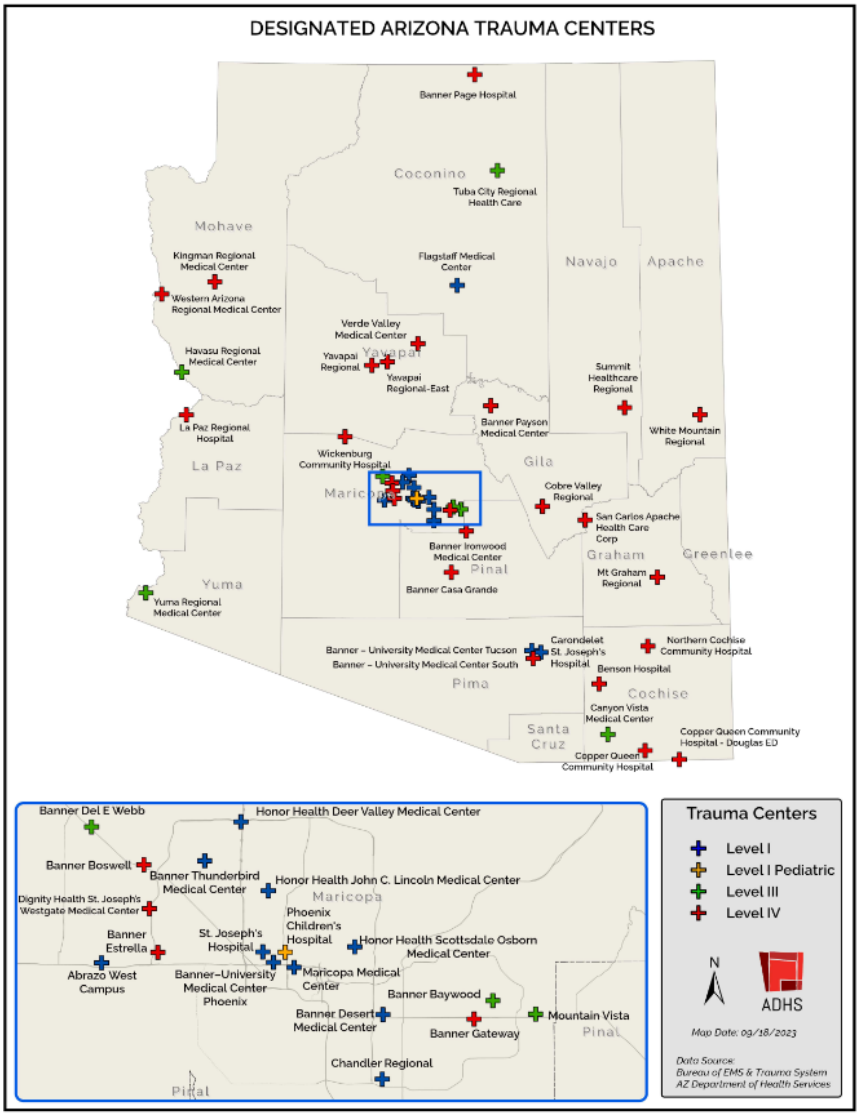
ARIZONA DEPARTMENT OF HEALTH SERVICES

Jennifer Cunico, Director

State Trauma Advisory Board 2023 Annual Report



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Acknowledgements

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.

Thank You to Public Body Members

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.

State Trauma Advisory Board		Trauma & EMS Performance Improvement Committee	
Andrew Tang, MD	Herman Butler	Alyson Welch	Josh Gaither, MD
Anthony Griffay, MD	Iman Feiz-Erfan, MD	Ariel Tarango, MPH	Julie Augenstein, MD
Brent Burgett, NRP	Nick Ells, EMCT-P	Barbara Stolfus, BSN	Laura Smith, DNP
Brian Stevens	Nirav Patel, MD	Candyce Williams, MD	Maria Salas, CSTR
Charles Hu, MD	Rodney Reed	Carey Lewis,	Michelle Guadnola, RN
Clifford Jones, MD	Ryan Southworth, DO	CPNP-AC/PC	Paul Dabrowski, MD
David Notrica, MD	Sandy Nygaard,	Corey Usher, EMCT-P	Ralph Zane Kelley, DO
Debbie Johnston	EMCT-P	Dale Woolridge, MD	Ray Proa, NREMT-P
Edgar Bissonnette, NREMT-P	Shawn Bowker, BSN	Dan Modrzejewski, Ed.D.	Shanna Cluff, BSN, CEN
Franco Castro-Marin, MD	Tara Johnson, MSN	Deborah Verkyk, BSN	Shawn Bowker, RN, BSN
Gail Bradley, MD	Vicki Bennett, MSN	Garth Gemar, MD	Tiffiny Strever, RN
Garth Gemar, MD		Heather Miller, BSN	Tom Flanagan, NRP

Annual Report to the Director

As Arizona's population continues to grow, traumatic injury remains a significant health threat. Each year, the State Trauma Advisory Board Report provides a comprehensive picture of the Arizona trauma system and the burden of traumatic injury among Arizona's residents and visitors. The report reveals information critical for mitigating the increasing trauma burden in our state: the leading causes of traumatic injury in Arizona, opportunities for continued education and injury prevention, health disparities within the Arizona trauma system, and the importance of continuing to build trauma system preparedness.

The 2023 State Trauma Advisory Board Report reveals the joint efforts of the State Trauma Advisory Board and the Bureau of EMS and Trauma System (BEMSTS) to support improved access to state trauma data through the development of a new annual report format: an online interactive trauma dashboard. The new trauma dashboard provides increased functionality to filter through several years of data to better identify trends and top causes of injury, risk and protective factors, and opportunities for quality improvement.

Throughout 2022 and the beginning of 2023, the State Trauma Advisory Board played an important role in guiding the state's trauma system through state and national updates and large-scale local events. In June 2022, the State Trauma Advisory Board held a special meeting to review the American College of Surgeons (ACS) National Guidelines for Field Triage of Injured Patients and subsequently provided oversight of implementation through the development and adoption of a statewide education and training module. Throughout 2022 and the beginning of 2023, the State Trauma Advisory Board supported the Bureau of EMS and Trauma System's implementation of the new Arizona EMS and Trauma Online Portal, bringing the traditionally paper-based state trauma center designation process onto a digital platform.

The State Trauma Advisory Board and Bureau of EMS and Trauma System will continue to support the Arizona trauma system to ensure that Arizona residents and visitors have access to high quality trauma care when they need it. In the year ahead, priorities will include the identification of a new trauma registry platform through an RFP process, refinement of the online trauma dashboard, and the development of a statewide EMS and Trauma System strategic plan. The State Trauma Advisory Board and Bureau of EMS and Trauma System remain committed to ensuring that the EMS and trauma community is engaged in further evaluating trends and outcomes, identifying needs, and developing recommendations to improve Arizona's trauma system.

Sincerely,

Gail Bradley, MD FACEP FAEMS, Medical Director

Rachel Zenuk Garcia, MPH, CHES, Bureau Chief

Link to Trauma Dashboard

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

Executive Summary

The State Trauma Advisory Board 2023 Report was developed in partnership with the Arizona Department of Health Services Bureau of EMS and Trauma System. This annual report and data visualization dashboard illustrates how Arizona's trauma system must continue to evolve and respond to new challenges as the burden of traumatic injuries increases in our state. This year's report features a 2022 Arizona Trauma Snapshot, including a summary of over 68,245 trauma incidents reported in Arizona's state trauma registry after receiving treatment at one of Arizona's 47 trauma centers. The new dashboard report provides insights into patient demographics, mechanisms of injury and mortality, assaults, and transportation modes to trauma centers, which can be filtered by year, trauma center level of designation, and age groups (all age groups, <18 years, and >=65 years).

A concerning trend noted in this year's report is that trauma incidents and rates per 100,000 Arizona residents continue to increase and American Indian and Alaskan Native populations have disproportionately higher rates of trauma incidence. Falls and motor vehicle traffic (MVT-Occupant) remain the top mechanisms of injury for all ages, including 34,084 (49.9%) and 12,253 (18.0%) patients respectively, who were treated at a trauma center in the last year. Additionally, the top mechanism of fatal injuries for children under eighteen years old in Arizona last year was firearms (9.9%), followed by motor vehicle traffic and child abuse. Furthermore, nearly one in four trauma patients were suspected or confirmed of being under the influence of drugs or alcohol. These trends are consistent with recent reports published by the Arizona Department of Transportation (ADOT) and the Arizona Child Fatality Review Team. These three reports clearly identify motor vehicle crashes and firearm injuries as the top causes of preventable death and identify substance use as a contributing factor.

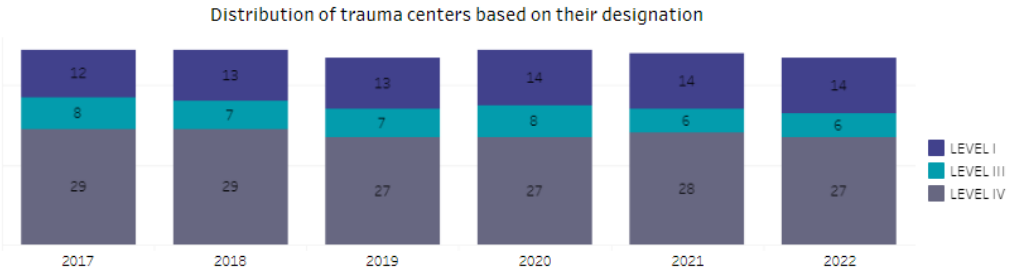
As Arizona's population continues to expand each year, the rise of traumatic injuries and deaths represents a significant health and economic threat to the state. It is critical that growing states like Arizona plan and project EMS and trauma resources that are necessary to achieve a constant state of readiness to respond to and mitigate the increasing number of preventable injuries and premature deaths due to trauma as our population rapidly expands. Consequently, Arizona's annual trauma report summarizes the importance of continuing to build EMS and trauma system preparedness, in response to the top mechanisms of injury and death, as well as opportunities for injury prevention to reduce the burden of traumatic injury. Additionally, this report highlights State Trauma Advisory Board accomplishments and recommendations moving forward.

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. 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.



In 2022, there were 47 hospitals submitting data to the Arizona State Trauma Registry (ASTR) including thirteen (13) Level 1 trauma centers, six (6) Level III trauma centers, twenty-seven (27) Level IV trauma centers, and one (1) Level 1 Pediatric trauma center. All the Level I trauma centers in Arizona are located in urban areas of the state, including 11 in Maricopa County, one in Coconino County, and two 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

All trauma centers are required to report any injuries meeting the ASTR inclusion criteria. 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.

The State Trauma Advisory Board 2023 Report analyzed incidents of traumatic injury reported to the ASTR with an Emergency Department Hospital Arrival Date between January 1, 2022 and December 31, 2022. This report gives an overview of trauma in the state by describing patient demographics, injury characteristics, and trauma risk factors.

Descriptive statistics were used to depict the distribution of traumatic injury in Arizona as well as differences over time. Trauma rates were calculated per 100,000 Arizona residents using Population Health and Vital Statistics - Population Denominators (Arizona Department of Health Services. (2023, May 16)). https://pub.azdhs.gov/health-stats/menu/info/pop/index.php.The output, code, and data analysis for this report was generated using SAS software (Version 9.4). The data visualization was generated using Tableau (version 2022.3).

2022 Arizona Trauma Snapshot

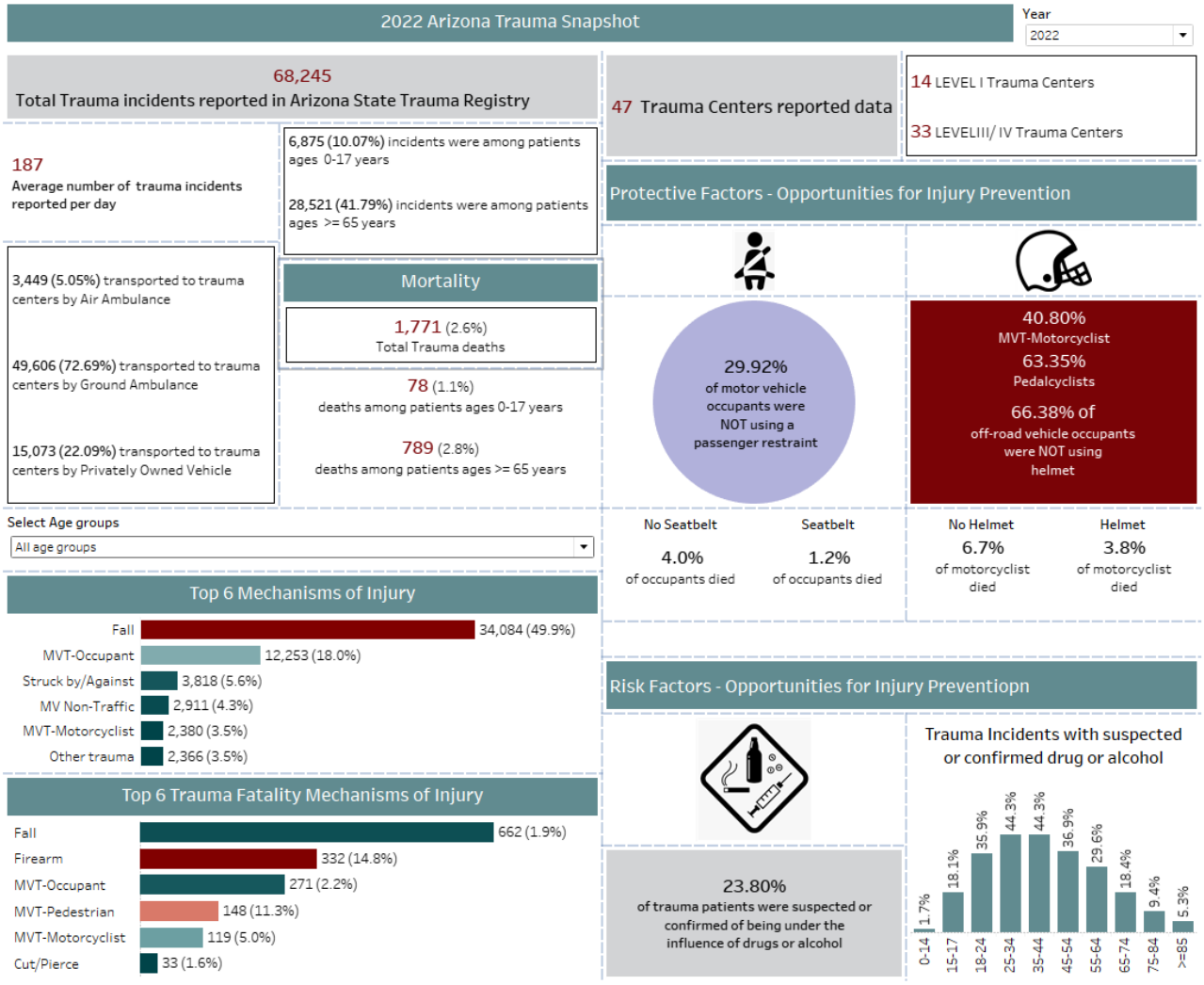
47 trauma centers reported a total of 68,245 trauma incidents to the Arizona State Trauma Registry in 2022, an average of 187 trauma incidents reported per day. 6,875 (10.07%) incidents were among pediatric patients ages 0-17 years and 28,521 (41.79%) incidents were among patients older than 65 years old. 1,771 (2.6% of all incidents) resulted in death. Of those, 78 deaths were among pediatric patients ages 0-17 years old (the same number of pediatric deaths reported in 2021) and 789 deaths were among patients greater than 65 years old.

The top mechanisms of injury in 2022 for all age groups largely mirror the top mechanisms of injury in 2021. Falls continue to be the top mechanism of injury for all age groups (49.9% of reported trauma incidents in 2022 compared to 47.07% in 2021), followed by MVT-Occupant (18.0% of all injuries in 2022 compared to 18.72% in 2021), Struck By/Against (5.6% of all injuries in 2022 compared to 6.02% in 2021), and MV Non-Traffic (4.3% in 2022 compared to 4.42% in 2021). Compared to 2021, MVT-Motorcyclist ranked slightly higher in top mechanisms of injury (3.5% in 2022 compared to 3.2% in 2021). This resulted in MVT-Motorcyclist replacing Cut/Pierce as the 5th highest mechanism of injury for all age groups for 2022 compared to 2021.

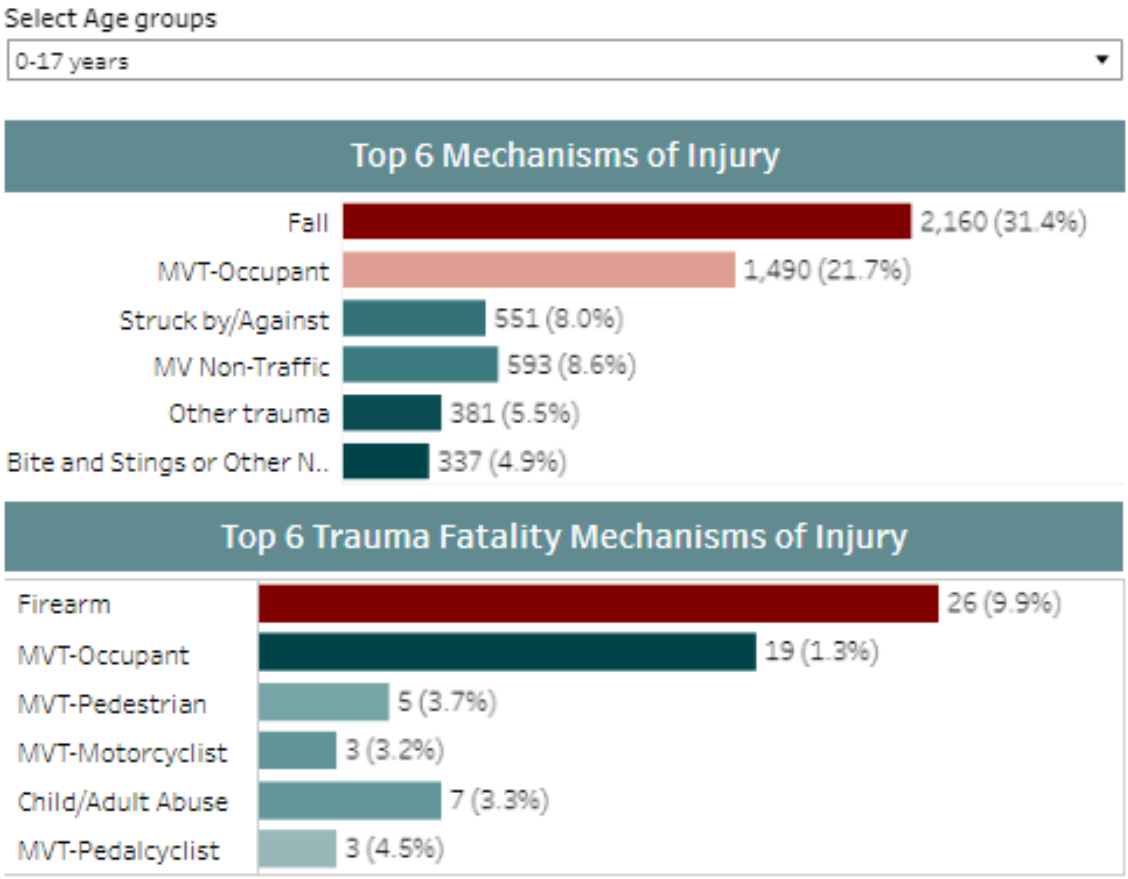
Risk and protective factors present opportunities to better understand populations with greater risk of injury or death and develop targeted safety and injury prevention programming. Helmets and passenger restraints are significant protective factors proven to increase survival. In 2022, 29.92% of motor vehicle occupants who visited a trauma center were not using a passenger restraint. Passengers who were not wearing seatbelts were nearly four times as likely to die in a motor vehicle accident compared to passengers who were wearing seatbelts. While less than half of motorcyclists involved in MVT-Motorcyclist wore helmets, motorcyclists were nearly two times more likely to die if they were not wearing a helmet at the time of the accident (6.7% compared to 3.8%).

Nearly a quarter (23.8%) of trauma patients were suspected or confirmed of being under the influence of drugs or alcohol at the time of their trauma incident. This percentage is higher among the age groups of 25-34 and 35-44, in which 44.3% of trauma patients were suspected or confirmed of being under the influence of drugs or alcohol.

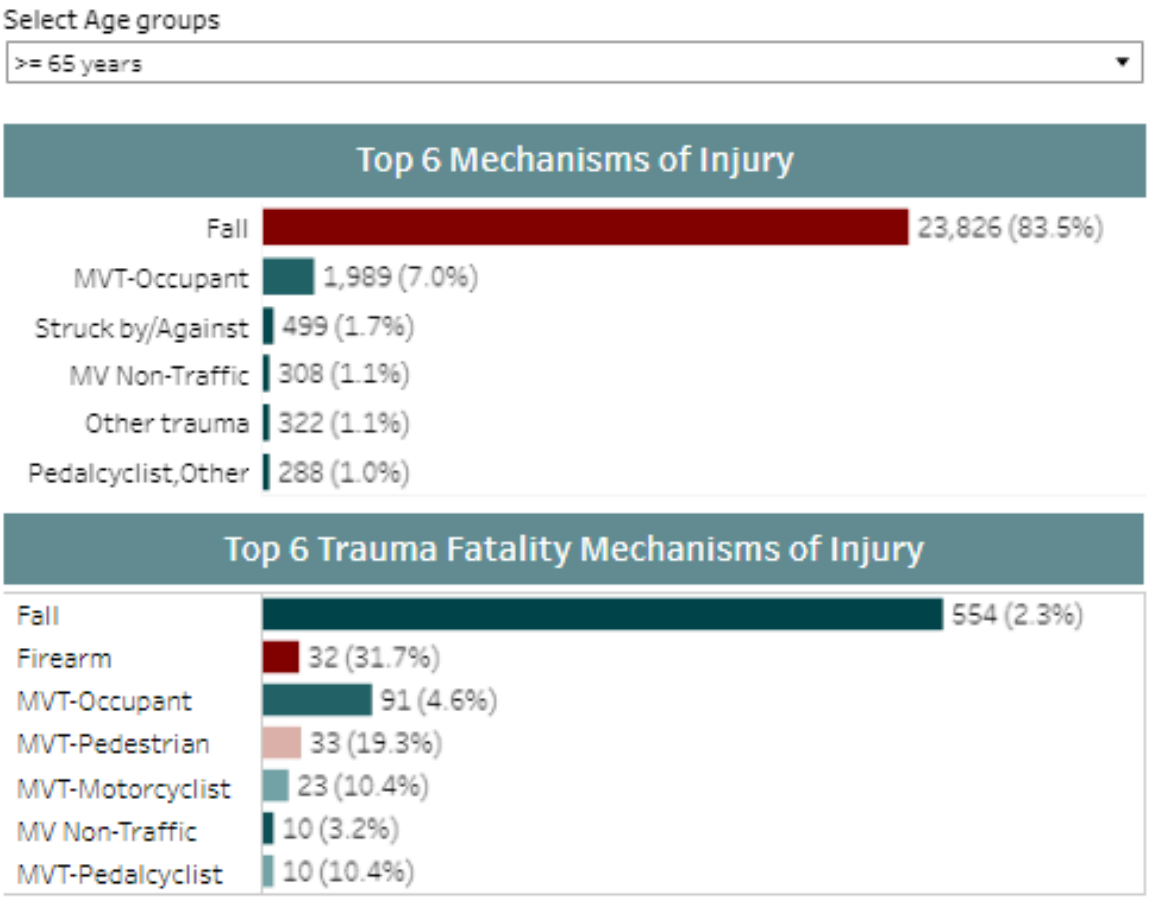
2022 Arizona Trauma Snapshot



2022 Top 6 Mechanisms of Traumatic Injury and Death for Children Under Age 18 Years



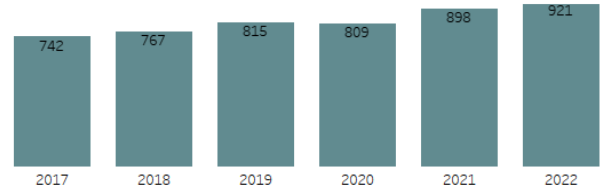
2022 Top 6 Mechanisms of Traumatic Injury and Death for Older Adults Over Age 65 Years



2022 Demographics of Patients who Suffered a Traumatic Injury

Year: 2022 | Trauma Center Designation Level: (All) | Age groups: All age groups

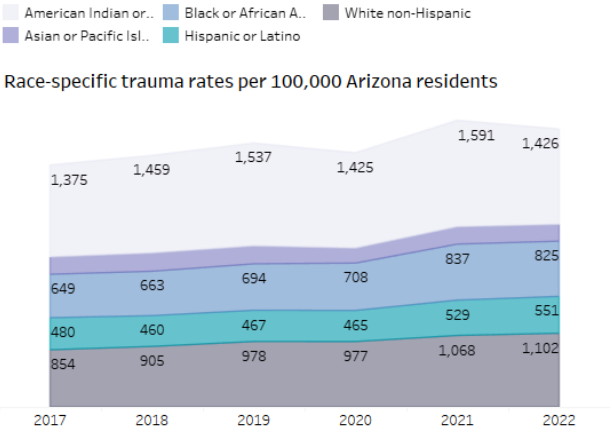
Trauma incidents and rate per 100,000 Arizona residents



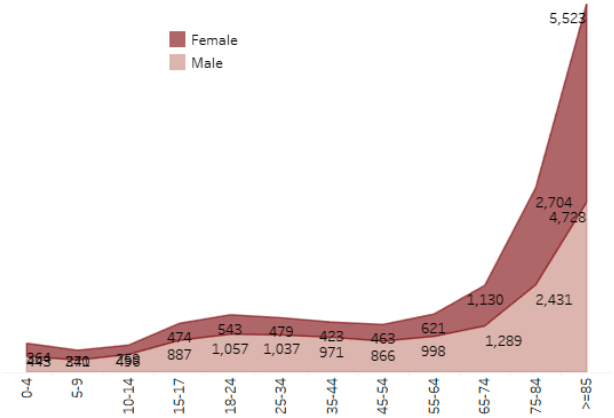
Trauma Intent

	Incidents	%
Unintentional	61,257	89.76%
Assault	5,309	7.78%
Self-harm	876	1.28%
Legal/War	145	0.21%
Undetermined/Missing	658	0.96%

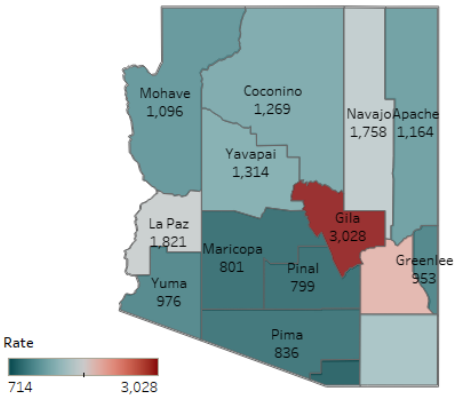
Race-specific trauma rates per 100,000 Arizona residents



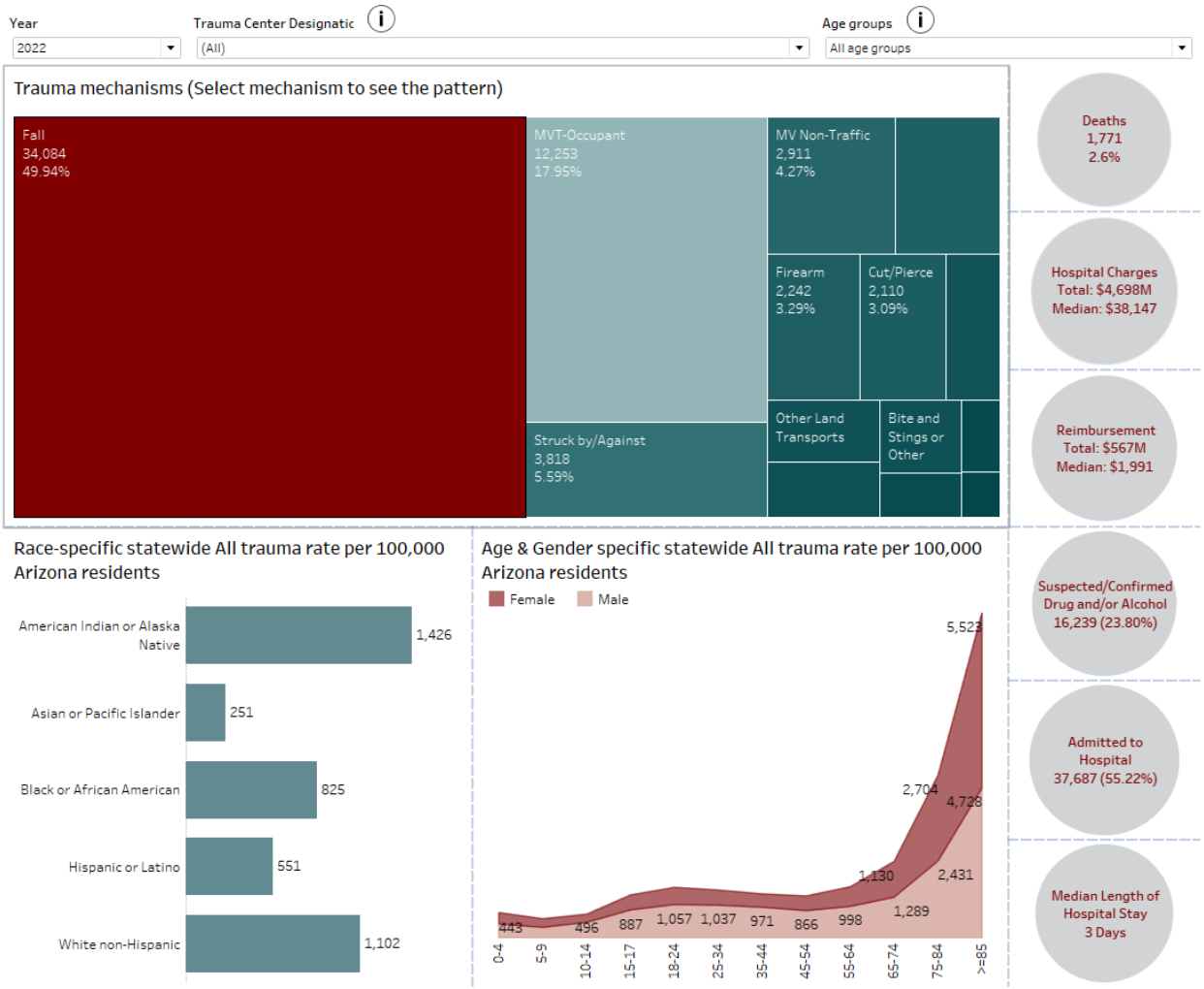
Age & Gender specific trauma rates per 100,000 Arizona residents



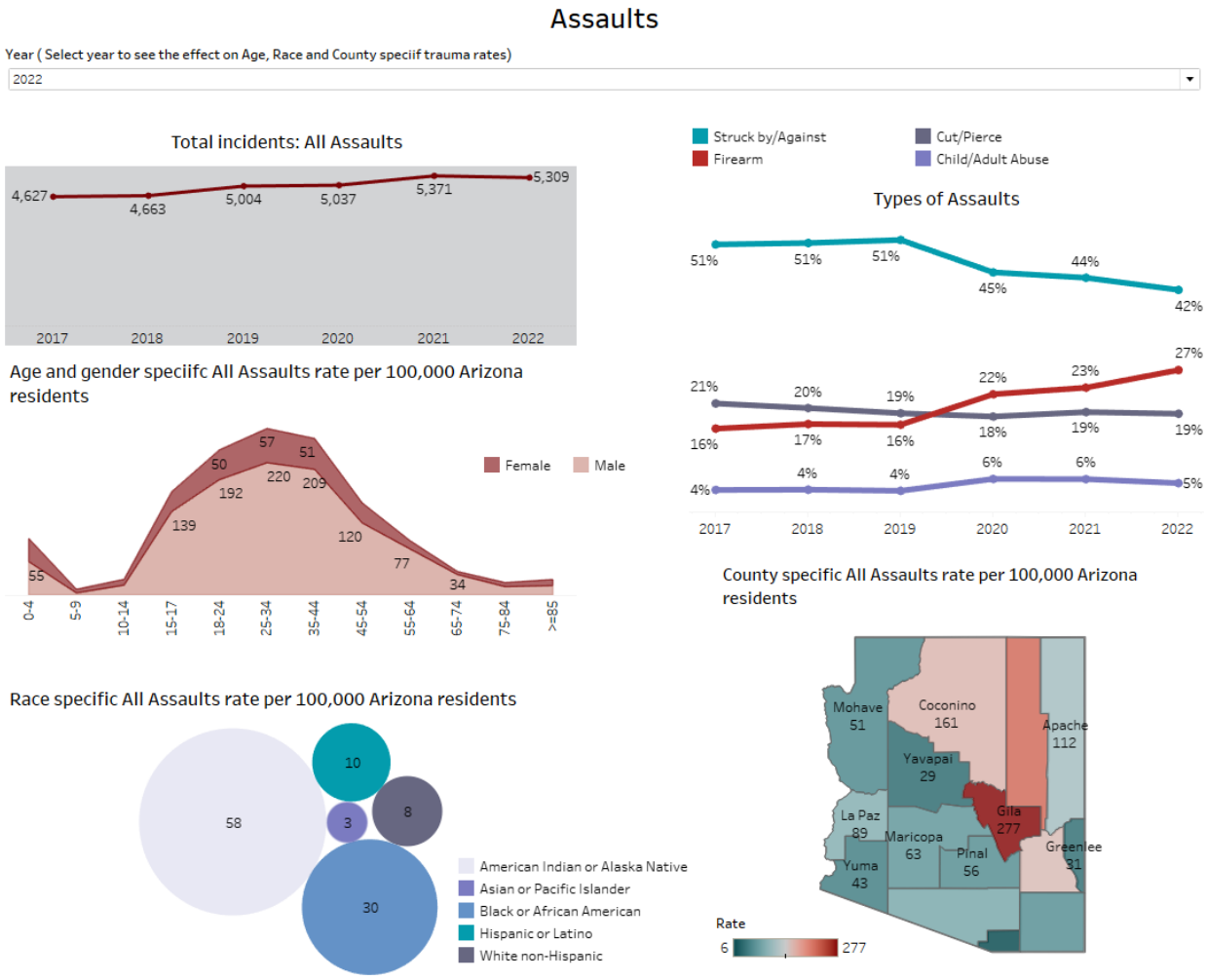
County-specific trauma rates per 100,000 Arizona residents



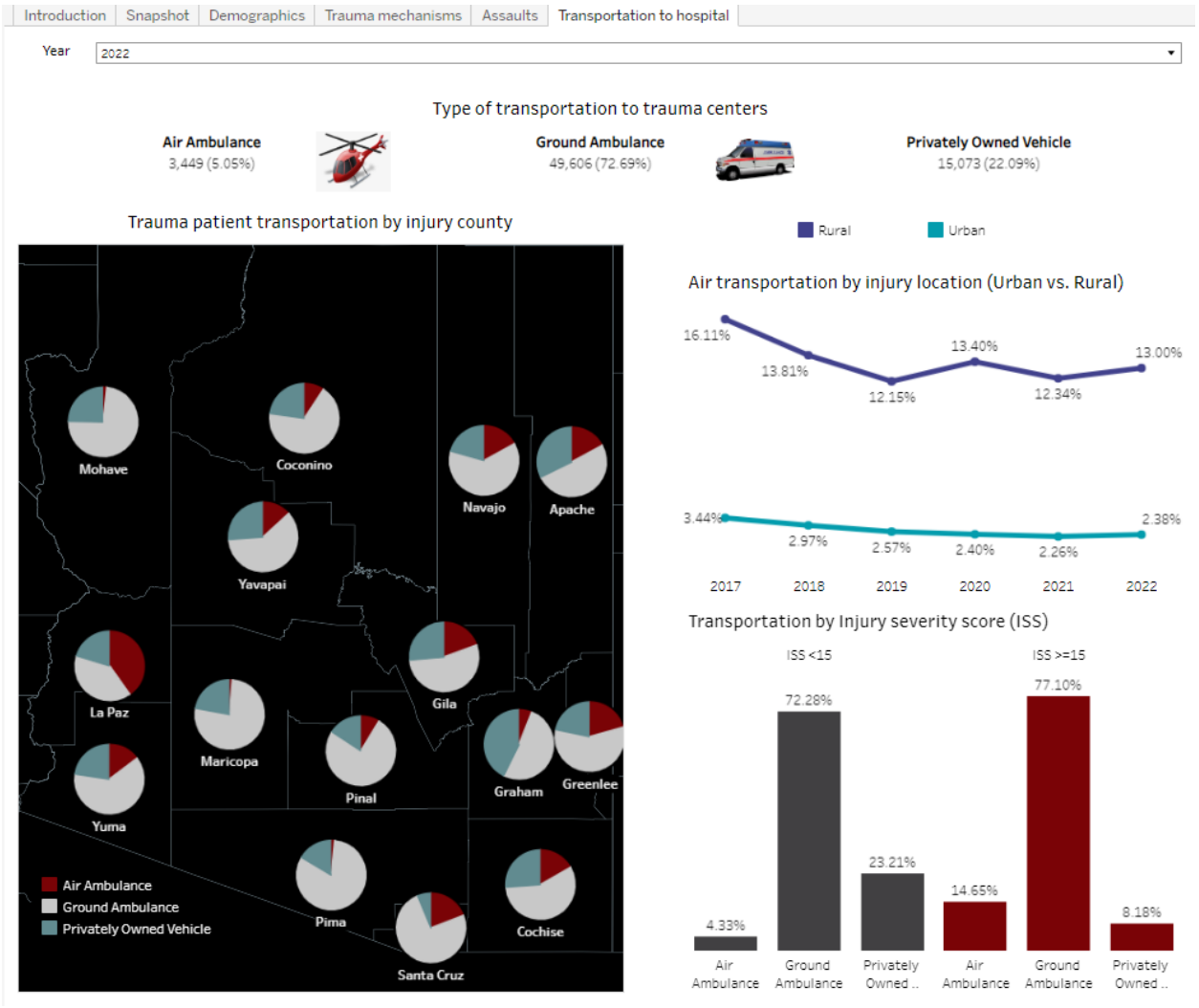
2022 Trauma Mechanisms



2022 Assaults



2022 Transportation Mode to Trauma Centers



Link to Trauma Dashboard

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State Trauma Advisory Board Accomplishments: October 1, 2022 to September 30, 2023

- Conducts three (3) State Trauma Advisory Board (STAB) regular meetings per year
- Conducts three (3) Trauma and EMS Performance Improvement (TEPI) Standing Committee regular meetings per year
- Conducted three (3) Trauma Program Manager workshops in Phoenix, Safford, and Flagstaff
- Convened workgroup meetings to review STAB and TEPI bylaws
- Special session to review the American College of Surgeons (ACS) National Guidelines for Field Triage of Injured Patients
- Development and adoption of a statewide education and training module on the updated ACS National Guidelines for Field Triage of Injured Patients
- Special session on Arizona State Trauma Registry to review statewide survey of trauma centers to provide input on a Request for Proposal for a new registry system in 2025
- Combined special meetings on Triage, Treatment, and Transport Guidelines (T3Gs) to adopt new T3Gs including national guidelines for EMS field triage of injured patients
- Participated in Education Committee workgroup to begin development of an EMS fall prevention training
- Participated in the rulemaking process to provide feedback on Arizona trauma center rules to address administrative issues identified during the last five (5) years the administrative code has been in effect
- Participated in statewide trainings on the new Arizona EMS and Trauma Online Portal for state trauma centers designation, including initial and renewal applications and site visits
- Developed a new trauma dashboard to monitor the status of the Arizona trauma system
- Adopted a new annual report format to satisfy the statutory requirements of the State Trauma Advisory Board due by October 1st each year

State Trauma Advisory Board Recommendations

- Review annual trauma dashboard and develop a report to inform policy and decision makers on preventable injuries and deaths by October 1st each year
- Collaborate with Arizona Department of Transportation, Governor's Office of Highway Safety, and Child Fatality Review Team to provide policy recommendations to reduce preventable injuries and deaths
- Promote injury prevention programs, education, and messaging to reduce preventable injuries and deaths
- Establish Annual Trauma Awards in recognition of key accomplishments by trauma program managers, trauma medical directors, registrars, and injury prevention programs
- Participate in Regional Needs Assessment and Strategic Planning efforts to update the Arizona EMS and Trauma System Plan for 2025-2030
- Participate in future Arizona State Trauma Registry meetings and trainings to prepare for implementation of new system in 2025