

2022 Annual Trauma Data Report

TRISTATE TRAUMA COALITION

The Health Collaborative

Tristate Trauma Coalition Annual Report 2022

The Tristate Trauma Coalition (TSTC) is a group of multidisciplinary agencies and organizations which collaborate to serve the community by improving patient outcomes and providing a forum for health care facilities and systems, emergency medical services, and community partners to work together to improve the care of the injured patient. The mission to enhance the care of the injured patient is achieved through collection and analysis of data from hospitals in the region, providing quality professional trauma education, and convening stakeholders to collaborate. The TSTC receives trauma data from 25 hospital members. The Health Collaborative (THC) is the convener, Regional Trauma Organization, and trauma education program manager for the TSTC.

The 2022 Annual Report of the Tristate Trauma Coalition contains data from local trauma centers and hospitals that treat trauma-related injuries in the Tristate Region of southwest Ohio, northern Kentucky, and southeast Indiana. The data were reported in the 2022 calendar year (CY2022). All trauma facilities in the State of Ohio are required to submit trauma patient data to the State of Ohio EMS/Trauma Data Registry on a quarterly basis. As the Regional Trauma Organization for the TSTC, THC submits quarterly data to the State on behalf of certified trauma centers. The report is reflective of aggregate trauma data and covers 12,719 records of patients treated across the region for CY2022. Current and historical data presented in this report were pulled from ESO TraumaBase system in June 2023. The accuracy of these data is reliant on manual entry at the facility delivering care. The visuals included in this report represent the aggregated regional data as queried, without statistical analysis performed. Duplicates occur in the data set when patients are transferred between trauma facilities. These duplicates are not removed from the data used in this report. Unless otherwise indicated, figures and tables in this report represent data reported in CY2022.

Data collected in the trauma registry must meet certain ICD-10 rules to be considered a traumatic injury. The Ohio Trauma Registry defines the trauma population as injured patients who are admitted to a facility, transferred to a higher level of care, or expired. Some variation in this definition will depend on inclusion criteria from the region, state or national dictionary. The mechanism of injury or cause code indicates how the patient became injured, such as a motor vehicle accident, fall, or assaulted. The cause code is captured for each patient which then defines the classification for type of injury. The types of traumatic injury with brief examples include:

- Blunt –vehicular impact with impalement, blunt for trauma with non-sharp object (e.g. fist, bat), falls
- Penetrating –gunshot wounds, stab wounds, dog bites, impalement, punch/fall through glass resulting in deep penetration
- Thermal –thermal burns, chemical burns, hypothermia
- Asphyxial – smoke inhalation, suffocation, drowning
- NA/Other – envenomation, human bites, overexertion resulting in injury

Tristate Trauma Coalition Facilities

Aggregate data in this report represent the following facilities:

Level 1 Trauma Centers	Level 3 Trauma Centers
UC Health – University of Cincinnati Medical Center	Atrium Medical Center
Cincinnati Children’s Hospital Medical Center	Kettering Ft. Hamilton Hospital
	Tri-Health Bethesda North Hospital
	UC Health – West Chester Hospital
TSTC Non-Trauma Facilities	
Adams County Regional Medical Center	Mercy Health Queen City Medical Center
Cincinnati Children’s Hospital Liberty	Mercy Health West Hospital
Clinton Memorial Hospital	The Christ Hospital
Mercy Health Anderson Hospital	The Christ Hospital Liberty
Mercy Health Clermont Hospital	TriHealth Bethesda Arrow Springs
Mercy Health Fairfield Hospital	TriHealth Bethesda Butler
Mercy Health Harrison Hospital	TriHealth Good Samaritan Hospital
Mercy Health Jewish Hospital*	TriHealth Good Samaritan Western Ridge
Mercy Health Mt. Orb Medical Center	TriHealth McCullough-Hyde Hospital
Mercy Health Rookwood Medical Center	
<i>*2022 data for Mercy Health Jewish was not available at time of data export.</i>	

Summary of Findings

The population of the Tristate is approximately 2.2 million based upon the 2021 census.¹ Over the past 8 years, reported traumatic injuries continue to rise. The data indicate that most traumatic injuries consistently occur between the months of May and October. Patients 64 years of age or older represent 23% percent of the total population and the 44.1% of traumatic injuries. Patients, 20 to 35-years old represent 13% percent of the total population and 25% percent of fatalities from trauma injuries. The percentage of trauma patients by gender has remained relatively stable and balanced. The top five causes for traumatic injury, after falls, are motor vehicle crash, struck by or against, gunshot, cut/pierce, and motorcycle crash. The top five causes of death from traumatic injury are suffocation, gunshot, near drowning, pedestrian, and motor vehicle crash. Blunt force trauma continues to be the highest percentage for types of injury. Burns account for the longest hospital stay followed by motorcycle crash. Most trauma patients that present to the emergency department were either admitted the floor, held for observation or in a step-down unit. For the past 3 years, the injury severity scores (ISS) have remained consistent at an average of 8.5. The data illustrates that 52% of majority of traumatic injuries presenting to the hospital are minor. Ambulance services provide approximately 70% of transportation for patients with traumatic injuries. Over the past 3 years, it appears that the use of private, public, or walk-in has increased. The wait time to transfer an ED patient to another facility is noted as greater than 4 hours and has continued to rise over the past three years.

Regional Opportunities for Improvement

The data queried for CY2022 identify an opportunity to investigate wait time for patients to be transferred to another facility to determine if the current 4+ hour wait for many patients has downstream impacts.

Falls continue to lead traumatic injury mechanism and length of stay. With patients 64 years and older having the most traumatic injuries, these data indicate that investigation of interventions, such as fall prevention programs could have benefit in the region.

The 20 – 35 age range has a higher fatality rate than any other age group. Investigating the relationship between age, race and ethnicity, and access via zip code illuminate additional strategies to reduce the fatality rate.

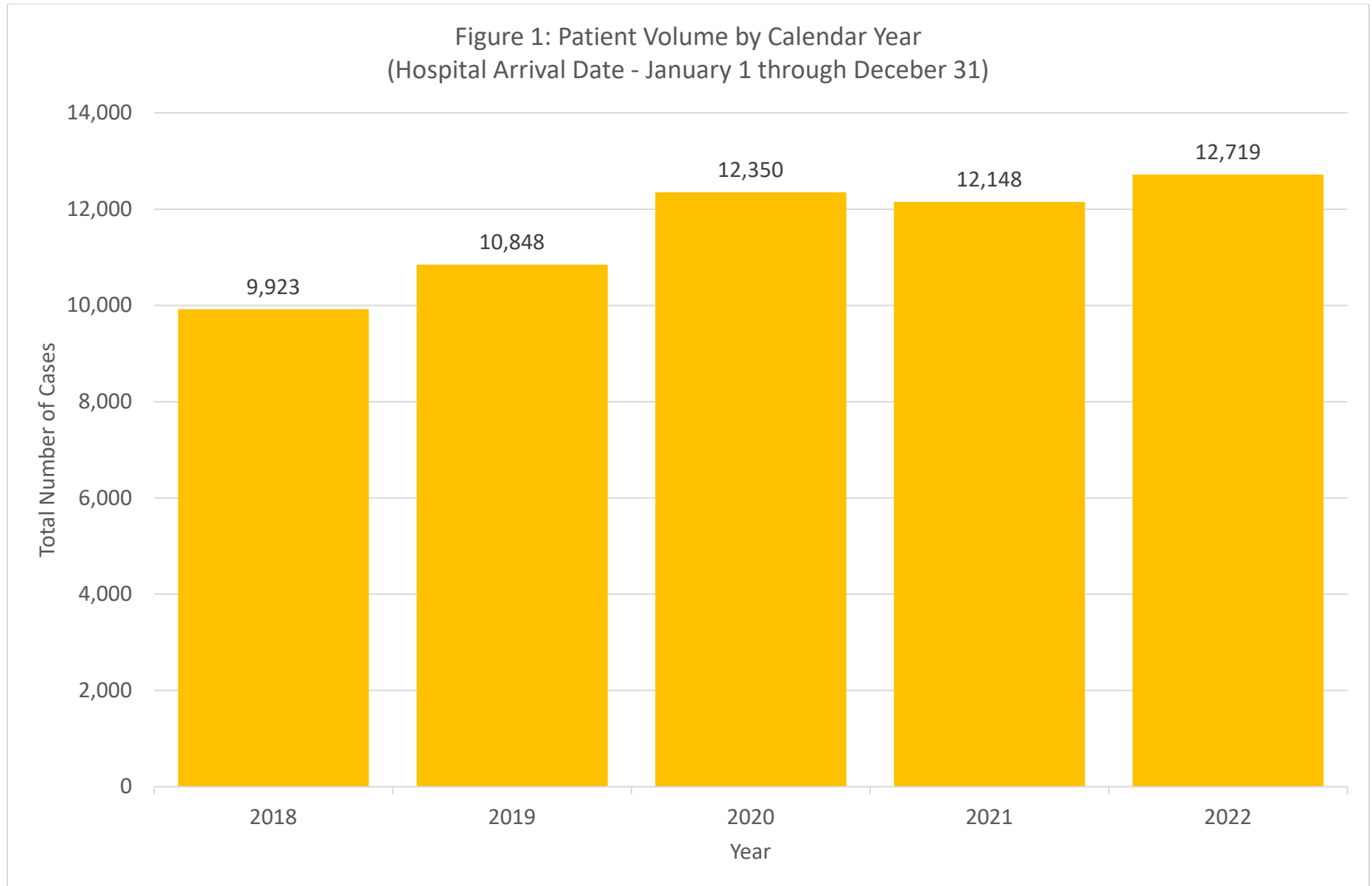
Acknowledgements

This report would not be possible without the expertise and hard work of the TSTC hospitals' registrars.

¹ <https://censusreporter.org/profiles/31000US17140-cincinnati-oh-ky-in-metro-area/>

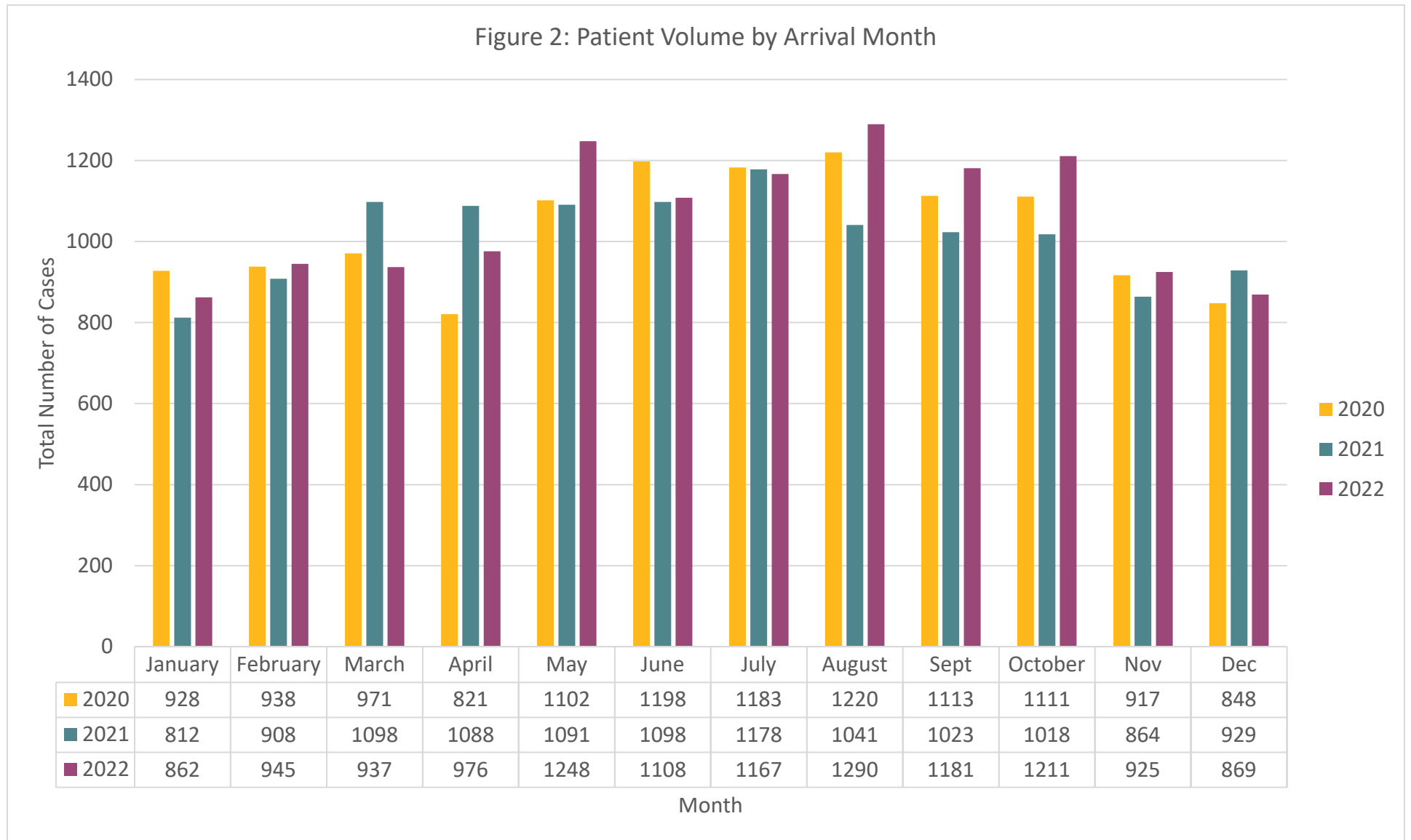
Patient Volume by Calendar Year

Figure 1 displays the total number of cases for all facilities in the Tristate Trauma Coalition (TSTC) for the last five years.



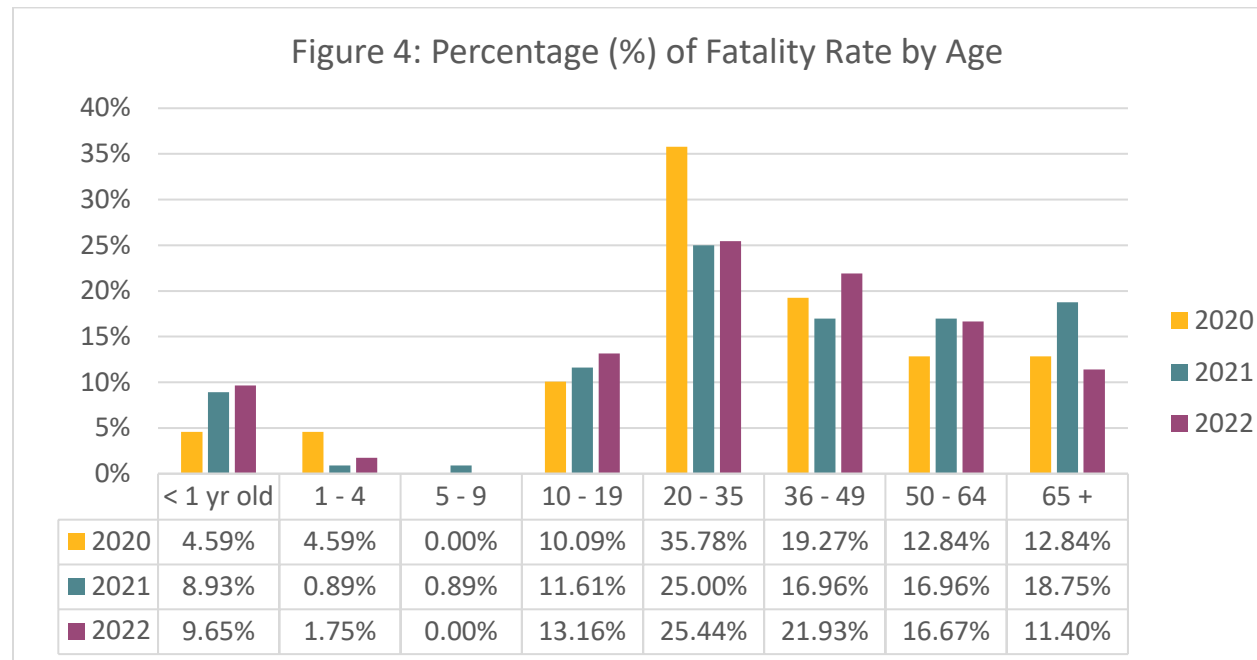
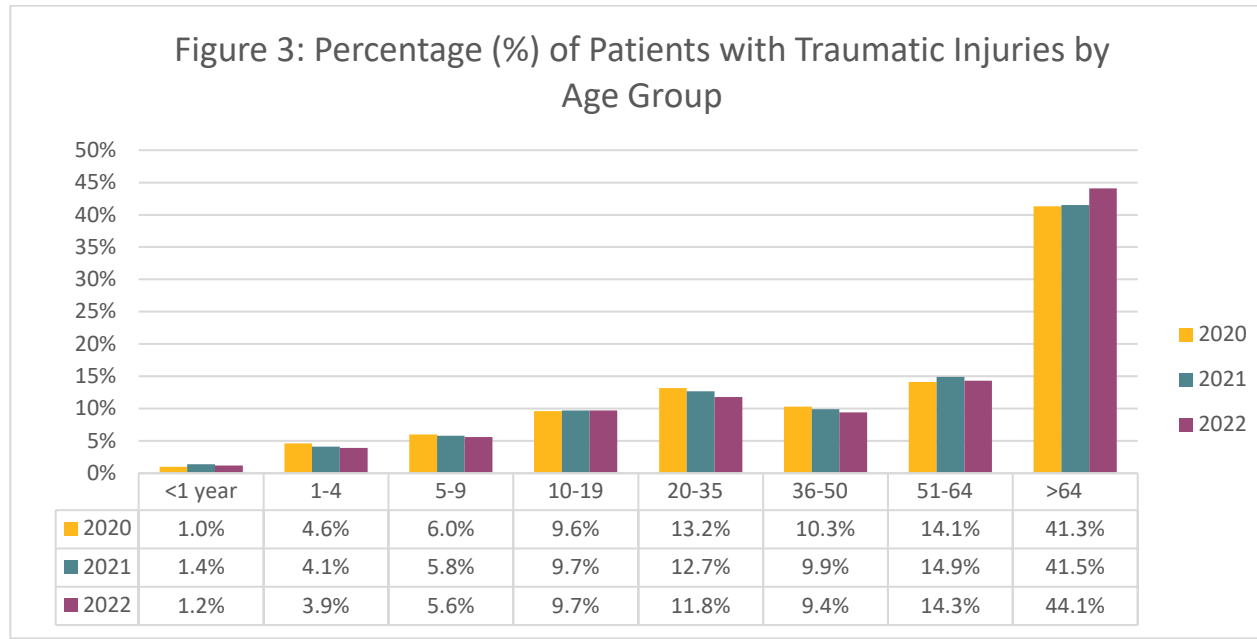
Patient Volume by Arrival Month

Figure 2 illustrates May through October shows a higher number of traumatic injuries compared to other months from 2020 - 2022.



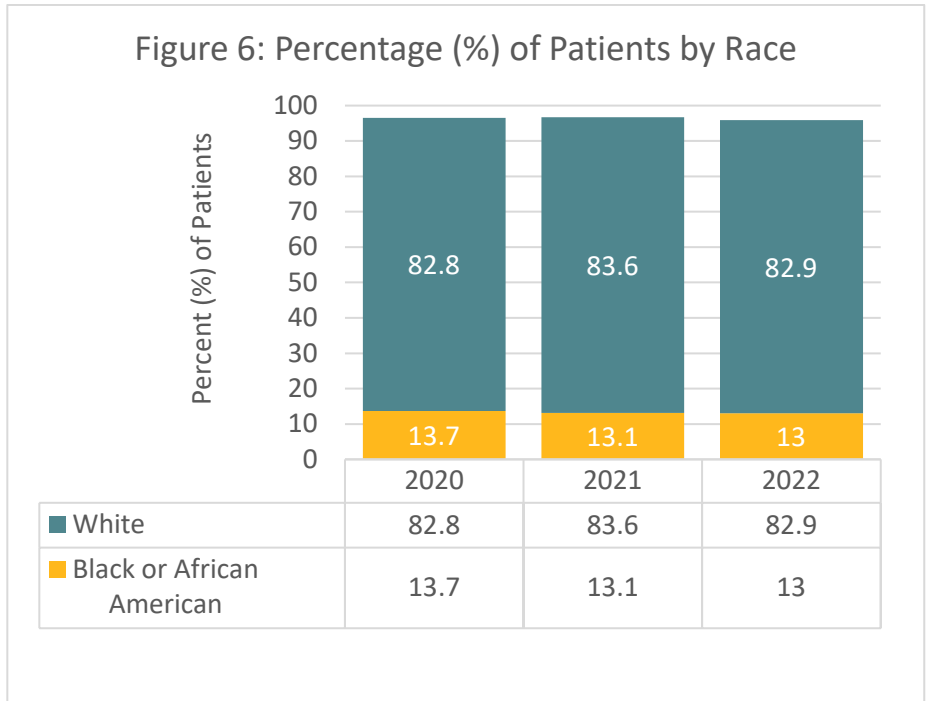
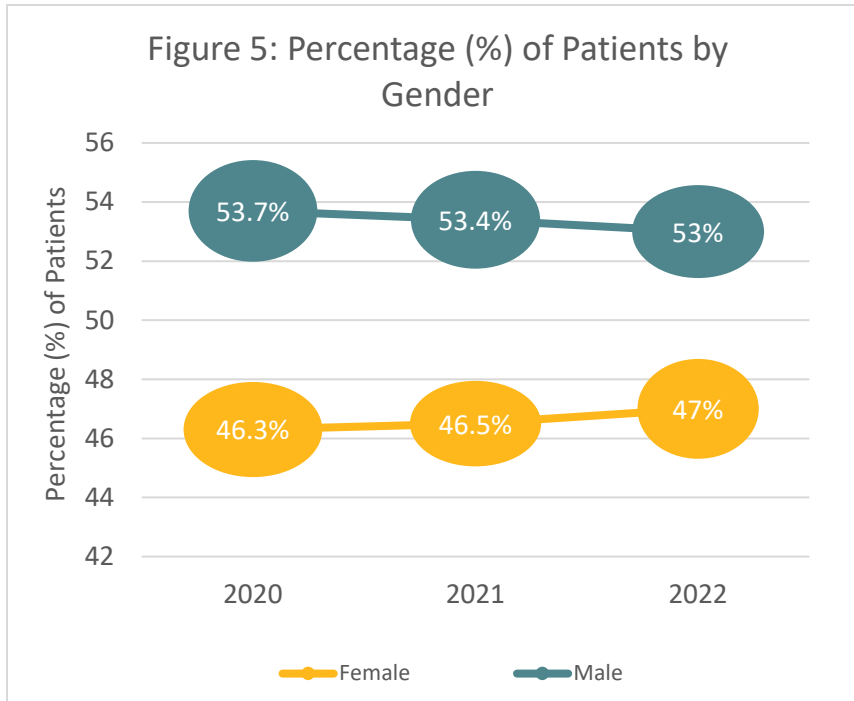
Percent of Patients by Age

Figure 3 shows patients over 64 years of age that have the highest percentage of traumatic injuries yet, patients of 20 – 49 years of age have the highest fatality rate as illustrated in Figure 4.



Percent of Patients by Gender & Race

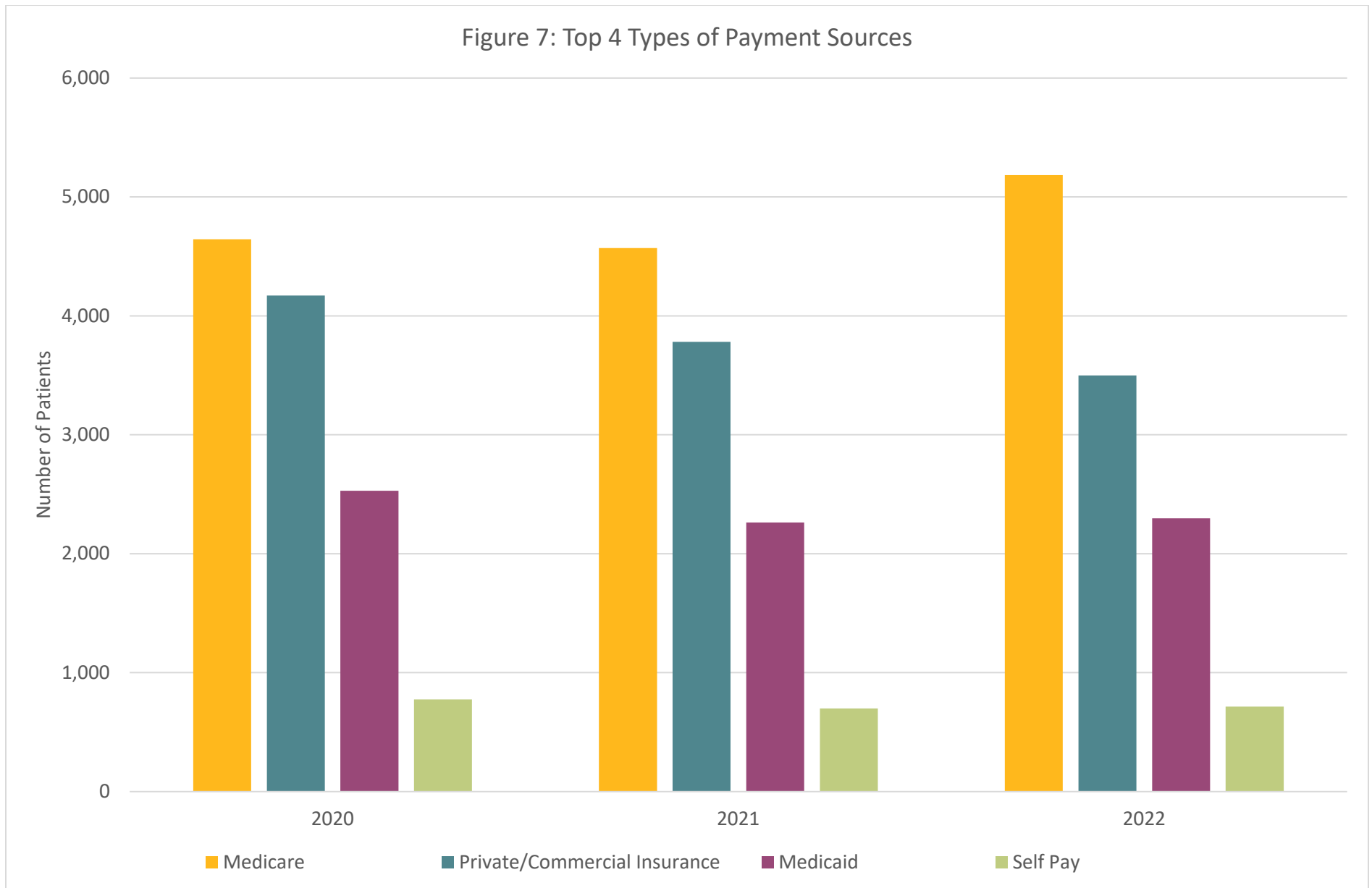
As shown in Figure 5, the percentage of trauma patients by gender has remained relatively stable and balanced. Over the past three years, there has been a 0.7% downward shift in male and upward shift in females. White (non-Hispanic) makes up 78.9% of the Cincinnati Ohio, Kentucky & Indiana tristate area and Black or African American (non-Hispanic) makes up 11.9% of the tristate population². Figure 6 illustrates that 83% of trauma patients are White (non-Hispanic) while, 13% of trauma patients are black, indicating that the white population may be over represented. Of note: Asian, American Indian, Native Hawaiian, Pacific Islander, and Other Race, together, represented 2% of the traumas reported.



² <https://datausa.io/profile/geo/cincinnati-oh-ky-in>

Type of Payment Source

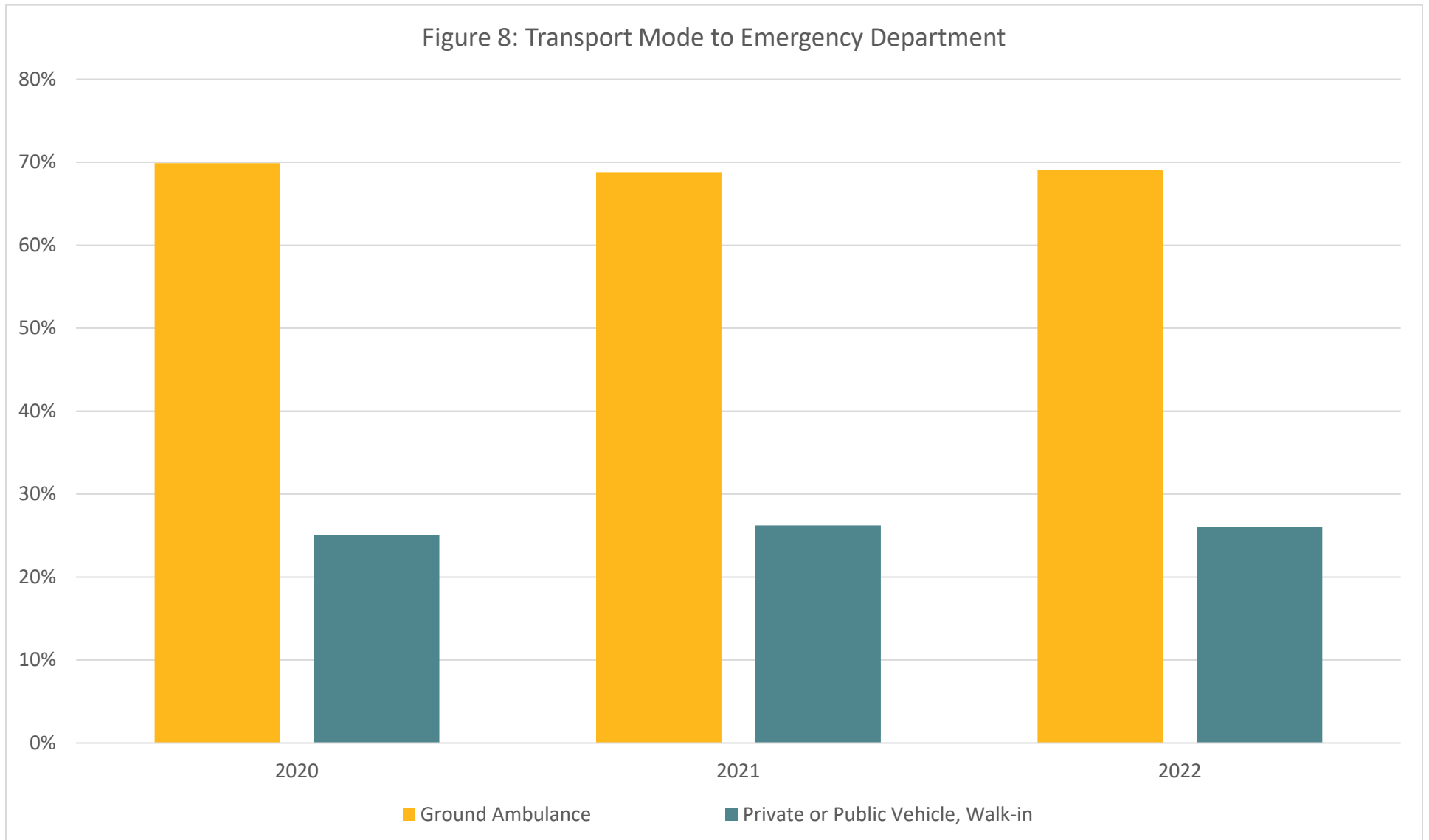
In the Cincinnati, Kentucky, Indiana Tristate area, 12.4% of the trauma population is insured by Medicare and 56.5% has commercial coverage.³ Figure 7 illustrates that patients experiencing trauma injuries most frequently are Medicare beneficiaries.



³ <https://datausa.io/profile/geo/cincinnati-oh-ky-in#demographics>

Transport Mode to Emergency Department

Figure 8 illustrates the different modes of transportation taken to the hospital. While ambulance services provide the highest percentage of transportation, the use of private vehicles has consistently increased from 20% to 26% of patients over the past three years. Less than 6% of patients were transported by helicopter, police, other or transportation was not documented.



Mechanism of Injury

Mechanism of injury is as illustrated in Table 1. Falls provided the largest number of traumatic injuries in the region, 7,753, followed by motor vehicle crash, 1,388. Table 2 illustrates that burns account for the longest length of hospital stay. While falls are most prevalent, they account for 0% of trauma-related deaths. Twenty-seven percent of suffocation injuries resulted in death in 2022, as shown in Table 3. Of note, the following mechanism of injuries resulted in zero deaths: animal injury, bicycle, crush injury, fall, machine, other, sport injury, and stabbing/cut/pierce.

<i>Mechanism of Injury</i>	<i>Injury Count</i>
Fall	7753
Motor Vehicle Crash	1388
Struck by or Against	611
Gun Shot	450
Cut/Pierce	392
Motorcycle Crash	343
Burns - Thermal, Chemical, Electrical	322
Sports related injury	247
Animal	188
Other Vehicular	186
Pedestrian	173
Assault	153
Unknown	139
Bicycle	139
Machine	81
Suffocation	37
Near Drowning	31
Other	30
Crush	15
Biting	5
Inhalation	1

<i>Mechanism of Injury</i>	<i>Avg. Days of Stay</i>
Burns	8.77
Motorcycle Crash	5.52
Pedestrian	5.42
Motor Vehicle Crash	5.18
Assault by person	5.04
Unknown (Found down)	4.57
Fall	4.33
Machine	4.16
Struck by or Against	4.16
Bicycle	4.14
Gun Shot Wound	4.13
Other Vehicle/Off road	4.04
Crush Injury	4.00
Suffocation	3.89
Drowning	3.24
Other	2.80
Cut	2.66
Stabbing/Cut/Pierce	2.45
Animal Injury	1.98
Sport Injury	1.19
Biting (human)	1.00

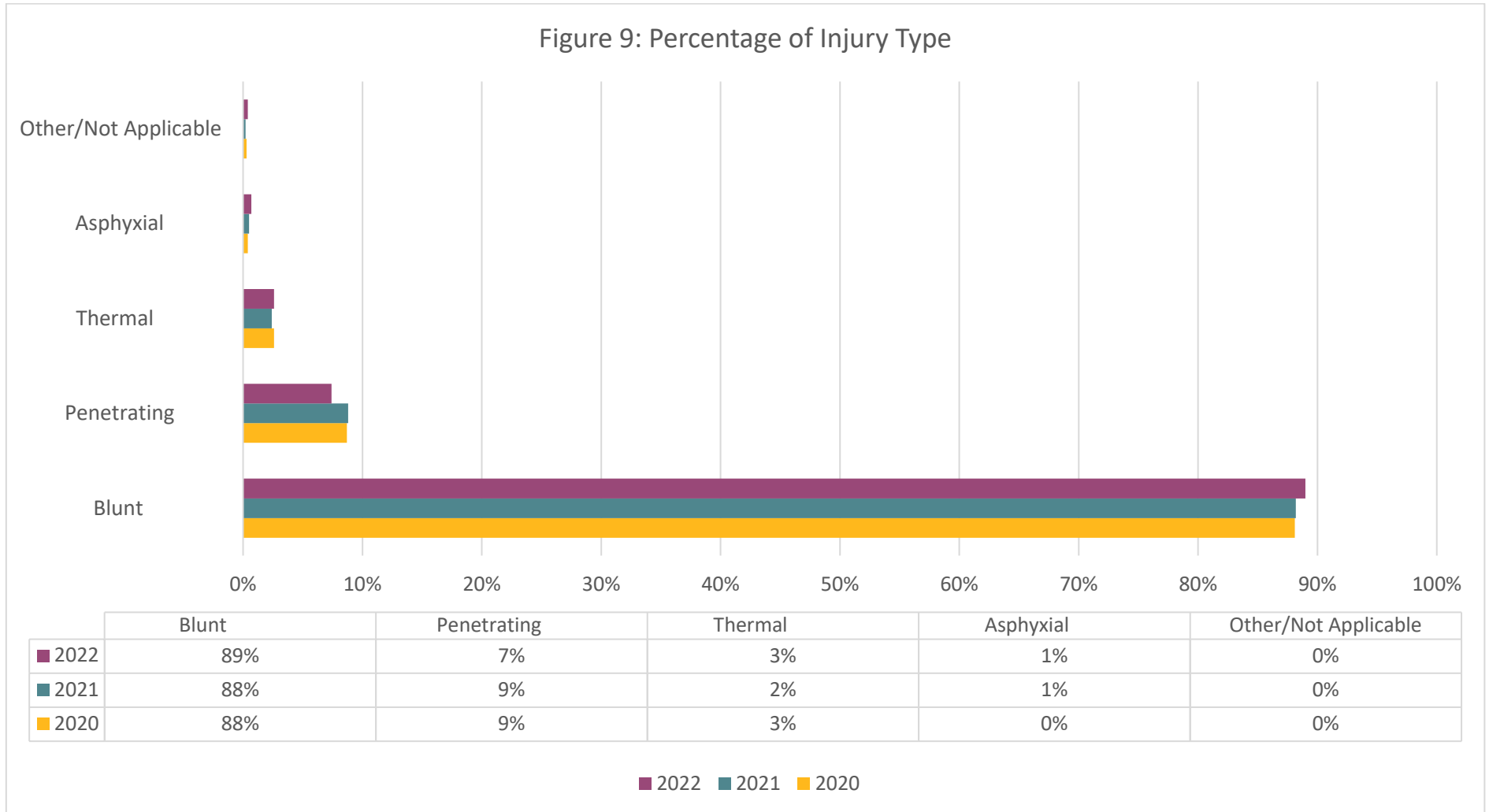
<i>Mechanism of Injury</i>	<i>Percentage of Deaths</i>
Suffocation	27.03%
Gun Shot Wound	12.50%
Drowning	6.45%
Pedestrian	2.89%
Motor Vehicle Crash	2.30%
Unknown (Found down)	2.16%
Motorcycle Crash	1.46%
Assault by person	1.31%
Other Vehicular/Off Road	1.08%
Burns	0.93%
Cut	0.57%
Struck by or Against	0.16%

Injury Type

Four injury type categories are reported:

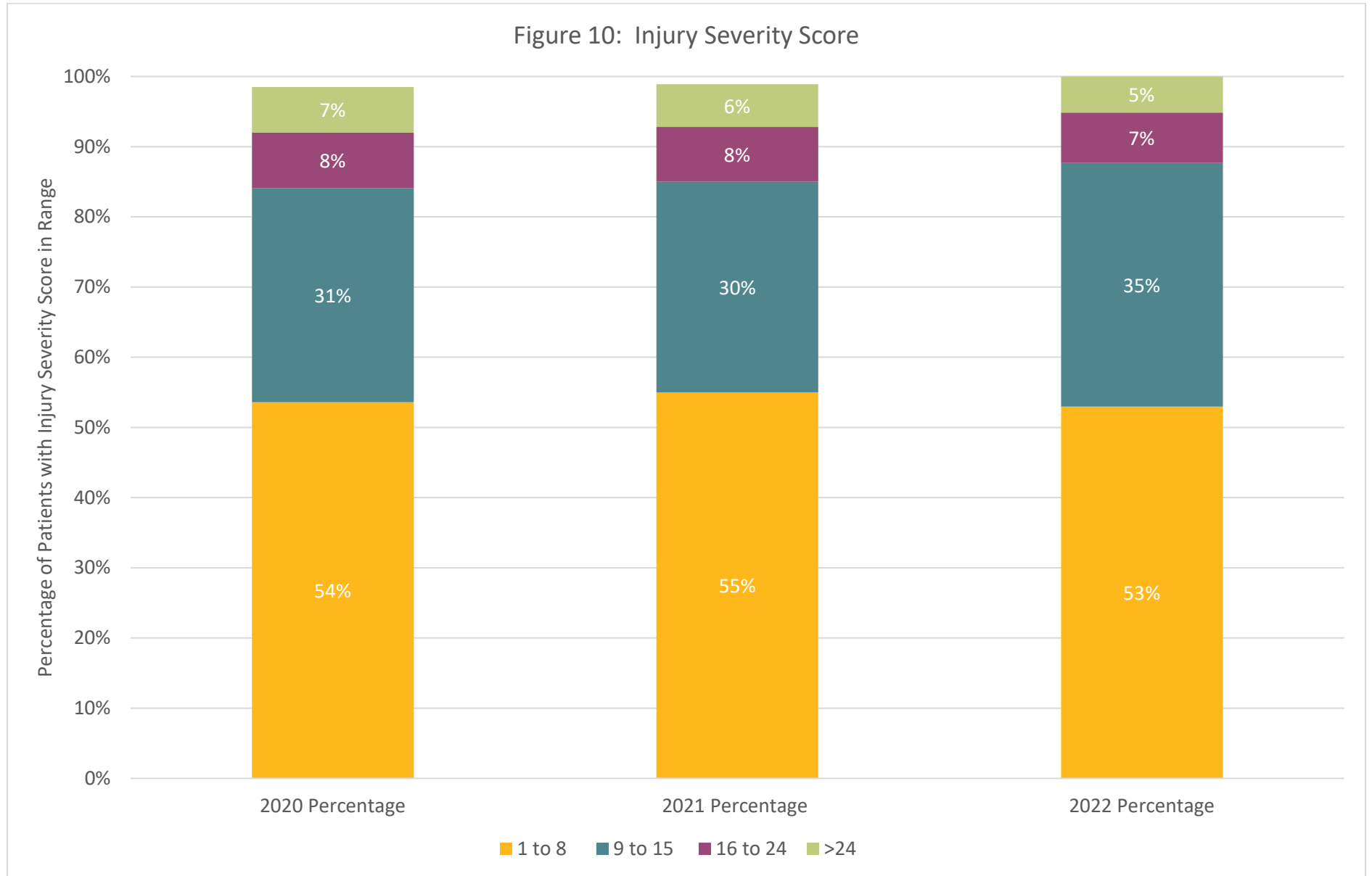
- Blunt – Impact from a blunt object
- Penetrating – Produced by a tool that is edged, pointed, or beveled.
- Thermal – Exposure to high temperature or direct contact with flame.
- Asphyxia – Respiration is prevented by external pressure

As shown in Figure 9, blunt trauma has, and continues to, account for nearly 90% of the type of trauma injuries in the region.



Injury Severity Score

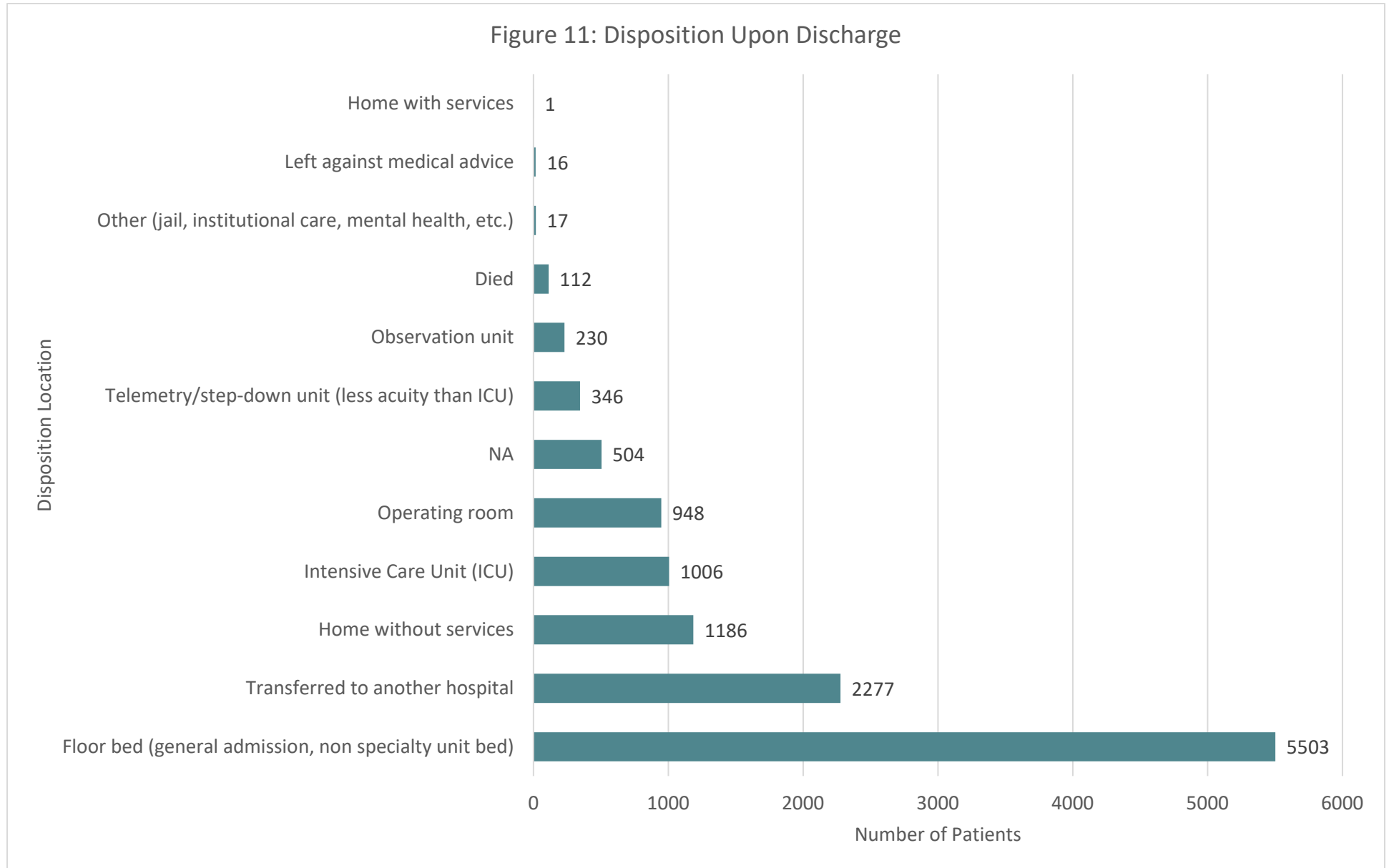
The Injury Severity Score (ISS) is the sum of the squares of the highest AIS⁴ code in each of the three most severely injured ISS body regions. A higher ISS indicates more severe injury. Figure 10 indicates that just over half of all trauma patients annually are assessed with an ISS of eight or below indicating that most trauma patients present with less severe injuries. Isolated Hip Fracture excluded from report.



⁴ AIS Code is defined as the Abbreviated Injury Score Code on a scale of 1 – 6, one being a minor injury and six being the maximal (currently untreatable) meaning death.

Disposition Upon Discharge

As shown in Figure 11, most trauma patients that present to the emergency department are transferred to a hospital floor or observation, while 19% are transferred to another facility.



Emergency Department Length of Stay of Patients Transferred

Figure 12 categorizes the length of emergency department stay prior to transfer to another facility. This transfer is often to a higher level of care. In 2022, 44% of trauma patients awaiting transfer waited four or more hours.

