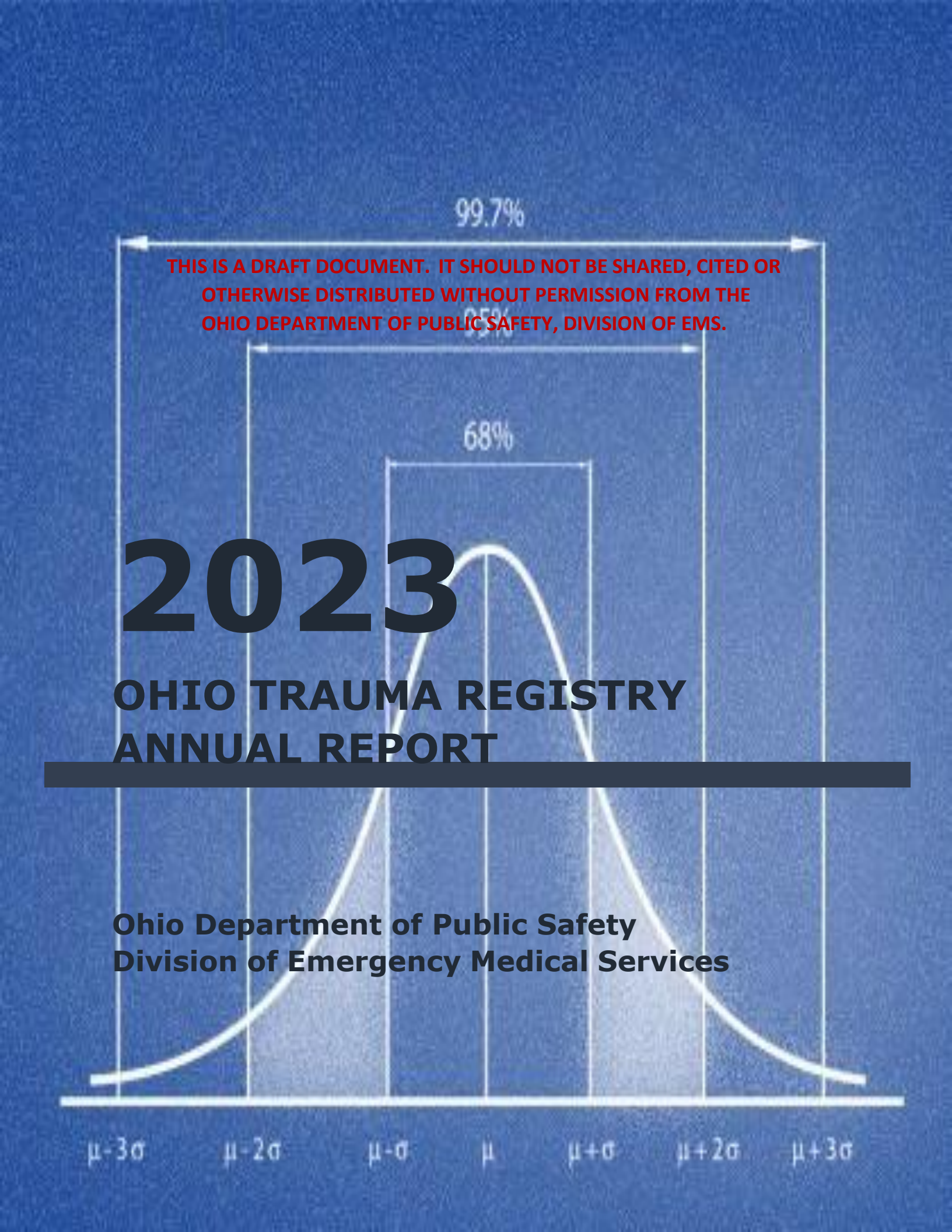
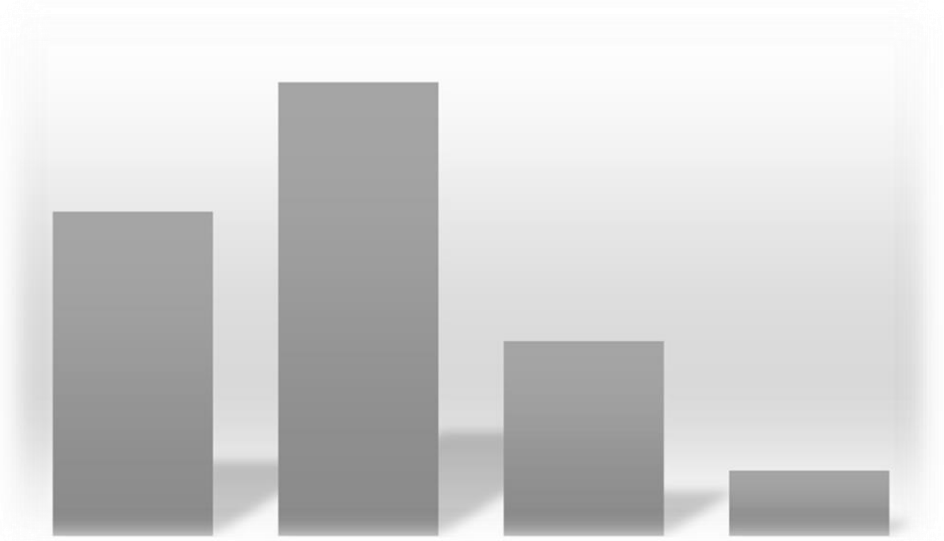


2023

OHIO TRAUMA REGISTRY ANNUAL REPORT

Ohio Department of Public Safety
Division of Emergency Medical Services



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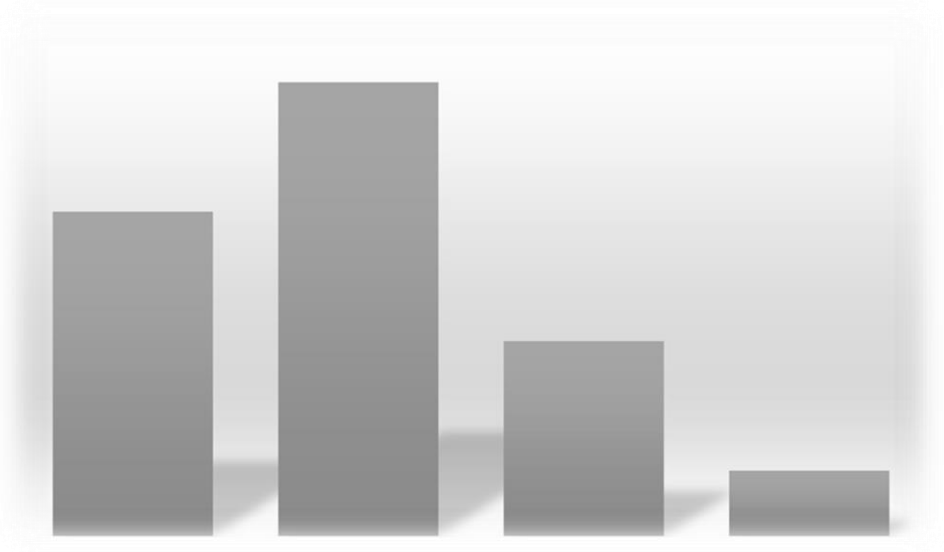

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FOREWORD

Residents of Ohio:

The year 2023 is in the not-too-distant past. However, so much has happened in a little over 2 years, that it seems like eons. The major advances in technology, from augmented reality (AR) to the dawning of artificial intelligence (AI), has turned our tech world into the new frontier. Quantum computing has led to multi-cloud complexity, and we all hold our collective breath as the latest technology is unleased.

While we have made incredible strides in the 'tech' world, findings have been harder to come in the 'wreck' world. Injuries from all types of mechanisms continues to plague our society, from motor vehicle crashes to burn injuries and falls. Despite advances being made in the treatment of injuries, accompanied by increasing awareness of injury prevention within the public, injuries remain the number one cause of death of people from ages 1-44. While the tech industry is booming, the work of decreasing the morbidity and mortality from injuries is not as stellar.

Although the work is daunting, the spirit to address this challenge head on and find solutions is not. And this is where the tech world and the wreck world meet: none of its technological advances and improvements can occur without data. That is the purpose of this document you are reading. Looking at the year 2023 through the lens of the injuries we have seen, trending it against the past, with the hope of finding some answers to help guide the future.

Just as the tech world does not survive and advance without those savvy in that world, a document of this nature is not generated without some skilled hands. It all starts at the top with the State Board of Emergency Medical, Fire, and Transportation Services. Their guidance and direction are vital in offering a global view to a persistent problem. Serving as an advisory committee to them is the State Trauma Committee, a collection of trauma gurus from all specialties and geographical locations throughout the state. They coordinate together on policy and protocol, on legislation and lessons learned, to advance our best practices for the injured patient. A special thank you goes to the Ohio Regional Trauma Organization Coalition, a collaboration of our regional trauma systems who support not only our state functions and work, but also trauma centers and acute care hospitals alike.

Finally, the biggest thank you goes to our Trauma Medical Directors, our Trauma Program Managers, our Trauma Registrars, our surgeons, mid-level providers, our nurses and their directors who are our boots on the ground. You are the heart and soul behind the numbers we study. It is only your diligence and dedication that helps us to collate and analyze multiple data points from each trauma patient treated which help define each new step forward. All the work that has been done and all the work that will be done remains focused on improving trauma care that will lead to a healthier and safer Ohio in the future!

Diane Simon RN, CEN

Chair, State Trauma Committee

INTRODUCTION

The 2023 Ohio Trauma Registry (OTR) Annual Report presents an overview of data collected from patients who sustained traumatic injuries and arrived at an Ohio facility in Calendar Year (CY) 2023. The purpose of this report is to provide relevant information to healthcare professionals and to the public which describes Ohio's trauma patient load and an analysis of the traumatic injuries seen during this period.

In accordance with Ohio Revised Code (ORC) 4765.06(B), the State Board of Emergency Medical, Fire, and Transportation Services (Board) has the statutory authority to establish a state trauma registry to be used for the collection of information regarding the care of adult and pediatric trauma victims in Ohio. The registry provides for the reporting of adult and pediatric trauma-related deaths, identification of adult and pediatric trauma patients, monitoring of adult and pediatric trauma patient care data, determination of the total amount of uncompensated adult and pediatric trauma care provided annually by each facility that provides care to trauma victims, and collection of any other information specified by the Board. The Board has authority over the OTR, specifications for information that may be collected (ORC 4765.11(B) (1)), and supervision of its operation via the Board's Trauma Committee and associated workgroups.

The Board's Trauma Committee and composition is outlined in ORC 4765.04(B) (1 – 22). A total of twenty-four (24) members, representing a diverse group of stakeholders from urban and rural areas, various geographical areas of the state, and various schools of training who are involved with oversight and care of Ohio's trauma patients, are nominated by their respective organizations and appointed by the Director of the Ohio Department of Public Safety. Currently, no more than one Committee member who is employed by or practices at the same hospital, health system, or emergency medical service organization may be appointed to this Committee. The Committee advises and assists the Board in matters related to adult and pediatric trauma care and the establishment and operation of the OTR. In matters relating to the OTR, the Board and the Committee can consult with trauma registrars from adult and pediatric trauma centers in the state. The Committee may appoint subcommittees and create workgroups to advise and assist with the OTR. Under the general direction of the Committee these additional groups may include persons with expertise relevant to the OTR who are not members of the Board or Committee.

The OTR is operated and maintained by the Ohio Department of Public Safety, Division of Emergency Medical Services (EMS). This report was produced by the Ohio Department of Public Safety, Division of EMS, Trauma and Research Team, in conjunction with the Trauma Committee and its Performance Improvement Workgroup. The information contained herein is based on data that were reported for trauma patients who arrived at a facility in 2023. It is intended for descriptive purposes only. The inclusion requirements for the trauma registry and the associated data dictionary can be found in Appendix B. Questions or comments concerning the report should be directed to EMSData@dps.ohio.gov.

CONSIDERATIONS

- For this report, 2023 data were defined as records that had an arrival date between 1/1/2023 and 12/31/2023. These data are intended for descriptive purposes only.

- The data utilized for this report was extracted on 11/1/2024. Any data received and processed for calendar year 2023 after this date was not included in this annual summary.

- In the OTR, we do receive records where the injury occurred out of state. For the figures and tables that look at health outcomes/injury information by county or region, these records are not included. The other figures and tables do include records where the injury may have occurred out of state. This can help provide an overall picture of the type of injuries that come to and the care that is provided at hospitals and freestanding emergency departments in Ohio.

- For calculations involving state and county populations, this analysis used the 2023 population estimates provided from the census website (https://www.census.gov/).

- If a table or figure has a label of "Not Recorded," that means that the corresponding records were blank for that field. If a table or figure has a label of "Not Valued," that means that the corresponding records were populated with something that could not be attributed to a recognized value for that variable. For each table/graph where "Not Valued" is listed, there is a description of what those records were populated with.

- For tables that have percentages, the percentages may not add up to 100% due to rounding.

- Patients with the following isolated ICD-10-CM codes are EXCLUDED from the OTR: S00, S10, S20, S30, S40, S50, S60, S70, S80, S90

- It is important to note that when "region" is referenced in the data, the Division of EMS is referring to the Ohio Homeland Security Regions as displayed on the map in Appendix L, and not Ohio's various regional trauma systems.

- Considerations should be made when evaluating the number of injuries and deaths that are reported for counties near and on the border with other states. These patients could have been transported out of Ohio where the injury occurred to be treated by a closer facility in a neighboring state. These injuries and any deaths resulting from these injuries would not be reflected in this report.

SECTION 1: STATE DEMOGRAPHICS

Geography

The State of Ohio encompasses a land area of 40,952.6 square miles. Land usage is predominantly farmland with 36.7% used for cultivated crops and an additional 13.3% used for hay and pasture land. Another 32.4% is forested land. Developed land usage is divided into 2.49% lower intensity and 11.3% higher intensity categories. The population is distributed across Ohio with 80% of Ohioans living in metropolitan areas.

Population

Based on a updated 2018-2019 reports from the Ohio Department of Development (ODD), Office of Research, Ohio's population was 11,689,442. Population growth in Ohio began to slow in the 1970s, increasing by only 3% since 2000 while the U.S. population has increased by 16.3% during the same timeframe. Ohio is the seventh most populous state and accounts for 3.6% of the nation's population (327,167,434). The median age of Ohio's population is 39.4 years of age and slightly higher than the nation's median age of 38.2 years. Since 2000, Ohio's median age has increased 3.2 years. Children ranging from 0 – 14 years of age make up 18.5% of the population. Teens and Adults ages 15 – 64 constitute 64.1% of the population and adults aged 65 and older account for 17.4%.

Education and Income

Based on a 2022 Fordham Institute study, statewide 87% of Ohio students graduated high school with the percentage exceeding 90% in suburban areas. Additionally, statewide 53% of students enrolled in a 2- or 4-year college program, with a higher average of 72% in suburban areas. Of these, 31% completed a degree within six years of leaving high school statewide, with a higher rate of 49% in suburban areas and lower 17% in urban areas. Based on the US Census Bureau's "Quick Facts", median annual income of Ohio households in 2020 was $58,116.

Healthcare

There were approximately 216 registered hospitals. Of facilities designated as hospitals, 79 were identified acute care facilities. Of the total registered hospitals, 32 are identified as critical access hospitals. There were also 51 freestanding emergency departments. There were 54 hospitals that met the American College of Surgeons Committee on Trauma criteria for registered trauma centers that are equipped to handle the more extreme traumatic injury cases. In Ohio there were 11 Level I Trauma Centers, 11 Level II Trauma Centers, and 27 Level III Trauma Centers. There were also 4 Level I Pediatric Trauma Centers and 4 Level II Pediatric Trauma Centers serving the state, three of which reside in the same facility as an adult trauma center. These registered trauma centers are located in the metropolitan areas of Akron, Cincinnati, Columbus, Cleveland, Dayton, and Toledo.

Emergency Medical Services

As of the end of December 2023, there were 41,533 individuals holding an active EMS provider certificate as either an Emergency Medical Responder, Emergency Medical Technician, Advanced Emergency Medical Technician, or Paramedic. EMS coverage throughout Ohio included a mixture of Emergency Medical Responder (4.3%), Emergency Medical Technician (45.6%), Advanced Emergency Medical Technician (4.0%), Paramedic (46.1%), and additional protocols

for invasive skills/interventions/advanced life support procedures beyond Paramedic level services based on the highest level of approved operational protocols.

A total of 14 air medical service providers, many of which have one or more satellite locations, currently serve Ohio patients. The majority of air medical services are located in Ohio with a few having headquarter or satellite locations in Indiana, Kentucky, Pennsylvania, and West Virginia. The system is comprised of 65 aircraft total, of which 3 aircrafts are fixed wing and 62 are rotor. Some headquarter locations and each satellite location have at least one aircraft stationed at their facility. The Ohio Department of Public Safety Division of EMS inspects and licenses all air medical aircraft on an annual basis.

As of March 2025, there was a total of 2,100,435 EMS runs reported to the Ohio EMS Incident Reporting System (EMSIRS) in 2023. Of those records, 261,264 (12.4%) were categorized as injuries based on an assigned mechanism of injury within EMSIRS.

Trauma Services

Of all injuries treated by an emergency facility, 82,634 records met the inclusion criteria for submission to the, OTR. The inclusion criteria can be found in the "Trauma Acute Care Registry Data Dictionary," prepared by the Ohio Department of Public Safety (http://www.publicsafety.ohio.gov/links/ems_OTR-TACR-Data-Dictionary-2021.pdf). For additional reference and context of these data, the Ohio Department of Health Injury Related Death Data, including a focus on the "External Injury Mechanism," is included in this report (Appendix K).

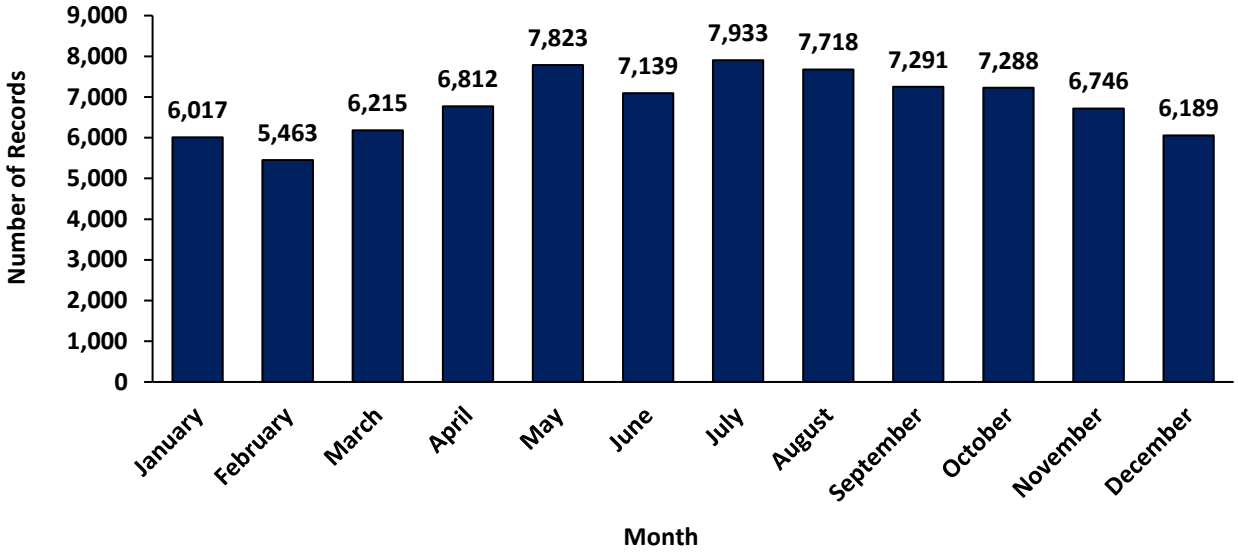
Regional Trauma Systems

A regional trauma system is an organized, coordinated effort in a defined geographic area that delivers the full range of care to all injured patients and works together with emergency services and disaster preparedness making efficient use of health care resources to improve patient outcomes in the state of Ohio. Membership is voluntary and not generally restricted by facility location.

SECTION 2: RECORDS OF HOSPITAL PATIENT CONTACT

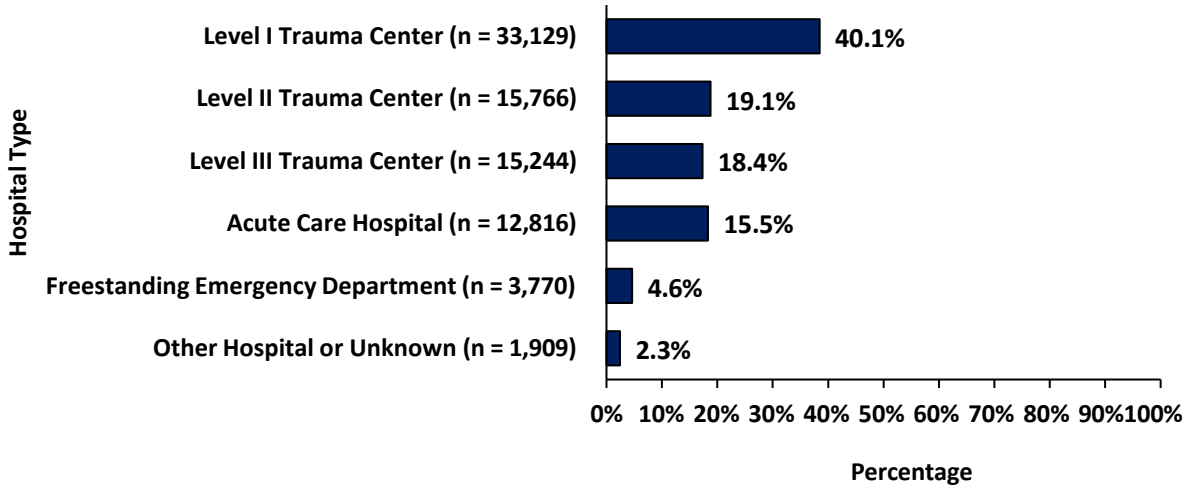
❖ Figure 1. Total records submitted to the Ohio Trauma Registry by month of arrival, 2023

This figure displays the number of trauma records submitted to the OTR by month of patient arrival during 2023. A total of 82,634 records met the inclusion criteria based on date of arrival in 2023. An average of 6,886 records were received by the OTR each month.



❖ Figure 2. Total records submitted to the Ohio Trauma Registry by hospital type, 2023

This figure shows the number and percentage of records that were submitted to the OTR by hospital type. The records most frequently came from Level I Trauma Centers (33,129; 40.1%).



❖ Table 1. Rates of injuries by county of injury, Ohio, 2023

This table displays the rate of injuries by the county where the injury occurred. Hocking (1,296.3 per 100,000 residents) and Marion (1,048.6 per 100,000 residents) counties reported the highest rates of injuries. For this table, records where the injuries occurred out of state were not included in the analysis.

County	Count	Population	Rate per 100,000	County	Count	Population	Rate per 100,000
Adams	241	27,521	875.7	Logan	381	46,057	827.2
Allen	826	100,838	819.1	Lorain	1,574	317,910	495.1
Ashland	265	52,190	507.8	Lucas	1,673	425,484	393.2
Ashtabula	309	96,845	319.1	Madison	411	44,602	921.5
Athens	529	62,706	843.6	Mahoning	1,102	225,596	488.5
Auglaize	266	46,050	577.6	Marion	680	64,851	1,048.6
Belmont	75	64,918	115.5	Medina	520	184,042	282.5
Brown	226	43,777	516.3	Meigs	112	21,767	514.5
Butler	2,729	393,043	694.3	Mercer	170	42,439	400.6
Carroll	79	26,758	295.2	Miami	1,153	110,876	1,039.9
Champaign	213	38,845	548.3	Monroe	36	13,153	273.7
Clark	994	134,610	738.4	Montgomery	4,544	533,796	851.3
Clermont	1,119	211,972	527.9	Morgan	126	13,646	923.3
Clinton	352	41,938	839.3	Morrow	219	35,595	615.3
Columbiana	359	100,182	358.3	Muskingum	860	86,305	996.5
Coshocton	265	36,869	718.8	Noble	97	14,311	677.8
Crawford	170	41,529	409.4	Ottawa	126	39,803	316.6
Cuyahoga	6,774	1,233,088	549.4	Paulding	25	18,706	133.6
Darke	401	51,415	779.9	Perry	367	35,551	1,032.3
Defiance	156	38,315	407.2	Pickaway	440	61,086	720.3
Delaware	1,160	231,636	500.8	Pike	121	27,001	448.1
Erie	220	74,035	297.2	Portage	1,049	162,665	644.9
Fairfield	1,049	165,360	634.4	Preble	319	40,556	786.6
Fayette	181	28,817	628.1	Putnam	156	34,199	456.2
Franklin	8,545	1,326,063	644.4	Richland	1,105	125,064	883.5
Fulton	186	42,007	442.8	Ross	573	76,501	749.0
Gallia	110	28,986	379.5	Sandusky	86	58,709	146.5
Geauga	516	95,407	540.8	Scioto	322	71,969	447.4
Greene	1,320	169,691	777.9	Seneca	423	54,527	775.8
Guernsey	315	38,089	827.0	Shelby	339	47,765	709.7
Hamilton	4,097	827,058	495.4	Stark	1,965	372,716	527.2
Hancock	118	74,704	158.0	Summit	2,612	535,733	487.6
Hardin	211	30,368	694.8	Trumbull	1,249	200,373	623.3
Harrison	32	14,159	226.0	Tuscarawas	248	91,874	269.9
Henry	99	27,520	359.7	Union	448	69,637	643.3
Highland	340	43,614	779.6	Van Wert	25	28,704	87.1
Hocking	357	27,540	1,296.3	Vinton	47	12,474	376.8
Holmes	93	44,386	209.5	Warren	1,647	252,148	653.2
Huron	420	58,199	721.7	Washington	539	58,577	920.2
Jackson	147	32,606	450.8	Wayne	263	116,510	225.7
Jefferson	82	64,026	128.1	Williams	37	36,591	101.1
Knox	315	63,320	497.5	Wood	348	132,650	262.3
Lake	1,042	231,640	449.8	Wyandot	161	21,457	750.3
Lawrence	75	56,118	133.6	Not Recorded	2,941		
Licking	736	183,201	401.7	Out of Ohio	--		

❖ Table 2. Rates of injuries resulting in death by county of injury, Ohio, 2023

This table displays the rate of injuries resulting in death by county of injury. Richland (30.4 per 100,000 residents) and Madison (29.1 per 100,000 residents) counties reported the highest rates. Records where the injuries occurred out of state were not included. Fatalities were based on the county of injury, not the county or facility where the fatality occurred. EMS runs involving fatalities are not always reported to the Trauma Registry.

County	Population	Rate per 100,000	County	Population	Rate per 100,000
Adams	27,521	18.2	Logan	46,057	26.1
Allen	100,838	25.8	Lorain	317,910	13.2
Ashland	52,190	17.2	Lucas	425,484	13.2
Ashtabula	96,845	18.6	Madison	44,602	29.1
Athens	62,706	22.3	Mahoning	225,596	16.0
Auglaize	46,050	8.7	Marion	64,851	20.0
Belmont	64,918	0.0	Medina	184,042	7.1
Brown	43,777	22.8	Meigs	21,767	13.8
Butler	393,043	19.3	Mercer	42,439	18.9
Carroll	26,758	3.7	Miami	110,876	15.3
Champaign	38,845	18.0	Monroe	13,153	0.0
Clark	134,610	17.8	Montgomery	533,796	24.0
Clermont	211,972	11.8	Morgan	13,646	0.0
Clinton	41,938	28.6	Morrow	35,595	14.0
Columbiana	100,182	5.0	Muskingum	86,305	19.7
Coshocton	36,869	8.1	Noble	14,311	7.0
Crawford	41,529	14.4	Ottawa	39,803	5.0
Cuyahoga	1,233,088	19.4	Paulding	18,706	0.0
Darke	51,415	7.8	Perry	35,551	25.3
Defiance	38,315	5.2	Pickaway	61,086	19.6
Delaware	231,636	12.1	Pike	27,001	22.2
Erie	74,035	12.2	Portage	162,665	17.2
Fairfield	165,360	8.5	Preble	40,556	19.7
Fayette	28,817	17.4	Putnam	34,199	0.0
Franklin	1,326,063	24.0	Richland	125,064	30.4
Fulton	42,007	9.5	Ross	76,501	18.3
Gallia	28,986	17.2	Sandusky	58,709	6.8
Geauga	95,407	7.3	Scioto	71,969	8.3
Greene	169,691	15.9	Seneca	54,527	12.8
Guernsey	38,089	28.9	Shelby	47,765	10.5
Hamilton	827,058	15.2	Stark	372,716	15.0
Hancock	74,704	1.3	Summit	535,733	11.9
Hardin	30,368	13.2	Trumbull	200,373	18.0
Harrison	14,159	0.0	Tuscarawas	91,874	4.4
Henry	27,520	3.6	Union	69,637	14.4
Highland	43,614	16.0	Van Wert	28,704	7.0
Hocking	27,540	18.2	Vinton	12,474	16.0
Holmes	44,386	0.0	Warren	252,148	14.7
Huron	58,199	12.0	Washington	58,577	17.1
Jackson	32,606	9.2	Wayne	116,510	9.4
Jefferson	64,026	3.1	Williams	36,591	2.7
Knox	63,320	11.1	Wood	132,650	8.3
Lake	231,640	9.5	Wyandot	21,457	18.6
Lawrence	56,118	0.0	Not Recorded		
Licking	183,201	12.6	Out of Ohio		

❖ Table 3. Duration of hospital stay by mechanism of injury, Ohio, 2023

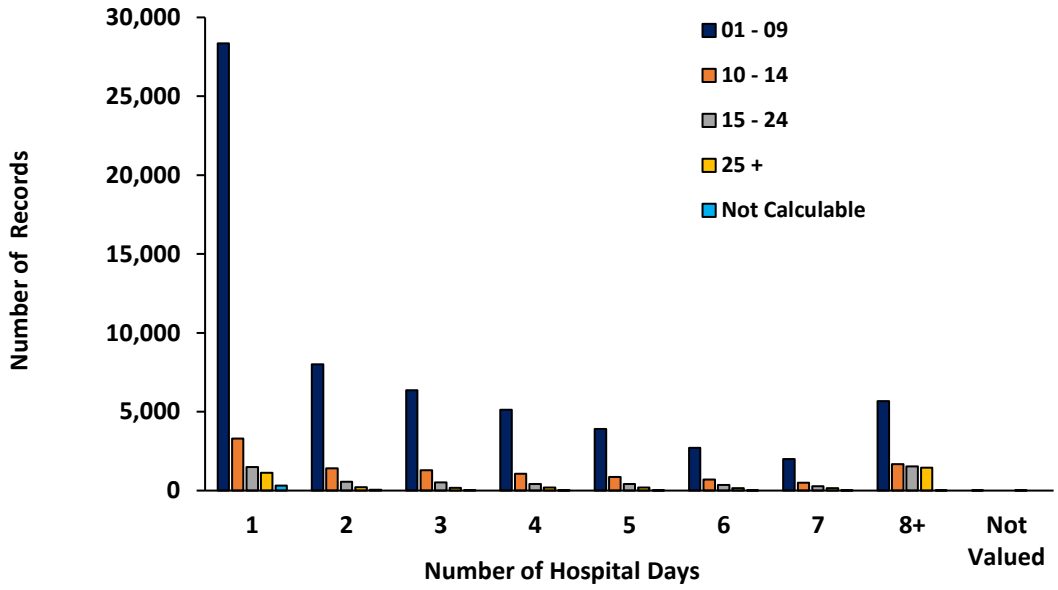
This table shows the distribution of the length of hospital stay (in days) by the mechanism of injury. The mechanism of injury is based on the reported ICD-10 code. Among all injury mechanisms reported, patients most frequently stayed one day at the hospital. Falls constituted the majority (61.8%) of traumatic injuries that occurred in 2023. Case fatality rate data are presented later in this report. Records labeled as "Not Classified" were populated with that text. Records labeled as "Not Valued" were populated with "- ".

	Duration of Hospital Stay (Days)										
Mechanism of Injury	**1 day**	**2 days**	**3 days**	**4 days**	**5 days**	**6 days**	**7 days**	**8 + days**	**Not Recorded**	**Total**	**Total %**
Abuse	175	54	23	15	10	6	3	31	0	317	0.4
Cut or Pierce	1,158	259	125	83	68	36	16	97	1	1,843	2.2
Drowning or Submersion	75	10	1	3	1	3	0	4	0	97	0.1
Electrical	40	6	4	0	3	0	0	4	0	57	0.1
Explosion	118	28	10	7	6	4	3	27	0	203	0.2
Fall	17,729	6,078	5,996	5,246	4,163	3,015	2,197	6,595	11	51,030	61.8
Fire or Flame	389	52	24	26	20	20	23	146	0	700	0.8
Firearm	1,145	269	154	123	105	77	83	482	1	2,439	3.0
Hot Object or Substance	400	47	30	22	24	19	18	97	0	657	0.8
Machinery	386	63	23	15	9	3	5	36	0	540	0.7
Mechanical	396	29	21	12	10	9	7	16	1	501	0.6
MVC** - Motorcyclist	626	244	163	108	91	61	64	338	1	1,696	2.1
MVC** - Occupant	3,675	1,244	773	520	404	343	258	1,324	3	8,544	10.3
MVC** - Other	12	1	0	0	1	0	0	0	0	14	0.0
MVC** - Pedal Cyclist	147	36	23	12	7	15	11	50	1	302	0.4
MVC** - Pedestrian	283	126	69	60	53	36	28	231	1	887	1.1
MVC** - Unspecified	363	51	42	13	20	14	10	61	0	574	0.7
Natural or Environmental	885	150	65	33	28	18	15	52	0	1,246	1.5
Other Land Transport	1,685	441	247	163	120	80	65	294	0	3,095	3.7
Other Specified, Classifiable	61	14	9	9	2	2	2	16	0	115	0.1
Other Specified, Not Elsewhere Classifiable	301	51	29	31	17	8	10	54	0	501	0.6
Other Transport	42	7	3	3	1	0	1	6	0	63	0.1
Overexertion	181	69	44	23	22	11	8	26	0	384	0.5
Pedal Cyclist, Other	584	130	74	50	21	25	11	37	0	932	1.1
Pedestrian Conveyance	412	99	63	26	24	19	7	44	1	695	0.8
Pedestrian, Other	123	37	23	22	20	14	10	60	0	309	0.4
Poisoning	36	11	6	5	1	1	2	6	0	68	0.1
Struck by or Against	2,938	585	321	173	129	67	52	185	0	4,450	5.4
Suffocation/Asphyxiation	59	14	11	6	5	1	1	7	0	104	0.1
Not Classified	72	7	3	5	5	2	1	14	0	109	0.1
Not Valued	90	14	8	9	12	6	6	17	0	162	0.2
TOTAL	**34,586**	**10,226**	**8,387**	**6,823**	**5,402**	**3,915**	**2,917**	**10,357**	**21**	**82,634**	**100.0**

** MVC is an abbreviation for Motor Vehicle Collision

❖ Figure 3. Duration of hospital stay by Injury Severity Score (ISS), Ohio, 2023

The Injury Severity Score (ISS) is an assessment of the patient's injury severity. ISS scores range from 0 to 75, where a higher ISS score indicates a more severe injury. This graph displays the duration of hospital stays (in days) based on the ISS. A description on how the ISS is calculated is located in the Glossary. Records labeled as "Not Valued" were populated with "- ".



❖ Table 4. Duration of hospital stay by Injury Severity Score (ISS), Ohio, 2023

Records labeled as "Not Valued" were populated with "- ". Persons with an ISS score between 01 and 09 were more likely to spend one day at the hospital following injury compared to other hospital stay durations. Persons with an ISS score of 25+ were most likely to spend eight days or more at the hospital following injury compared to other hospital stay durations. Case fatality rate data are presented later in this report.

	Injury Severity Score (ISS)					
Hospital Days	**01 - 09**	**10 - 14**	**15 - 24**	**25 +**	**Not Calculable**	**Total**
1	28,349	3,301	1,496	1,133	307	**34,586**
2	7,999	1,402	567	212	46	**10,226**
3	6,370	1,297	513	183	24	**8,387**
4	5,120	1,076	412	197	18	**6,823**
5	3,915	859	408	200	20	**5,402**
6	2,703	691	360	152	9	**3,915**
7	1,995	494	266	157	5	**2,917**
8+	5,677	1,680	1,542	1,442	16	**10,357**
Not Valued	19	0	0	2	0	**21**
Total	**62,147**	**10,800**	**5,564**	**3,678**	**445**	**82,634**

❖ Table 5. Number of transfers out of emergency departments by hospital type, Ohio, 2023

This table looks at the number of instances where a patient was transferred out of a hospital based on the hospital type. This report looks at five different hospital types: Level I, II, and III Trauma Centers, freestanding emergency departments, and acute care hospitals.
The majority (39.6%) of transfers out of the hospital were by acute care hospitals. Among the trauma centers, most (3,897) of the transfers out came from Level III Trauma Centers.

Hospital Type	Transfers	
	#	%
Level I Trauma Center	235	1.4
Level II Trauma Center	893	5.4
Level III Trauma Center	3,897	23.4
Free Standing Emergency Department	3,666	22.0
Acute Care Hospital	6,594	39.6
Other Hospital or Unknown	1,349	8.1
Total	**16,634**	**100.0**

❖ Table 5a. Destinations of emergency department transfers out of Level I Trauma Centers, Ohio, 2023

Though comprising the smallest percentage, there are a small number of transfers from emergency departments that come from Level I Trauma Centers. The table below identifies the destination by hospital type for these transfers.
Of the 235 emergency department transfers that came from Level I Trauma Centers, most went to other Level I Trauma Centers (140, 59.6%).

Hospital Type	Transfers	
	#	%
Level I Trauma Center	140	59.6
Level II Trauma Center	4	1.7
Level III Trauma Center	24	10.2
Acute Care Hospital	16	6.8
Free Standing Emergency Department	0	0.0
Other Hospital or Unknown	51	21.7
Total	**235**	**100.0**

❖ Table 5b. Destinations of emergency department transfers out of acute care hospitals, Ohio, 2023

The majority of emergency department transfers came from acute care hospitals. The table below identifies the destination by hospital type for these transfers.
The majority of emergency department transfers that came from acute care hospitals went to Level I Trauma Centers (4,454, 67.5%).

Hospital Type	Transfers	
	#	%
Level I Trauma Center	4,454	67.5
Level II Trauma Center	1,361	20.6
Level III Trauma Center	326	4.9
Acute Care Hospital	299	4.5
Free Standing Emergency Department	4	0.1
Other Hospital or Unknown	150	2.3
Total	**6,594**	**100.0**

❖ Table 5c. Destinations of pediatric emergency department transfers out of acute care hospitals, Ohio, 2023

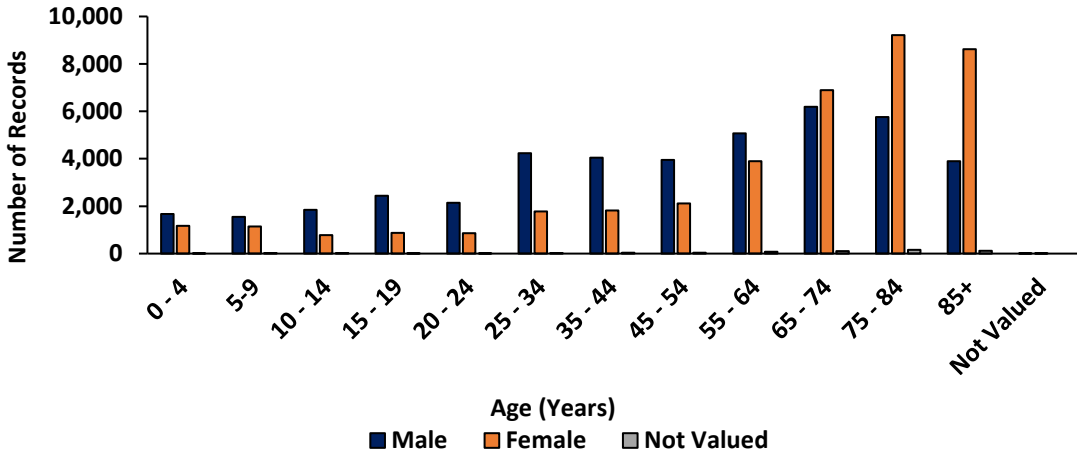
The table below identifies the destination by hospital type for pediatric transfer cases that come from acute care hospitals. The majority (93.1%) of pediatric transfer cases from acute care hospitals went to pediatric level I trauma centers.

Hospital Type	Transfers	
	#	%
Pediatric Level I Trauma Center	1,087	93.1
Pediatric Level II Trauma Center	42	3.6
Adult Level I Trauma Center	10	0.9
Adult Level II Trauma Center	2	0.2
Adult Level III Trauma Center	1	0.1
Acute Care Hospital	13	1.1
Other Hospital or Unknown	13	1.1
Total	**1,168**	**100.0**

SECTION 3: PATIENT CHARACTERISTICS

❖ Figure 4. Demographics by sex and age group, Ohio, 2023

This graph, along with Table 6 below, looks at the demographics of the records submitted to the trauma registry by sex and age group. From birth to age 64, males outnumbered females in each age group. Females accounted for a larger number of records compared to males from age 65 and older. Records where gender is labeled as "Not Valued" were populated with "U". Records where the age category is labeled as "Not Valued" were populated with "- ". There are 3 records where age was not valued.



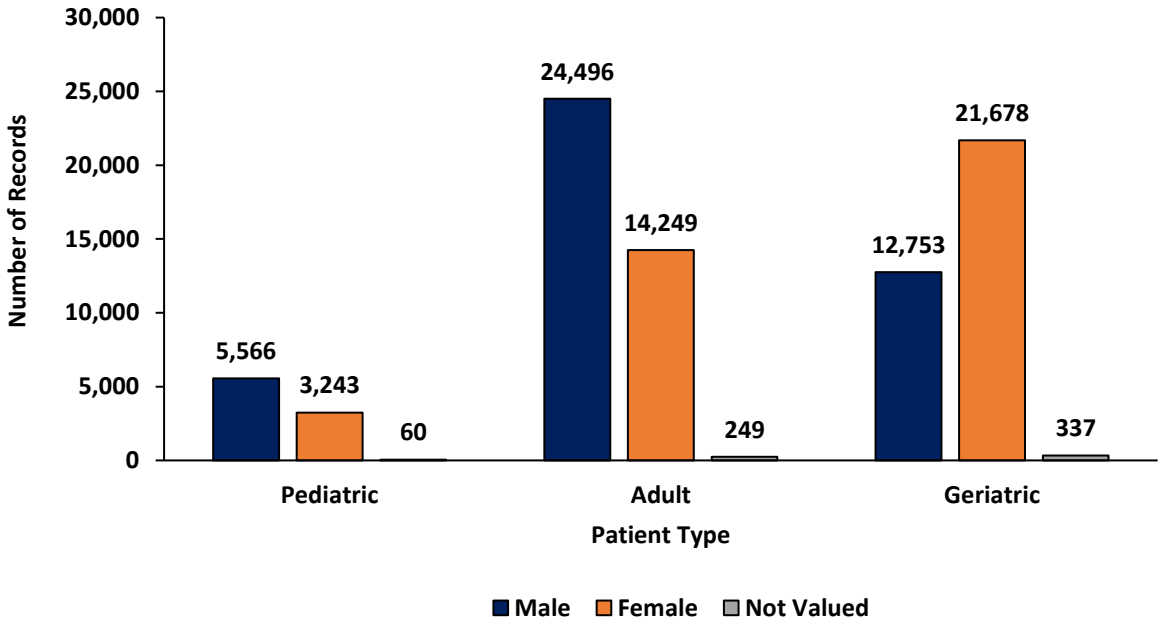
❖ Table 6. Demographics by sex and age group, Ohio, 2023

The most common age group among males was 65 – 74. The most common age group among females was 75-84. Records where gender is labeled as "Not Valued" were populated with "U". Records where the age category is labeled as "Not Valued" were populated with "- ".

Age (Years)	Male		Female		Not Valued		Total	
	#	%	#	%	#	%	#	%
0 - 4	1,675	3.9	1,173	3.0	13	2.0	**2,861**	**3.5**
5-9	1,555	3.6	1,141	2.9	20	3.1	**2,716**	**3.3**
10-14	1,844	4.3	777	2.0	23	3.6	**2,644**	**3.2**
15 - 19	2,440	5.7	874	2.2	12	1.9	**3,326**	**4.0**
20 - 24	2,143	5.0	865	2.2	11	1.7	**3,019**	**3.7**
25 - 34	4,233	9.9	1,780	4.5	27	4.2	**6,040**	**7.3**
35 - 44	4,043	9.4	1,815	4.6	39	6.0	**5,897**	**7.1**
45 - 54	3,949	9.2	2,115	5.4	38	5.9	**6,102**	**7.4**
55 - 64	5,071	11.8	3,902	10.0	82	12.7	**9,055**	**11.0**
65 - 74	6,195	14.5	6,897	17.6	110	17.0	**13,202**	**16.0**
75 - 84	5,764	13.5	9,208	23.5	154	23.8	**15,126**	**18.3**
85 and over	3,903	9.1	8,623	22.0	117	18.1	**12,643**	**15.3**
Not Valued	2	0.0	1	0.0	0	0.0	**3**	**0.0**
Total	**42,817**	**100.0**	**39,171**	**100.0**	**646**	**100.0**	**82,634**	**100.0**

❖ Figure 5. Demographics by patient type and sex, Ohio, 2023

This analysis defines pediatric patients as those between the ages of 0 to 15 years, adult patients as those between the ages of 16 to 69 years, and geriatric patients as those ages 70 and older.
The graph below shows the number of records based on type of patient (i.e., pediatric, adult, or geriatric) and patient sex. There were 3 records where age was not valued (records were populated with "- ") and therefore patient type could not be calculated. These records were not included in this analysis. Records where gender is labeled as "Not Valued" were populated with "U".



❖ Table 7. Demographics by patient type and sex, Ohio, 2023

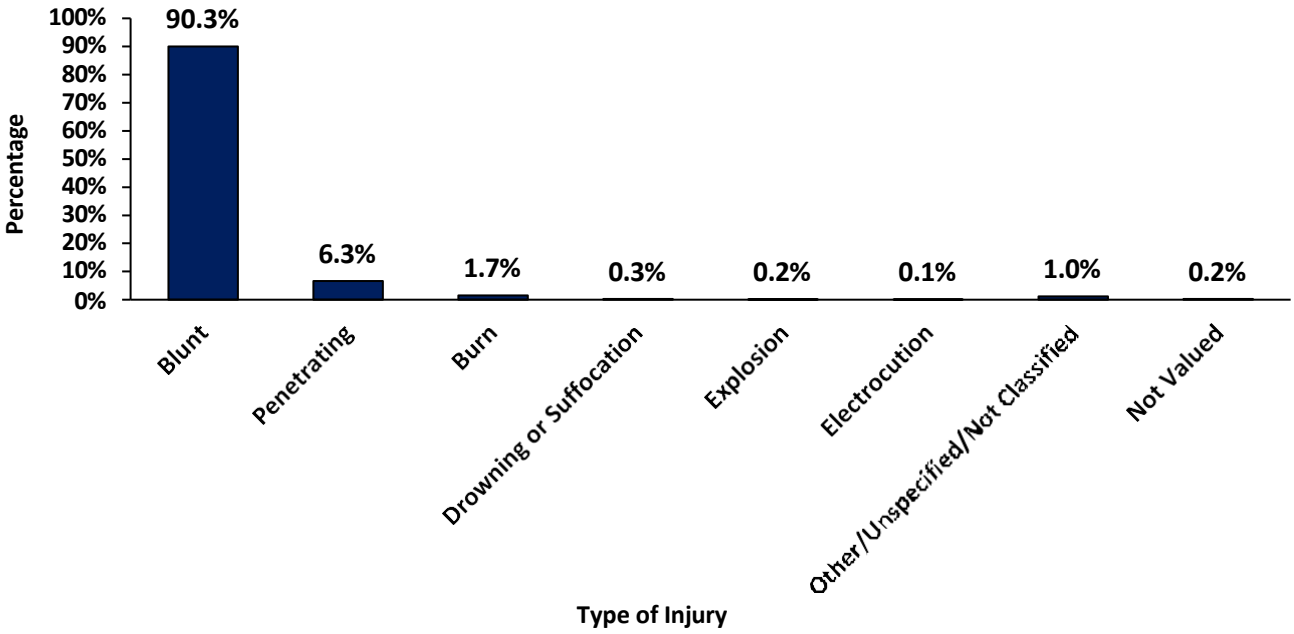
The table below shows the number of patients based on type of patient (i.e., pediatric, adult, or geriatric) and patient sex. There were 3 records where age was not valued (records were populated with "- ") and therefore patient type could not be calculated. These records were not included in the table. Records where gender is labeled as "Not Valued" were populated with "U".
The majority of pediatric (62.8%) and adult (62.8%) records involved males. The majority (62.4%) of geriatric records involved females.

Sex	Type of Patient							
	Pediatric		Adult		Geriatric		Total	
	#	%	#	%	#	%	#	%
Male	5,566	62.8	24,496	62.8	12,753	36.7	42,815	51.8
Female	3,243	36.6	14,249	36.5	21,678	62.4	39,170	47.4
Not Valued	60	0.7	249	0.6	337	1.0	646	0.8
Total	**8,869**	**100.0**	**38,994**	**100.0**	**34,768**	**100.0**	**82,631**	**100.0**

SECTION 4: INJURY CHARACTERISTICS

❖ Figure 6. Types of injuries, Ohio, 2023

This graph shows the types of injuries sustained in 2023. The type of injury is based on the reported ICD-10 code. Records where the type of injury was labeled as "Not Valued" were populated with "- ". Blunt injuries were the most common injury type identified, comprising 90.3% of the reported injuries.



❖ Table 8. Types of injuries, Ohio, 2023

This table shows the types of injuries sustained by the patient in 2023. Records where the type of injury was labeled as "Not Valued" were populated with "- ". The most common type of injury was blunt (90.3%), followed by penetrating (6.3%).

Type of Injury	Injuries	
	#	%
Blunt	74,637	90.3
Penetrating	5,187	6.3
Burn	1,390	1.7
Drowning or Suffocation	228	0.3
Explosion	146	0.2
Electrocution	58	0.1
Other/Unspecified/Not Classified	826	1.0
Not Valued	162	0.2
Total	**82,634**	**100.0**

❖ Table 9. Intent of injury, Ohio, 2023

This table shows the intent of the injury sustained in 2023. The categories of intent of injury were based on the reported ICD-10 code. Records where the intent of injury was labeled as "Not Valued" were populated with "- ". The majority (90.0%) of the injuries were unintentional.

Intent of Injury	Injuries	
	#	%
Unintentional	74,356	90.0
Self-inflicted	732	0.9
Assault	4,439	5.4
Undetermined	358	0.4
Other	48	0.1
Not Valued	2,701	3.3
Total	**82,634**	**100.0**

❖ Table 10. Intent of injury by patient type, Ohio, 2023

This table shows the intent of injury sustained by patient type (i.e., pediatric, adult, geriatric). This analysis defines pediatric patients as being between the ages of 0 and 15 years, adult patients as being between the ages of 16 and 69 years, and geriatric patients as being ages 70 and older. There were 3 records where age was not valued (records were populated with "- ") and patient type could not be calculated. These records were not included in the table. Records where the intent of injury was labeled as "Not Valued" were populated with "- ".

Across all patient types, the majority (Pediatric: 92.1%; Adult: 81.5%; Geriatric: 99.0%; Overall: 90.0%) of the injuries were unintentional.

Intent of Injury	Patient Type							
	Pediatric		Adult		Geriatric		Total	
	#	%	#	%	#	%	#	%
Unintentional	8,171	92.1	31,777	81.5	34,408	99.0	**74,356**	**90.0**
Self-inflicted	28	0.3	659	1.7	45	0.1	**732**	**0.9**
Assault	181	2.0	4,146	10.6	109	0.3	**4,436**	**5.4**
Undetermined	47	0.5	283	0.7	28	0.1	**358**	**0.4**
Other	4	0.0	43	0.1	1	0.00	**48**	**0.1**
Not Valued	438	4.9	2,086	5.3	177	0.5	**2,701**	**3.3**
Total	**8,869**	**100.0**	**38,994**	**100.0**	**34,768**	**100.0**	**82,631**	**100.0**

❖ Table 11. Intent of injury by region, Ohio, 2023

This table shows the intent of the injuries sustained in 2023 based on region where the injury occurred. Regions were based on the eight out-of-hospital emergency medical services regions that the State Board of Emergency Medical, Fire, and Transportation Services geographically divided the state for purposes of overseeing the delivery of adult and pediatric out-of-hospital emergency medical services. A state map of these eight Homeland Security regions is located in Appendix L. For this table, records where the injuries occurred out of state were not included in the analysis. Records where the intent of injury was labeled as "Not Valued" were populated with "- ".

Across all regions, the majority (92.8% in Region 1; 89.0% in Region 2; 92.4% in Region 3; 89.0% in Region 4; 91.6% in Region 5; 91.4% in Region 6; 92.9% in Region 7; 93.3% in Region 8) of the injuries were unintentional.

Intent	Region 1		Region 2		Region 3		Region 4		Region 5	
	#	%	#	%	#	%	#	%	#	%
Unintentional	4,976	92.8	9,091	89.0	8,582	92.4	13,445	89.0	9,995	91.6
Self-Inflicted	84	1.6	71	0.7	56	0.6	147	1.0	118	1.1
Assault	162	3.0	687	6.7	357	3.8	1,054	7.0	400	3.7
Undetermined	21	0.4	48	0.5	32	0.3	72	0.5	39	0.4
Other	5	0.1	1	0.0	3	0.0	12	0.1	4	0.0
Not Valued	112	2.1	317	3.1	253	2.7	377	2.5	353	3.2
Total	**5,360**	**100.0**	**10,215**	**100.0**	**9,283**	**100.0**	**15,107**	**100.0**	**10,909**	**100.0**

Intent	Region 6		Region 7		Region 8		Not Recorded		Total	
	#	%	#	%	#	%	#	%	#	%
Unintentional	9,824	91.4	2,564	92.9	2,265	93.3	2,482	84.4	63,224	90.6
Self-Inflicted	98	0.9	19	0.7	16	0.7	26	0.9	635	0.9
Assault	431	4.0	105	3.8	59	2.4	239	8.1	3,494	5.0
Undetermined	52	0.5	9	0.3	7	0.3	17	0.6	297	0.4
Other	10	0.1	0	0.0	1	0.0	0	0.0	36	0.1
Not Valued	336	3.1	63	2.3	79	3.3	177	6.0	2,067	3.0
Total	**10,751**	**100.0**	**2,760**	**100.0**	**2,427**	**100.0**	**2,941**	**100.0**	**69,753**	**100.0**

❖ Table 12. Rates of injury intent by region of injury, Ohio, 2023

This table displays the rates of different intents of injury per 100,000 population by the region where the injury occurred. A state map of these eight Homeland Security regions is located in Appendix L. For this table, records where the injuries occurred out of state were not included in the analysis. Records where the county of injury was not valued (and so a region of injury could not be determined) were not included in this analysis. Records where the intent of injury was labeled as "Not Valued" were populated with "- ".

Across all regions, the highest rates of injury intent were for unintentional injuries. The highest rate of unintentional injury was in Region 3, whereas the highest rate of injury by assault was in Region 4.

Region	Unintentional		Self-Inflicted		Assault		Undetermined	
	Number of Injuries	Rate per 100,000	Number of Injuries	Rate per 100,000	Number of Injuries	Rate per 100,000	Number of Injuries	Rate per 100,000
Region 1	4,976	373.2	84	6.3	162	12.1	21	1.6
Region 2	9,091	460.3	71	3.6	687	34.8	48	2.4
Region 3	8,582	761.1	56	5.0	357	31.7	32	2.8
Region 4	13,445	557.1	147	6.1	1,054	43.7	72	3.0
Region 5	9,995	446.6	118	5.3	400	17.9	39	1.7
Region 6	9,824	533.6	98	5.3	431	23.4	52	2.8
Region 7	2,564	565.7	19	4.2	105	23.2	9	2.0
Region 8	2,265	560.6	16	4.0	59	14.6	7	1.7
Total	**60,742**	**515.4**	**609**	**5.2**	**3,255**	**27.6**	**280**	**2.4**

Region	Other		Not Valued		Total	
	Number of Injuries	Rate per 100,000	Number of Injuries	Rate per 100,000	Number of Injuries	Rate per 100,000
Region 1	5	0.4	112	8.4	5,360	402.0
Region 2	1	0.1	317	16.1	10,215	517.2
Region 3	3	0.3	253	22.4	9,283	823.3
Region 4	12	0.5	377	15.6	15,107	625.9
Region 5	4	0.2	353	15.8	10,909	487.4
Region 6	10	0.5	336	18.3	10,751	584.0
Region 7	0	0.0	63	13.9	2,760	609.0
Region 8	1	0.2	79	19.6	2,427	600.7
Total	**36**	**0.3**	**1,890**	**16.0**	**66,812**	**566.9**

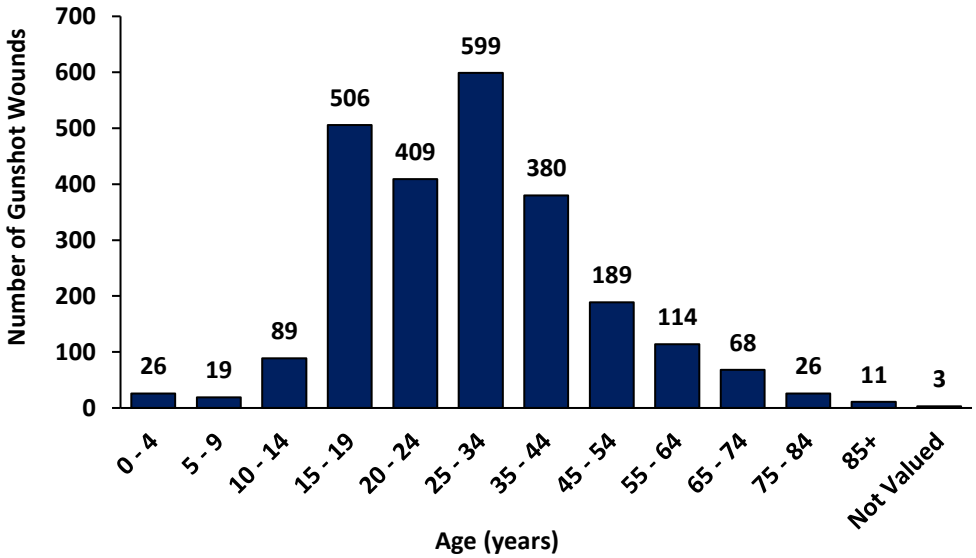
❖ Table 13. Intent of injury by urban and rural areas, Ohio, 2023

This table shows the intent of injuries sustained in 2023 by urban and rural areas. For this table, records where the injuries occurred out of state were not included in the analysis. Records where the intent of injury was labeled as "Not Valued" were populated with "- ". Counties in Ohio were assigned an urban or rural classification based on the 2013 National Center for Health Statistics Urban-Rural Classification Scheme for Counties (Appendix M). Unintentional injuries were the most common intent of injury in both rural and urban areas. A higher percentage of assaults occurred in urban areas compared to the percentage in rural areas.

Intent	Rural		Urban		Not Recorded		Total	
	#	%	#	%	#	%	#	%
Unintentional	11,592	93.5	49,150	90.3	2,482	84.4	63,224	90.6
Self-Inflicted	118	1.0	491	0.9	26	0.9	635	0.9
Assault	286	2.3	2,969	5.5	239	8.1	3,494	5.0
Undetermined	38	0.3	242	0.4	17	0.6	297	0.4
Other	7	0.1	29	0.1	0	0.0	36	0.1
Not Valued	358	2.9	1,532	2.8	177	6.0	2,067	3.0
Total	**12,399**	**100.0**	**54,413**	**100.0**	**2,941**	**100.0**	**69,753**	**100.0**

❖ Figure 7. Gunshot wounds by age group, Ohio, 2023

This graph shows the distribution of gunshot wounds in the Ohio Trauma Registry by age group. Records where the age category is labeled as "Not Valued" were populated with "- ". In 2023, gunshot wounds occurred most frequently among persons 25 – 34 years of age. Air guns were included in the ICD-10 codes that defined gunshot wounds for this analysis. This analysis only includes gunshot wounds that were sent to a facility.



❖ Table 14. Gunshot wounds by region, Ohio, 2023

This table shows the distribution of gunshot wounds where the injury occurred by Ohio Homeland Security Region. A state map of these eight regions is located in Appendix L. For this table, records where the injuries occurred out of state were not included in the analysis. This analysis only includes gunshot wounds that were sent to a facility. Gunshot wounds occurred most frequently in Region 2 (526, 26.0%).

Region	#	%
Region 1	90	4.4
Region 2	526	26.0
Region 3	202	10.0
Region 4	499	24.7
Region 5	260	12.9
Region 6	298	14.7
Region 7	31	1.5
Region 8	16	0.8
Not Recorded	101	5.0
Total	**2,023**	**100.0**

❖ Table 15. Rate of gunshot wounds by county of injury, Ohio, 2023

This table displays the rate of gunshot wounds by the county where the injury occurred. For this table, records where the county of injury was not recorded and where the injuries occurred out of state were not included in the analysis. This analysis only includes gunshot wounds that were sent to a facility. Cuyahoga County (with 38.2 per 100,000 population) and Franklin County (with 33.6 per 100,000 population) reported the highest rates of gunshot wounds during this reporting period. Among the injuries with identified counties, the statewide rate of gunshot wounds was 16.3 per 100,000 population.

County	Population	Rate per 100,000	County	Population	Rate per 100,000
Adams	27,521	10.9	**Logan**	46,057	8.7
Allen	100,838	14.9	**Lorain**	317,910	12.6
Ashland	52,190	3.8	**Lucas**	425,484	12.5
Ashtabula	96,845	6.2	**Madison**	44,602	17.9
Athens	62,706	8.0	**Mahoning**	225,596	18.2
Auglaize	46,050	4.3	**Marion**	64,851	10.8
Belmont	64,918	0.0	**Medina**	184,042	2.2
Brown	43,777	9.1	**Meigs**	21,767	13.8
Butler	393,043	14.0	**Mercer**	42,439	2.4
Carroll	26,758	7.5	**Miami**	110,876	4.5
Champaign	38,845	12.9	**Monroe**	13,153	0.0
Clark	134,610	18.6	**Montgomery**	533,796	26.6
Clermont	211,972	2.8	**Morgan**	13,646	14.7
Clinton	41,938	11.9	**Morrow**	35,595	5.6
Columbiana	100,182	2.0	**Muskingum**	86,305	11.6
Coshocton	36,869	0.0	**Noble**	14,311	0.0
Crawford	41,529	7.2	**Ottawa**	39,803	0.0
Cuyahoga	1,233,088	38.2	**Paulding**	18,706	0.0
Darke	51,415	11.7	**Perry**	35,551	19.7
Defiance	38,315	2.6	**Pickaway**	61,086	8.2
Delaware	231,636	1.3	**Pike**	27,001	3.7
Erie	74,035	6.8	**Portage**	162,665	5.5
Fairfield	165,360	2.4	**Preble**	40,556	0.0
Fayette	28,817	3.5	**Putnam**	34,199	5.8
Franklin	1,326,063	33.6	**Richland**	125,064	18.4
Fulton	42,007	2.4	**Ross**	76,501	5.2
Gallia	28,986	0.0	**Sandusky**	58,709	1.7
Geauga	95,407	3.1	**Scioto**	71,969	4.2
Greene	169,691	11.2	**Seneca**	54,527	3.7
Guernsey	38,089	5.3	**Shelby**	47,765	0.0
Hamilton	827,058	25.3	**Stark**	372,716	12.1
Hancock	74,704	4.0	**Summit**	535,733	14.2
Hardin	30,368	0.0	**Trumbull**	200,373	25.0
Harrison	14,159	0.0	**Tuscarawas**	91,874	3.3
Henry	27,520	0.0	**Union**	69,637	4.3
Highland	43,614	9.2	**Van Wert**	28,704	0.0
Hocking	27,540	18.2	**Vinton**	12,474	0.0
Holmes	44,386	2.3	**Warren**	252,148	4.8
Huron	58,199	3.4	**Washington**	58,577	0.0
Jackson	32,606	6.1	**Wayne**	116,510	1.7
Jefferson	64,026	3.1	**Williams**	36,591	5.5
Knox	63,320	0.0	**Wood**	132,650	0.0
Lake	231,640	2.6	**Wyandot**	21,457	4.7
Lawrence	56,118	1.8	**Not Recorded**		
Licking	183,201	7.1	**Out of Ohio**		

The national average rate of fatal firearm injuries from CY 2010 – 2012 was 10.23 per 100,000, and the average rate of non-fatal firearm injuries was 21.6 per 100,000. [1] Fatal firearm injuries were most commonly reported within the 25 – 34 age group, while those ages 15 – 24 were the most common age group in which non-fatal firearm injuries occurred. [1]

In 2017, the age-adjusted death rate for firearm-related injuries in the United States was 12.0 per 100,000. The highest death rate was reported in the 25 – 34 age group (18.5 per 100,000), followed by the 15 – 24 age group (17.7 per 100,000). [2]

Sources:

[1] Fowler KA, Dahlberg LL, Haileyesus T, Annest JL. Firearm injuries in the United States. Prev Med. 2015 Oct;79:5-14. doi: 10.1016/j.ypmed.2015.06.002. Epub 2015 Jun 24. PMID: 26116133; PMCID: PMC4700838.

[2] Kochanek KD, Murphy SL, Xu J, Arias E. Deaths: Final Data for 2017. Natl Vital Stat Rep. 2019 Jun;68(9):1-77. PMID: 32501199.

SECTION 5: OUTCOME MEASURES

Outcome measures as defined by the World Health Organization are the "change in the health of an individual, group of people, or population that is attributable to an intervention or series of interventions." For the purposes of this report, outcome measures include but are not limited to a patient's initial disposition on arrival, transfer between different level facilities, final discharge disposition, and mortality.

❖ Table 16. Emergency department disposition of trauma cases, Ohio, 2023

This table shows the disposition of patients after arriving at the emergency department. The most frequent ED disposition was being admitted to the floor (40.7%).

Emergency Department Disposition	Patients	
	#	%
Floor	33,671	40.7
Transferred To Another Hospital	16,634	20.1
Intensive Care Unit (ICU)	8,769	10.6
Interventional Radiology (IR)	65	0.1
Telemetry/Step-Down Unit	7,192	8.7
Operating Room	5,971	7.2
Observation Unit	2,531	3.1
Home without Services	3,797	4.6
Morgue	647	0.8
Left Against Medical Advice	89	0.1
Other (Out of Hospital)	92	0.1
Home with Services	27	0.0
Direct Admissions to Hospital	3,149	3.8
Total	**82,634**	**100.0**

❖ Table 17. Emergency department disposition of trauma cases by region, Ohio, 2023

This table shows the disposition of patients after arriving at the emergency department by the region where the injury occurred. A state map of these eight Homeland Security regions is located in Appendix L. For this table, records where the injuries occurred out of state were not included in the analysis. For all regions, the most frequent emergency department disposition was getting admitted to the floor (42.8% in Region 1; 52.3% in Region 2; 36.0% in Region 3; 37.6% in Region 4; 44.3% in Region 5; 42.8% in Region 6; 39.2% in Region 7; 41.1% in Region 8).

Emergency Department Disposition	Region 1		Region 2		Region 3		Region 4		Region 5	
	#	%	#	%	#	%	#	%	#	%
Floor	2,296	42.8	5,343	52.3	3,343	36.0	5,681	37.6	4,838	44.3
Transferred To Another Hospital	1,037	19.3	1,206	11.8	2,192	23.6	3,269	21.6	1,714	15.7
Intensive Care Unit (ICU)	771	14.4	1,620	15.9	844	9.1	1,355	9.0	1,371	12.6
Interventional Radiology (IR)	7	0.1	1	0.01	0	0.0	22	0.1	2	0.02
Telemetry/Step-Down Unit	496	9.3	46	0.5	1,199	12.9	2,179	14.4	1,150	10.5
Operating Room	234	4.4	1,061	10.4	449	4.8	1,122	7.4	745	6.8
Observation Unit	155	2.9	323	3.2	286	3.1	601	4.0	200	1.8
Home without Services	119	2.2	292	2.9	180	1.9	514	3.4	389	3.6
Morgue	33	0.6	135	1.3	60	0.6	158	1.0	67	0.6
Left Against Medical Advice	1	0.02	6	0.1	7	0.1	12	0.1	19	0.2
Other (Out of Hospital)	3	0.1	29	0.3	5	0.1	5	0.03	11	0.1
Home with Services	0	0.0	1	0.01	0	0.0	10	0.1	0	0.0
Direct Admissions to Hospital Upon Arrival	208	3.9	152	1.5	718	7.7	179	1.2	403	3.7
Total	**5,360**	**100.0**	**10,215**	**100.0**	**9,283**	**100.0**	**15,107**	**100.0**	**10,909**	**100.0**

Emergency Department Disposition	Region 6		Region 7		Region 8		Not Recorded		Total	
	#	%	#	%	#	%	#	%	#	%
Floor	4,597	42.8	1,081	39.2	998	41.1	1,223	41.6	29,400	42.1
Transferred To Another Hospital	2,226	20.7	664	24.1	858	35.4	746	25.4	13,912	19.9
Intensive Care Unit (ICU)	955	8.9	195	7.1	127	5.2	254	8.6	7,492	10.7
Interventional Radiology (IR)	5	0.05	3	0.1	1	0.04	4	0.1	45	0.1
Telemetry/Step-Down Unit	627	5.8	256	9.3	110	4.5	64	2.2	6,127	8.8
Operating Room	747	6.9	174	6.3	110	4.5	197	6.7	4,839	6.9
Observation Unit	337	3.1	81	2.9	35	1.4	92	3.1	2,110	3.0
Home without Services	520	4.8	202	7.3	58	2.4	233	7.9	2,507	3.6
Morgue	114	1.1	14	0.5	15	0.6	8	0.3	604	0.9
Left Against Medical Advice	2	0.02	0	0.0	1	0.04	10	0.3	58	0.1
Other (Out of Hospital)	13	0.1	1	0.04	3	0.1	5	0.2	75	0.1
Home with Services	0	0.0	5	0.2	4	0.2	1	0.03	21	0.03
Direct Admissions to Hospital Upon Arrival	608	5.7	84	3.0	107	4.4	104	3.5	2,563	3.7
Total	**10,751**	**100.0**	**2,760**	**100.0**	**2,427**	**100.0**	**2,941**	**100.0**	**69,753**	**100.0**

❖ Table 18. Hospital inpatient discharge disposition, Ohio, 2023

This table shows the disposition of patients at the time of their discharge. The most common hospital discharge disposition was going home or doing self-care as a routine discharge (33.7%).

Discharge Disposition	Patients	
	#	%
Home or Self Care (Routine Discharge)	27,840	33.7
Skilled Nursing Facility	16,003	19.4
Home with Services	7,544	9.1
Inpatient Rehab or Designated Unit	4,796	5.8
Expired	1,485	1.8
Left Against Medical Advice or Discontinued Care	666	0.8
Hospice	903	1.1
Transferred to Another Hospital	756	0.9
Long Term Care Hospital (LTCH)	451	0.5
Psychiatric Hospital or Psychiatric Distinct Part of a Hospital	314	0.4
Court/Law Enforcement	253	0.3
Intermediate Care Facility	87	0.1
Another Type of Inpatient Facility Not Defined Elsewhere	57	0.1
Discharged from Emergency Department After Arrival	21,286	25.8
Not Valued	193	0.2
Total	**82,634**	**100.0**

❖ Table 19. Hospital inpatient discharge disposition by region, Ohio, 2023

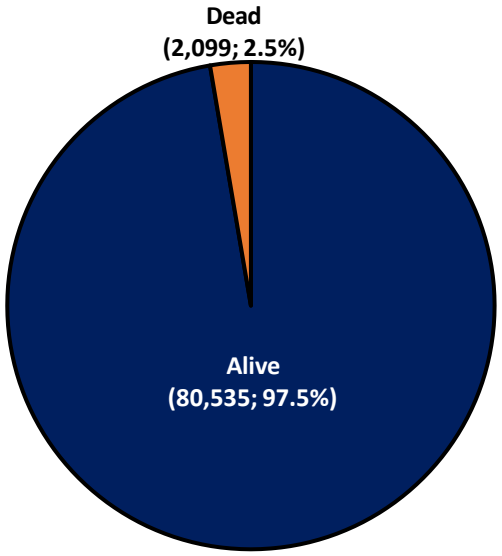
This table looks at the disposition of patients at the time of their discharge by the region where the injury occurred. A state map of these eight Homeland Security regions is located in Appendix L. Records where the injuries occurred out of state were not included in this analysis.

Discharge Disposition	Region 1		Region 2		Region 3		Region 4		Region 5	
	#	%	#	%	#	%	#	%	#	%
Home or Self Care (Routine Discharge)	1,830	34.1	3,007	29.4	2,914	31.4	5,333	35.3	3,398	31.1
Skilled Nursing Facility	1,211	22.6	2,693	26.4	1,908	20.6	2,595	17.2	2,736	25.1
Home with Services	356	6.6	1,155	11.3	963	10.4	1,665	11.0	975	8.9
Inpatient Rehab or Designated Unit	346	6.5	853	8.4	546	5.9	567	3.8	832	7.6
Expired	113	2.1	192	1.9	163	1.8	320	2.1	240	2.2
Left Against Medical Advice or Discontinued Care	37	0.7	95	0.9	86	0.9	130	0.9	70	0.6
Hospice	61	1.1	114	1.1	108	1.2	168	1.1	169	1.5
Transferred to Another Hospital	75	1.4	117	1.1	75	0.8	111	0.7	136	1.2
Long Term Care Hospital (LTCH)	73	1.4	39	0.4	26	0.3	64	0.4	70	0.6
Psychiatric Hospital or Psychiatric Distinct Part of a Hospital	33	0.6	32	0.3	17	0.2	66	0.4	56	0.5
Court/Law Enforcement	12	0.2	36	0.4	29	0.3	98	0.6	12	0.1
Intermediate Care Facility	14	0.3	8	0.1	2	0.02	10	0.1	10	0.1
Another Type of Inpatient Facility Not Defined Elsewhere	6	0.1	18	0.2	0	0.0	11	0.1	5	0.05
Discharged from Emergency Department After Arrival	1,193	22.3	1,669	16.3	2,444	26.3	3,968	26.3	2,200	20.2
Not Valued	0	0.0	187	1.8	2	0.02	1	0.01	0	0.0
Total	**5,360**	**100.0**	**10,215**	**100.0**	**9,283**	**100.0**	**15,107**	**100.0**	**10,909**	**100.0**

Discharge Disposition	Region 6		Region 7		Region 8		Not Recorded		Total	
	#	%	#	%	#	%	#	%	#	%
Home or Self Care (Routine Discharge)	2,723	25.3	970	35.1	746	30.7	1,383	47.0	22,304	32.0
Skilled Nursing Facility	2,687	25.0	416	15.1	408	16.8	189	6.4	14,843	21.3
Home with Services	1,004	9.3	255	9.2	153	6.3	161	5.5	6,687	9.6
Inpatient Rehab or Designated Unit	787	7.3	93	3.4	54	2.2	102	3.5	4,180	6.0
Expired	201	1.9	53	1.9	28	1.2	14	0.5	1,324	1.9
Left Against Medical Advice or Discontinued Care	61	0.6	19	0.7	15	0.6	23	0.8	536	0.8
Hospice	167	1.6	22	0.8	16	0.7	8	0.3	833	1.2
Transferred to Another Hospital	84	0.8	24	0.9	51	2.1	24	0.8	697	1.0
Long Term Care Hospital (LTCH)	55	0.5	8	0.3	5	0.2	14	0.5	354	0.5
Psychiatric Hospital or Psychiatric Distinct Part of a Hospital	42	0.4	5	0.2	3	0.1	14	0.5	268	0.4
Court/Law Enforcement	21	0.2	4	0.1	5	0.2	3	0.1	220	0.3
Intermediate Care Facility	32	0.3	4	0.1	3	0.1	2	0.1	85	0.1
Another Type of Inpatient Facility Not Defined Elsewhere	11	0.1	1	0.04	1	0.04	1	0.03	54	0.1
Discharged from Emergency Department After Arrival	2,875	26.7	886	32.1	939	38.7	1,003	34.1	17,177	24.6
Not Valued	1	0.01	0	0.0	0	0.0	0	0.0	191	0.3
Total	**10,751**	**100.0**	**2,760**	**100.0**	**2,427**	**100.0**	**2,941**	**100.0**	**69,753**	**100.0**

❖ Figure 8. Discharge status of all reported trauma cases, Ohio, 2023

This pie chart shows the discharge status (i.e., alive or dead) of records with reported traumatic injuries.



❖ Table 20. Discharge status of all reported trauma cases, Ohio, 2023

This table shows the discharge status (i.e., alive or dead) of records with reported traumatic injuries. The majority (97.5%) were alive at the time of discharge. The total case fatality rate is 2.5%. A table of case fatality rates across multiple demographics, injury, and patient disposition variables can be found on page 33.

Discharge Status	Patients	
	#	%
Alive	80,535	97.5
Dead	2,099	2.5
Total	**82,634**	**100.0**

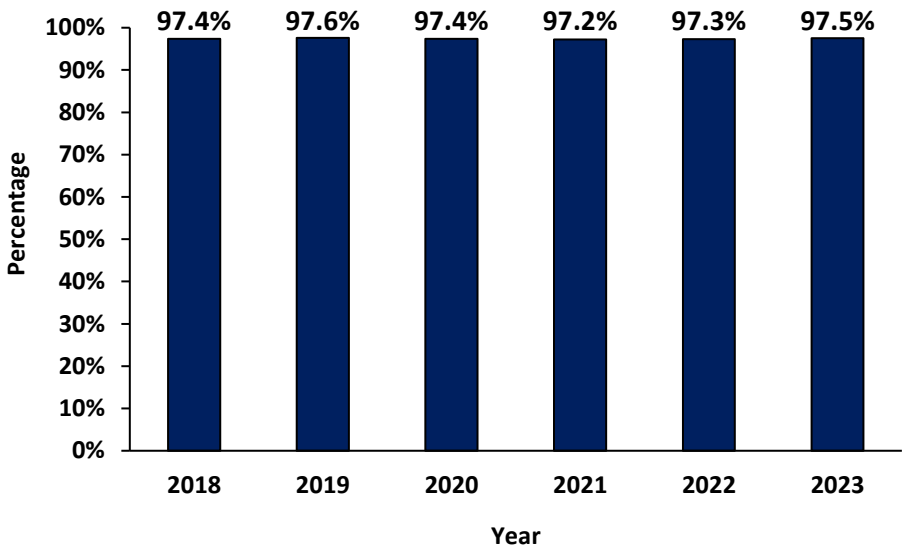
❖ Table 21. Discharge status of all reported trauma cases, Ohio, 2018-2023

This table shows the discharge status (i.e., alive or dead) of records with reported traumatic injuries from 2018 to 2023. 2018-2022 discharge data are from previous trauma reports.

Year	Discharge Status		
	Alive	Dead	Total
2018	66,629	1,773	68,402
2019	70,316	1,762	72,078
2020	78,215	2,101	80,316
2021	82,115	2,398	84,513
2022	82,467	2,277	84,744
2023	80,535	2,099	82,634

❖ Figure 9. Percentage of reported trauma cases discharged alive, Ohio, 2018-2023

This table shows the percentage of records with reported traumatic injuries that were discharged alive from 2018 to 2023. 2018-2022 discharge data are from previous trauma reports.



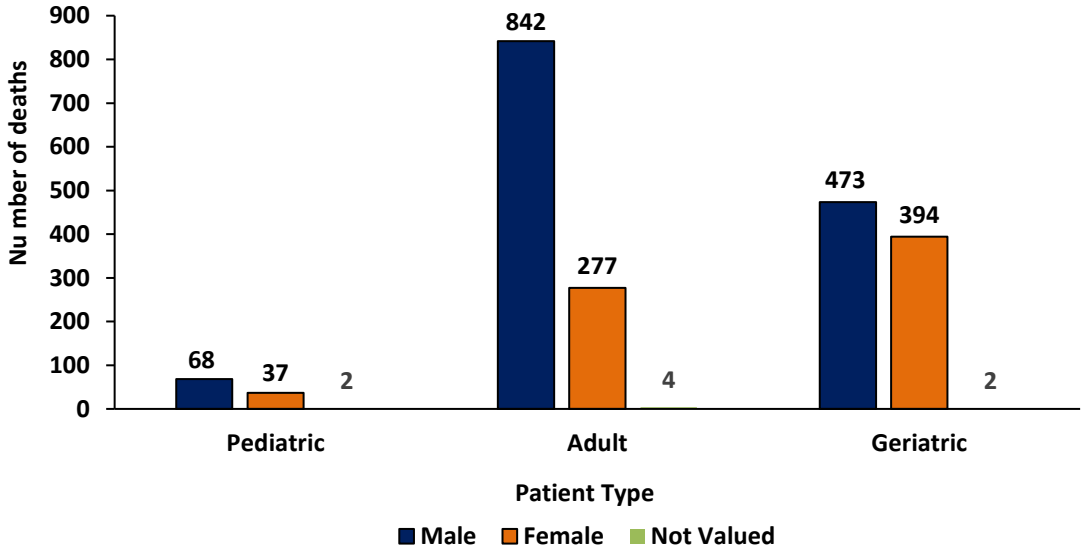
❖ Table 22. Discharge status of all reported trauma cases by region, Ohio, 2023

This table shows the discharge status of patients by region where the injury occurred. A state map of these eight Homeland Security regions is located in Appendix L. These regions are also used by the Regional Physician Advisory Board (RPAB). For this table, records where the injuries occurred out of state were not included in the analysis. Regions 2 and 4 had the highest percentage of patients discharged deceased.

Region	Alive	Dead	Total	% Discharged Dead
Region 1	5,215	145	5,360	2.7
Region 2	9,887	328	10,215	3.2
Region 3	9,063	220	9,283	2.4
Region 4	14,633	474	15,107	3.1
Region 5	10,608	301	10,909	2.8
Region 6	10,453	298	10,751	2.8
Region 7	2,693	67	2,760	2.4
Region 8	2,383	44	2,427	1.8
Not Recorded	2,919	22	2,941	0.7
Total	**67,854**	**1,899**	**69,753**	**2.7**

❖ Figure 10. Number of injury-related deaths by patient type and sex, Ohio, 2023

This graph shows the number of deaths related to injuries sustained by patients in 2023 by patient type and sex. Overall, deaths were more common among males than females.



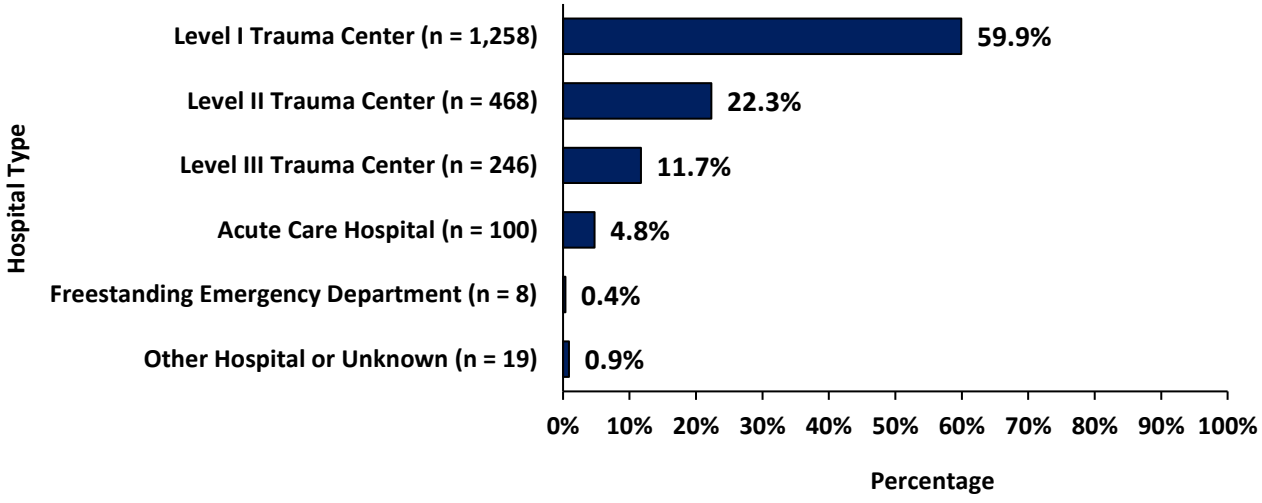
❖ Table 23. GCS Documentation of head injuries with an Abbreviated Injury Scale (AIS) ≥ 3, Ohio, 2023

This table shows the number and percentages of patients with an AIS ≥ 3 who had a Glasgow Coma Scale (GCS) score reported prior to arrival at the hospital and once in the facility. Records where the GCS scores were labeled as "Not Valued or Recorded" were populated with "II", "UU", or nothing. Of the 9,618 records who had an AIS ≥ 3, 56.8% did not have a valued GCS score prior to arrival at the hospital. Of all patients, 6.8% did not have a valued GCS score in the hospital.

	Out of-Hospital GCS		In-Hospital GCS	
	#	%	#	%
GCS 3	504	5.2	997	10.4
GCS 4	33	0.3	71	0.7
GCS 5	60	0.6	48	0.5
GCS 6	63	0.7	129	1.3
GCS 7	56	0.6	115	1.2
GCS 8	77	0.8	92	1.0
GCS 9	94	1.0	85	0.9
GCS 10	73	0.8	108	1.1
GCS 11	90	0.9	118	1.2
GCS 12	122	1.3	135	1.4
GCS 13	208	2.2	314	3.3
GCS 14	684	7.1	1,260	13.1
GCS 15	2,089	21.7	5,495	57.1
Not Valued or Recorded	5,465	56.8	651	6.8
Total	**9,618**	**100.0**	**9,618**	**100.0**

❖ Figure 11. Emergency department deaths by hospital type, Ohio, 2023

This graph shows the number and percentage of emergency department deaths by hospital type. The majority (59.9%) of deaths occurred at Level I Trauma Centers. This is likely due to the fact that by their nature, Level I Trauma Centers receive the most critical trauma cases.



SECTION 6: CASE FATALITY RATES

The Case Fatality Rate (CFR) is the proportion of deaths within a designated population or grouping of "cases" (people with a particular medical condition or hospital disposition) over the course of the disease. A CFR is conventionally expressed as a percentage.

❖ Table 24. Case fatality rate (CFR) by age group and sex, Ohio, 2023

The table below looks at case fatality rates by age group and sex among the records submitted to the registry. Records where age was not valued (populated with "- ") were not included in this analysis. Except for the 0-4 and 15-19 age categories, the case fatality rates were higher among males compared to females.

	CFR (%)			
Age Group	**Male**	**Female**	**Not Reported**	**Total**
0-4	1.9	2.0	15.4	2.0
5-9	0.6	0.4	0.0	0.6
10-14	0.9	0.5	0.0	0.8
15-19	2.4	2.7	0.0	2.5
20-24	4.4	2.5	0.0	3.9
25-34	4.0	1.9	3.7	3.3
35-44	3.2	1.9	2.6	2.8
45-54	3.4	1.9	0.0	2.9
55-64	3.3	1.9	1.2	2.7
65-74	3.3	1.6	0.9	2.4
75-84	3.3	1.6	0.6	2.3
85+	4.4	2.2	0.9	2.9
Not Valued	--	0.0	--	0.0
Total	3.2	1.8	1.2	2.5

❖ Table 25. Case fatality rate (CFR) by Injury Severity Score (ISS), Ohio, 2023

The table below looks at case fatality rates by Injury Severity Score (ISS) among the records submitted to the registry. In 2023, the case fatality rate was the highest among those with an ISS of ≥ 25 (26.4%).

ISS	**CFR (%)**
01-09	1.0
10-14	2.1
15-24	4.9
25+	26.4
Not Calculable	2.7
Total	**2.5**

❖ Table 26. Case fatality rate (CFR) by duration of hospital stay for Injury Severity Score (ISS) ≥ 25, Ohio, 2023

This table looks at case fatality rates for injuries with ISS ≥ 25 by duration of hospital days. For patients with an ISS ≥ 25, overall, the case fatality rate decreased the longer they were hospitalized. The CFR was the highest (52.3%) for patients that stayed in the hospital for one day.

	Hospital stay (days)							
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8+**
CFR (%)	52.3	42.0	25.7	19.3	19.5	19.1	11.5	8.3

❖ Table 27. Case fatality rate (CFR) by intent of injury, Ohio, 2023

This table looks at case fatality rates by intent of injury. Records where the intent of injury was labeled as "Not Valued" were populated with "- ". In 2023, the case fatality rate was the highest among those with "Other" injuries (25.0%).

Intent	CFR (%)
Unintentional	2.1
Self-Inflicted	18.0
Assault	5.4
Undetermined	7.8
Other	25.0
Not Valued	4.1
Total	**2.5**

❖ Table 28. Case fatality rate (CFR) by hospital type, Ohio, 2023

This table looks at case fatality rates by hospital type. In 2023, the case fatality rate was the highest in Level I Trauma Centers (3.8%).

Hospital Type	CFR (%)
Level I Trauma Center	3.8
Level II Trauma Center	3.0
Level III Trauma Center	1.6
Free Standing Emergency Department	0.2
Acute Care Hospital	0.8
Other Hospital or Unknown	1.0
Statewide	**2.5**

❖ Table 29. Case fatality rate (CFR) by mechanism of injury, Ohio, 2023

This table looks at case fatality rates by mechanism of injury. Records labeled as "Not Classified" were populated with that text. Records labeled as "Not Valued" were populated with "- ". The case fatality rate was the highest among those who died by suffocation/asphyxiation (42.3%) and drowning/submersion (18.6%).

Mechanism of Injury	CFR (%)
Abuse	2.8
Cut or Pierce	1.2
Drowning/Submersion	18.6
Electrical	0.0
Explosion	4.4
Fall	1.8
Fire or Flame	6.1
Firearm	15.3
Hot Object or Substance	0.2
Machinery	0.6
Mechanical	0.8
Motor Vehicle Collisions	4.1
Natural or Environmental	0.6
Other Land Transport	1.8
Other Specified, Classifiable	13.9
Other Specified, Not Elsewhere Classifiable	3.2
Other Transport	6.3
Overexertion	0.0
Pedal Cyclist, Other	0.3
Pedestrian, Other	2.9
Pedestrian Conveyance	0.6
Poisoning	0.0
Struck by or Against	0.5
Suffocation/Asphyxiation	42.3
Not Classified/Not Valued	3.7
Statewide	**2.5**

❖ Table 30. Case fatality rates (CFR) among motor vehicle collisions, Ohio, 2023

The table below looks at CFR among different types of motor vehicle collisions. Pedestrian collisions had the highest CFR (9.6%).

Type of Motor Vehicle Collision (MVC)	CFR (%)
MVC – Motorcyclist	5.4
MVC – Occupant	3.4
MVC – Other	0.0
MVC - Pedal Cyclist	3.3
MVC – Pedestrian	9.6
MVC - Unspecified	1.4
Total	**4.1**

❖ Table 31. Case fatality rate (CFR) by county, Ohio, 2023

This table displays the case fatality rate by the county where the injury occurred. For this table, records where the injuries occurred out of state were not included in the analysis. The statewide CFR is 2.7%. Van Wert (8.0%) and Ashtabula (5.8%) counties reported the highest CFRs in 2023. This table displays fatalities based on the county of injury, not the county or facility where the fatality occurred. EMS runs involving fatalities are not always reported to the Trauma Registry.

County	CFR (%)	County	CFR (%)
Adams	2.1	**Logan**	3.1
Allen	3.1	**Lorain**	2.7
Ashland	3.4	**Lucas**	3.3
Ashtabula	5.8	**Madison**	3.2
Athens	2.6	**Mahoning**	3.3
Auglaize	1.5	**Marion**	1.9
Belmont	0.0	**Medina**	2.5
Brown	4.4	**Meigs**	2.7
Butler	2.8	**Mercer**	4.7
Carroll	1.3	**Miami**	1.5
Champaign	3.3	**Monroe**	0.0
Clark	2.4	**Montgomery**	2.8
Clermont	2.2	**Morgan**	0.0
Clinton	3.4	**Morrow**	2.3
Columbiana	1.4	**Muskingum**	2.0
Coshocton	1.1	**Noble**	1.0
Crawford	3.5	**Ottawa**	1.6
Cuyahoga	3.5	**Paulding**	0.0
Darke	1.0	**Perry**	2.5
Defiance	1.3	**Pickaway**	2.7
Delaware	2.4	**Pike**	5.0
Erie	4.1	**Portage**	2.7
Fairfield	1.3	**Preble**	2.5
Fayette	2.8	**Putnam**	0.0
Franklin	3.7	**Richland**	3.4
Fulton	2.2	**Ross**	2.4
Gallia	4.5	**Sandusky**	4.7
Geauga	1.4	**Scioto**	1.9
Greene	2.0	**Seneca**	1.7
Guernsey	3.5	**Shelby**	1.5
Hamilton	3.1	**Stark**	2.8
Hancock	0.8	**Summit**	2.5
Hardin	1.9	**Trumbull**	2.9
Harrison	0.0	**Tuscarawas**	1.6
Henry	1.0	**Union**	2.2
Highland	2.1	**Van Wert**	8.0
Hocking	1.4	**Vinton**	4.3
Holmes	0.0	**Warren**	2.2
Huron	1.7	**Washington**	1.9
Jackson	2.0	**Wayne**	4.2
Jefferson	2.4	**Williams**	2.7
Knox	2.2	**Wood**	3.2
Lake	2.1	**Wyandot**	2.5
Lawrence	0.0	**Not Recorded**	0.7
Licking	3.1	**Statewide**	2.7

Appendix A: Glossary of Terms

Abbreviated Injury Scales (AIS) – is an anatomically-based, global severity scoring system that classifies each injury by body region according to its relative importance. AIS is the basis for the Injury Severity Score (ISS) calculation of the multiply injured patient.
Acute Care Hospital – a facility providing a level of health care in which a patient is treated for a brief but severe episode of illness, for conditions that are the result of disease or trauma, and during recovery from surgery.
Adult – is defined and used in this report to describe an individual whose age ranges from 16 to 69 years of age.
Case Fatality Rate (CFR) – the case fatality rate is the calculation derived from dividing the number of deaths from a specific injury over a defined period of time by the total number of individuals diagnosed with the same injury during the same time period; the resulting ratio is then multiplied by 100 to yield a percentage.

Critical Access Hospital – is a designation given to eligible rural hospitals by the Centers for Medicare and Medicaid Services (CMS). See Appendix F for locations of Ohio's Critical Access Hospitals.

Dataset – a collection of related sets of information that are composed of separate elements but can be manipulated as a group to display relational information.
Disposition - The final place or setting to which the patient was discharged on the day of discharge (i.e. home, hospice, acute care facility, etc.)
Division of Emergency Medical Services (DEMS) – the division where the State Board of Emergency Medical, Fire, and Transportation Services is housed within the Ohio Department of Public Safety.
Emergency Medical, Fire and Transportation Services Board – The state board responsible for: Establishing training and certification standards for emergency medical services personnel; accreditation of EMS training programs; approval of EMS continuing education sites; oversight of Ohio's trauma system; oversight of the EMS grant program; providing grants for training, equipment and research; EMS for Children (EMSC) program coordination; licensing of Ohio's medical transportation services; coordination of the Regional Physician Advisory Boards (RPABs); collection and analysis of data submitted to the EMS Incident Reporting System and the Ohio Trauma Registry and investigations to ensure compliance with the Ohio Revised and Administrative Codes.
Emergency Medical Services Incident Reporting System (EMSIRS) – the system used to collect out-of-hospital care data reported by Emergency Medical Service (EMS) providers to the State of Ohio.

Freestanding Emergency Department (FSED) – is an emergency facility that is structurally separate and distinct from a hospital and provides emergency care.
Geriatric – is defined and used in this report to describe an individual whose age is 70 years of age or greater.
Glasgow Coma Scale (GCS) – an evaluation system developed to assess impairment and conscious levels in response to defined stimuli.
Injury Severity Score (ISS) - an evaluation system developed to predict the outcomes of traumas, including mortality and length of hospital stay. The score is based on the Abbreviated Injury Scale (AIS), another scoring system for injury severity. When a patient is injured, each area of the body is assigned an AIS score depending on the injury severity.

An ISS is calculated by squaring the AIS score from the three most severely injured body areas and adding them together. ISS scores range from 0 to 75 [1]. The higher the ISS score, the more severe the injury.

Mechanism of Injury (MOI) – refers to the method by which damage (trauma) to the body occurred.

Motor Vehicle Collision (MVC) – also referred to as a Motor Vehicle Accident (MVA).

Ohio Trauma Registry (OTR) – the system used to collect trauma-related patient data reported by emergency facilities and trauma centers to the State of Ohio.

Outcome measures – as defined by the World Health Organization are the "change in the health of an individual, group of people, or population that is attributable to an intervention or series of interventions." For the purposes of this report, outcome measures include but are not limited to a patient's initial disposition on arrival, transfer between different level facilities, final discharge disposition, and mortality.

Pediatric – is defined and used in this report to describe an individual whose age ranges from 0 to 15 years of age.

Record – is used to reference an individual incident as reported to the Ohio Trauma Acute Care Registry.

Region – as defined and used in this report refers to one of eight Ohio Homeland Security Regions a county is assigned. The Regional Physician Advisory Board (RPAB) utilizes this same regional mapping. See Appendix L.

Regional Trauma System – is an organized, coordinated effort in a defined geographic area that delivers the full range of care to all injured patients and works together with emergency services and disaster preparedness making efficient use of health care resources to improve patient outcomes in the state of Ohio. Membership is voluntary and not generally restricted by facility location. See Appendix O.

Rural – a county designation based on lower population densities and larger amounts of agricultural and undeveloped land. See Appendix M.

Trauma Center – an emergency medical facility that can provide a higher-level treatment and surgical care to trauma patients than other types of emergency facilities. In Ohio, the designation of "trauma center" and its level of service is based on assessment and verification by the American College of Surgeons (ACS). See Appendix C and D for locations of Ohio's Trauma Centers.

Level I Trauma Centers are a comprehensive regional resource that is a tertiary care facility central to the trauma system. A Level I Trauma Center is capable of providing total care for every aspect of injury – from prevention through rehabilitation.

Level II Trauma Centers are able to initiate definitive care for all injured patients.

Level III Trauma Centers have demonstrated an ability to provide prompt assessment, resuscitation, surgery, intensive care and stabilization of injured patients and emergency operations.

These descriptions above are provided by the American Trauma Society. A detailed description of the patient care offered at each service level can be found in the ACS document, "Resources for Optimal Care of the Injured Patient." [2]

Urban – a county designation based on higher population densities. See Appendix M.

[1] http://www.trauma.org/archive/scores/iss.html

[2] https://www.facs.org

Appendix B: Ohio Trauma Registry Inclusion Criteria and Data Dictionary

TRAUMA PATIENT DEFINITION

To ensure consistent data collection across the State of Ohio and to follow the National Trauma Data Standard, a trauma patient is defined as a patient sustaining a traumatic injury within 14 days of initial hospital encounter and meeting the following:

PATIENT INCLUSION CRITERIA

To be included in the Trauma Acute Care Registry (TACR):

The patient must have incurred at least one of the injury diagnostic codes defined in the International Classification of Diseases, Tenth Revision, Clinical Modification (ICD-10-CM):

- **J70.5 with character modifier of A ONLY** (Respiratory conditions due to smoke inhalation – initial encounter)
- **S00-S99 with 7th character modifier of A, B or C ONLY** (Injuries to specific body parts – initial encounter):
- **T07** (Unspecified multiple injuries);
- **T14** (Injury of unspecified body region);
- **T20-T28 with 7th character modifier of A ONLY** (Burns by specified body parts – initial encounter);
- **T30-T32** (Burn by TBSA percentage);
- **T33 with character modifier of A ONLY** (Superficial frostbite – initial encounter)
- **T34 with character modifier of A ONLY** (Frostbite with tissue necrosis – initial encounter)
- **T67 with character modifier of A ONLY** (Effects of heat and light – initial encounter)
- **T68 with character modifier of A ONLY** (Hypothermia – initial encounter)
- **T69 with character modifier of A ONLY** (Other effects of reduced temperature – initial encounter)
- **T70.4 with character modifier of A ONLY** (Effects of high-pressure fluids – initial encounter)
- **T70.8 with character modifier of A ONLY** (Other effects of air pressure and water pressure – initial encounter)
- **T70.9 with character modifier of A ONLY** (Effect of air pressure and water pressure, unspecified – initial encounter)
- **T71 with character modifier of A ONLY** (Asphyxiation – initial encounter)
- **T74.1 with character modifier of A ONLY** (Physical abuse, confirmed – initial encounter)
- **T74.4 with character modifier of A ONLY** (Shaken infant syndrome – initial encounter)
- **T75.0 with character modifier of A ONLY** (Effects of lightning – initial encounter)
- **T75.1 with character modifier of A ONLY** (Unspecified effects of drowning and nonfatal submersion – initial encounter)
- **T75.4 with character modifier of A ONLY** (Electrocution – initial encounter)
- **T79.A1-T79.A9 with 7th character modifier of A ONLY** (Traumatic compartment syndrome – initial encounter)
- **S00, S10, S20, S30, S40, S50, S60, S70, S80, S90** (Patients with these isolated injuries that were transferred in/out or died.)

THE PATIENT MUST ALSO IN ADDITION TO THE ABOVE INCLUSION CRITERIA

- Death resulting from the traumatic injury (independent of hospital admission or hospital transfer status);

  OR
- Patient transfer from one acute care hospital* to another acute care hospital;

  OR
- Patients directly admitted to your hospital (exclude patients with isolated injuries admitted for elective and/or planned surgical intervention);

  OR
- Patients who were an in-patient admission and/or observed.

PATIENT EXCLUSION CRITERIA

Patients with the following isolated ICD-10-CM codes are **EXCLUDED** from the TACR:

- **S00, S10, S20, S30, S40, S50, S60, S70, S80, S90** (Patients with these isolated injuries that were not transferred in/out or died would be excluded.);
- **7th character modifiers of D through S** (Late effects)
- More information on the trauma inclusion or exclusion criteria and the full 2021 data dictionary can be found at https://www.ems.ohio.gov/links/ems_OTR-TACR-Data-Dictionary-2021.pdf .

Appendix C: List of Ohio Adult Trauma Centers in 2023

Level 1

Metro Health Main Campus Medical Center
UH Cleveland Medical Center
The Ohio State University Wexner Medical Center
Grant Medical Center
University of Cincinnati Medical Center
Mercy Health - St. Vincent Medical Center & Nationwide Children's Hospital -Toledo
ProMedica Toledo Hospital
Mercy Health - St. Elizabeth Youngstown Hospital
Miami Valley Hospital
Summa Health System - Akron Campus
Akron General

Level 2

Riverside Methodist Hospital
Kettering Health Main Campus
Hillcrest Hospital
Mount Carmel East
Lima Memorial Hospital
Mercy Health - St. Rita's Medical Center
Fairview Hospital
University of Toledo Medical Center
Mansfield Hospital
Aultman Hospital
Mercy Hospital

Level 3

Mercy Health - St. Joseph Warren Hospital
UH Geauga Medical Center
UH Parma Medical Center
Mercy Health - Lorain Hospital
Bethesda North Hospital
UH St. John Medical Center
Atrium Medical Center
Kettering Health Hamilton
Southwest General Health Center
ProMedica Defiance Regional Hospital
Firelands Regional Medical Center
The Ohio State University Hospital East
Blanchard Valley Hospital
Fisher-Titus Medical Center
UH Elyria Medical Center
Mercy Health - St. Charles Hospital
Upper Valley Medical Center
Kettering Health Dayton
Genesis Hospital
UH Portage Medical Center
Western Reserve Hospital
West Chester Hospital
Trumbull Regional Medical Center
Marietta Memorial Hospital
Miami Valley Hospital South Campus Emergency and Trauma Center
Soin Medical Center - Kettering Health
Parma Medical Center

Appendix D: List of Ohio Pediatric Trauma Centers in 2023

Level 1

UH Rainbow Babies & Children's Hospital
Nationwide Children's Hospital
Cincinnati Children's Hospital - Burnet Campus
Dayton Children's - Main Campus

Level 2

Metro Health Main Campus Medical Center
Mercy Health - St. Vincent Medical Center &
Nationwide Children's Hospital -Toledo
ProMedica Toledo Hospital
Akron Children's Hospital

Appendix E: List of Ohio Burn Centers in 2023

ABA Verified

Metro Health Medical Center

Akron Children's Hospital

The Ohio State University Wexner Medical Center

Nationwide Children's Hospital

University of Cincinnati Medical Center

Non-ABA

St. Vincent's Hospital Burn Center

Miami Valley Hospital Regional Adult Burn Center

Shriners Children's Ohio Burn Center

Appendix F: List of Ohio Critical Access Hospitals in 2023

Harrison Community Hospital
Adams County Regional Medical Center
Blanchard Valley Hospital - Bluffton Campus
UH Conneaut Medical Center
UH Geneva Medical Center
Barnesville Hospital
Mercy Health - Urbana Hospital
Bucyrus Hospital
Galion Hospital
Community Memorial Hospital
Adena Fayette Medical Center
Fulton County Health Center
Promedica Fostoria Community Hospital
Hardin Memorial Hospital
Highland District Hospital
Henry County Hospital
Adena Greenfield Medical Center
Hocking Valley Community Hospital
Mercy Health - Willard Hospital
Mercy Health - Allen Hospital
Akron General Lodi Hospital
Morrow County Hospital
Magruder Hospital
Paulding County Hospital
MedCentral Health System - Shelby Hospital
Twin City Medical Center
Selby General Hospital
Aultman Orrville Hospital
Montpelier Hospital
Wyandot Memorial Hospital
Adena Pike Medical Center
Holzer Medical Center - Jackson

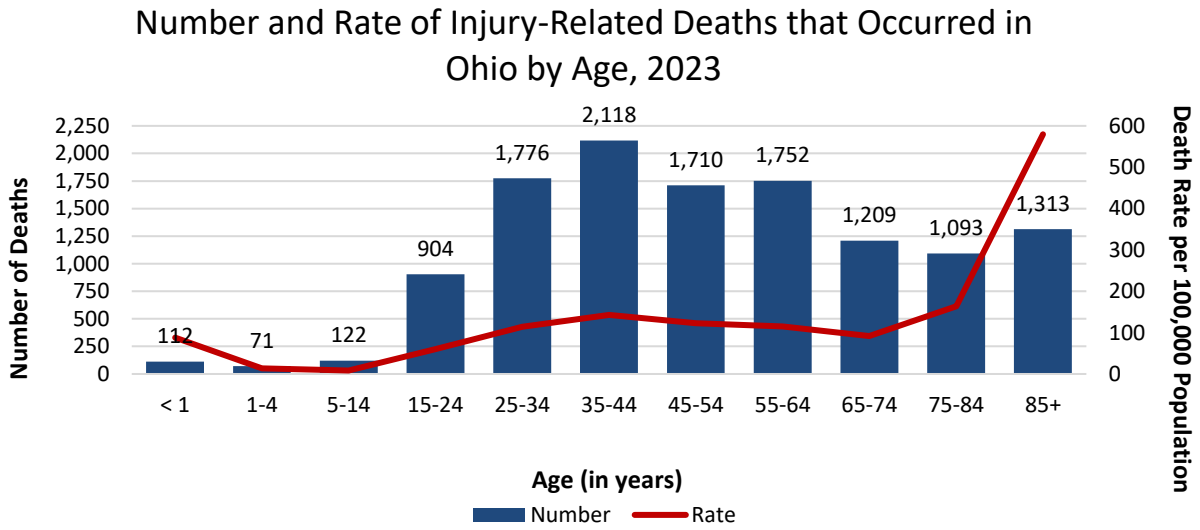
Appendix G: List of Acute Care Hospitals in 2023

The Jewish Hospital - Mercy Health
Trinity Medical Center West
UH Lake West Medical Center
Madison Health
Avon Hospital at Richard E Jacobs
Doctors Hospital
Holzer Gallipolis
Mercy Health - Clermont Hospital
Adena Regional Medical Center
Knox Community Hospital
Kettering Health Miamisburg (formerly Sycamore Med Ctr.)
Mercy Health - Fairfield Hospital
Kettering Health Washington Twp
UH Samaritan Medical Center
Ashtabula County Medical Center
O'Bleness Hospital
Joint Township District Memorial Hospital
McCullough-Hyde Memorial Hospital
Mercy Health - Springfield Regional Medical Center
Clinton Memorial Hospital
Salem Regional Medical Center
East Liverpool City Hospital
Coshocton Regional Medical Center
Euclid Hospital
Marymount Hospital
Lutheran Hospital
Cleveland Clinic Main Campus
Wayne Hospital
Grady Memorial Hospital
Fairfield Medical Center
Promedica Bay Park Hospital
Southeastern Medical Center
The Christ Hospital
Good Samaritan Hospital (Cincinnati)
Mercy Health - Anderson Hospital
Pomerene Hospital
Ontario Hospital
TriPoint Medical Center
Licking Memorial Hospital
Mary Rutan Hospital
McLaren St. Luke's Hospital
Promedica Flower Hospital
Marion General Hospital
Medina Hospital
Mercer County Community Hospital - Coldwater
Berger Hospital
The Bellevue Hospital
ProMedica Memorial Hospital
Southern Ohio Medical Center
Mercy Health - Tiffin Hospital
Wilson Health
Aultman Alliance Community Hospital
Summa Health System - Barberton Campus
Dublin Methodist Hospital
Union Hospital
Memorial Hospital
Van Wert Health
Akron Children's Hosp Beeghly Campus, Boardman
Wooster Community Hospital
Bryan Hospital
Wood County Hospital
South Pointe Hospital
Mercy Health - St. Anne Hospital
Mount Carmel New Albany
Mercy Health - Defiance Hospital
Mercy Health - St. Elizabeth Boardman Hospital
UH Ahuja Medical Center
Mercy Health - West Hospital
Mount Carmel St. Ann's
Diley Ridge Medical Center
King's Daughters Medical Center - Ohio
Kettering Health Troy
Cincinnati Children's Hospital - Liberty Campus
Bethesda Butler Hospital
Miami Valley Hospital North Campus
The Christ Hospital Medical Center - Liberty Twp
Mercy Health - Perrysburg Hospital
Mount Carmel Grove City

Appendix H: List of Freestanding Emergency Departments in 2023

Lakewood Family Health Center ED
Mount Carmel Franklinton (FSED)
Summa Health Wadsworth-Rittman Medical Center
Cleveland Heights Medical Center
Bethesda Medical Center at Arrow Springs
Mercy Health - Harrison Medical Center
Mercy Health - Mt. Orab Medical Center
Brunswick Medical Center
Good Samaritan Medical Center - Western Ridge
CC - Akron General H&W Ctr – West
Madison Health Center
Akron General H&W Ctr – North
Summa Health Green Medical Center
St. Mary's Medical Center - Ironton Campus
Kettering Health Huber
Twinsburg Fam Health & Surg Ctr
Westerville Medical Campus
Akron General H&W Ctr – Green
St. Elizabeth Emergency & Diagnostic Center (Austintown Medical Ctr)
Mercy Health - Putnam County Emergency Services
Miami Valley Hospital Jamestown Emergency Center
Marietta Memorial - Belpre Medical Campus
Kettering Health Preble
Kettering Health - Franklin Emergency Center
OhioHealth Pickerington Methodist Hospital
Mount Carmel Lewis Center
Brecksville Health and Surgery Center
Lewis Center Health Center
Dayton Children's - South Campus ED
Lewis Center Close to Home Center and ED
Genesis Perry County Medical Center
Miami Valley Hospital Austin Blvd Emergency Center
OhioHealth Emergency Care - Reynoldsburg
OhioHealth Emergency Care – Powell
Grove City Methodist Hospital
OhioHealth Emergency Care - New Albany
Kettering Health Middletown ED
Beachwood Medical Center
Fairfield Medical Ctr. - River Valley Campus
Mercy Health - Dayton Springfield Emergency Center
Aultman Massillon
OhioHealth Emergency Care – Ashland
Kettering Health Piqua
OhioHealth Emergency Care – Hilliard
Mount Carmel Reynoldsburg
OhioHealth Emergency Care – Ontario
OhioHealth Emergency Care – Obetz
Holzer Meigs - Emergency Department
Promedica Toledo Hospital Emergency and Urgent Care – Maumee Campus
Miami Valley Hospital Beavercreek Emergency Center
Kettering Health Springfield

Appendix I: Ohio Department of Health Injury-Related Death Data



Source: Ohio Department of Health (ODH) Bureau of Vital Statistics; analysis conducted by ODH Violence and Injury Epidemiology and Surveillance Section

Number and Age-Adjusted Rate of Injury-Related Deaths that Occurred in Ohio by Sex, 2020-2023

	Female		Male		Total	
Year	**Number**	**Age- Adjusted Rate**	**Number**	**Age- Adjusted Rate**	**Number**	**Age- Adjusted Rate**
2020	3,934	61.5	8,215	143.1	**12,149**	**101.6**
2021	4,088	63.5	8,683	150.9	**12,771**	**106.7**
2022	3,993	61.7	8,471	145.5	**12,464**	**102.8**
2023	3,878	58.6	8,302	141.3	**12,180**	**99.1**

Includes injury-related deaths of individuals that died in Ohio regardless of their state of residence (underlying cause of death ICD-10 codes *U01-*U03, V01-Y36, Y85-Y87, Y89).

Age-adjusted rates are based on the 2000 U.S. standard population and are calculated per 100,000 population.

Source: ODH Bureau of Vital Statistics; analysis conducted by ODH Violence and Injury Epidemiology and Surveillance Section.

Number and Percentage of Injury-Related Deaths that Occurred in Ohio by Mechanism, All Intent, 2023

	Female		Male		Total	
External Injury Mechanism	**Number**	**Percentage**	**Number**	**Percentage**	**Number**	**Percentage**
Cut or Pierce	20	1%	64	1%	**84**	**1%**
Drowning	28	1%	112	1%	**140**	**1%**
Drug Poisoning	1,499	39%	3,246	39%	**4,745**	**39%**
Fall	1,088	28%	1,088	13%	**2,176**	**18%**
Fire or Flame	61	2%	101	1%	**162**	**1%**
Firearm	278	7%	1,505	18%	**1,783**	**15%**
Hot Object or Substance	2	0%	0	0%	**2**	**0%**
Machinery	2	0%	20	0%	**22**	**0%**
MV-Motorcyclist	20	1%	188	2%	**208**	**2%**
MV-Occupant	70	2%	145	2%	**215**	**2%**
MV-Other	0	0%	0	0%	**0**	**0%**
MV-Pedal Cyclist	2	0%	18	0%	**20**	**0%**
MV-Pedestrian	59	2%	124	1%	**183**	**2%**
MV-Unspecified	206	5%	491	6%	**697**	**6%**
Natural or Environmental	25	1%	40	0%	**65**	**1%**
Non-Drug Poisoning	57	1%	118	1%	**175**	**1%**
Other Land Transport	8	0%	48	1%	**56**	**0%**
Other Specified, classifiable and NEC	62	2%	200	2%	**262**	**2%**
Other Transport	0	0%	13	0%	**13**	**0%**
Overexertion	0	0%	0	0%	**0**	**0%**
Pedal Cyclist, Other	1	0%	7	0%	**8**	**0%**
Pedestrian, Other	5	0%	14	0%	**19**	**0%**
Struck by or against	9	0%	45	1%	**54**	**0%**
Suffocation	229	6%	563	7%	**792**	**7%**
Unspecified	147	4%	152	2%	**299**	**2%**
Total	**3,878**		**8,302**		**12,180**	

Includes injury-related deaths of individuals that died in Ohio regardless of their state of residence (underlying cause of death ICD-10 codes *U01-*U03, V01-Y36, Y85-Y87, Y89).

All intent includes unintentional, suicide, homicide, legal intervention or war, and undetermined.

MV – motor vehicle crash

NEC – Not elsewhere classifiable

Source: ODH Bureau of Vital Statistics; analysis conducted by ODH Violence and Injury Epidemiology and Surveillance Section.

Number of Injury-Related Deaths that Occurred in Ohio by Mechanism and Intent, 2023

	Intent					
External Injury Mechanism	**Unintentional**	**Suicide**	**Homicide**	**Legal Intervention or War**	**Undetermined**	**Total**
Cut or Pierce	14	26	41	0	3	**84**
Drowning	112	17	0	…	11	**140**
Drug Poisoning	4,497	180	14	…	54	**4,745**
Fall	2,142	31	0	…	3	**2,176**
Fire or Flame	147	7	3	…	5	**162**
Firearm	11	1,041	699	17	15	**1,783**
Hot Object or Substance	2	0	0	…	0	**2**
Machinery	22	…	…	…	…	**22**
MV-Motorcyclist	208	…	…	…	…	**208**
MV-Occupant	215	…	…	…	…	**215**
MV-Other	0	…	…	…	…	**0**
MV-Pedal Cyclist	20	…	…	…	…	**20**
MV-Pedestrian	183	…	…	…	…	**183**
MV-Unspecified	697	…	…	…	…	**697**
Natural or Environmental	65	…	…	…	…	**65**
Non-Drug Poisoning	123	49	1		2	**175**
Other Land Transport	48	6	2	…	0	**56**
Other Specified, classifiable and NEC	168	23	48	10	13	**262**
Other Transport	13	…	0	0	…	**13**
Overexertion	0	…	…	…	…	**0**
Pedal Cyclist, Other	8	…	…	…	…	**8**
Pedestrian, Other	19	…	…	…	…	**19**
Struck by or against	43	1	10	0	0	**54**
Suffocation	361	411	15	…	5	**792**
Unspecified	238	4	46	0	11	**299**
Total	**9,356**	**1,796**	**879**	**27**	**122**	**12,180**

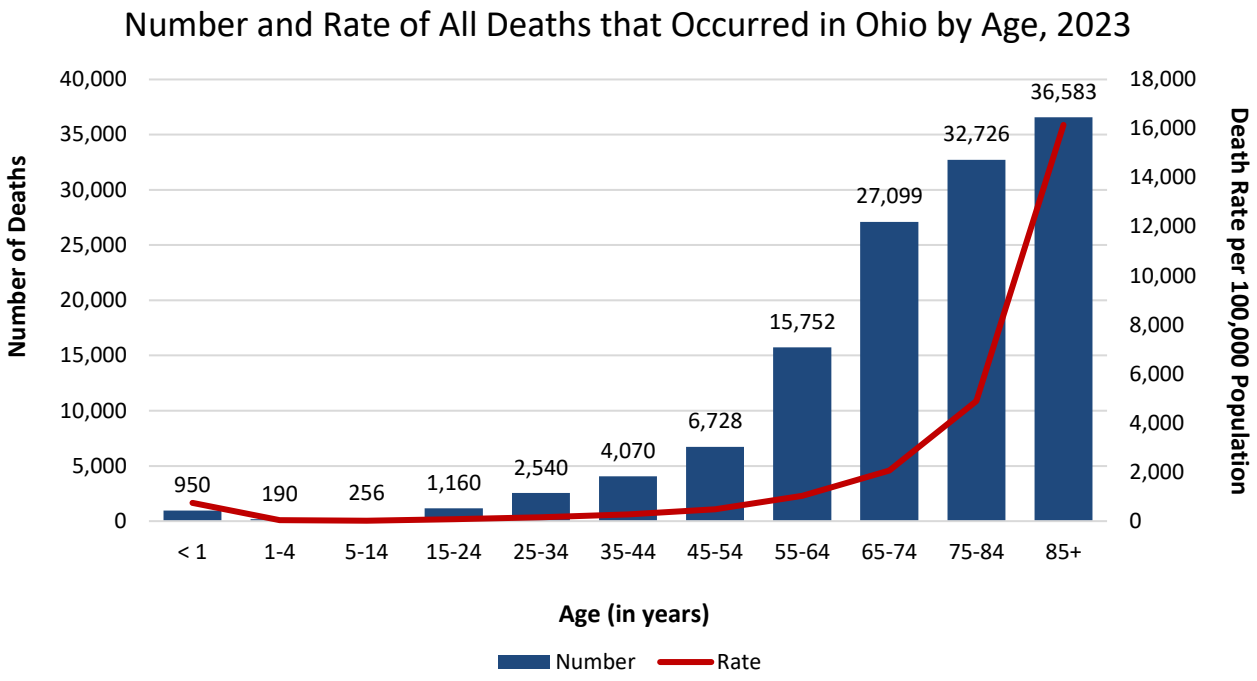
Includes injury-related deaths of individuals that died in Ohio regardless of their state of residence (underlying cause of death ICD-10 codes *U01-*U03, V01-Y36, Y85-Y87, Y89).

... Category not applicable.

MV – motor vehicle traffic

NEC – Not elsewhere classifiable

Source: ODH Bureau of Vital Statistics; analysis conducted by ODH Violence and Injury Epidemiology and Surveillance Section



Source: ODH Bureau of Vital Statistics; analysis conducted by ODH Violence and Injury Epidemiology and Surveillance Section.

Number and Age-Adjusted Rate of All Deaths that Occurred in Ohio by Sex, 2020-2023

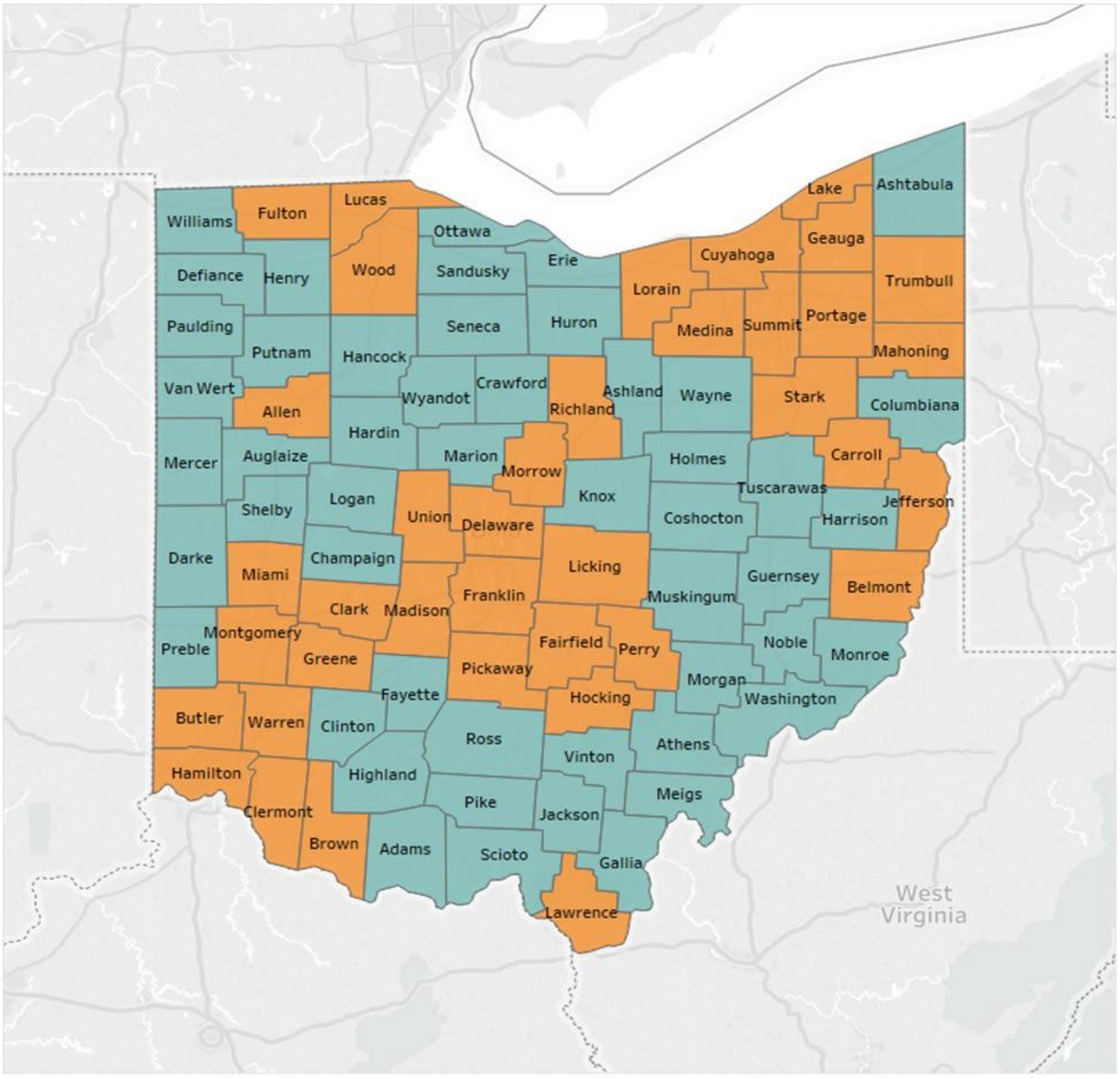
	Female		Male		Total[†]	
Year	**Number**	**Age- Adjusted Rate**	**Number**	**Age- Adjusted Rate**	**Number**	**Age- Adjusted Rate**
2020	70,338	837.3	73,610	1,167.9	**143,949**	**987.8**
2021	70,627	847.7	76,951	1,209.4	**147,581**	**1,012.5**
2022	66,867	791.6	71,289	1,107.7	**138,157**	**935.5**
2023	62,094	722.5	65,960	1,007.9	**128,054**	**853.7**

Includes all deaths of individuals that died in Ohio regardless of their state of residence.
Age-adjusted rates are based on the 2000 U.S. standard population and are calculated per 100,000 population.
[†] Includes cases with unknown sex.
Source: ODH Bureau of Vital Statistics; analysis conducted by ODH Violence and Injury Epidemiology and Surveillance Section.

Appendix J: Map of Ohio Homeland Security Regions Utilized by the Regional Physician Advisory Board (RPAB)

* Unless otherwise stated, the Ohio Homeland Security Regions shown in the map above are the 'regions' referred to in this annual report. These are the same regions utilized by the Regional Physician Advisory Board (RPAB).

Appendix K: Map of Ohio Counties, Urban and Rural Designations



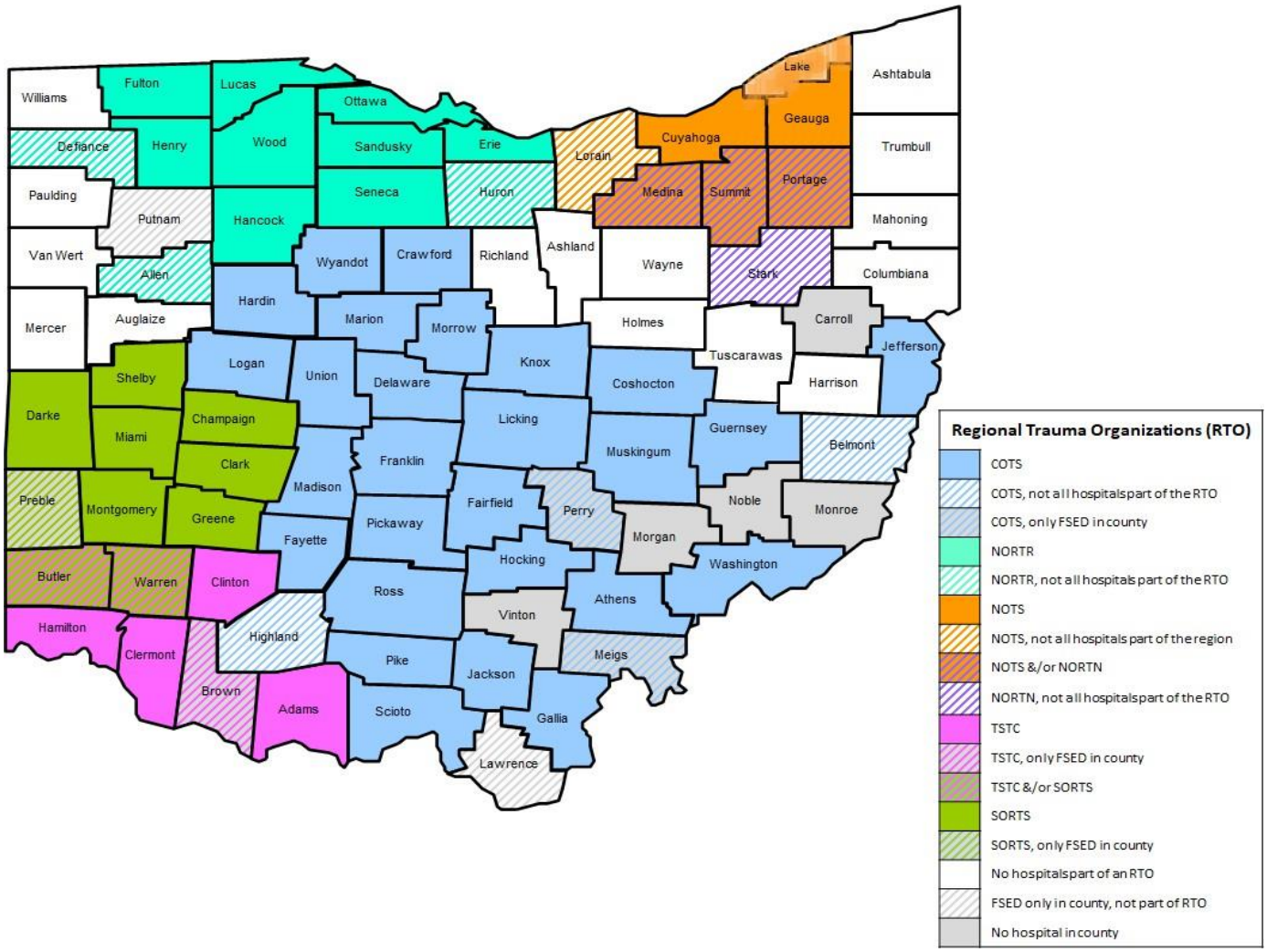
Source: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, 2013 NCHS Urban-Rural Classification Scheme for Counties.

There are minor classification changes from the 2017 annual report where the USDA Economic Research Service classification system was used. Erie, Ottawa, Preble and Washington counties are reclassified from "urban" to "rural." Hocking and Perry counties are reclassified from "rural" to "urban."

APPENDIX L: Summary of 2023 – 2024 Trauma Related EMS Grants

No trauma-related projects were funded for this grant year.

APPENDIX M: Ohio Regional Trauma Systems Map as of September 2021



A regional trauma system is an organized, coordinated effort in a defined geographic area that delivers the full range of care to all injured patients and works together with emergency services and disaster preparedness making efficient use of health care resources to improve patient outcomes in the state of Ohio. Membership is voluntary and not generally restricted by facility location.

APPENDIX N: Members of the Board, Trauma Committee, Trauma Registry Advisory Workgroup (TRAW), Performance Improvement (PI) Workgroup, and EMS Prehospital Workgroup

Board

Thomas Allenstein
Kent Appelhans
Dorothy Battles
Karen Beavers
Geoffrey J. Dutton
Patrick Ferguson
Jeffery Jackson
Pradeesh George, DO
Brian Hathaway
Ruda Jenkins
Mark Marchetta
Deana Pace
Matthew Phillips
Amy Raubenolt, MD
Mark N. Resanovich
Darin Robinaugh
Hamilton P. Schwartz, MD
Kevin Uhl
John Weimer
Dudley Wright

Trauma Committee

Diane Simon (Chair)
Laurie Johnson, MD (Vice Chair)
Michael Beltran, MD
Steven Berry II
Erik Evans, MD
Stephen Feagins, MD
Brian Fletcher
Kent Harshbarger, MD
Timothy Hake, MD
Aaron Jennings
Shaheed Koury, MD
Andrea Light, RN
Deanah Moore
Mary Moran, PhD
Bradley Raetzke, MD
Darin Robinaugh
James Sauto, Jr., MD
Michael Shannon, MD
M. Chance Spalding, DO
Rajan Thakkar, MD
Staci Trudo, RN
Rachel Velasquez
Julie Warholic, RN

Trauma Registry Advisory Workgroup (TRAW)

Deanah Moore (Co-Chair)
Sara Arida
Brandi Cario
Sarah Christophel
Wendi Dean
Caroline Eckles
Danielle Dell
Michelle Doll
Roxanna Giambri
Kelly Harrison
Lita Holdeman
Vanessa Isler
Jessica Johnson
Taunya Kessler
Victoria Kreckman
Jillian Kuethe
Alysia Lazear
Jessica Mazzocco
Pam Owen
Alana Prosser
Karen Silberhorn
Diane Simon
Halina Sliwinski
Catherine Smith
Shannon Swader
Jennifer Talkington
Pamela Tanner

Performance Improvement (PI) Workgroup

Lee Ann Wurster (Chair)
Richard George, MD (Co-Chair)
Sara Arida
Sahithi Aurand
Tod Baker
Melody Campbell
Alex Carpenter
Michelle Doll
Emma Fox
Sherri Kovach
Roxanna Giambri
Lauren Phipps
Danielle Rossler
Monica Rozzell
Valerie Stoker
Dan Swords
Diane Simon

EMS Prehospital Workgroup

Ashish Panchal, M.D.
Brian Anderson
Brian Bemiller
Herb de la Porte
Joel Dickinson
Mark Huckaby
James Sauto, M.D.
Tammy Wilkes
Jamie Wilson
Paul Zeeb, M.D.

ODPS/Division of EMS

Carol A. Cunningham, MD,
State Medical Director

Robert L. Wagoner, Executive Director

Sahithi Aurand, MPH,
Chief, Research & Analysis Section

Haydi Labib, MPH,
Human Services Program Consultant

Heidi Piccininni,
Human Services Program Consultant

Ohio Department of Public Safety
Division of Emergency Medical Services

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