



State Trauma Advisory Board 2024 Annual Report



Arizona Department of Health Services
Jennie Cunico, MC, Director

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Acknowledgments

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

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Annual Report to the Director

This year, the State Trauma Advisory Board celebrates 30 years of oversight, expansion, and quality improvement within the Arizona trauma system. As Arizona's population continues to grow and the burden of traumatic injuries across the state increases, the State Trauma Advisory Board provides recommendations to reduce the significant health threat of traumatic injury.

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 2024 State Trauma Advisory Board Report and [online interactive trauma dashboard](#) illustrate the joint efforts of the State Trauma Advisory Board and the Bureau of EMS and Trauma System (BEMSTS) to provide public access to quality state trauma data from last year (January 1, 2023-December 31, 2023). The trauma dashboard offers 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 2023 and the beginning of 2024, the State Trauma Advisory Board utilized Arizona trauma data to identify key opportunities for injury prevention, and as a result played an important role in taking steps to prevent injuries.

Falls continue to be the top mechanism of injury in Arizona. Over the past year, the State Trauma Advisory Board collaborated with the BEMSTS Education Committee to publish a [Training for EMCTs for Patient Fall Prevention](#) and expanded [Falls Incidents dashboard](#). Additionally, the State Trauma Advisory Board collaborated with the Trauma Program Managers Workshop to highlight the number of [Off-Road Vehicle injuries](#) occurring in the state each year and implement an injury prevention program in partnership with the Arizona Game and Fish Department.

In early 2024, the State Trauma Advisory Board helped to facilitate the first annual statewide Trauma Awards. This inaugural event recognized seven (7) trauma system stakeholders for their outstanding contribution to the Arizona trauma system and highlighted the dedication of the State Trauma Advisory Board and Arizona trauma community to promoting excellence.

As we look forward to 2025 and beyond, 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 transitioning to a new trauma registry system, finalizing and implementing the statewide EMS and Trauma System strategic plan, and identifying further opportunities to promote injury prevention. We 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

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Executive Summary

The State Trauma Advisory Board 2024 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 illustrate 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 2023 Arizona Trauma Snapshot, including a summary of over 71,015 trauma incidents reported in Arizona's state trauma registry after receiving treatment at one of Arizona's 47 trauma centers. The 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).

At a rate of 1,380 traumatic injuries per 100,000 population in 2023, the American Indian/Alaska Native population has by far the highest rate of traumatic injury, consistent with previous years. This year's report also shows a substantial increase in the rate of traumatic injury among Asian/Pacific Islanders, up to 299 per 100,000 population from 251 in 2022. Falls and motor vehicle traffic (MVT-Occupant) remain the top mechanisms of injury for all ages, including 36,986 (52.1%) and 12,283 (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 (34 fatalities, 14.3% of traumatic firearm injuries), followed by motor vehicle traffic (including occupant and pedestrian incidents) and child abuse. This data reflects recent reports published by the Arizona Department of Transportation (ADOT) and the Child Fatality Review Team. Furthermore, nearly one in four trauma patients were suspected or confirmed of being under the influence of drugs or alcohol.

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 the State Trauma Advisory Board's accomplishments and recommendations moving forward.

Background

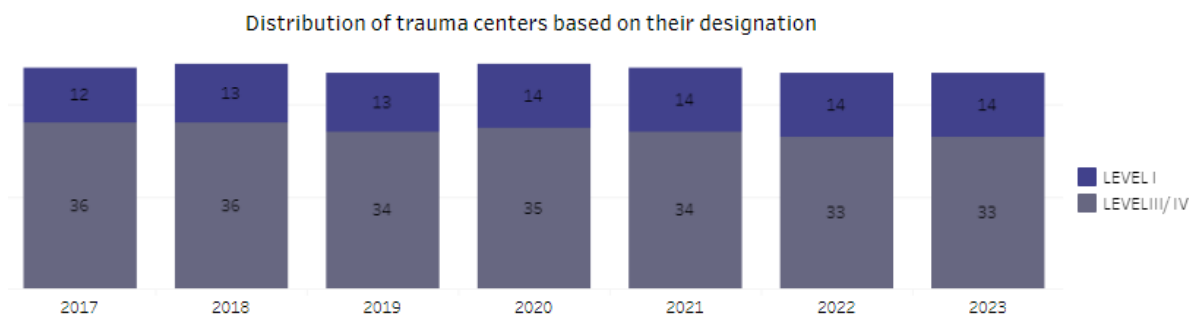
The Bureau of Emergency Medical Services and Trauma System (BEMSTS) is responsible for collecting, analyzing, and reporting on data obtained from designated trauma centers and participating EMS agencies to enhance the EMS and Trauma System in Arizona. Geographically, Arizona's trauma system has evolved 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

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of traumatic injuries and deaths during that time. Since the 2000 Census, Arizona's population has grown 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 2023, there were 47 hospitals submitting data to the Arizona State Trauma Registry (ASTR): fourteen (14) Level 1 trauma centers, including one (1) Level 1 Pediatric trauma center, six (6) Level III trauma centers, and twenty-seven (27) Level IV trauma centers. 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.

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The State Trauma Advisory Board 2024 Report analyzed incidents of traumatic injury reported to the ASTR with an Emergency Department Hospital Arrival Date between January 1, 2023 and December 31, 2023. This report gives an overview of trauma in the state by describing patient demographics, injury characteristics, and trauma risk factors. Analysis was conducted utilizing the [CDC's External Cause-of-Injury Framework for Categorizing Mechanism and Intent of Injury](#).

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 2022.4).

2023 Arizona Trauma Snapshot

Last year, 47 trauma centers reported a total of 71,015 trauma incidents to the Arizona State Trauma Registry in 2023, an average of 195 trauma incidents reported per day. 6,568 (9.25%) incidents were among pediatric patients ages 0-17 years and 31,334 (44.14%) incidents were among patients older than 65 years old. 1,750 (2.5% of all incidents) resulted in death. Of those, 101 deaths were among pediatric patients ages 0-17 years old (up from 78 pediatric deaths reported in 2022) and 757 deaths were among patients greater than 65 years old.

The top mechanisms of injury in 2023 for all age groups largely mirror the top mechanisms of injury in previous years. Falls continue to be the top mechanism of injury for all age groups (52.1% of reported trauma incidents in 2023 compared to 49.9% in 2022), followed by MVT-Occupant (18.0% of all injuries in 2023, the same proportion as 2022), Struck By/Against (5.3% of all injuries in 2023 compared to 5.6% in 2022), and MV Non-Traffic (3.8% in 2023 compared to 4.3% in 2022). MVT-Motorcyclist maintained its rank as the 4th most common injury mechanism in 2023 (3.4% in 2023 compared to 3.5% in 2022).

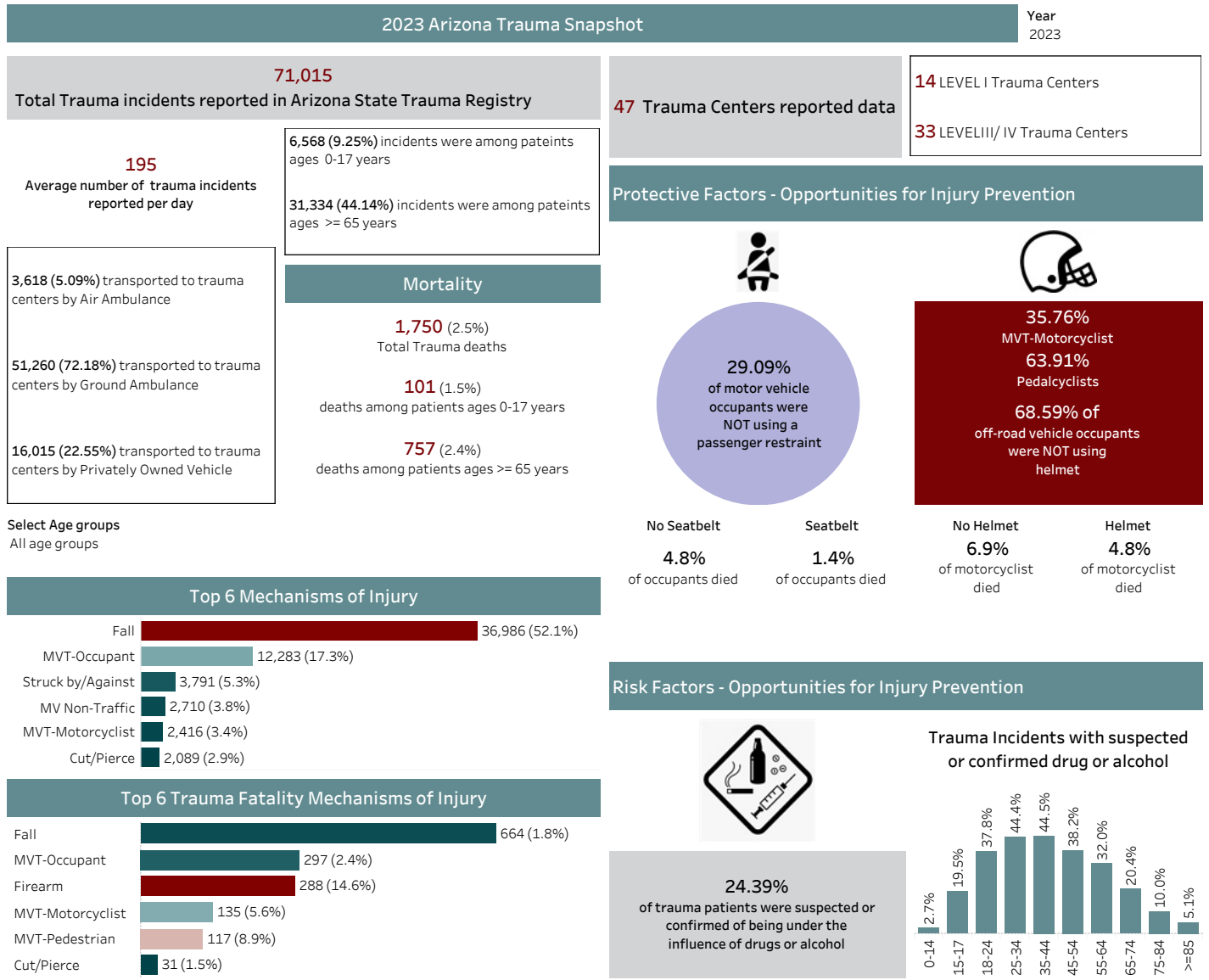
Risk and protective factors present opportunities to better understand populations with greater risk of injury or death and develop targeted safety and injury prevention programming. Helmets and passenger restraints are significant protective factors proven to increase survival. In 2023, 29.09% of motor vehicle occupants who visited a trauma center were not using a passenger restraint. Passengers who were not wearing seatbelts were over three times as likely to die in a motor vehicle accident compared to passengers who were wearing seatbelts. Less than half of motorcyclists involved in MVT-Motorcyclist accidents wore helmets, and motorcyclists were more likely to die if they were not wearing a helmet at the time of the accident (6.9% compared to 4.8%).

Nearly a quarter (24.39%) 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 over 44% of trauma patients were suspected or confirmed of being under the influence of drugs or alcohol.

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Preview of 2023 Arizona Trauma Snapshot



Full, interactive data dashboard is published online at:

<https://www.azdhs.gov/preparedness/emergency-medical-services-trauma-system/data-visualization/index.php#dashboards-trauma-injuries-year>

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State Trauma Advisory Board Accomplishments: October 1, 2023 to September 30, 2024

- Conducted three (3) State Trauma Advisory Board (STAB) regular meetings per year
- Conducted three (3) Trauma and EMS Performance Improvement (TEPI) Standing Committee regular meetings per year
- Conducted two (2) Trauma Program Manager workshops in Phoenix
- Conducted four (4) Trauma Registry Users Group meetings
- Conducted the first annual Trauma Awards at the May 2024 STAB meeting and recognized seven (7) trauma system stakeholders for their outstanding contributions to the trauma community
- Held a Fall Injury workgroup to review and discuss the impact of ground level falls and associated injuries on the EMS and Trauma system statewide
- Created fall injury dashboard to include patients transported to trauma and non-trauma facilities across Arizona
- Participated in Education Committee workgroup to begin development of an EMS fall prevention training and convened a workgroup meeting to review Fall data
- Expanded available trauma dashboards to monitor traumatic injuries and their impact in Arizona
- Provided Off-Highway Vehicle (OHV) safety recommendations and a data dashboard in collaboration with the Trauma Program Managers and the Arizona Game and Fish Department, including promoting “Quail Kids” OHV outreach program as best practice that reached 72 trainers and 450 children, which expands on knowledge in the safety course required by legislation that is set to go into effect in January 2025
- In collaboration with other BEMSTS committees, provided recommendations related to Drug Tables and Scope of Practice revisions
- Participated in the development of the EMS & Trauma System Needs Assessment and 2025-2030 Strategic Plan, including Arizona trauma registry transition milestones and recommendations
- Participated in the transition of all trauma designation applications to the new EMS & Trauma Portal and trauma site visit medical record reviews to virtual medical record reviews

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 recommendations to reduce preventable injuries and deaths
- Promote injury prevention programs, education, and messaging to reduce preventable injuries and deaths
- Continue Annual Trauma Awards in recognition of key accomplishments by trauma program managers, trauma medical directors, registrars, and injury prevention programs
- Participate in implementation of the 2025 - 2030 EMS and Trauma System Strategic Plan

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- Participate in future Arizona State Trauma Registry meetings and trainings to prepare for implementation of the new system in 2025
- Encourage trauma centers to include fentanyl testing and reporting as part of Arizona State Trauma Registry data to better understand how fentanyl is affecting patient outcomes in Arizona
- Continue to expand trauma dashboards related to injury prevention, including the examination of anticoagulant use related to fall injuries and seatbelt use related to OHV injuries.
- Expand OHV injury prevention project to collaborate with additional stakeholders (i.e. EMS agencies)
- Collaborate across the state to promote fall injury prevention and decrease the morbidity and mortality associated with ground level falls
- Further evaluate the impact of all traumatic injuries and associated mechanisms of injury on the Trauma system to include improving reimbursement in order to sustain the availability of Trauma care statewide
- Identify additional issues that limit the availability of trauma care statewide