
Western	Fall	2,305	523 [502, 544]
	MVT-Occupant	744	169 [157, 181]
	Struck By/Against	176	40 [34, 46]
	Cut/Pierce	91	21 [16, 25]
	Firearm	114	26 [21, 31]
	MV Non-Traffic	472	107 [97, 117]
Statewide	Fall	30,788	423 [418, 427]
	MVT-Occupant	12,247	168 [165, 171]
	Struck By/Against	3,942	54 [52, 56]
	Cut/Pierce	2,198	30 [29, 31]
	Firearm	2,105	29 [28, 30]
	MV Non-Traffic	2,897	40 [38, 41]

Figure 30: Region-specific trauma rate per 100,000 by intent



Data source: Arizona State Trauma Registry 2021

Table 23: Region-specific trauma rate per 100,000 by intent of injury

Region	Intent	Total Trauma Cases	Rate per 100,000 (95%CI)
Central Region	Unintentional	34,919	698 [691, 706]
	Assault	3,258	65 [63, 67]
	Self-harm	553	11 [10, 12]
Northern Region	Unintentional	7,040	1,251 [1,222, 1,280]
	Assault	666	118 [109, 127]
	Self-harm	109	19 [16, 23]
Southeastern Region	Unintentional	9,892	772 [756, 787]
	Assault	1,043	81 [76, 86]
	Self-harm	131	10 [8, 12]
Western Region	Unintentional	4,324	981 [952, 1,010]
	Assault	214	49 [42, 55]
	Self-harm	46	10 [7, 13]
Statewide	Unintentional	56,175	771 [765, 777]
	Assault	5,181	71 [69, 73]
	Self-harm	839	12 [11, 12]

CI= Confidence interval

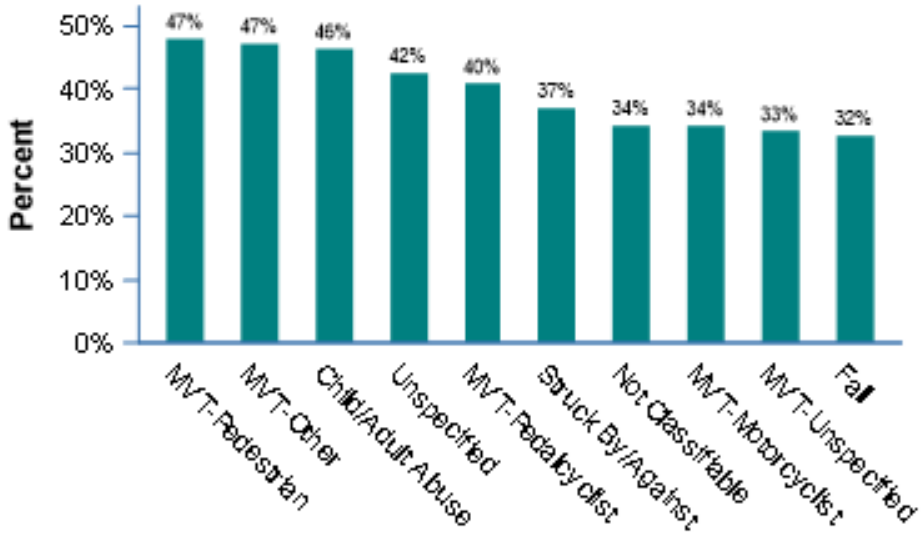
INCIDENCE & MORTALITY

Table 24: Traumatic brain injury incidence and mortality proportion by age and brain injury severity

Age	Total Trauma Cases	Major TBI				Minor TBI			
		N	Percent	Mortality	Mortality Percent	N	Percent	Mortality	Mortality Percent
Total	65,396	6,655	10.17%	765	11.49%	13,021	19.91%	203	1.55%
<1	570	181	31.75%	5	2.76%	136	23.85%	2	1.47%
1-4	1,358	130	9.57%	4	3.07%	221	16.27%	0	0
5-9	1,433	97	6.76%	4	4.12%	225	15.70%	0	0
10-14	1,789	94	5.25%	5	5.31%	313	17.49%	0	0
15-19	3,670	301	8.20%	49	16.27%	814	22.17%	4	0.49%
20-24	4,164	305	7.32%	53	17.37%	824	19.78%	12	1.45%
25-34	8,168	595	7.28%	104	17.47%	1,605	19.64%	17	1.05%
35-44	6,412	583	9.09%	97	16.63%	1,218	18.99%	15	1.23%
45-54	5,482	578	10.54%	93	16.08%	1,065	19.42%	22	2.06%
55-64	7,020	803	11.43%	83	10.33%	1,354	19.28%	30	2.21%
65-74	8,875	1,011	11.39%	115	11.37%	1,670	18.81%	42	2.51%
75-84	9,471	1,202	12.69%	105	8.73%	1,955	20.64%	27	1.38%
85+	6,984	775	11.09%	48	6.19%	1,621	23.21%	32	1.97%

MECHANISM OF INJURY (TOP 10)

Figure 31: Proportion of Traumatic Brain Injury by mechanism



Data source: Arizona State Trauma Registry 2021

Table 25: Traumatic brain injury incidence and mortality proportion by age and GCS

Age	Total Trauma Cases	TBI- GCS<9				TBI- GCS 9-12				TBI- GCS 13-15			
		N	Percent	Mortality	Mortality Percent	N	Percent	Mortality	Mortality Percent	N	Percent	Mortality	Mortality Percent
Total	65,396	1,434	2.19%	694	48.39%	651	0.99%	68	10.44%	17,206	26.31%	187	1.08%
<1	570	10	1.75%	7	70.00%	6	1.05%	0	0	286	50.17%	0	0
1-4	1,358	10	0.73%	4	40.00%	17	1.25%	0	0	311	22.90%	0	0
5-9	1,433	15	1.04%	4	26.66%	14	0.97%	0	0	286	19.95%	0	0
10-14	1,789	21	1.17%	5	23.80%	7	0.39%	0	0	367	20.51%	0	0
15-19	3,670	120	3.26%	51	42.50%	41	1.11%	0	0	933	25.42%	0	0
20-24	4,164	122	2.92%	60	49.18%	40	0.96%	2	5.00%	956	22.95%	2	0.20%
25-34	8,168	249	3.04%	114	45.78%	82	1.00%	2	2.43%	1,840	22.52%	3	0.16%
35-44	6,412	226	3.52%	95	42.03%	73	1.13%	5	6.84%	1,471	22.94%	8	0.54%
45-54	5,482	175	3.19%	92	52.57%	71	1.29%	9	12.67%	1,377	25.11%	12	0.87%
55-64	7,020	158	2.25%	82	51.89%	76	1.08%	13	17.10%	1,897	27.02%	17	0.89%
65-74	8,875	168	1.89%	93	55.35%	62	0.69%	14	22.58%	2,394	26.97%	48	2.00%
75-84	9,471	103	1.08%	59	57.28%	84	0.88%	9	10.71%	2,893	30.54%	63	2.17%
85+	6,984	57	0.81%	28	49.12%	78	1.11%	14	17.94%	2,195	31.42%	34	1.54%

DISCHARGED TO REHAB BY PAYER

Table 26: Discharged to rehab by primary payer and Injury Severity Score

Primary Payer	Total Patient admitted		Discharged to Rehab		ISS <=15 and Discharged to Rehab		ISS >15 and Discharged to Rehab	
	N	%	N	%	N	%	N	%
AHCCCS	11,630	30.46%	705	6.06%	393	4.11%	304	17.02%
Medicare	14,157	37.09%	1,527	10.78%	1,267	10.33%	238	16.05%
Not Documented	50	0.13%	2	4.00%	1	2.50%	1	11.11%
Other	213	0.55%	19	8.92%	15	8.15%	4	16.66%
Private	10,520	27.56%	876	8.32%	529	5.95%	343	24.07%
Self pay	1,599	4.18%	22	1.37%	9	0.67%	13	5.55%
Total	38,169	100.00%	3,151	8.25%	2,214	6.86%	903	18.20%

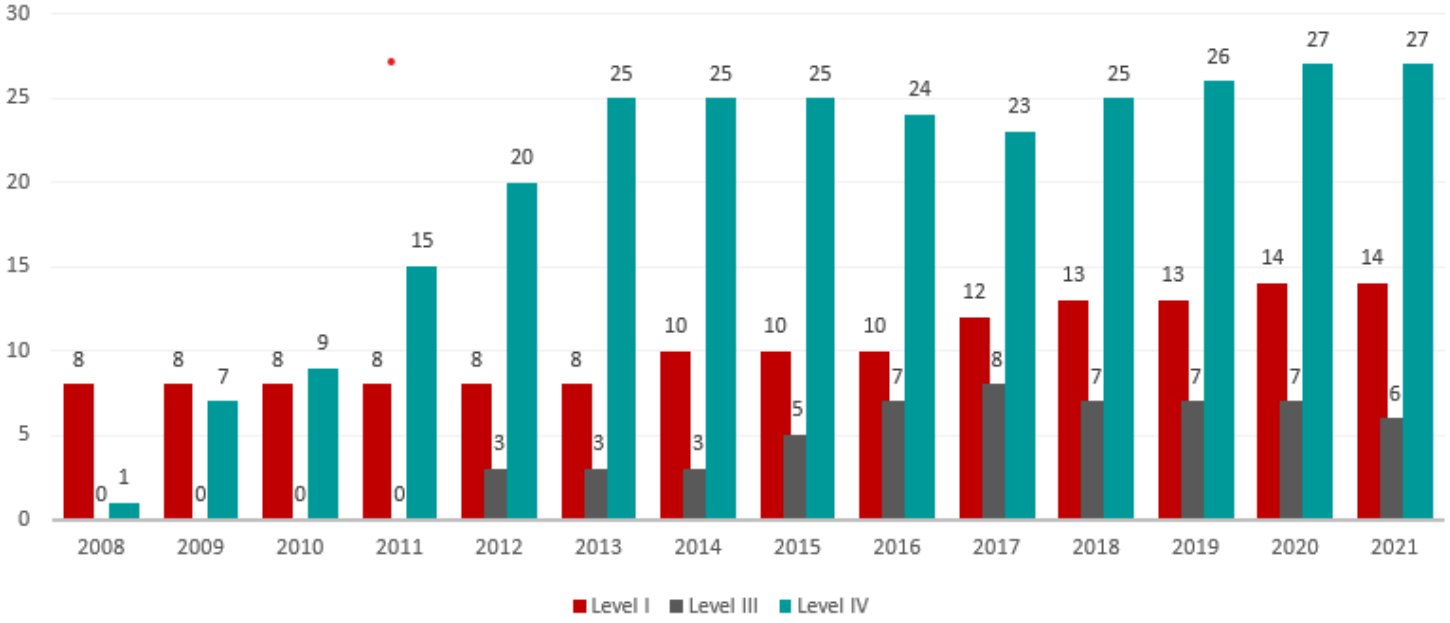
DISCHARGED TO REHAB BY REGION

Table 27: Discharged to rehab by region of injury

Region	Total Patient Admitted		Discharged to Rehab	
	N	%	N	%
Missing Region	918	2.7%	59	6.4%
Central Region	23,984	71.7%	1,728	7.2%
Western Region	1,869	5.5%	184	9.8%
Northern Region	3,388	10.1%	326	9.6%
Southeastern Region	3,284	9.8%	351	10.6%
Statewide	33,443	100.0%	2,648	7.9%

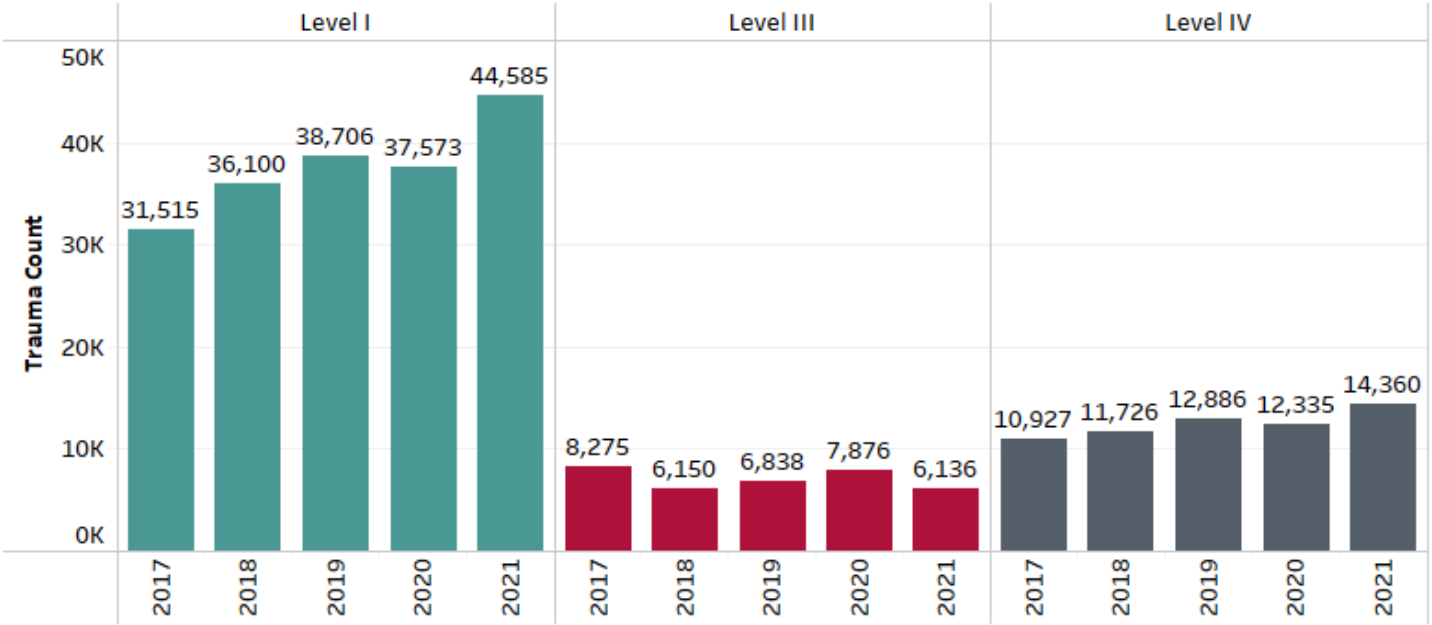
TRAUMA CENTER NUMBERS

Figure 32: Number of Trauma Centers from 2008 to 2021



INCIDENCE REPORTED

Figure 33: Trauma incidence



INCIDENCE & MORTALITY

Table 28: Trauma incidence and mortality proportion by trauma center designation

Trauma Center Designation	Count	Percent	Deaths	Mortality Proportion
Level I	44,585	68.50%	1,501	3.36%
Level III	6,136	9.42%	73	1.18%
Level IV	14,360	22.06%	142	0.98%

CHARGES & REIMBURSEMENT

Table 29: Trauma charges and reimbursement by trauma center designation

Trauma Center Designation	Total Charges	Median Charges	Total Reimbursement	Reimbursement Percent
Level I	$3,389,633,974	$41,055	$420,112,221	12.3%
Level III	$231,272,343	$22,142	$29,751,415	12.8%
Level IV	$315,510,571	$13,796	$33,840,953	10.7%

Table 30: Trauma incidence by mechanism of injury

	Level I		Level III		Level IV	
	N	%	N	%	N	%
Grand Total	44,585	100.00%	6,136	100.00%	14,360	100.00%
Fall	19,860	44.54%	3,931	64.06%	6,871	47.85%
MVT-Occupant	9,083	20.37%	728	11.86%	2,369	16.50%
Struck By/Against	2,575	5.78%	293	4.78%	1,046	7.28%
Cut/Pierce	1,782	4.00%	86	1.40%	321	2.24%
Firearm	1,770	3.97%	50	0.81%	279	1.94%
MVT-Motorcyclist	1,698	3.81%	127	2.07%	263	1.83%
MV Non-traffic	1,473	3.30%	198	3.23%	1,205	8.39%
Pedalcyclist, other	852	1.91%	97	1.58%	187	1.30%
MVT-Pedestrian	1,072	2.40%	30	0.49%	112	0.78%
Other	602	1.35%	29	0.47%	123	0.86%
Other land transport	529	1.19%	111	1.81%	365	2.54%
Bite/stings, non-venomous	435	0.98%	14	0.23%	52	0.36%
MVT-Pedalcyclist	410	0.92%	26	0.42%	76	0.53%
Child/Adult Abuse	313	0.70%	4	0.07%	17	0.12%
Other NEC	303	0.68%	26	0.42%	35	0.24%
Pedistrain, other	258	0.58%	18	0.29%	105	0.73%
Machinery	189	0.42%	11	0.18%	42	0.29%
Unspecified	216	0.48%	48	0.78%	90	0.63%
Natural/environ	148	0.33%	29	0.47%	99	0.69%
Overexertion	133	0.30%	32	0.52%	29	0.20%
Other Transport	163	0.37%	54	0.88%	69	0.48%
Hot object	96	0.22%	17	0.28%	39	0.27%
Fire/Flame	76	0.17%	17	0.28%	41	0.29%
Suffocation	63	0.14%	2	0.03%	15	0.10%
Null	425	0.95%	145	2.36%	469	3.27%
Drowning	13	0.03%	5	0.08%	9	0.06%
MVT-Other	32	0.07%			4	0.03%
Poisoning:Non-Drug	11	0.02%	2	0.03%	4	0.03%
Foreign body	2	0.00%	1	0.02%	1	0.01%
Bite/stings, Venomous			2	0.03%	17	0.12%
MVT-Unspecified	2	0.00%	2	0.03%	2	0.01%
Poisoning:Drug	1	0.00%	1	0.02%	4	0.03%

Table 31: Trauma mortality proportion by mechanism of injury

	Level I		Level III		Level IV	
	%	N	%	N	%	N
Grand Total	3.37%	1,501	1.19%	73	0.99%	142
Bite and Stings	0.46%	2				
Cut/Pierce	2.24%	40			0.31%	1
Fall	2.53%	503	1.20%	47	0.89%	61
Firearm	16.78%	297	16.00%	8	7.89%	22
MV Non-Traffic	1.63%	24			0.58%	7
MVT-Motorcyclist	5.12%	87	1.57%	2	2.28%	6
MVT-Occupant	3.02%	274	0.82%	6	1.01%	24
MVT-Pedalcyclist	5.61%	23			3.95%	3
MVT-Pedestrian	12.59%	135	6.67%	2		
MVT-Unspecified	50.00%	1				
Other trauma	2.70%	78	1.03%	4	0.71%	7
Pedalcyclist,Other	0.12%	1			0.53%	1
Pedestrian,Other	4.26%	11			2.86%	3
Struck by/Against	0.62%	16	0.34%	1	0.38%	4
Unknown	2.12%	9	2.07%	3	0.64%	3

TRAUMA PROPORTION BY TOP 6 MECHANISMS OF INJURY

Figure 34: Level I trauma proportion by top 6 mechanisms of injury

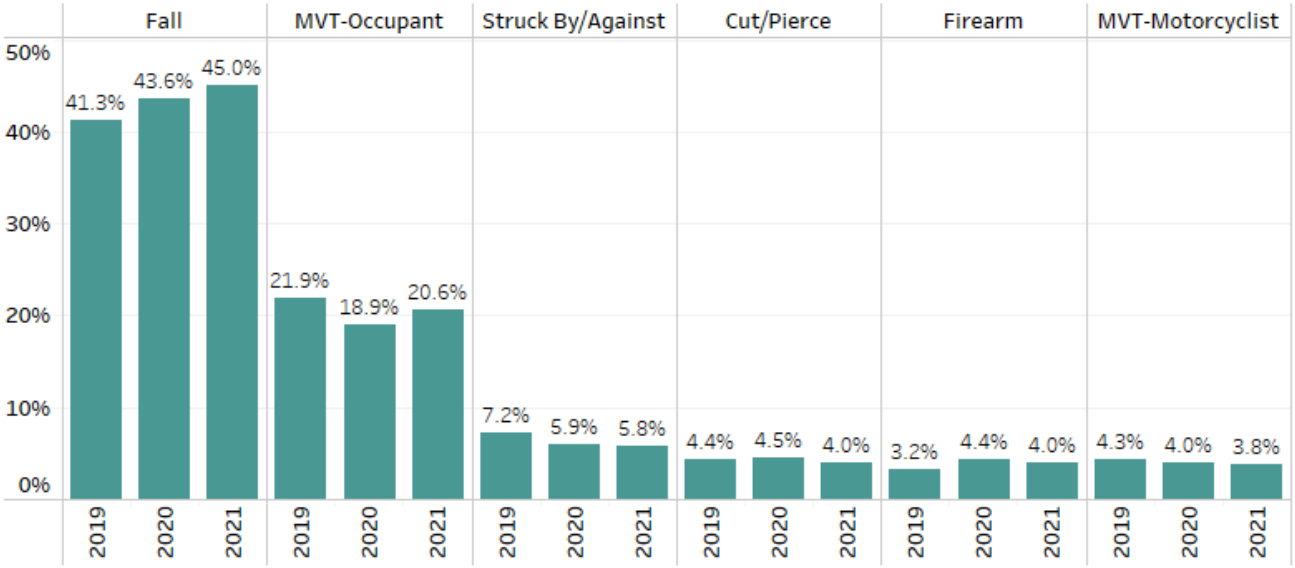
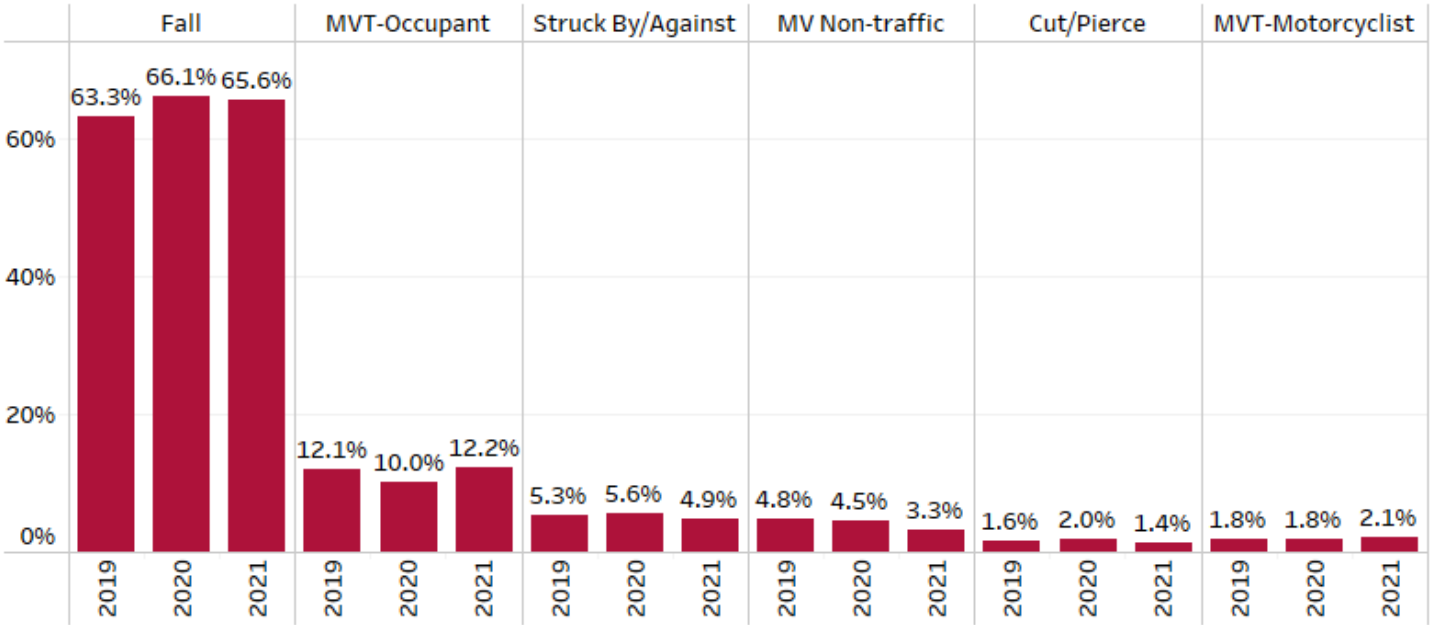
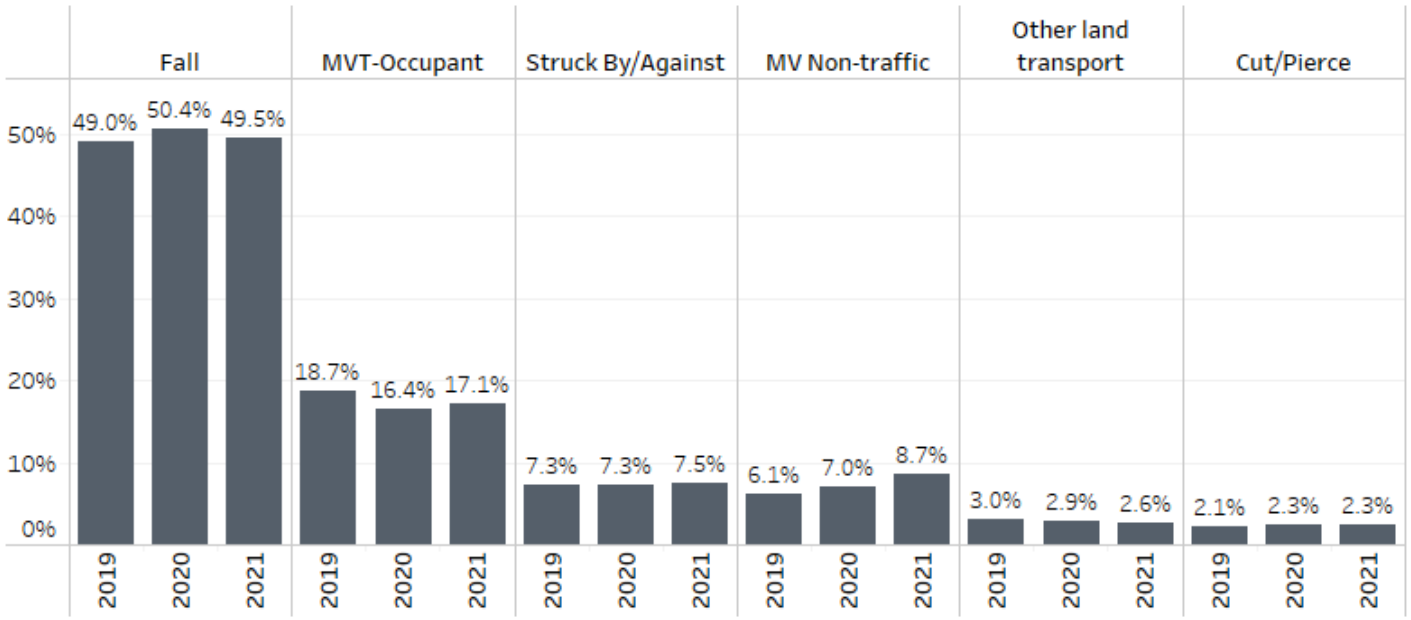


Figure 35: Level III trauma proportion by top 6 mechanisms of injury



TRAUMA PROPORTION BY TOP 6 MECHANISMS OF INJURY

Figure 36: Level IV trauma proportion by top 6 mechanisms of Injury



TRAUMA PROPORTION AND MORTALITY BY INJURY SEVERITY SCORE

Figure 37: Trauma proportion by injury severity score

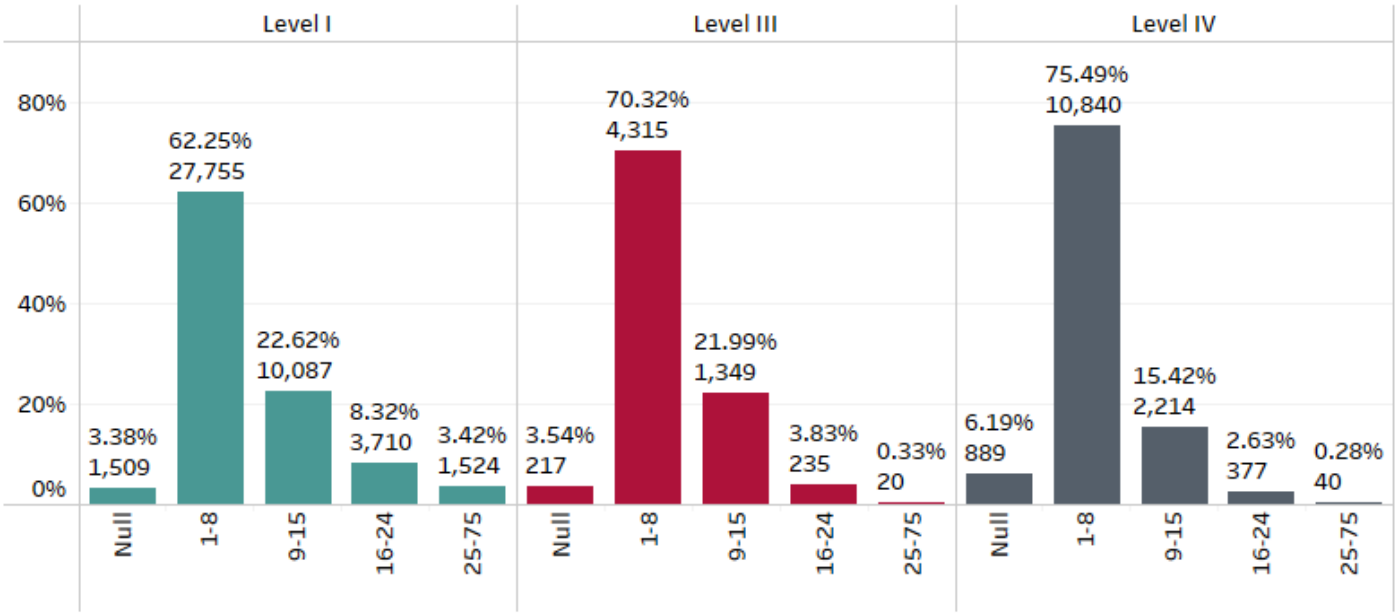
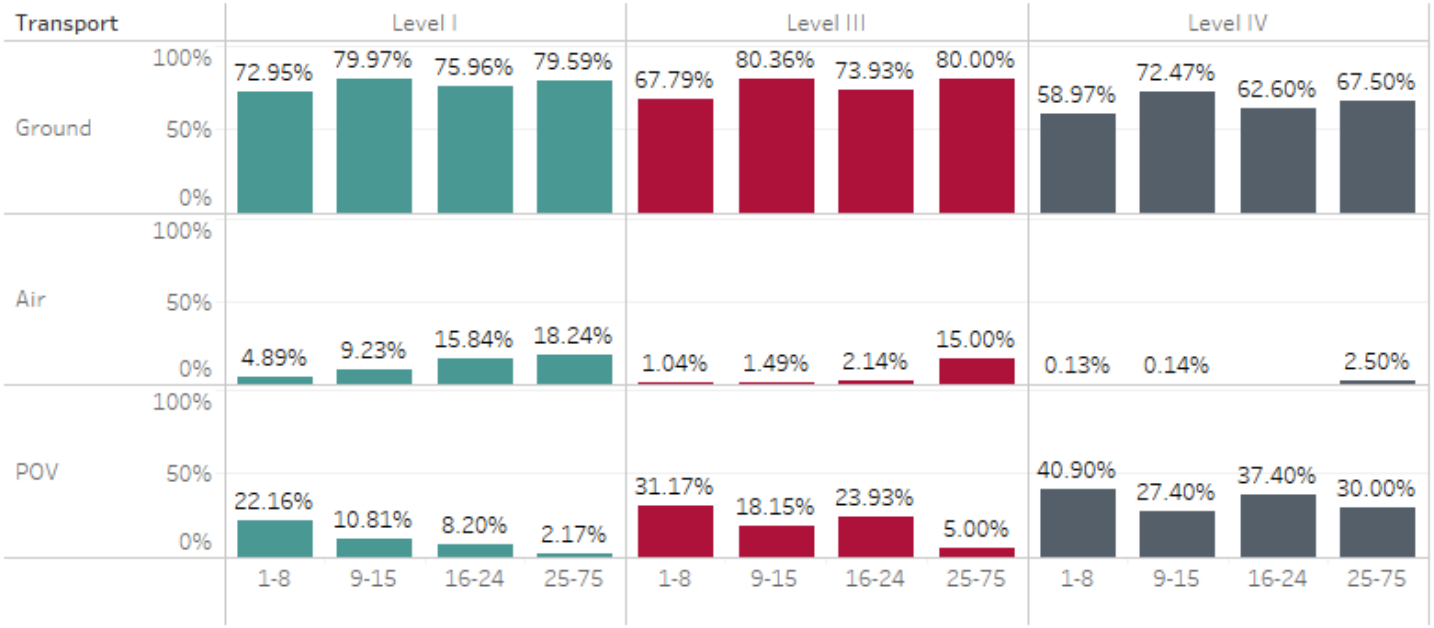


Table 32: Trauma mortality proportion by injury severity score and level of designation

	1-8		9-15		16-24		25-75		Null	
	N	%	N	%	N	%	N	%	N	%
Level I	285	0.66%	292	2.13%	245	5.66%	622	39.24%	57	2.15%
Level III	28	0.06%	31	0.23%	8	0.18%	5	0.32%	1	0.04%
Level IV	73	0.17%	42	0.31%	9	0.21%	8	0.50%	10	0.38%

MODE OF TRANSPORT BY INJURY SEVERITY SCORE

Figure 38: Mode of transport, Injury Severity Score and level of designation



ACCESS TO CARE

Table 33: Injury to ED arrival time for patients with injury sverity score >15 by location and designation level

		N	Injury time available	Injury time missing	Median time	25th percentile	75th percentile
Level I	Rural	328	250	23.8%	104	81	140
	Urban	3,353	2,165	35.4%	46	34	69
Level III	Rural	66	40	39.4%	47	37	68
	Urban	184	86	53.3%	64	46	177
Level IV	Rural	132	118	10.6%	62	44	107
	Urban	269	146	45.7%	60	39	153
Grand Total		**4,332**	**2,805**	**35.2%**	**50**	**35**	**83**

Table 34: Traumatic brain injury and mortality proportion by designation level

Total Trauma Cases		Total TBI Cases				TBI Mortality			
Age Groups	Level I	Major TBI		Minor/Moderate TBI		Major TBI		Minor/Moderate TBI	
		N	%	N	%	N	%	N	%
Grand Total	44,585	5,497	12.33%	9,117	20.45%	735	13.37%	173	1.90%
<1	456	162	35.53%	104	22.81%	5	3.09%	2	1.92%
1-4	1,108	115	10.38%	182	16.43%	4	3.48%		
5-9	1,122	80	7.13%	171	15.24%	4	5.00%		
10-14	1,289	77	5.97%	229	17.77%	4	5.19%		
15-24	5,650	531	9.40%	1,244	22.02%	99	18.64%	16	1.29%
25-34	6,022	517	8.59%	1,245	20.67%	100	19.34%	16	1.29%
35-44	4,625	501	10.83%	918	19.85%	95	18.96%	13	1.42%
45-54	3,953	494	12.50%	780	19.73%	90	18.22%	18	2.31%
55-64	4,894	680	13.89%	974	19.90%	79	11.62%	27	2.77%
65-74	5,574	812	14.57%	1,063	19.07%	109	13.42%	37	3.48%
75-84	5,691	930	16.34%	1,204	21.16%	101	10.86%	19	1.58%
85+	4,201	598	14.23%	1,003	23.88%	45	7.53%	25	2.49%

Table 35: Traumatic brain injury and mortality proportion by designation level

Total Trauma Cases		Total TBI Cases				TBI Mortality			
Age Groups	Level III	Major TBI		Minor/Moderate TBI		Major TBI		Minor/Moderate TBI	
		N	%	N	%	N	%	N	%
Grand Total	6,136	427	6.96%	1,433	23.35%	14	3.28%	12	0.84%
<1	17	2	11.76%	6	35.29%				
1-4	44	4	9.09%	10	22.73%				
5-9	53	6	11.32%	14	26.42%				
10-14	98	5	5.10%	17	17.35%	1	20.00%		
15-24	412	16	3.88%	87	21.12%	1	6.25%		
25-34	448	13	2.90%	89	19.87%	1	7.69%		
35-44	393	19	4.83%	75	19.08%	1	5.26%	1	1.33%
45-54	383	22	5.74%	91	23.76%			3	3.30%
55-64	621	48	7.73%	130	20.93%	4	8.33%	2	1.54%
65-74	1,084	88	8.12%	258	23.80%	2	2.27%	1	0.39%
75-84	1,413	120	8.49%	343	24.27%	3	2.50%	2	0.58%
85+	1,170	84	7.18%	313	26.75%	1	1.19%	3	0.96%

TRAUMATIC BRAIN INJURY: INCIDENCE AND MORTALITY

Table 36: Traumatic brain injury and mortality proportion by designation level

Total Trauma Cases		Total TBI Cases				TBI Mortality			
Age Groups	Level IV	Major TBI		Minor/Moderate TBI		Major TBI		Minor/Moderate TBI	
		N	%	N	%	N	%	N	%
Grand Total	14,360	715	4.98%	2,447	17.04%	16	2.24%	18	0.74%
<1	96	17	17.71%	25	26.04%				
1-4	201	11	5.47%	28	13.93%				
5-9	250	10	4.00%	40	16.00%				
10-14	391	12	3.07%	66	16.88%				
15-24	1,707	59	3.46%	303	17.75%	2	3.39%		
25-34	1,643	58	3.53%	266	16.19%	3	5.17%	1	0.38%
35-44	1,353	62	4.58%	223	16.48%	1	1.61%	1	0.45%
45-54	1,123	61	5.43%	192	17.10%	3	4.92%	1	0.52%
55-64	1,476	74	5.01%	249	16.87%			1	0.40%
65-74	2,180	108	4.95%	344	15.78%	4	3.70%	4	1.16%
75-84	2,345	151	6.44%	407	17.36%	1	0.66%	6	1.47%
85+	1,595	92	5.77%	304	19.06%	2	2.17%	4	1.32%

GASGOW COMA SCORE (GCS): INCIDENCE AND MORTALITY

Table 37: Traumatic brain injury and mortality proportion by GCS and designation level

Total Trauma		Total TBI Cases						TBI Mortality					
Age Groups	Level I	TBI- GCS<9		TBI- GCS 9-12		TBI- GCS 13-15		TBI- GCS<9		TBI- GCS 9-12		TBI- GCS 13-15	
		N	%	N	%	N	%	N	%	N	%	N	%
Grand Total	44,585	1,286	2.88%	546	1.22%	12,601	28.26%	660	51.32%	62	11.36%	170	1.35%
<1	456	8	1.75%	6	1.32%	240	52.63%	7	87.50%				
1-4	1,108	10	0.90%	17	1.53%	264	23.83%	4	40.00%				
5-9	1,122	14	1.25%	14	1.25%	219	19.52%	4	28.57%				
10-14	1,289	20	1.55%	7	0.54%	272	21.10%	4	20.00%				
15-24	5,650	230	4.07%	70	1.24%	1,456	25.77%	108	46.96%	2	2.86%	2	0.14%
25-34	6,022	236	3.92%	70	1.16%	1,444	23.98%	111	47.03%	1	1.43%	3	0.21%
35-44	4,625	202	4.37%	68	1.47%	1,128	24.39%	91	45.05%	5	7.35%	8	0.71%
45-54	3,953	162	4.10%	64	1.62%	1,035	26.18%	87	53.70%	9	14.06%	10	0.97%
55-64	4,894	137	2.80%	64	1.31%	1,440	29.42%	77	56.20%	12	18.75%	16	1.11%
65-74	5,574	140	2.51%	49	0.88%	1,660	29.78%	87	62.14%	14	28.57%	43	2.59%
75-84	5,691	84	1.48%	58	1.02%	1,968	34.58%	56	66.67%	7	12.07%	56	2.85%
85+	4,201	43	1.02%	59	1.40%	1,475	35.11%	24	55.81%	12	20.34%	32	2.17%

GASGOW COMA SCORE (GCS): INCIDENCE AND MORTALITY

Table 38: Traumatic brain injury and mortality proportion by GCS and designation level

Total Trauma		Total TBI Cases						TBI Mortality					
Age Groups	Level III	TBI- GCS<9		TBI- GCS 9-12		TBI- GCS 13-15		TBI- GCS<9		TBI- GCS 9-12		TBI- GCS 13-15	
		N	%	N	%	N	%	N	%	N	%	N	%
Grand Total	6,136	55	0.90%	32	0.52%	1,642	26.76%	13	23.64%	4	12.50%	8	0.49%
<1	17					6	35.29%						
1-4	44					11	25.00%						
5-9	53					19	35.85%						
10-14	98	1	1.02%			19	19.39%	1	100.00%				
15-24	412	3	0.73%	3	0.73%	90	21.84%	1	33.33%				
25-34	448	4	0.89%	1	0.22%	90	20.09%	1	25.00%				
35-44	393	8	2.04%	1	0.25%	81	20.61%	2	25.00%				
45-54	383	5	1.31%	3	0.78%	102	26.63%	1	20.00%			2	1.96%
55-64	621	11	1.77%	1	0.16%	157	25.28%	4	36.36%	1	100.00%	1	0.64%
65-74	1,084	9	0.83%	6	0.55%	304	28.04%	2	22.22%			1	0.33%
75-84	1,413	11	0.78%	13	0.92%	403	28.52%	1	9.09%	1	7.69%	3	0.74%
85+	1,170	3	0.26%	4	0.34%	360	30.77%			2	50.00%	1	0.28%

Table 39: Traumatic brain injury and mortality proportion by GCS and designation level

Total Trauma		Total TBI Cases						TBI Mortality					
Age Groups	Level IV	TBI- GCS<9		TBI- GCS 9-12		TBI- GCS 13-15		TBI- GCS<9		TBI- GCS 9-12		TBI- GCS 13-15	
		N	%	N	%	N	%	N	%	N	%	N	%
Grand Total	14,360	92	0.64%	69	0.48%	2,929	20.40%	21	22.83%	2	2.90%	9	0.31%
<1	96	2	2.08%			39	40.62%						
1-4	201					35	17.41%						
5-9	250	1	0.40%			47	18.80%						
10-14	391					75	19.18%						
15-24	1,707	9	0.53%	7	0.41%	340	19.92%	2	22.22%				
25-34	1,643	8	0.49%	10	0.61%	296	18.02%	2	25.00%	1	10.00%		
35-44	1,353	16	1.18%	4	0.30%	260	19.22%	2	12.50%				
45-54	1,123	8	0.71%	4	0.36%	237	21.10%	4	50.00%				
55-64	1,476	10	0.68%	11	0.75%	298	20.19%	1	10.00%				
65-74	2,180	19	0.87%	5	0.23%	424	19.45%	4	21.05%			4	0.94%
75-84	2,345	8	0.34%	13	0.55%	520	22.17%	2	25.00%	1	7.69%	4	0.77%
85+	1,595	11	0.69%	15	0.94%	358	22.45%	4	36.36%			1	0.28%

Health Care Institution	Address	Effective Date	Expiration Date
Level I Trauma Centers			
Abrazo West Campus	13677 W. McDowell Road, Goodyear, AZ 85395	06/30/18	06/30/24
Banner - University Medical Center Phoenix	1111 E. McDowell Rd., Phoenix, AZ 85006	11/18/17	11/18/24
Banner Desert Medical Center	1400 South Dobson Rd., Meza, AZ 85202	04/23/19	**04/23/22
Banner Thunderbird Medical Center	5555 W. Thunderbird Rd, Glendale, AZ 85306	09/30/19	**09/30/22
Banner University Medical Center – Tucson Campus	1625 N. Campbell Ave, Tucson, AZ 85719	11/11/18	11/11/22
Carondelet St. Joseph's Hospital	350 N. Wilmot Rd., Tucson, AZ 85718	09/20/20	1/14/25
Dignity Health, dba Chandler Regional Medical Center	1955 W. Frye Rd., Chandler, AZ 85224	07/01/18	07/01/25
Flagstaff Medical Center	1200 N. Beaver St., Flagstaff, AZ 86001	05/27/21	05/27/24
HonorHealth Deer Valley Medical Center	19829 N. 27th Ave., Phoenix, AZ 85027	06/01/19	**06/01/22
HonorHealth John C. Lincoln Medical Center	250 E. Dunlap Ave., Phoenix, AZ 85020	04/24/21	04/24/24
HonorHealth Scottsdale Osborn Medical Center	7400 E. Osborn, Scottsdale, AZ 85251	10/27/18	10/27/24
Maricopa County Special Health Care District, dba Valleywise Health Medical Center	2601 E. Roosevelt, Phoenix, AZ 85008	12/19/17	12/19/24
St. Joseph's Hospital & Medical Center	350 W. Thomas Rd., Phoenix, AZ 85013	11/20/19	11/20/23
Level I Pediatric Trauma Centers **			
Phoenix Children's Hospital	1919 E. Thomas Rd., Phoenix, AZ 85016	08/31/18	08/31/22
Level III Trauma Centers			
Banner Baywood Medical Center	6644 E. Baywood Ave., Mesa, AZ 85206	02/25/20	02/25/24
Banner Del E. Webb Medical Center	14502 W. Meeker Blvd, Sun City West, AZ 85375	01/25/19	01/25/23
Canyon Vista Medical Center	5700 E. Highway 90, Sierra Vista, AZ 85635	04/03/20	04/03/23
Havasu Regional Medical Center	101 Civic Center Ln., Lake Havasu City, AZ 86403	04/26/21	02/28/24
Mountain Vista Medical Center	1301 S. Crismon Rd., Mesa, AZ 85209	07/26/20	07/26/23
Tuba City Regional Health Care Corp.	P.O. Box 600, 167 Main St., Tuba City, AZ 86045	12/10/18	12/10/22

***Application Pending:** **In accordance with R9-25-1307D – If an owner submits for renewal of designation, the designation does not expire until the Department has made a final determination.**

** Due to the significant impacts of COVID-19 on public health The American College of Surgeons (ACS) has made the decision to grant an extension of 1 year for verified hospital programs with a verification expiration date falling between January 2020 and December 2023. The dates above represent state designation expiration dates, not ACS verification expiration dates.

**** Pediatric Level I Trauma Centers:** All Arizona Designated Trauma Centers are required to have the capabilities necessary to resuscitate, stabilize, and transfer pediatric patients. Pediatric Trauma Centers have a trauma service specifically intended to meet the needs of children requiring trauma care.

Level IV Trauma Centers			
Banner Boswell Medical Center	10401 W. Thunderbird Blvd., Sun City, AZ 85351	12/17/18	12/17/24
Banner Casa Grande Medical Center	1800 E. Florence Blvd., Casa Grande, AZ 85122	10/01/19	10/01/24
Banner Estrella Medical Center	9201 W. Thomas Road, Phoenix, AZ 85037	08/30/18	08/30/24
Banner Gateway Medical Center	1900 N. Higley Road, Gilbert, AZ 85234	01/02/19	01/02/25
Banner Ironwood Medical Center	37000 N. Gantzel Rd., San Tan Valley, AZ 85140	10/11/18	10/11/24
Banner Page Hospital	501 N. Navajo, Page, AZ 86040	11/05/20	11/05/23
Banner Payson Medical Center	807 S. Ponderosa Street, Payson, AZ 85541	11/22/19	11/22/22
Banner University Medical Center – South Campus	2800 E. Ajo Way, Tucson, AZ 85713	08/13/20	08/13/25
Benson Hospital	450 S. Ocotillo Ave., Benson, AZ 85602	09/18/19	09/18/24
Cobre Valley Regional Medical Center	5880 S. Hospital Dr., Globe, AZ 85501	11/26/18	11/26/24
Copper Queen Community Hospital	101 Cole Ave., Bisbee, AZ 85603	12/01/19	12/01/24
Copper Queen Community Hospital – Douglas Emergency Department	100 E. 5th Street, Douglas, AZ 85607	06/25/19	06/25/25
Dignity Health St. Joseph's – Westgate Medical Center	7300 N. 99th Ave, Glendale, AZ 85307	02/9/21	02/09/24
Kingman Regional Medical Center	3269 Stockton Hill Rd., Kingman, AZ 86409	10/15/18	10/15/24
La Paz Regional Hospital	1200 W. Mohave Rd., Parker, AZ 85344	06/02/21	06/02/24
Little Colorado Medical Center	1501 N. Williamson Ave, Winslow, AZ 86047	06/22/21	06/22/24
Mt. Graham Regional Medical Center	1600 S. 20th Ave., Safford, AZ 85546	03/20/20	03/20/23
Northern Cochise Community Hospital	901 W. Rex Allen Dr., Willcox, AZ 85643	12/04/20	12/04/23
San Carlos Apache Health Care Corporation	103 Medicine Way Road, Peridot, AZ 85542	05/09/21	05/09/24
Summit Healthcare Regional Medical Center	2200 Show Low Lake Rd., Show Low, AZ 85901	08/12/20	08/12/23
Verde Valley Medical Center	269 S. Candy Ln., Cottonwood, AZ 86326	08/18/20	8/18/2023
Verde Valley Medical Center – Sedona Campus	3700 W. Hwy 89A, Sedona, AZ 86336	05/08/19	05/08/22
Western Arizona Regional Medical Center	2735 Silver Creek Road, Bullhead City, AZ 86442	10/28/19	10/28/22
White Mountain Regional Medical Center	118 S. Mountain Ave., Springerville, AZ 85938	06/18/21	06/18/24
Wickenburg Community Hospital	520 Rose Ln., Wickenburg, AZ 85390	08/08/20	08/08/23
Yavapai Regional Medical Center – West Campus	1003 Willow Creek Road, Prescott, AZ 86301	01/10/20	01/10/23
Yavapai Regional Medical Center – East Campus	7700 E. Florentine, Prescott Valley, AZ 86314	06/24/20	06/24/23
Yuma Regional Medical Center	2400 South Avenue A, Yuma, AZ 85364	10/28/20	10/28/22

***Application Pending:** **In accordance with R9-25-1303E – If an owner submits for renewal of designation, the designation does not expire until the Department has made a final determination.**

** Due to the significant impacts of COVID-19 on public health The American College of Surgeons (ACS) has made the decision to grant an extension of 1 year for verified hospital programs with a verification expiration date falling between January 2020 and December 2023. The dates above represent state designation expiratio dates, not ACS verification expiration dates.

****** **Pediatric Level I Trauma Centers:** All Arizona Designated Trauma Centers are required to have the capabilities necessary to resuscitate, stabilize, and transfer pediatric patients. Pediatric Trauma Centers have a trauma service specifically intended to meet the needs of children requiring trauma care.

TRAUMA PATIENT INCLUSION DEFINITION

ARIZONA STATE TRAUMA REGISTRY (ASTR)

Effective for records with ED/Hospital Arrival Dates January 1, 2018 – Current**

The owner of a trauma center shall ensure that:

1. The trauma registry, established according to subsection (B)(1), includes the information required in R9- 25-1309 for each patient with whom the trauma center had contact who meets one or more of the following criteria:
    a. A patient with injury or suspected injury who is:
        i. Transported from a scene to a trauma center or an emergency department based on the responding emergency medical services provider's or ambulance service's triage protocol required in R9-25- 201(E)(2)(b), or
        ii. Transferred from one health care institution to another health care institution by an emergency medical services provider or ambulance service;
    b. A patient with injury or suspected injury for whom a trauma team activation occurs; or
    c. A patient with injury, who is admitted as a result of the injury or who dies as a result of the injury, and whose medical record includes one or more of specific ICD-codes indicating that:
        i. At the initial encounter with the patient, the patient had:
        (1) An injury or injuries to specific body parts - S00-S99 with 7th character modifiers of A, B, or C ONLY. (Injuries to specific body parts –initial encounter)
        (2) Unspecified multiple injuries - T07 (unspecified multiple injuries)
        (3) Injury of an unspecified body region - T14 (injury of unspecified body region)
        (4) A burn or burns to specific body parts - T20-T28 with 7th character modifier of A ONLY (burns by specific body parts – initial encounter)
        (5) Burns assessed through Total Body Surface Area percentages - T30-T32 (burn by TBSA percentages) or
        (6) Traumatic Compartment Syndrome - T79.A1-T79.A9 with 7th character modifier of A ONLY (Traumatic Compartment Syndrome – initial encounter);

and

ii. The patient's injuries or burns were not only:

(1) An isolated distal extremity fracture from a same-level fall,

(2) An isolated femoral neck fracture from a same-level fall,

(3) Effects resulting from an injury or burn that developed after the initial encounter – (Late effect codes, which are represented using the same range of injury diagnosis codes but with the 7th digit modifier code of D through S),

(4) A superficial injury or contusion –

S00 (Superficial injuries of the head)
S10 (Superficial injuries of the neck)
S20 (Superficial injuries of the thorax)
S30 (Superficial injuries of the abdomen, pelvis, lower back and external genitals)
S40 (Superficial injuries of shoulder and upper arm)
S50 (Superficial injuries of elbow and forearm)
S60 (Superficial injuries of wrist, hand and fingers)
S70 (Superficial injuries of hip and thigh)
S80 (Superficial injuries of knee and lower leg) S90 (Superficial injuries of ankle, foot and toes)), or

(5) A foreign body entering through an orifice;

*The inclusion criteria are in the trauma rules. This document is a guide and does not supercede the rules.