Ohio Trauma Registry

2010

Trauma Acute Care Registry Annual Data Report

Published: September 2011

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Introduction

This annual report from the Ohio Trauma Registry (OTR) presents an overview of the data about traumatic injuries in Ohio in 2010. The purpose of this report is to provide information to healthcare professionals as well as to the public about the current state of care for seriously injured patients treated at hospitals throughout Ohio.

The OTR is operated and maintained by the Ohio Department of Public Safety, Division of Emergency Medical Services. The State of Ohio's Emergency Medical Services (EMS) Board has statutory authority over the OTR and supervises its operation via the EMS Board's Trauma Committee and the Trauma Registry Advisory Subcommittee.

This report was produced by the Ohio Department of Public Safety, Division of Emergency Medical Services, Office of Research and Analysis. Questions or comments concerning the report should be directed to the Office of Research and Analysis at 800-233-0785 (toll free) or EMSData@dps.state.oh.us.

Executive Summary

The Ohio Trauma Registry (OTR) began collecting data on January 1, 1999. This report represents data from the year 2010. This report is intended to give the reader a strong sense of the type and amount of data available in the OTR. The Ohio Revised Code and the Ohio Administrative Code prohibit the release of data that would identify or tend to identify a provider or recipient of trauma care.

- The data in the OTR are prescribed by the Patient Inclusion Criteria (Appendix A). To be included in the OTR, patients must be admitted to the hospital for at least 48 hours or transferred into the hospital, with an injury-related ICD-9 code. Patients that die after receiving any evaluation or treatment while on hospital premises, as well as patients who are transferred out of the hospital, are also included.
- Between January 1, 1999 and December 31, 2010, a total of 396,066 records were submitted to the OTR. This report includes the 36,797 records that were submitted in 2010. Because patients who are transferred between hospitals generate multiple records, the number of records submitted to the OTR is greater than the number of individual patients.
- Of the 28,491 patients included in this report, 95.8% survived to discharge.
- 30.8% of the patients included in this report were geriatric patients (age 70 or older), while 12.5% of the patients were pediatric patients (age 15 or younger).
- 55.4% of the total trauma patients in 2010 were males while 44.6% were females.
- Except for the 0-4 and 10-14 year old age ranges, males had a higher case fatality rate than females of the same age.
- 90.5% of the injuries reported to the OTR in 2010 were the result of blunt trauma.
- 52.9% of the injuries reported to the OTR in 2010 were caused by falls, while an additional 15.3% were caused by motor vehicle collisions. Of the injuries reported to the OTR that resulted in in-hospital death in 2010, 37.7% were caused by falls, 17.2% were caused by motor vehicle collisions, and 13.3% were caused by assault.
- Injuries caused by drowning/submersion or firearms had the highest case fatality rate of 32.5 per 100 patients and 28.2 per 100 patients respectively.
- 89% of the injuries reported to the OTR in 2010 were unintentional. Self-inflicted injuries had the highest case fatality rate at 26%.
- Over time, the overall mortality for patients included in the OTR has remained steady around 4%. After a small drop from 6% in 2003, mortality among patients treated in a trauma center in Ohio has since remained steady around 5%. Mortality among patients treated at non-trauma centers in Ohio has been steadily trending downward from 2.5% in 2000 to 2.2% in 2010.

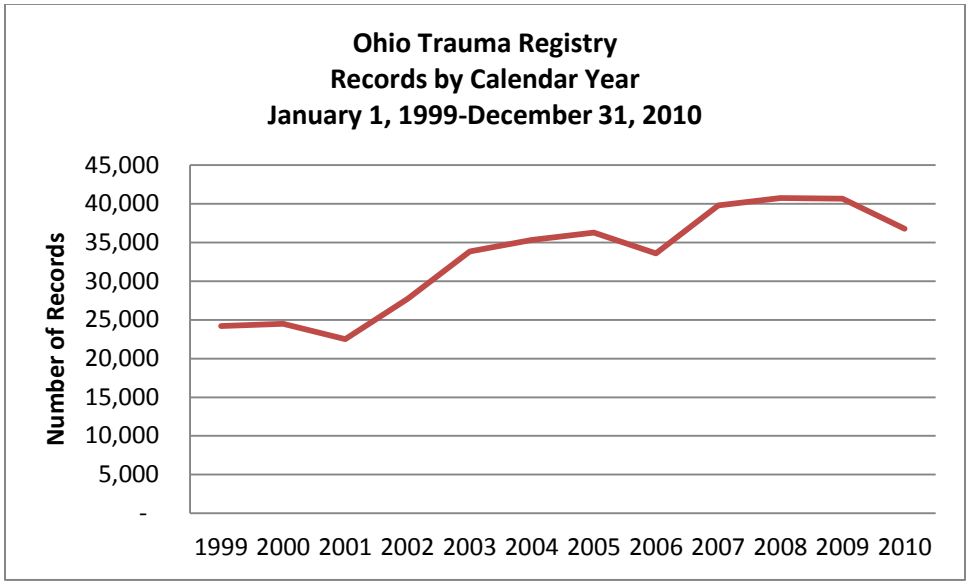
Limitations of the Data

There are a number of issues that need to be considered when reading this report. These are listed here in no specific order.

- 48-Hour Rule: To be included in the OTR, patients must be admitted to the hospital for at least 48 hours or transferred into the hospital with an injury-related ICD-9 code. Patients that die after receiving any evaluation or treatment while on hospital premises, as well as patients who transfer out of the hospital, are also included.
- Accuracy: External validation of the data in OTR has not been performed; therefore, the accuracy of the data contained in this report is limited to the accuracy of the data submitted to OTR by the individual hospitals.
- Age: Patient date of birth is reported to OTR, age is not. Age is calculated by the Office of Research and Analysis using the difference between date of birth and date of arrival at the hospital. A very small number of records (n=7) do not have a date of birth recorded. Age is therefore not calculable on these records. Date of arrival at hospital is chosen for this calculation as a substantially larger number of records (n = 86) do not have a date of injury recorded.
- Death Data: In OTR, data on patients who die as a result of their injuries is limited to in-hospital deaths. Persons pronounced dead at the scene and not transported to the hospital are not reported to OTR.
- OTR participation: Submission of trauma patient data to OTR is statutorily required by Ohio Revised Code §4765.06. However, a small number of hospitals did not contribute data to this report. A list of contributing hospitals can be found in Appendix F.
- Out-of-state patients: OTR data includes patients who were injured in neighboring states and transported to an Ohio hospital. These records do not include county of injury data.
- Records vs. Patients: Because patients who are transferred between hospitals generate a separate trauma record at each hospital in which they receive treatment, the number of records submitted to the OTR will be greater than the number of individual trauma patients. To account for some patients having multiple records for the same incident, care has been taken to note whether a graph or table is using records or patients as the population.
- Rounding: Because of rounding, percentages displayed in graphs and tables will not always total 100%.
- Trauma Center vs. Non-Trauma Center Data: This report contains data submitted by all hospitals, regardless of whether or not the hospital is a trauma center. Because they employ specially trained trauma registry personnel, trauma center data tends to be more detailed and precise. However, the data from non-trauma centers gives a broader view of trauma care in Ohio and adds richness and depth to this report. This additional data is something many other states lack; therefore, comparisons with other states should be undertaken with caution.

Registry Characteristics

Records by Calendar Year: 1999 - 2010



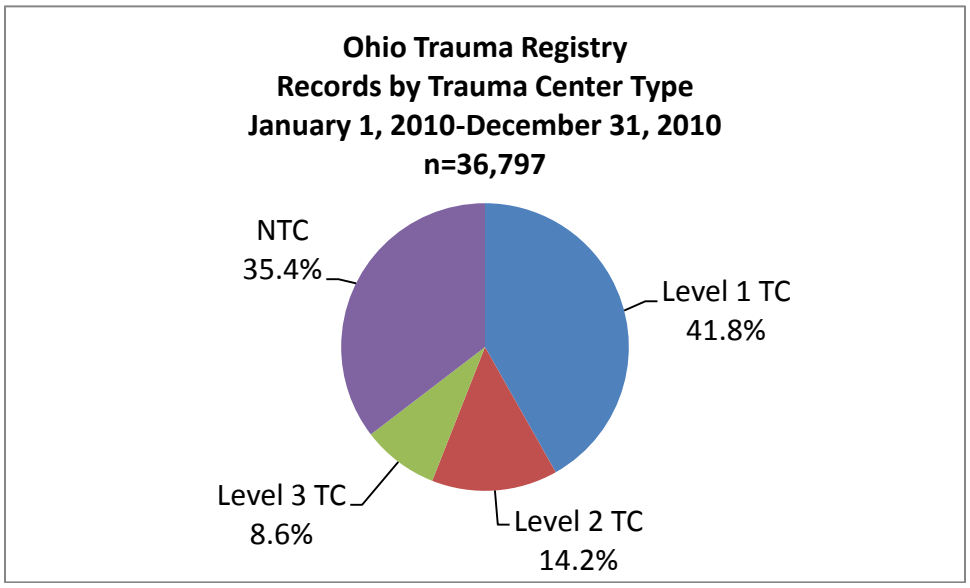
	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Total
Records	24,220	24,490	22,516	27,733	33,844	35,347	36,296	33,587	39,820	40,756	40,660	36,797	396,066

Trauma Records by Year

The total number of records reported to the Ohio Trauma Registry (OTR) has increased over time from 24,220 records in 1999 to 36,797. As of December 31, 2010, a total of 396,066 records had been submitted to the OTR.

The overall annual increase in records submitted to OTR is thought to be a result of system maturation, increased hospital participation, as well as increasing computerization of hospital medical records. Such computerization allows for easier and more accurate identification of eligible patients. This supposition has not been verified and requires further study.

Records by Trauma Center Type



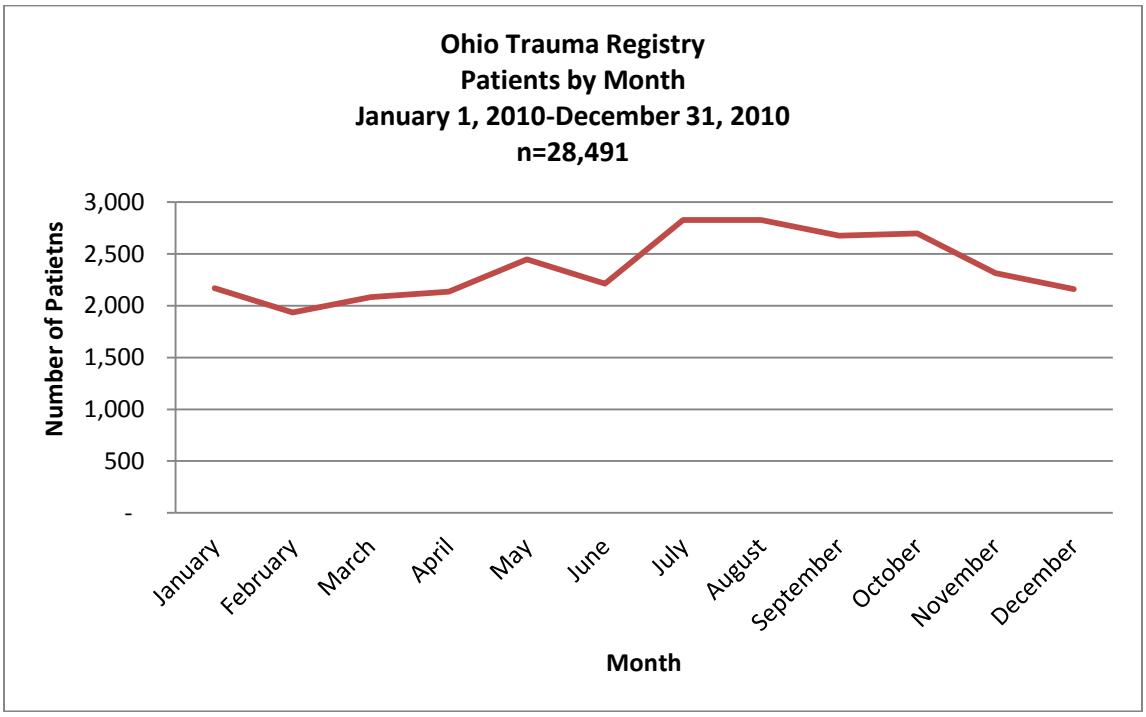
	2010	
	# of Records	**% of Records**
Level 1 TC	15,386	41.8%
Level 2 TC	5,214	14.2%
Level 3 TC	3,172	8.6%
NTC	13,025	35.4%
Total	36,797	100.0%

Records by Trauma Center Type:

In 2010, non-trauma centers accounted for 35.4% of records submitted to the Ohio Trauma Registry. Level 1 trauma centers accounted for the largest portion of records submitted to the Ohio Trauma Registry with 41.8%.

Patient Characteristics

Patients by Month: 2010



	2010	
	# of Patients	% of Patients
January	2,169	7.6%
February	1,934	6.8%
March	2,083	7.3%
April	2,137	7.5%
May	2,449	8.6%
June	2,214	7.8%
July	2,827	9.9%
August	2,828	9.9%
September	2,676	9.4%
October	2,697	9.5%
November	2,316	8.1%
December	2,161	7.6%
Total	28,491	100.0%

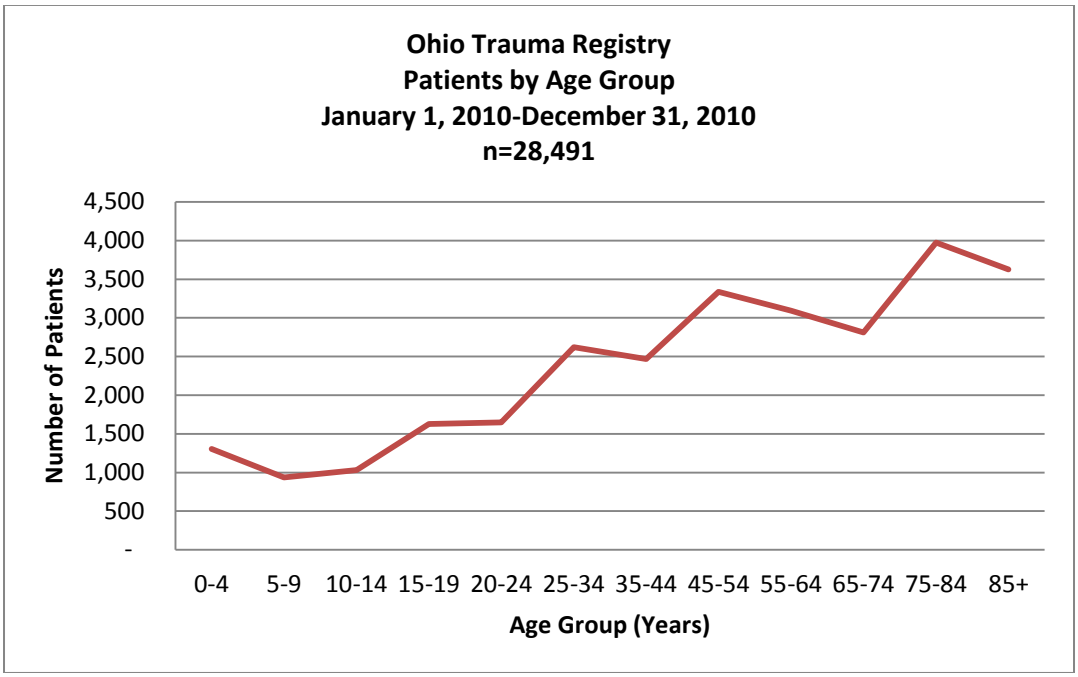
Patients by Month:

The month listed in this chart reflects the month that the patient arrived at the hospital and not necessarily the month during which the injury occurred. The number of patients admitted to the hospital in 2010 peaked in July and August and was lowest in February. The number of patients was calculated by subtracting the number of records with the following two classifications from the total number of records submitted:

1. "ED Disposition" equal to "Transfer to another Ohio hospital" or "Transfer to an out-of-state hospital"

2. "Discharge Disposition" equal to "Transfer to another Ohio hospital" or "Transfer to an out-of-state hospital"

Patients by Age Group: 2010



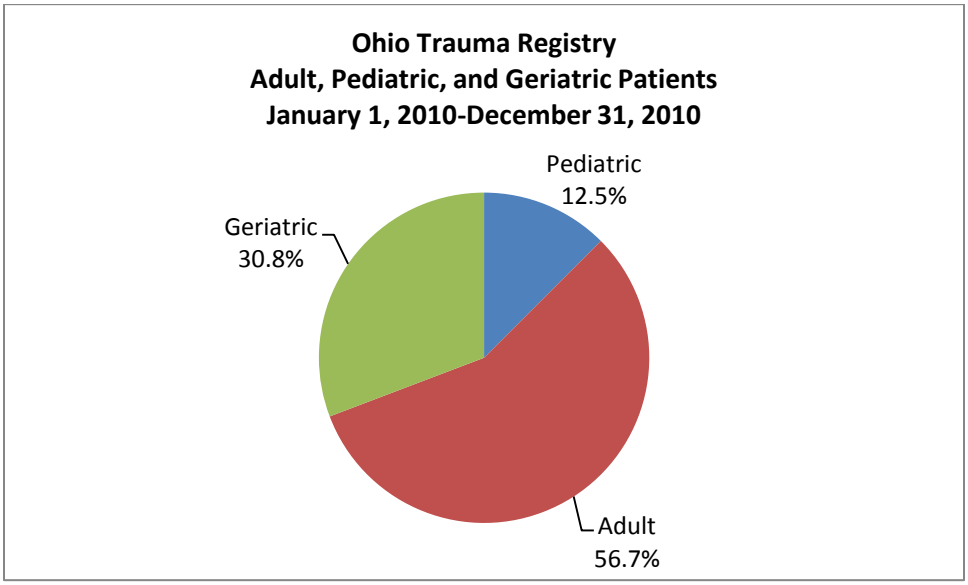
**7 patients were excluded due to lack of calculable age*

2010		
Age	**# of Patients**	**% of Patients**
0-4	1,306	4.6%
5-9	937	3.3%
10-14	1,031	3.6%
15-19	1,626	5.7%
20-24	1,649	5.8%
25-34	2,623	9.2%
35-44	2,466	8.7%
45-54	3,339	11.7%
55-64	3,091	10.8%
65-74	2,812	9.9%
75-84	3,976	14.0%
85+	3,628	12.7%
Unknown	7	0.0%
Total	28,491	100.0%

Number of Patients by Age

The 75-84 year old age group, which included 3,976 patients (14.0%), had the most patients reported. As a group, patients 0-14 years of age accounted for 3,274 (11.5%) of the overall patients reported.

Adult, Pediatric, and Geriatric Count: 2010



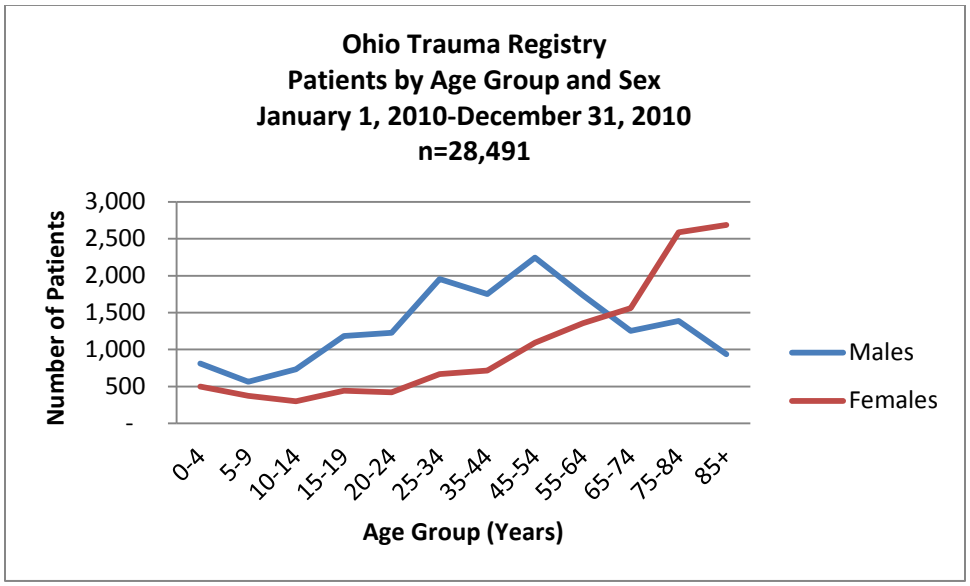
**7 patients were excluded due to lack of a calculable age*

2010		
Age Group	**# of Patients**	**% of Patients**
Pediatric	3,560	12.5%
Adult	16,156	56.7%
Geriatric	8,768	30.8%
Unknown	7	0.0%
Total	28,491	100.0%

Adult vs Pediatric vs Geriatric Patients

The Ohio Revised Code has established that pediatric trauma patients are those age 15 or younger and that geriatric patients are those age 70 and older. Trauma patients age 16-69 are considered adults. In 2010, 12.5% of the patients reported were age 15 or younger and 30.8% were age 70 and older.

Patients by Age & Sex: 2010



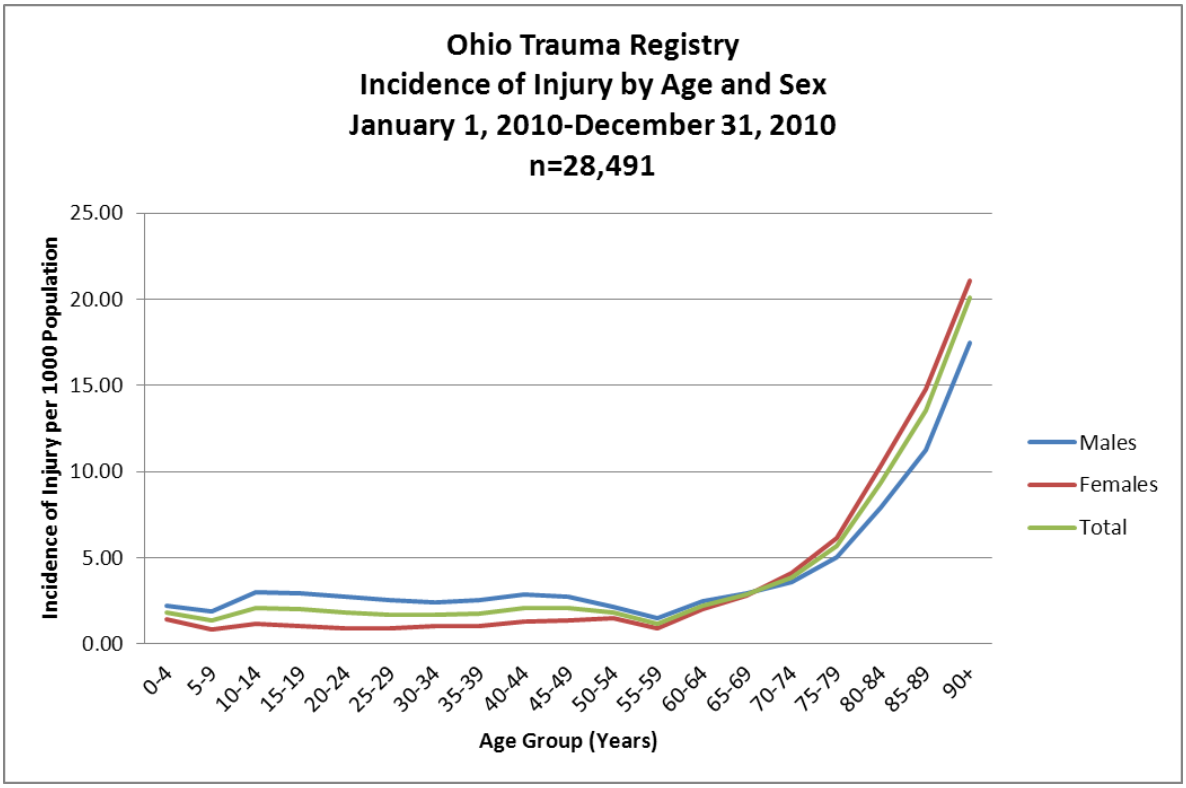
**7 patients were excluded due to unknown age and/or sex*

2010					
Age Group	**Males**	**Females**	**Male %**	**Female %**	**Total # Pts**
0-4	810	496	62.0%	38.0%	1,306
5-9	563	374	60.1%	39.9%	937
10-14	731	300	70.9%	29.1%	1,031
15-19	1,184	442	72.8%	27.2%	1,626
20-24	1,227	422	74.4%	25.6%	1,649
25-34	1,956	667	74.6%	25.4%	2,623
35-44	1,752	714	71.0%	29.0%	2,466
45-54	2,246	1,093	67.3%	32.7%	3,339
55-64	1,733	1,358	56.1%	43.9%	3,091
65-74	1,253	1,559	44.6%	55.4%	2,812
75-84	1,388	2,588	34.9%	65.1%	3,976
85+	938	2,690	25.9%	74.1%	3,628
Unknown	6	1	85.7%	14.3%	7
Total	15,787	12,704	55.4%	44.6%	28,491

Patients by Age and Sex

Overall, 55.4% of the patients reported were male, while 44.6% were female. Males accounted for more than 50% of the patients reported up until age 65. At ages greater than 65, females accounted for the majority of the patient population.

Incidence of Injury by Age and Sex



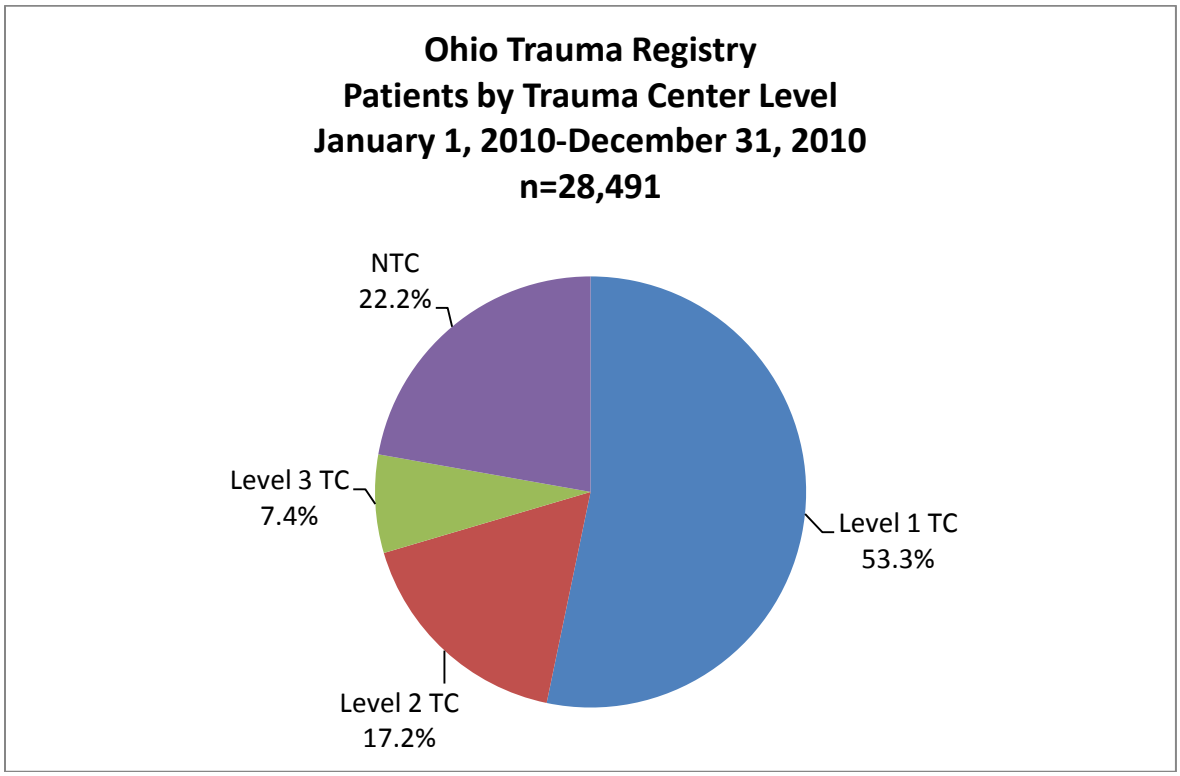
**7 patients were excluded due to unknown age and/or sex*

	2010		
Age Group	**Males**	**Females**	**Total**
0-4	2.20	1.40	1.81
5-9	1.91	0.82	1.38
10-14	2.99	1.17	2.10
15-19	2.91	1.05	2.00
20-24	2.75	0.89	1.83
25-29	2.52	0.91	1.71
30-34	2.43	1.01	1.71
35-39	2.57	1.01	1.78
40-44	2.87	1.29	2.08
45-49	2.76	1.38	2.06
50-54	2.17	1.48	1.82
55-59	1.47	0.93	1.19
60-64	2.47	2.00	2.22
65-69	2.91	2.81	2.86
70-74	3.60	4.12	3.88
75-79	5.01	6.18	5.68
80-84	7.89	10.33	9.38
85-89	11.24	14.77	13.57
90+	17.45	21.06	20.12
Total	2.80	2.15	2.47

Incidence of Injury by Age and Sex:

Incidence is of injury is calculated as the number of injuries that occur for every 1000 people at risk. For the purposes of this report, the entire Ohio population is considered the population at risk. The incidence of injury sharply increases in both sexes after age 70. This increase is especially pronounced among females.

Patients by Trauma Center Level

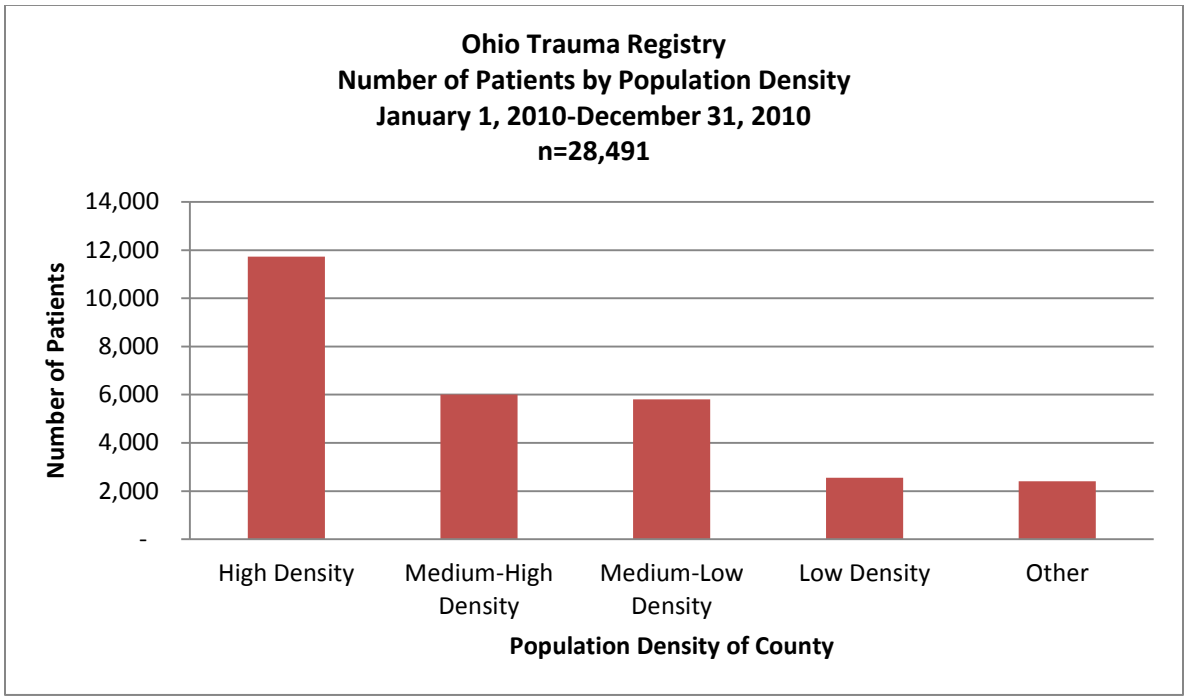


	2010				
	Level 1 TC	**Level 2 TC**	**Level 3 TC**	**NTC**	**Total**
# of Pts.	15,176	4,890	2,098	6,327	28,491

Patients by Trauma Center Level:

In 2010, 77.8% of trauma patients received definitive care at a trauma center. Level 1 trauma centers provided definitive care for 15,176 patients, representing 53.3% of all trauma patients in Ohio in 2010.

Number of Patients by Population Density: 2010



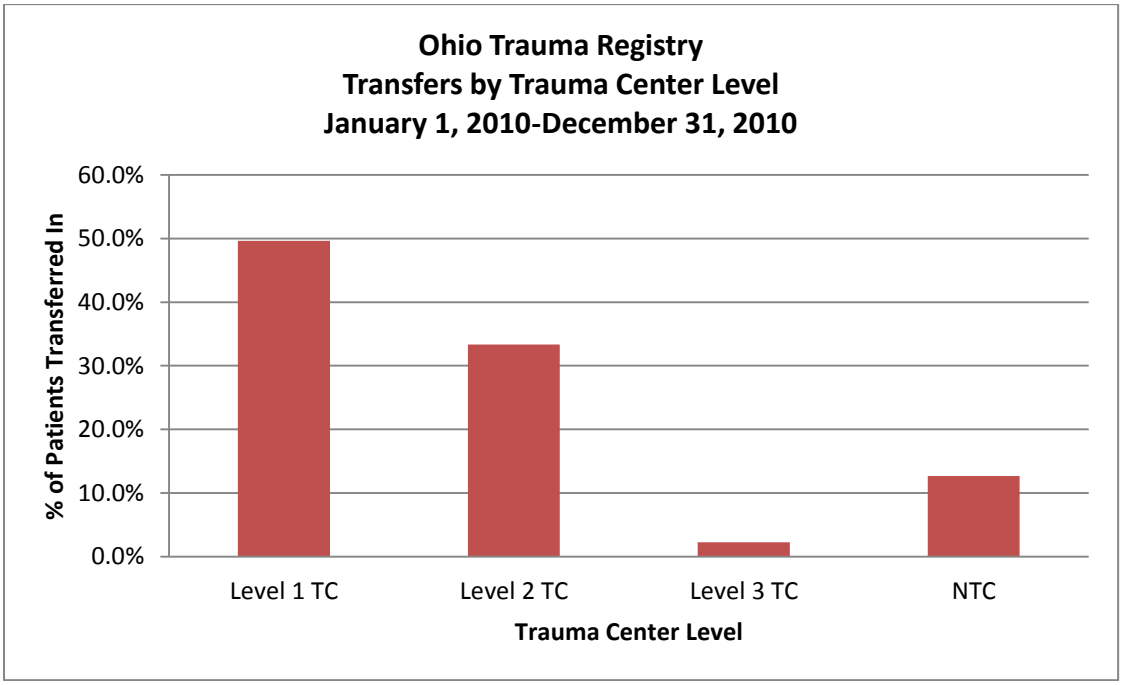
2010	
Population Density	**Number of Patients**
High Density	11,726
Medium-High Density	6,007
Medium-Low Density	5,812
Low Density	2,545
Other	2,401
Total	28,491

Patients by Population Density:

Counties with a population density >1000 people per square mile were considered "High Density." Counties with a population density between 300 and 999 people per square mile were considered "Medium-High Density." Counties with a population density between 100 and 299 people per square mile were considered "Medium-Low Density." Counties with a population density <100 people per square mile were considered "Low Density." The "Other" category includes any records with missing county data or out-of-state county data. As expected, the majority of patients come from highly populated counties, while more sparsely populated counties contribute relatively few patients.

The list of counties by population density can be found in Appendix J.

Transfers by Trauma Center Level



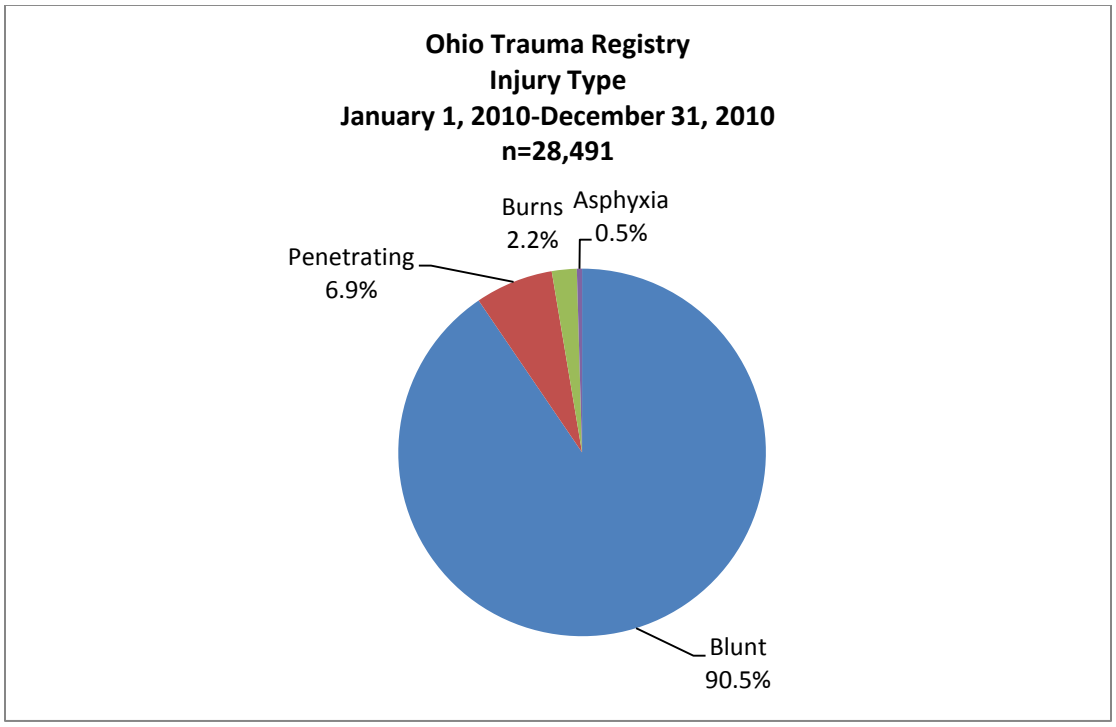
	2010			
	Scene	**Transfer**	**Total**	**% Transferred In**
Level 1 TC	7,641	7,535	15,176	49.7%
Level 2 TC	3,260	1,630	4,890	33.3%
Level 3 TC	2,050	48	2,098	2.3%
NTC	5,524	803	6,327	12.7%
Total	18,475	10,016	28,491	35.2%

Transfers by Trauma Center Level:

Almost half of the trauma patients seen at level 1 trauma centers were transferred from another facility. Overall, 35.2% of trauma patients were transferred at least once before receiving definitive care.

Injury Characteristics

Injury Type: 2010

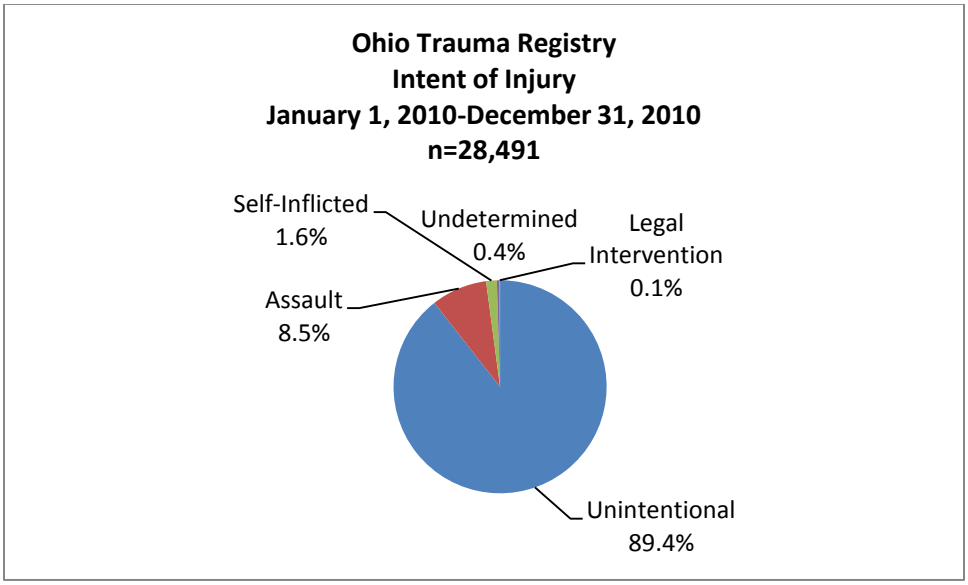


	2010	
Injury Type	**# of Patients**	**% of Patients**
Blunt	25,780	90.5%
Penetrating	1,957	6.9%
Burns	624	2.2%
Asphyxia	130	0.5%
Total	28,491	100.0%

Injury Type

Blunt injuries accounted for the vast majority of injuries reported to the OTR in 2010 (90.5%), while penetrating injuries only accounted for 6.9% of all injuries and burns accounted for an additional 2.2%.

Intent of Injury: 2010

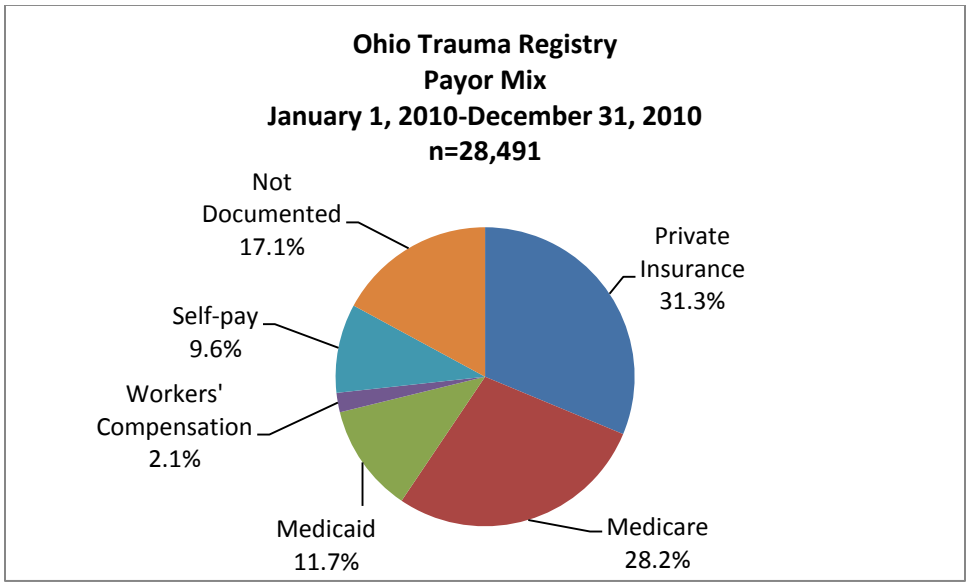


2010		
Intent	# of Patients	% of Patients
Unintentional	25,474	89.4%
Assault	2,417	8.5%
Self-Inflicted	461	1.6%
Undetermined	117	0.4%
Legal Intervention	22	0.1%
Total	28,491	100.0%

Intent of Injury

The intent by which the injury was sustained is derived from the ICD-9-CM *External Cause of Injury Codes* (E-codes) (see Appendix C). Within the total number of patients reported to the OTR in 2010, 89.4% were injured unintentionally.

Payor Mix: 2010

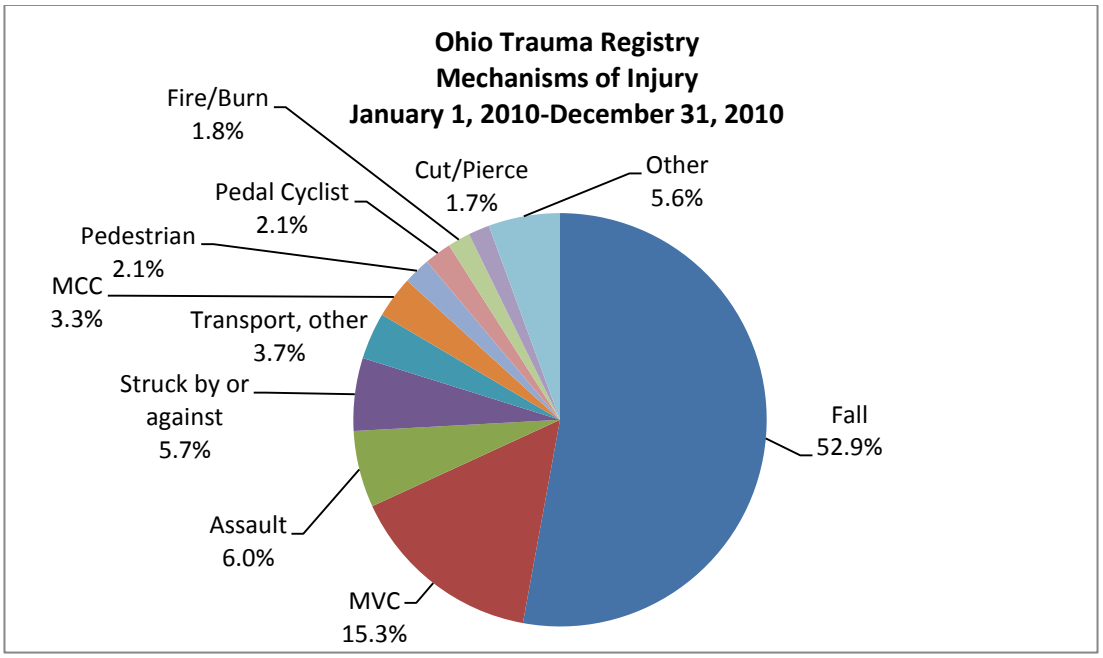


2010		
Payment Source	# of Patients	% of Patients
Private Insurance	8,908	31.3%
Medicare	8,025	28.2%
Medicaid	3,347	11.7%
Workers' Compensation	598	2.1%
Self-pay	2,740	9.6%
Not Documented	4,873	17.1%
Total	28,491	100.0%

Payor Mix

Payor mix is reported as the primary source of payment documented during the patient's hospitalization. It can give a rough estimate of how trauma care is reimbursed, but it does not reflect the final source of revenue to the hospital, as this is sometimes not known for many months post-discharge. Of the total number of records reported to the OTR, 31.3% had commercial insurance coverage. In terms of anticipated reimbursement, 42.0% of the hospitals expected payment from Medicare, Medicaid, or Worker's Compensation, with the vast majority of these reported as Medicare.

Mechanisms of Injury: 2010



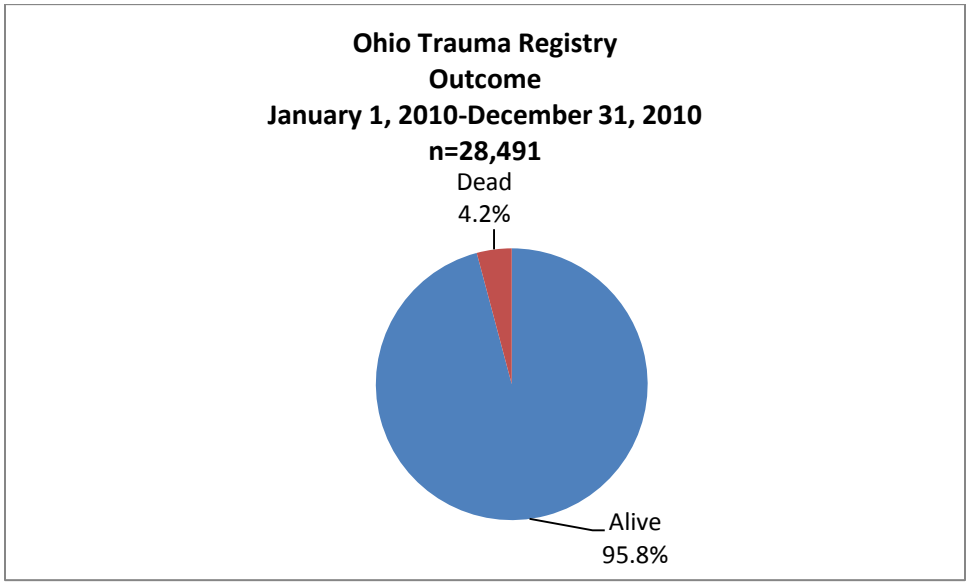
2010		
Mechanism of Injury	# of Patients	% of Patients
Fall	15,065	52.9%
Motor Vehicle Collision (MVC)	4,347	15.3%
Assault	1,709	6.0%
Struck by or against	1,624	5.7%
Transport, other	1,041	3.7%
Motorcycle Collision (MCC)	931	3.3%
Pedestrian	603	2.1%
Pedal Cyclist	602	2.1%
Fire/Burn	503	1.8%
Cut/Pierce	472	1.7%
Other	1,594	5.6%
Total	28,491	100.0%

Mechanism of Injury

Of the patient records submitted, 52.9% of all patients suffered injury due to a fall and 15.3% were injured as a result of a motor vehicle collision. In this graph, the mechanism of injury is reported as the External Cause of Injury code or E-code. The Centers for Disease Control and Prevention place E-codes into groupings reflective of similar causes of injury. More information about E-codes and E-code groupings can be found in Appendix C. The "Other" category consists of a large number of E-codes, including such things as injuries sustained on a train and boating injuries.

Outcomes

Patient Outcome: 2010

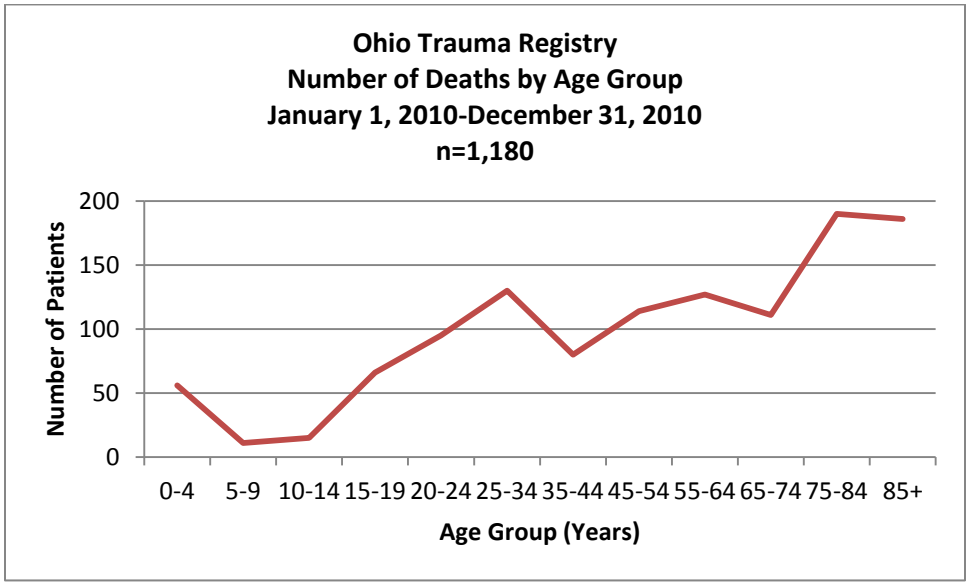


	2010	
Outcome	# of Patients	% of Patients
Alive	27,308	95.8%
Dead	1,183	4.2%
Total	28,491	100.0%

Outcome

In 2010, 4.2% of the patients reported to the OTR died. Please note that these data only reflect patients treated in the hospital; deaths occurring outside a medical facility are not included in this analysis.

Number of Deaths by Age: 2010



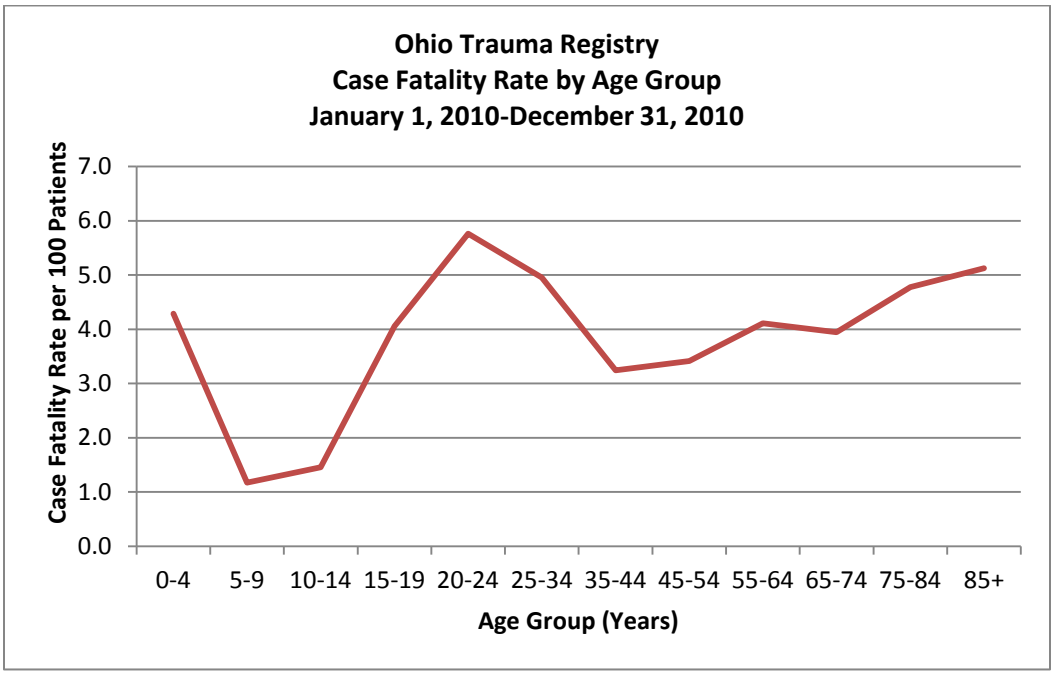
**7 patients were excluded due to lack of a calculable age*

2010		
Age Group	# of Deaths	Total # Patients
0-4	56	1,306
5-9	11	937
10-14	15	1,031
15-19	66	1,626
20-24	95	1,649
25-34	130	2,623
35-44	80	2,466
45-54	114	3,339
55-64	127	3,091
65-74	111	2,812
75-84	190	3,976
85+	186	3,628
Unknown	2	7
Total	1,183	28,491

Deaths by Age

More patients (190) died in the 75-84 year old age group than in any other group. This represents 16.1% of all deaths reported. It should be noted that this data reflects deaths occurring in the hospital setting (ED or inpatient). Trauma patients that die at the scene of an injury or following discharge from the hospital are not included in this report.

Case Fatality Rate by Age: 2010



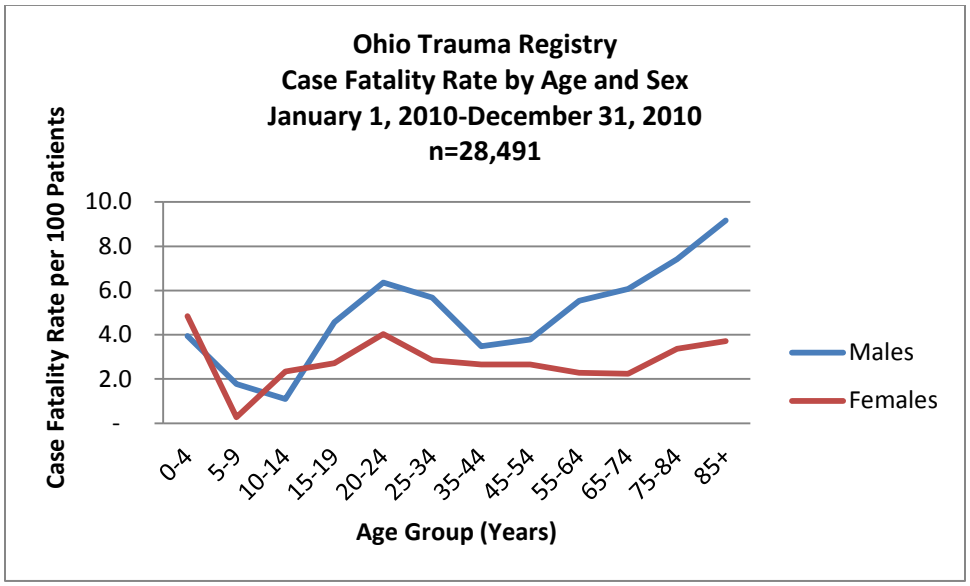
**7 patients were excluded due to lack of a calculable age*

2010			
Age Group	# of Deaths	Total # Patients	Case Fatality Rate
0-4	56	1,306	4.3
5-9	11	937	1.2
10-14	15	1,031	1.5
15-19	66	1,626	4.1
20-24	95	1,649	5.8
25-34	130	2,623	5.0
35-44	80	2,466	3.2
45-54	114	3,339	3.4
55-64	127	3,091	4.1
65-74	111	2,812	3.9
75-84	190	3,976	4.8
85+	186	3,628	5.1
Unknown	2	7	28.6
Total	1,183	28,491	4.2

Case Fatality Rate:

The case fatality rate is calculated as the number of deaths in each age group divided by the total number of patients in each age group, and then multiplied by 100. The case fatality rate represents the number of deaths for every 100 patients. The 5-9 year old age group had the lowest case fatality rate (1.2) while the 20-24 year old age group had the highest case fatality rate (5.8).

Case Fatality Rate by Age and Sex: 2010



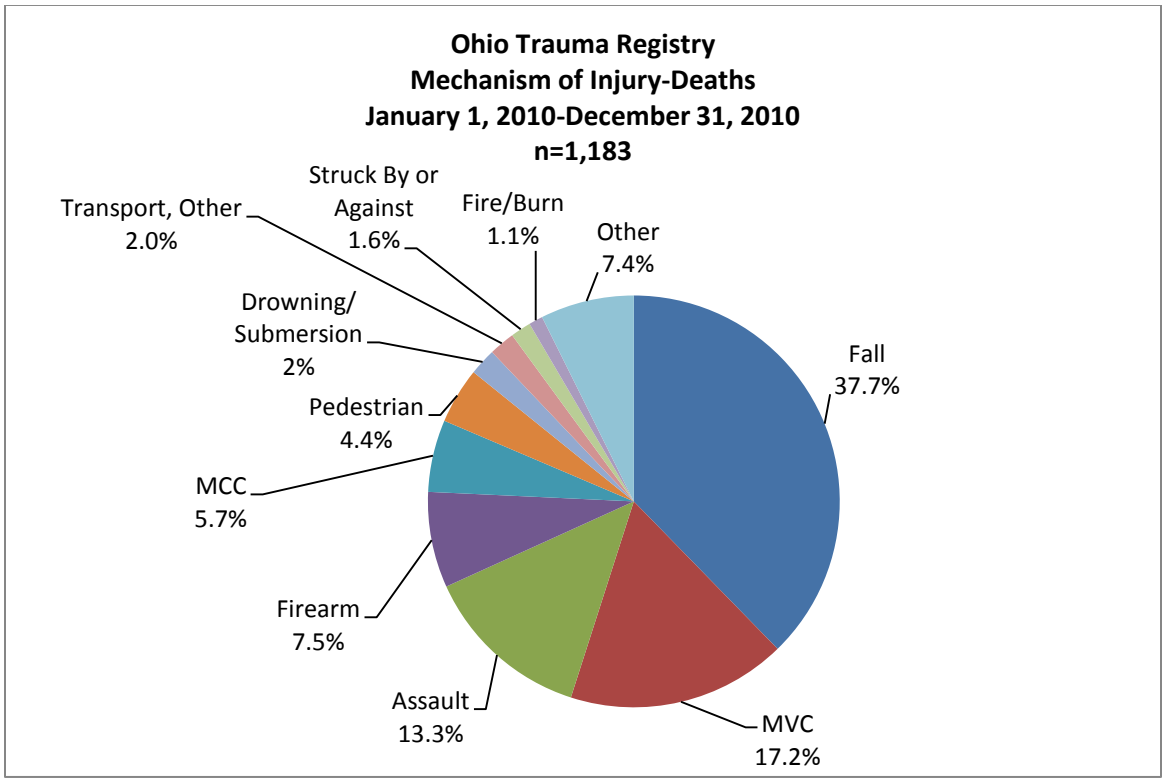
**7 patients were excluded due to unknown age and/or sex*

2010									
	Males			Females			Total		
Age Group	Lived	Died	CFR	Lived	Died	CFR	Lived	Died	CFR
0-4	778	32	4.0	472	24	4.8	1,250	56	4.3
5-9	553	10	1.8	373	1	0.3	926	11	1.2
10-14	723	8	1.1	293	7	2.3	1,016	15	1.5
15-19	1,130	54	4.6	430	12	2.7	1,560	66	4.1
20-24	1,149	78	6.4	405	17	4.0	1,554	95	5.8
25-34	1,845	111	5.7	648	19	2.8	2,493	130	5.0
35-44	1,691	61	3.5	695	19	2.7	2,386	80	3.2
45-54	2,161	85	3.8	1,064	29	2.7	3,225	114	3.4
55-64	1,637	96	5.5	1,327	31	2.3	2,964	127	4.1
65-74	1,177	76	6.1	1,524	35	2.2	2,701	111	3.9
75-84	1,285	103	7.4	2,501	87	3.4	3,786	190	4.8
85+	852	86	9.2	2,590	100	3.7	3,442	186	5.1
Unknown	5	1	16.7	-	1	100.0	5	2	28.6
Total	14,986	801	5.1	12,322	382	0.0	27,308	1183	4.2

Case Fatality Rate:

After age 14, males tend to have a higher case fatality rate, which increases sharply starting at age 45. Women tend to have a lower case fatality rate which remains static until age 74, after which it increases sharply. The case fatality rate presented is a crude rate and does not adjust for any other factors such as injury severity or type.

Mechanisms of Injury for Deaths: 2010

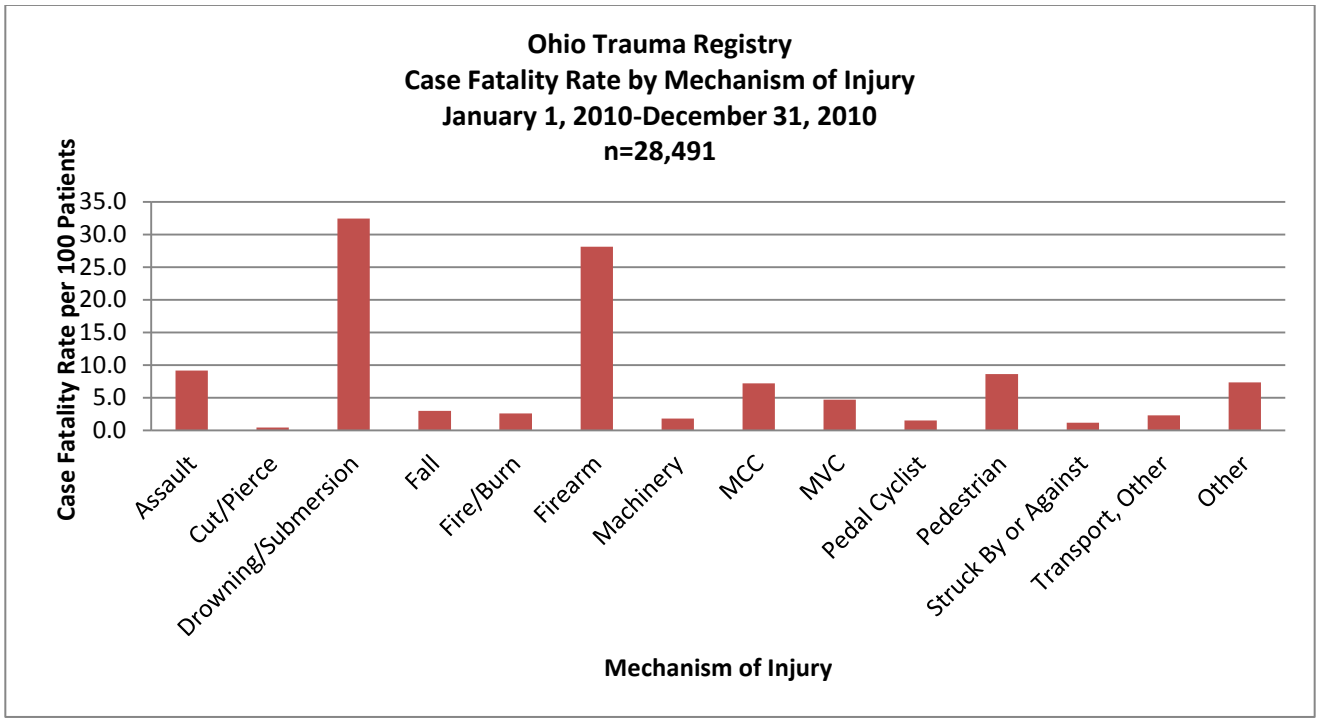


2010		
Mechanism of Injury	# of Patients	% of Patients
Fall	446	37.7%
Motor Vehicle Collision (MVC)	204	17.2%
Assault	157	13.3%
Firearm	89	7.5%
Motorcycle Collision (MCC)	67	5.7%
Pedestrian	52	4.4%
Drowning/Submersion	25	2.1%
Transport, Other	24	2.0%
Struck By or Against	19	1.6%
Fire/Burn	13	1.1%
Other	87	7.4%
Total	1,183	100.0%

Deaths by Mechanism of Injury

Analysis of the patients who died in the hospital in 2010 shows that falls were responsible for 40.0% of in-hospital mortality. Motor vehicle collisions were responsible for 15.4% of in-hospital deaths, and 13.6% of in-hospital mortality was due to assault. It is important to recognize that patients who die at the scene are not reported by the hospitals. These data reflect only patients who died in the hospital.

Case Fatality Rate by Mechanism of Injury: 2010

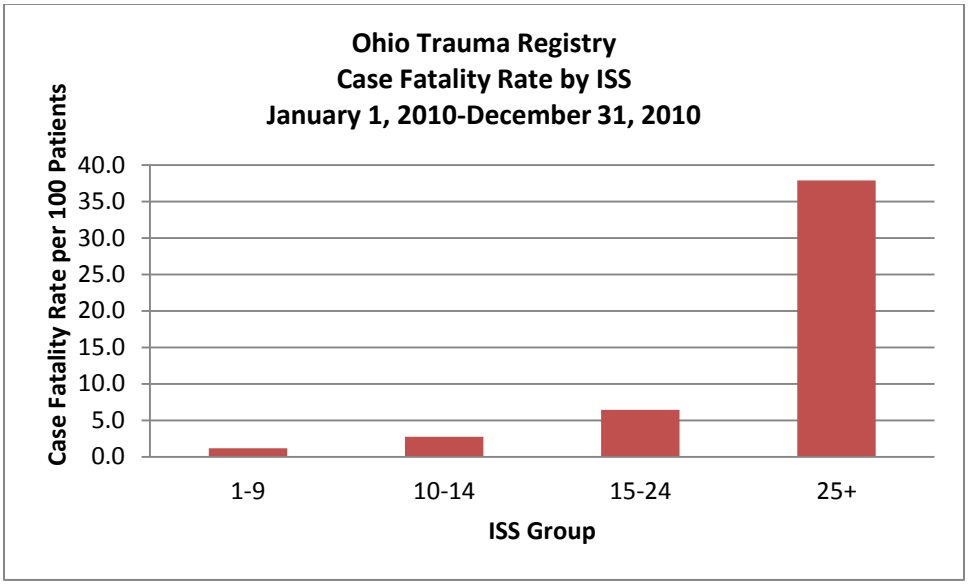


	2010			
Mechanism of Injury	Lived	Died	Total	Case Fatality Rate
Assault	1,552	157	1,709	9.2
Cut/Pierce	470	2	472	0.4
Drowning/Submersion	52	25	77	32.5
Fall	14,619	446	15,065	3.0
Fire/Burn	490	13	503	2.6
Firearm	227	89	316	28.2
Machinery	220	4	224	1.8
Motorcycle Collision (MCC)	864	67	931	7.2
Motor Vehicle Collision (MVC)	4,143	204	4,347	4.7
Pedal Cyclist	593	9	602	1.5
Pedestrian	551	52	603	8.6
Struck By or Against	1,605	19	1,624	1.2
Transport, Other	1,017	24	1,041	2.3
Other	905	72	977	7.4
Total	27,308	1,183	28,491	4.2

Case Fatality Rate:

Firearm injuries and injuries due to drowning/submersion had the highest case fatality rates (28.2 per 100 patients and 32.5 per 100 patients respectively). Assault had the next highest case fatality rate (9.2 per 100 patients).

Case Fatality Rate by Injury Severity Score: 2010



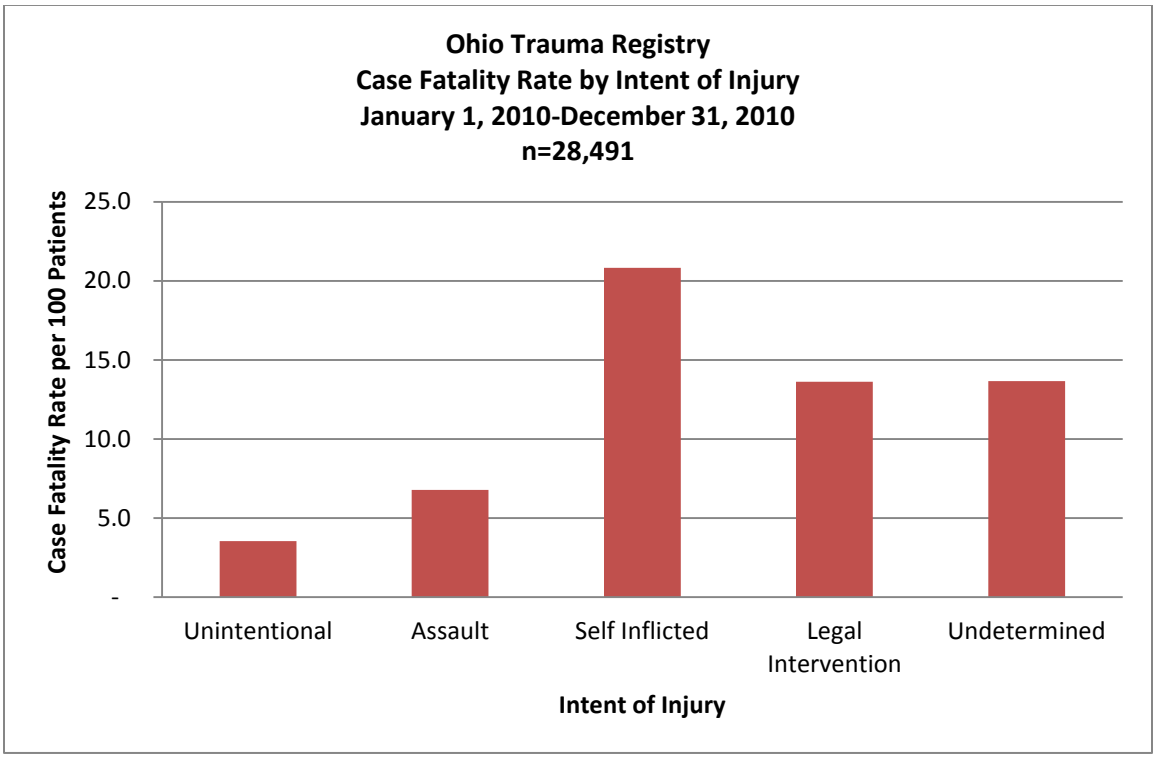
**1477 patients without a reported ISS were excluded*

2010				
ISS	Lived	Died	Total	Case Fatality Rate
1-9	18,648	220	18,868	1.2
10-14	3,801	108	3,909	2.8
15-24	2,375	163	2,538	6.4
25+	1,055	644	1,699	37.9
Unknown	1,429	48	1,477	3.2
Total	27,308	1,183	28,491	4.2

Case Fatality Rate by Injury Severity Score:

This graph primarily reflects patients treated at a trauma center because non-trauma center facilities generally do not report an ISS. As expected, the case fatality rate increases as the severity of the injury increases.

Case Fatality Rate by Intent of Injury: 2010

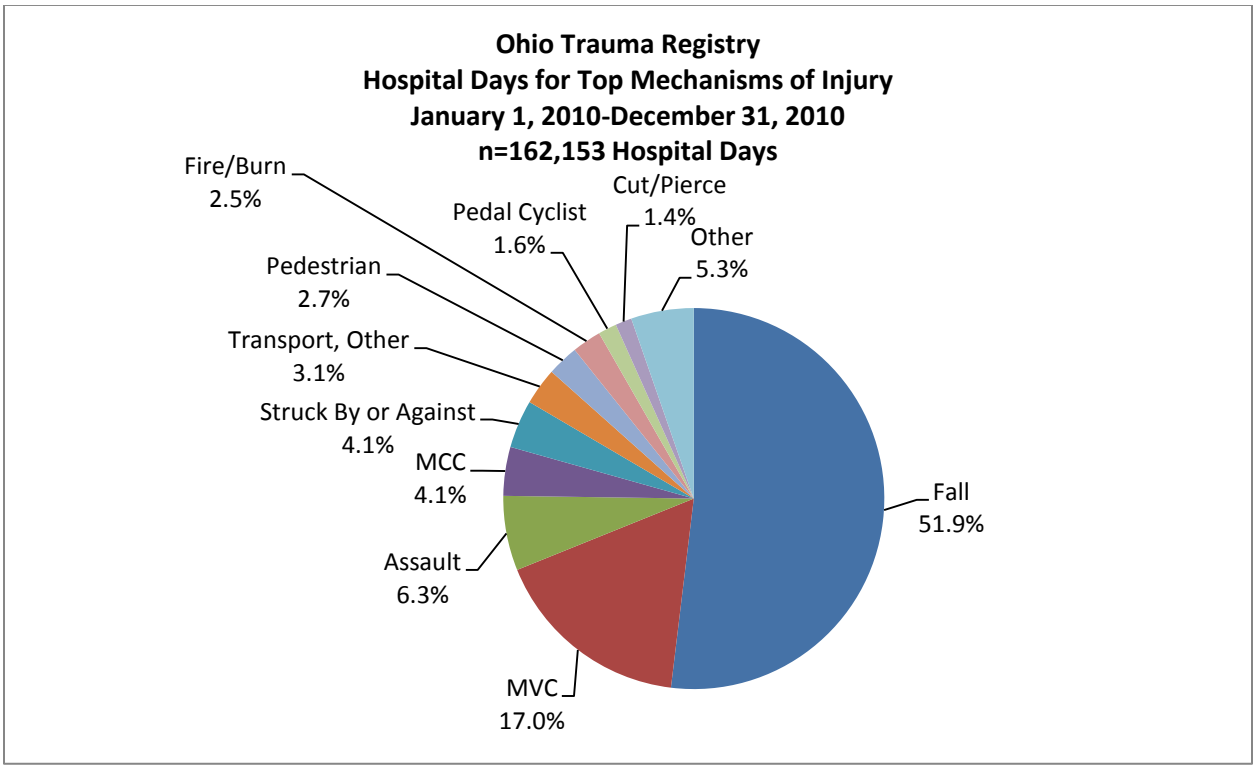


	2010			
Intent	Lived	Died	Total	Case Fatality Rate
Unintentional	24,570	904	25,474	3.5
Assault	2,253	164	2,417	6.8
Self Inflicted	365	96	461	20.8
Legal Intervention	19	3	22	13.6
Undetermined	101	16	117	13.7
Total	27,308	1,183	28,491	4.2

Case Fatality Rate by Intent of Injury:

Self-inflicted injuries had the highest case fatality rate (20.8 per 100 patients) while unintentional injuries had the lowest case fatality rate (3.5 per 100 patients).

Hospital Days by Mechanism of Injury: 2010

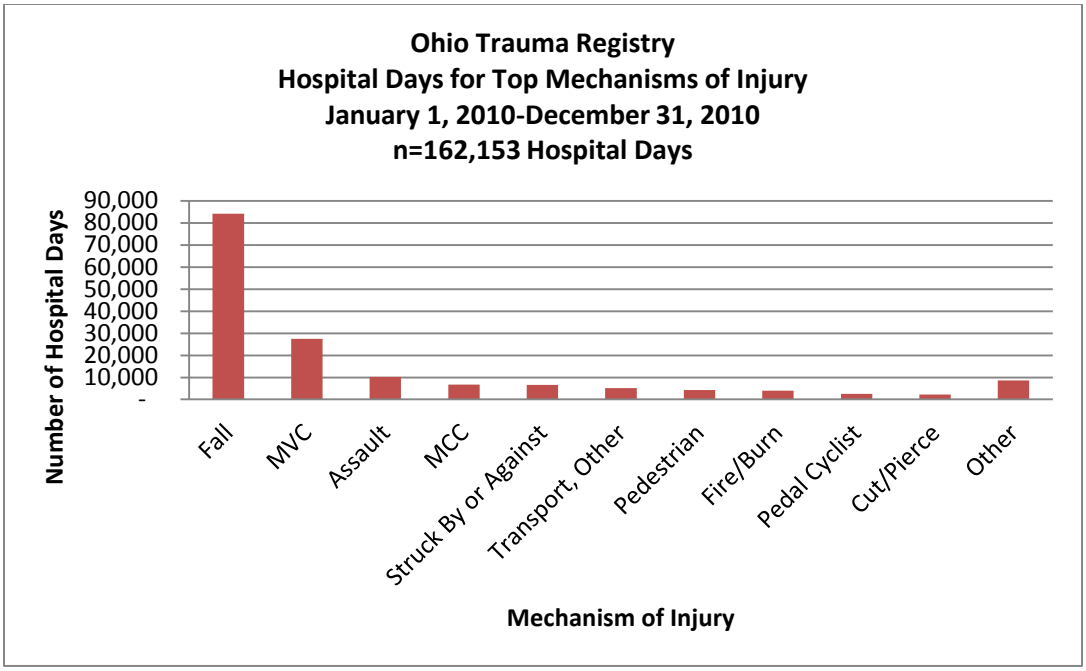


	2010	
Mechanism of Injury	# of Hospital Days	% of Total Hospital Days
Fall	84,186	51.9%
MVC	27,523	17.0%
Assault	10,275	6.3%
MCC	6,714	4.1%
Struck By or Against	6,616	4.1%
Transport, Other	5,092	3.1%
Pedestrian	4,317	2.7%
Fire/Burn	4,008	2.5%
Pedal Cyclist	2,541	1.6%
Cut/Pierce	2,249	1.4%
Other	8,632	5.3%
Total	162,153	100.0%

Hospital Days by Mechanism of Injury

The total number of hospital days reported for patients in 2010 was 162,153. Falls accounted for 51.9% of hospital days reported to the OTR and motor vehicle collisions accounted for 17.0%. There were 8,632 hospital days attributed to patient records that were coded with a variety of other Mechanism of Injury codes, which are aggregated here as “Other”.

Hospital Days by Mechanism of Injury: 2010



	2010	
Mechanism of Injury	# of Hospital Days	% of Total Hospital Days
Fall	84,186	51.9%
MVC	27,523	17.0%
Assault	10,275	6.3%
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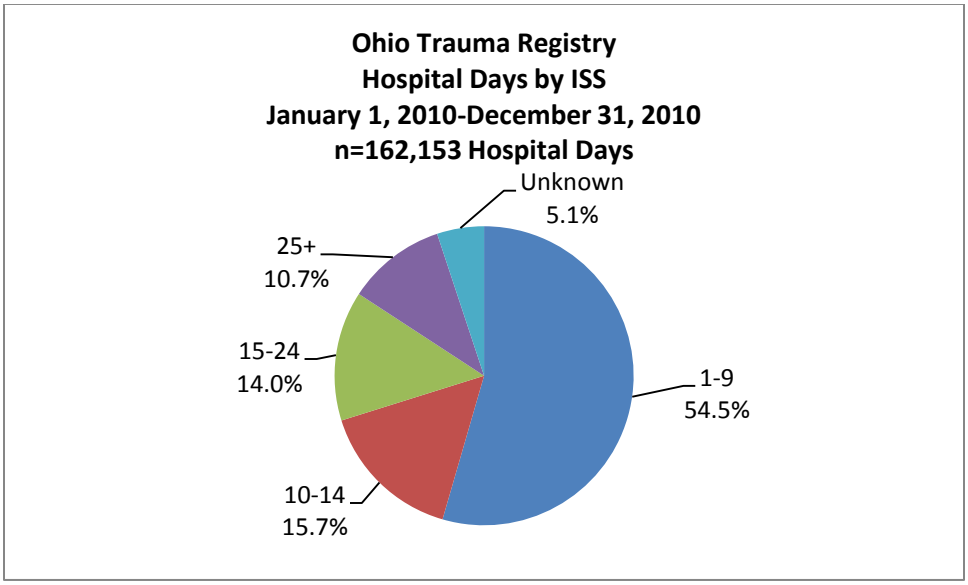
Pedal Cyclist	2,541	1.6%
Cut/Pierce	2,249	1.4%
Other	8,632	5.3%
Total	162,153	100.0%

Hospital Days by Mechanism of Injury:

Falls accounted for the highest percentage of hospital days (51.9%), while motor vehicle collisions accounted for the second highest percentage of hospital days (17.0%).

Hospital Days by Injury Severity Score: 2010



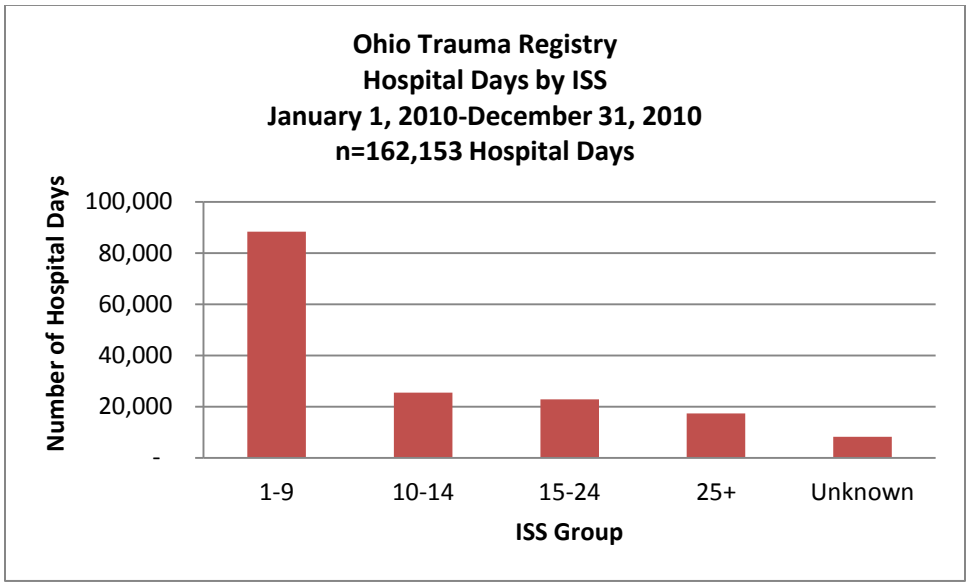
**1477 patients without a reported ISS were excluded*
**Percentages may not add up to 100% due to rounding*

	2010	
ISS Group	Hospital Days	% of Total Hospital Days
1-9	88,350	54.5%
10-14	25,419	15.7%
15-24	22,775	14.0%
25+	17,362	10.7%
Unknown	8,247	5.1%
Total	162,153	100.0%

Hospital Days by Injury Severity Score:

Minor injuries accounted for the majority of all hospital days. As the ISS increased, the proportion of total hospital days decreased. There were 1,477 patients for whom an ISS was not recorded, and this accounted for 8,247 hospital days.

Hospital Days by Injury Severity Score: 2010



**1477 patients without a reported ISS were excluded*

	2010	
ISS Group	Hospital Days	% of Total Hospital Days
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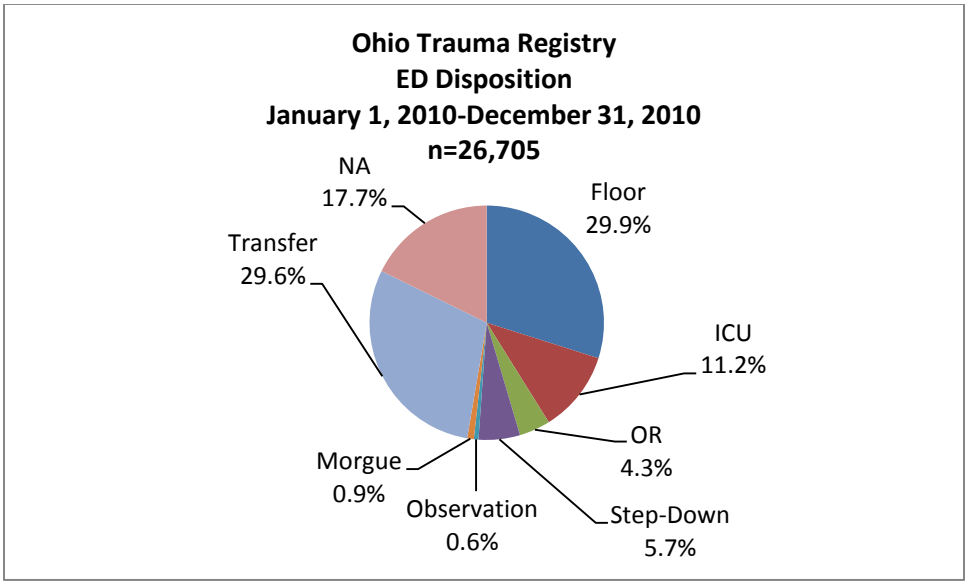
15-24	22,775	14.0%
25+	17,362	10.7%
Unknown	8,247	5.1%
Total	162,153	100.0%

Hospital Length of Stay by Injury Severity Score:

Minor injuries accounted for the majority of all hospital days. As the ISS increased, the proportion of total hospital days decreased.

Emergency Department Disposition: 2010

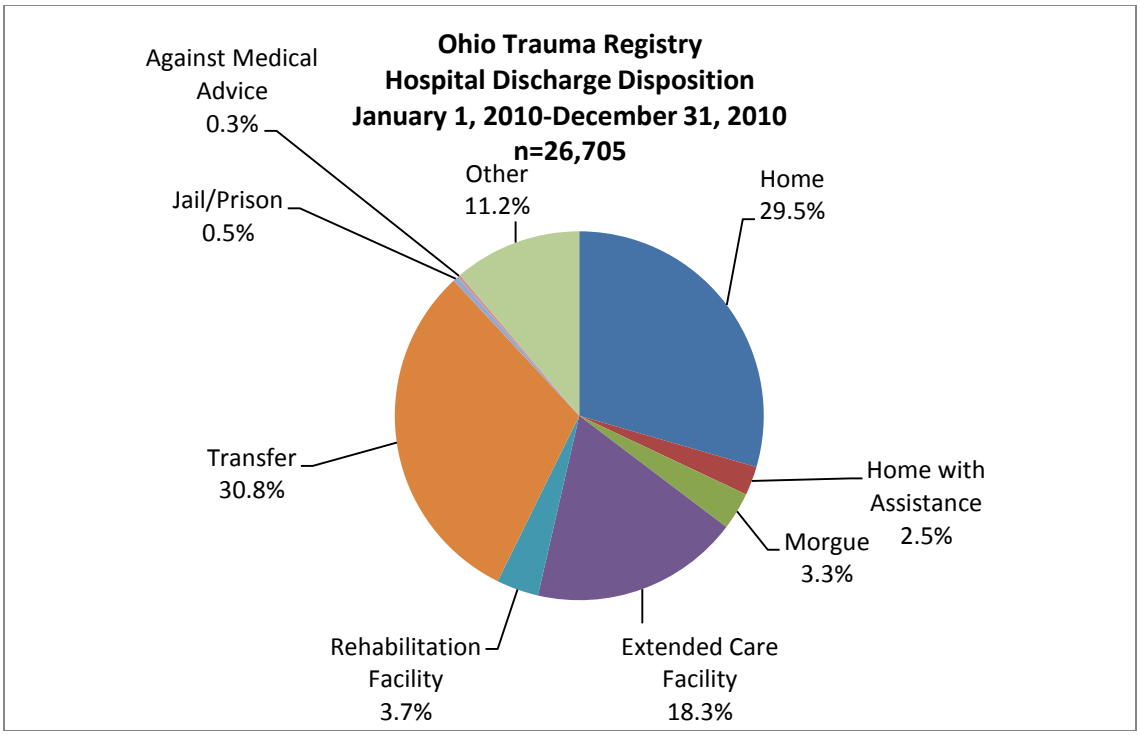


	2010	
ED Disposition	# of Patients	% of Patients
Floor	7,983	29.9%
ICU	3,000	11.2%
OR	1,146	4.3%
Step-Down	1,524	5.7%
Observation	170	0.6%
Morgue	245	0.9%
Transfer	7,901	29.6%
NA	4,736	17.7%
Total	26,705	100.0%

Emergency Department Disposition

This graph only includes data for patients who arrived directly from the scene of the injury. It shows the first patient care area to which the patient was sent after they were discharged from the emergency department in the first hospital in which they received treatment. Of the total number of patients, 29.9% were admitted to the floor (i.e. a regular medical/surgical hospital room), 15.5% were sent directly to the operating room or an intensive care unit, and 29.6% were transferred to another hospital. The OTR data reflects that 17.7% were reported as not applicable, indicating that the initial care was not in the emergency department (e.g. a direct admission).

Hospital Discharge Disposition: 2010



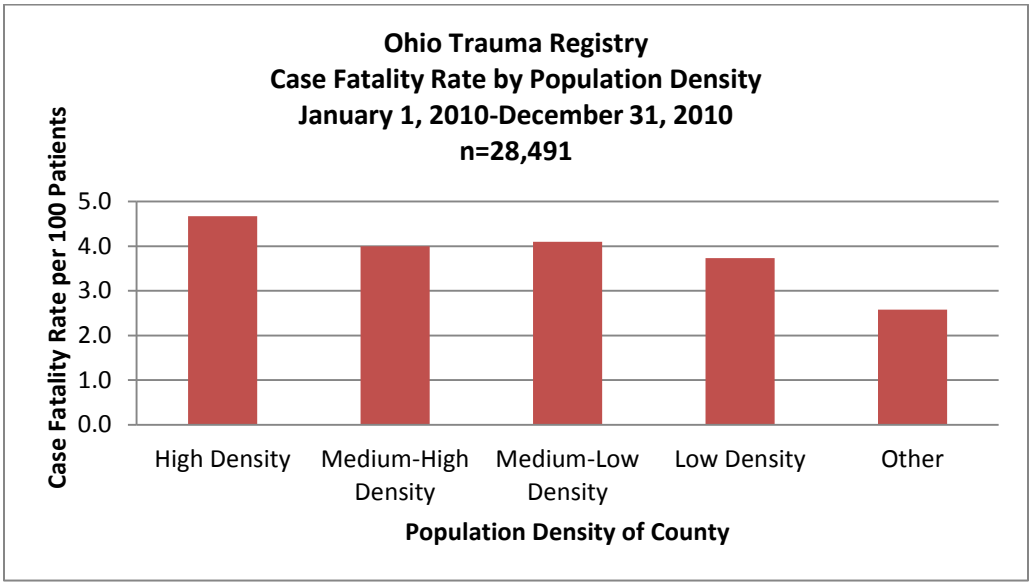
**Percentages may not add up to 100% due to rounding*

2010		
Discharge Disposition	# of Patients	% of Patients
Home	7,875	29.5%
Home with Assistance	675	2.5%
Morgue	879	3.3%
Extended Care Facility	4,885	18.3%
Rehabilitation Facility	984	3.7%
Transfer	8,226	30.8%
Jail/Prison	126	0.5%
Against Medical Advice	67	0.3%
Other	2,988	11.2%
Total	26,705	100.0%

Hospital Disposition

This reflects hospital disposition from the first hospital that provided treatment to the patient. According to the OTR data, 32.0% of patients were discharged home and 30.8% of patients were transferred to another facility. This data reflects where patients were discharged after being admitted to the hospital, in contrast to the previous page, which reflected where patients were discharged from the emergency department.

Case Fatality Rate by Population Density: 2010



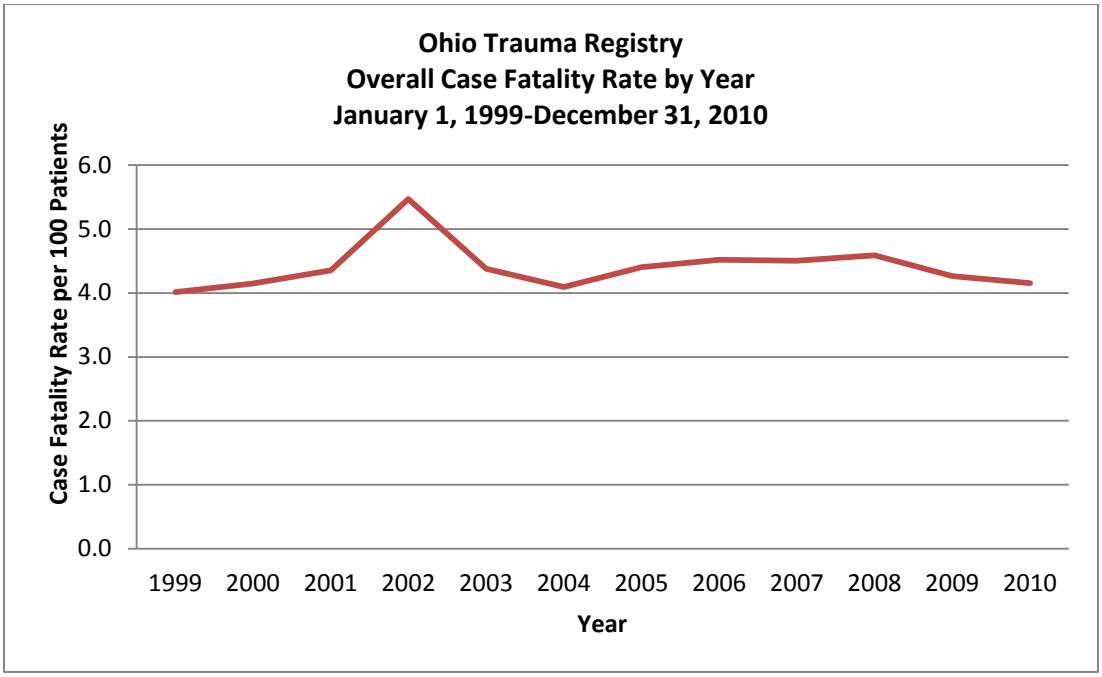
	2010			
Population Density	Lived	Died	Total	Case Fatality Rate
High Density	11,178	548	11,726	4.7
Medium-High Density	5,767	240	6,007	4.0
Medium-Low Density	5,574	238	5,812	4.1
Low Density	2,450	95	2,545	3.7
Other	2,339	62	2,401	2.6
Total	27,308	1,183	28,491	4.2

Case Fatality Rate by Population Density:

Patients coming from counties with high population density had the highest case fatality rate (4.7 per 100 pati). Patients coming from counties with medium-low population density had the second highest case fatality rate (4.1 per 100 patients). This chart reflects crude case fatality rates and is unadjusted for severity or any other variables.

The list of counties by population density can be found in Appendix J.

Overall Case Fatality Rate by Year: 1999-2010

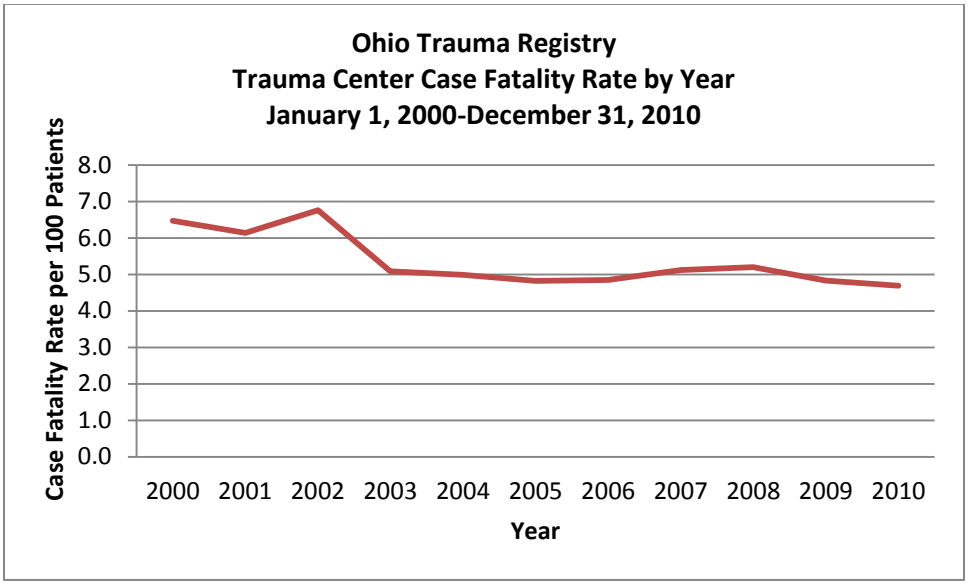


2010				
Year	Lived	Died	Total	Case Fatality Rate
1999	18,750	784	19,534	4.0
2000	19,448	842	20,290	4.1
2001	16,914	770	17,684	4.4
2002	20,860	1,207	22,067	5.5
2003	26,253	1,203	27,456	4.4
2004	26,776	1,143	27,919	4.1
2005	27,151	1,251	28,402	4.4
2006	24,245	1,148	25,393	4.5
2007	29,688	1,401	31,089	4.5
2008	30,603	1,473	32,076	4.6
2009	30,445	1,356	31,801	4.3
2010	27,308	1,183	28,491	4.2
Total	298,441	13,761	312,202	4.4

Overall Case Fatality Rate by Year:

This graph shows the overall crude case fatality rate by year for patient records contained in the OTR. With the exception of a small escalation in 2002, the case fatality rate for trauma patients in Ohio has remained relatively steady.

Trauma Center Case Fatality Rate by Year: 2000-2010

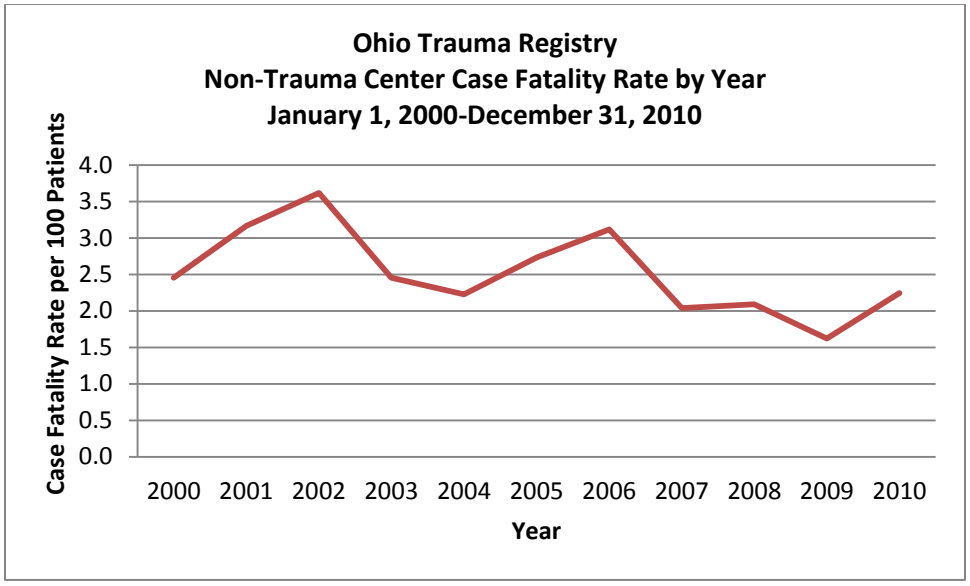


	2010			
Year	Lived	Died	Total	Case Fatality Rate
2000	8,008	554	8,562	6.5
2001	6,613	433	7,046	6.1
2002	12,122	879	13,001	6.8
2003	19,071	1,022	20,093	5.1
2004	17,906	941	18,847	5.0
2005	21,597	1,095	22,692	4.8
2006	19,557	997	20,554	4.9
2007	23,592	1,274	24,866	5.1
2008	24,427	1,341	25,768	5.2
2009	24,920	1,265	26,185	4.8
2010	21,123	1,041	22,164	4.7
Total	198,936	10,842	209,778	5.2

Trauma Center Case Fatality Rate by Year:

This graph reflects the crude case fatality rate for all trauma patients seen at a trauma center between 2000 and 2010. The case fatality rate remained steady from 2000-2002 at slightly above 6 per 100 patients. In 2003 there was a drop to approximately 5 per 100 patients and that rate remained steady through 2010.

Non-Trauma Center Case Fatality Rate by Year: 2000-2010

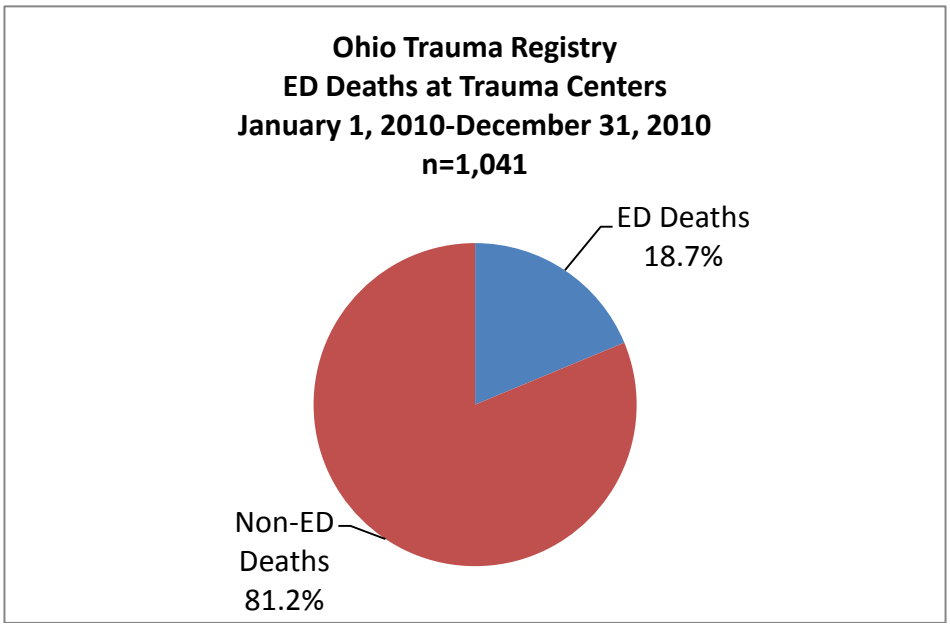


2010				
Year	Lived	Died	Total	Case Fatality Rate
2000	11,440	288	11,728	2.5
2001	10,301	337	10,638	3.2
2002	8,738	328	966	3.6
2003	7,182	181	7,363	2.5
2004	8,870	202	9,072	2.2
2005	5,554	156	5,710	2.7
2006	4,688	151	4,839	3.1
2007	6,096	127	6,223	2.0
2008	6,176	132	6,308	2.1
2009	5,525	91	5,616	1.6
2010	6,185	142	6,327	2.2
Total	80,755	2,135	82,890	2.6

Non-Trauma Center Case Fatality Rate by Year;

This graph reflects the crude case fatality rate for all trauma patients treated at a non-trauma center from 2000-2010. Over time, the mortality rate for non-trauma centers has declined from 2.5 per 100 patients in 1999 to 2.2 per 100 patients in 2010.

ED Deaths at Trauma Centers

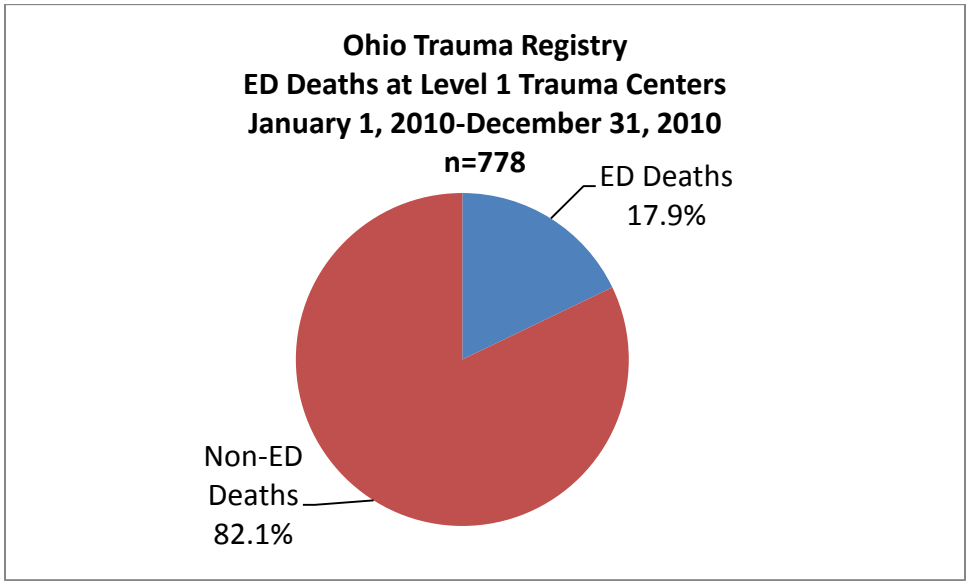


	ED Deaths	Non-ED Deaths	Total Deaths	% Deaths in ED
Level 1 TC	139	639	778	17.9%
Level 2 TC	41	165	206	19.9%
Level 3 TC	15	42	57	26.3%
Total	195	846	1,041	18.7%

ED Deaths at Trauma Centers:

In 2010, 81.3% of inpatient trauma deaths in trauma centers in Ohio occurred outside of the Emergency Department (ED).

ED Deaths at Level 1 Trauma Centers

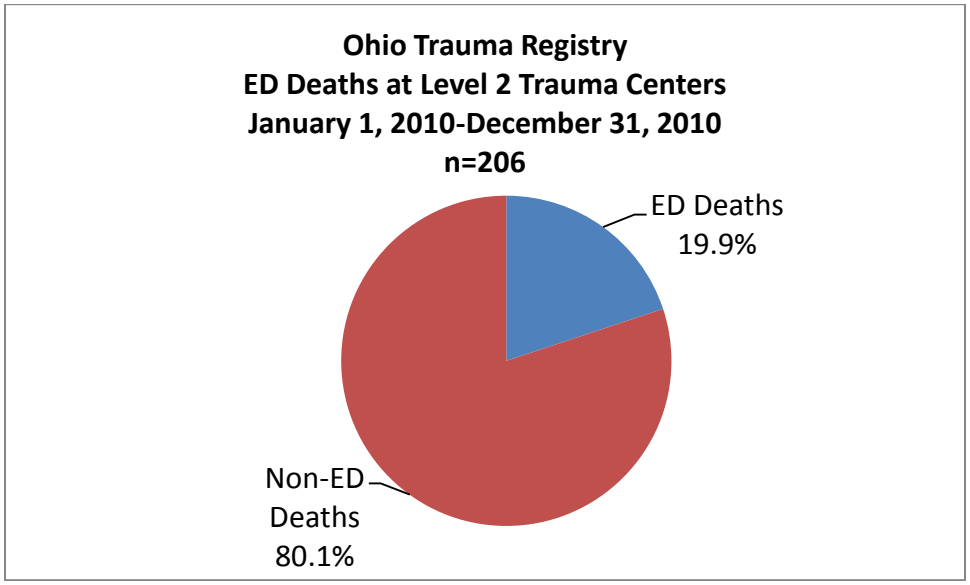


	ED Deaths	Non-ED Deaths	Total Deaths	% Deaths in ED
Level 1 TC	139	639	778	17.9%
Level 2 TC	41	165	206	19.9%
Level 3 TC	15	42	57	26.3%
Total	195	846	1,041	18.7%

ED Deaths at Level 1 Trauma Centers:

In 2010, 82.1% of inpatient trauma deaths that occurred in level 1 trauma centers occurred outside of the ED.

ED Deaths at Level 2 Trauma Centers

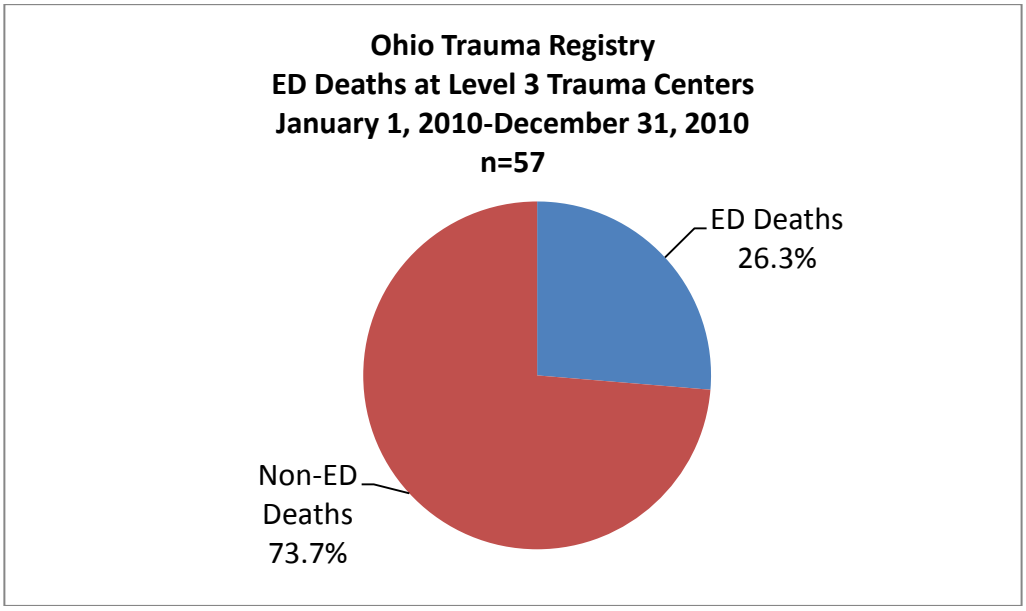


	ED Deaths	Non-ED Deaths	Total Deaths	% Deaths in ED
Level 1 TC	139	639	778	17.9%
Level 2 TC	41	165	206	19.9%
Level 3 TC	15	42	57	26.3%
Total	195	846	1,041	18.7%

ED Deaths at Level 2 Trauma Centers:

In 2010, 80.1% of inpatient trauma deaths that occurred in level 2 trauma centers in Ohio occurred outside of the ED.

ED Deaths at Level 3 Trauma Centers

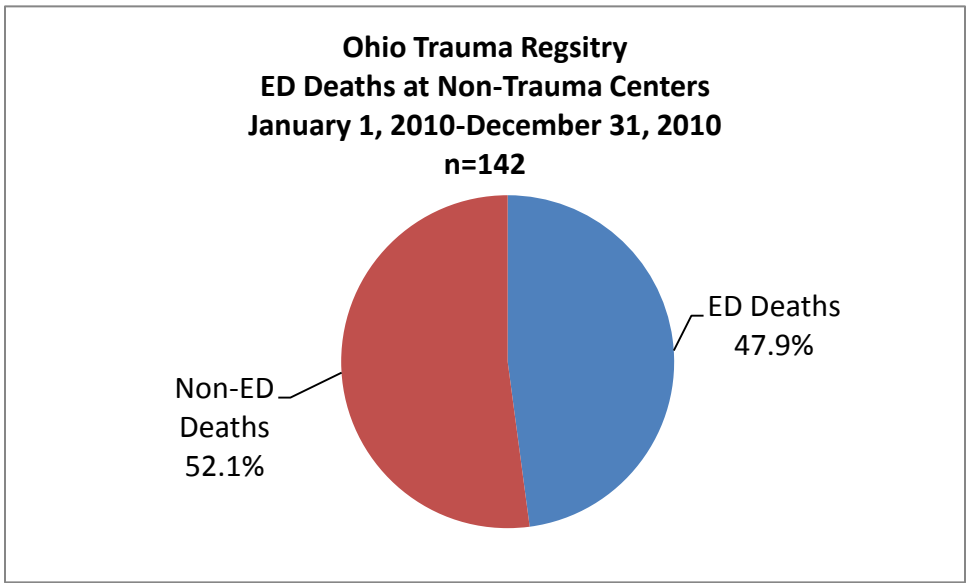


	ED Deaths	Non-ED Deaths	Total Deaths	% Deaths in ED
Level 1 TC	139	639	778	17.9%
Level 2 TC	41	165	206	19.9%
Level 3 TC	15	42	57	26.3%
Total	195	846	1,041	18.7%

ED Deaths at Level 3 Trauma Centers:

In 2010, 73.7% of inpatient trauma deaths that occurred in level 3 trauma centers occurred outside of the ED.

ED Deaths at Non-Trauma Centers



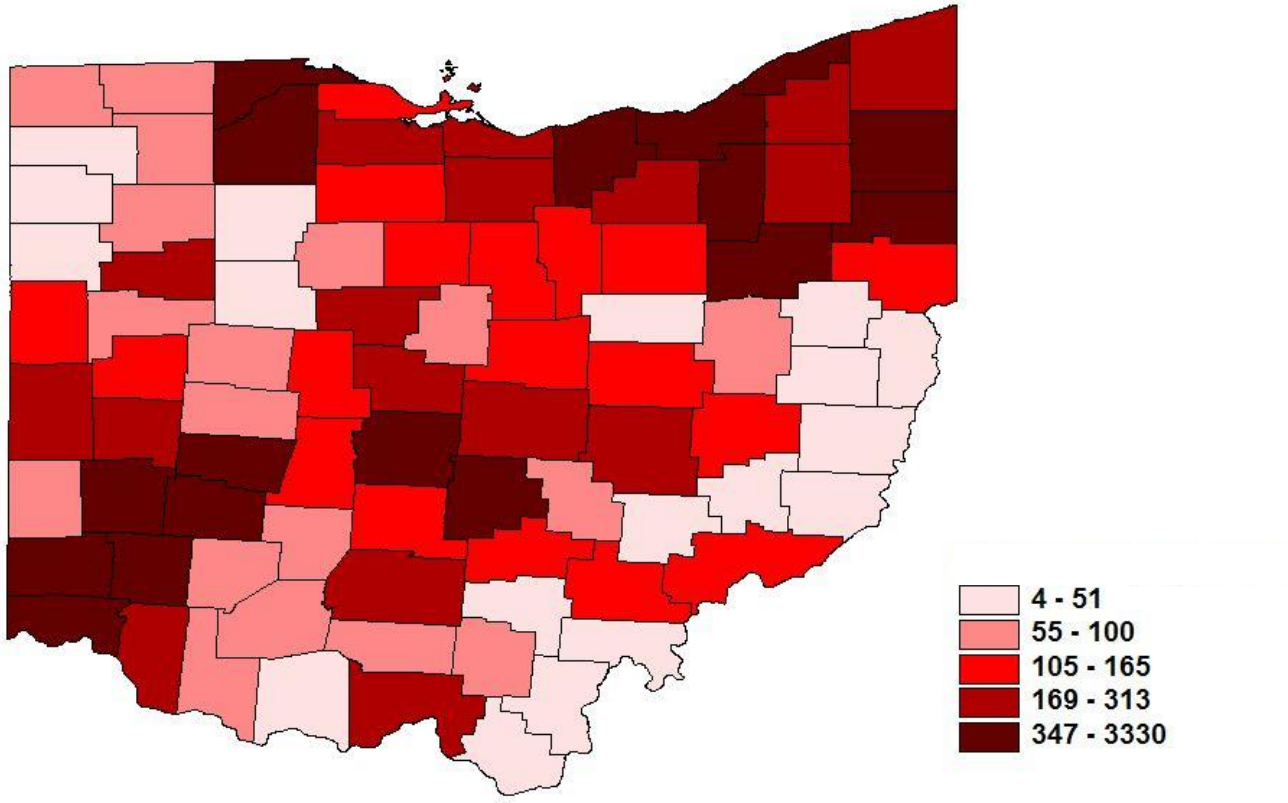
	ED Deaths	Non-ED Deaths	Total Deaths	% Deaths in ED
Level 1 TC	139	639	778	17.9%
Level 2 TC	41	165	206	19.9%
Level 3 TC	15	42	57	26.3%
NTC	68	74	142	47.9%
Total	263	920	1183	22.2%

ED Deaths at Non-Trauma Centers:

In 2010, 52.1% of inpatient trauma deaths that occurred in non-trauma centers occurred outside of the ED.

Geographic Characteristics

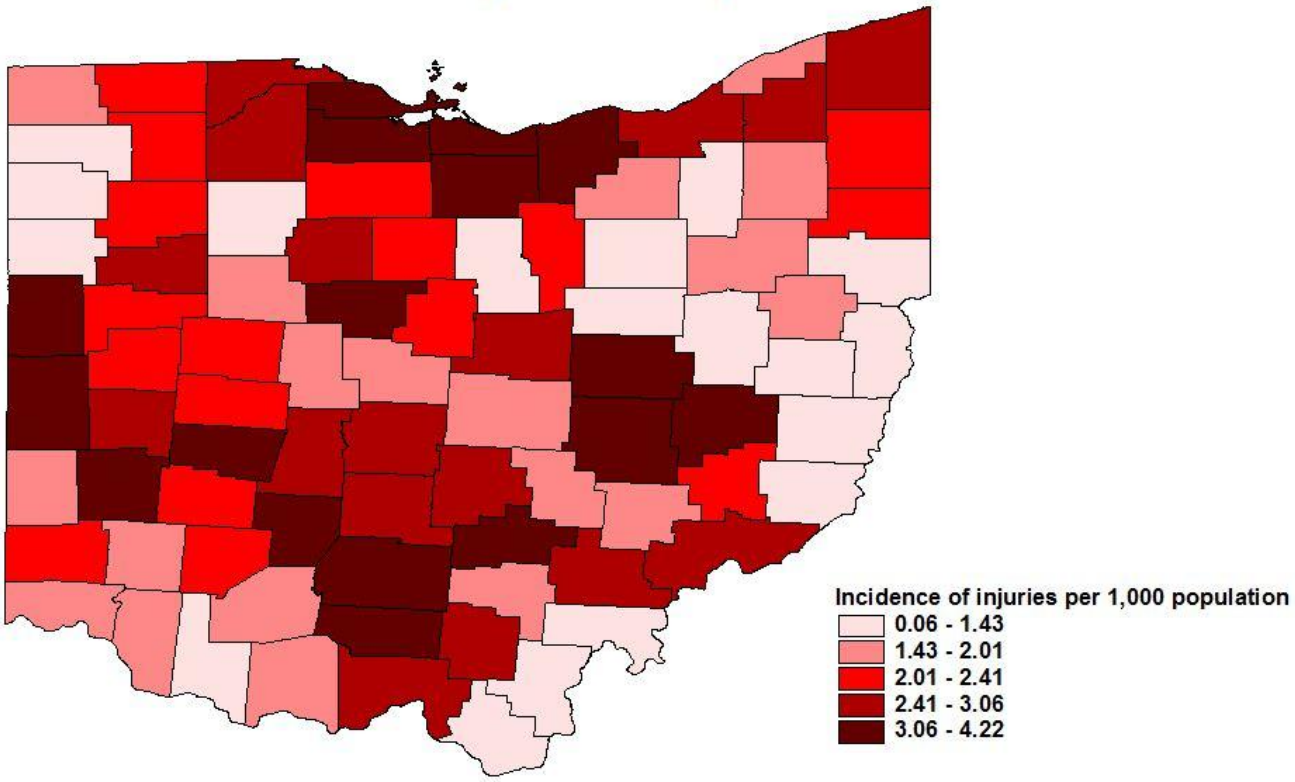
Number of Injuries by County



Number of Injuries by County:

This map reflects a basic count of injuries in each county. Darker shades of red reflect a higher number of injuries.

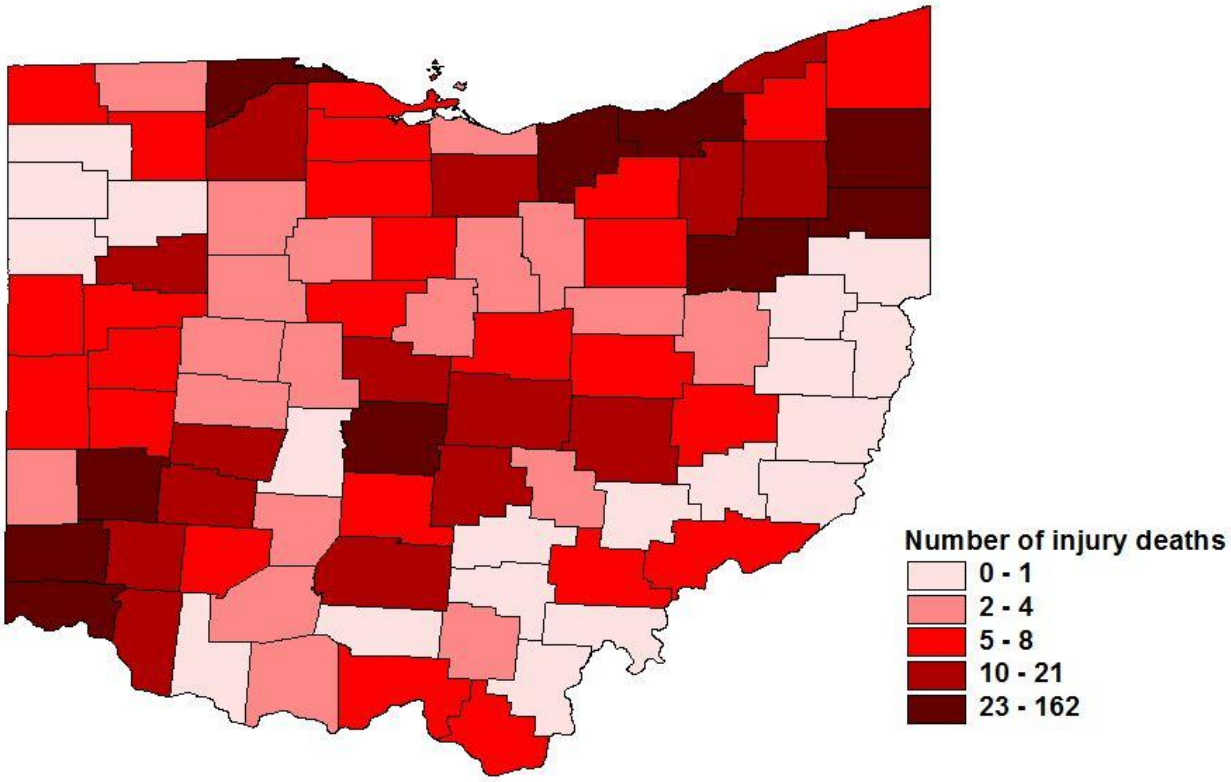
Incidence of Injuries/1,000 Population by County



Incidence of Injuries by County:

This map reflects the crude incidence of injury per 1000 population by county. Darker shades of red reflect higher incidence rates.

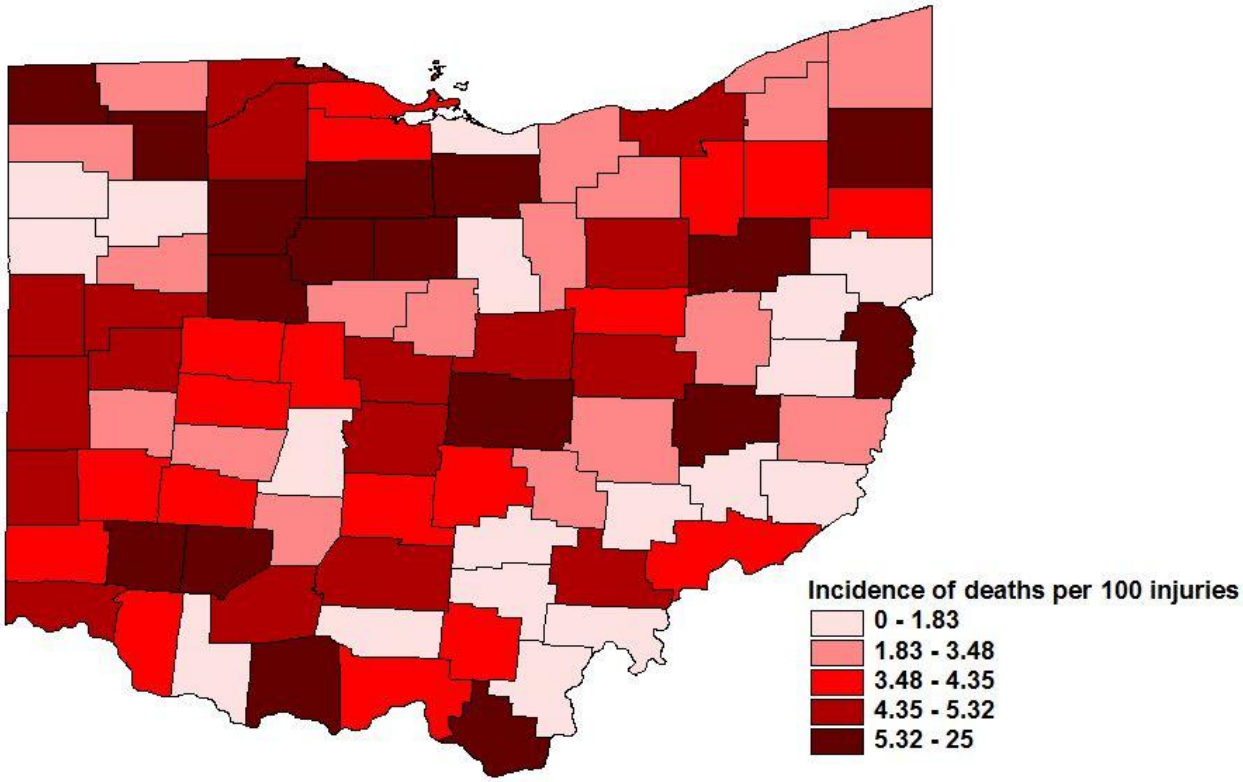
Number of Injury Deaths by County



Number of Injury Deaths:

This map reflects the number of deaths that resulted from injury in each county. Darker shades of red reflect a higher number of injury deaths.

Incidence of Deaths/100 Injuries by County



Incidence of Injury Deaths by County:

This map reflects the crude incidence of injury per 1000 population by county. Darker shades of red reflect higher incidence rates.

Appendix A: Patient Inclusion/Exclusion Criteria

The State Board of EMS has established these criteria for inclusion of records in the OTR:
1. Patient's first or initial admission for at least 48 hours, and who meet one of the following inclusion criteria; **or**
2. Patients who transfer into or out of any hospital, regardless of their length of stay, and who meet one of the following inclusion criteria; **or**
3. Patients that arrive dead on arrival (DOA) and who meet one of the following inclusion criteria; **or**
4. Patients that die after receiving any evaluation or treatment while on hospital premises,
and who meet one of the following inclusion criteria:

Inclusion Criteria

ICD-9-CM Diagnosis Codes on discharge from acute care hospital	
ICD-9-CM Diagnosis Codes	**ICD-9-CM Diagnoses Descriptions**
800.00 – 819.1	Fractures
821.00 – 904.9	Fractures, dislocations/sprains, intracranial injury, internal injury of thorax, abdomen and pelvis, open wounds, injury to blood vessels
911.0, 911.1, 912.0, 912.1	Abrasions/friction burns to trunk, shoulder and upper arm
916.0, 916.1, 919.0, 919.1	Abrasions / friction burns hip, thigh, leg, ankle, other or multiple sites
920 – 929.9	Contusions and crush injury
940.0 – 959.9	Burns, injury to nerves and spinal cord, traumatic complications and unspecified injury
987.9	Smoke inhalation
991.0 – 991.6	Frostbite, hypothermia and external effects of cold
994.0, 994.1, 994.7, 994.8	Asphyxiation, strangulation, drowning, and electrocution
995.50 – 995.59	Child maltreatment and abuse

******OR******

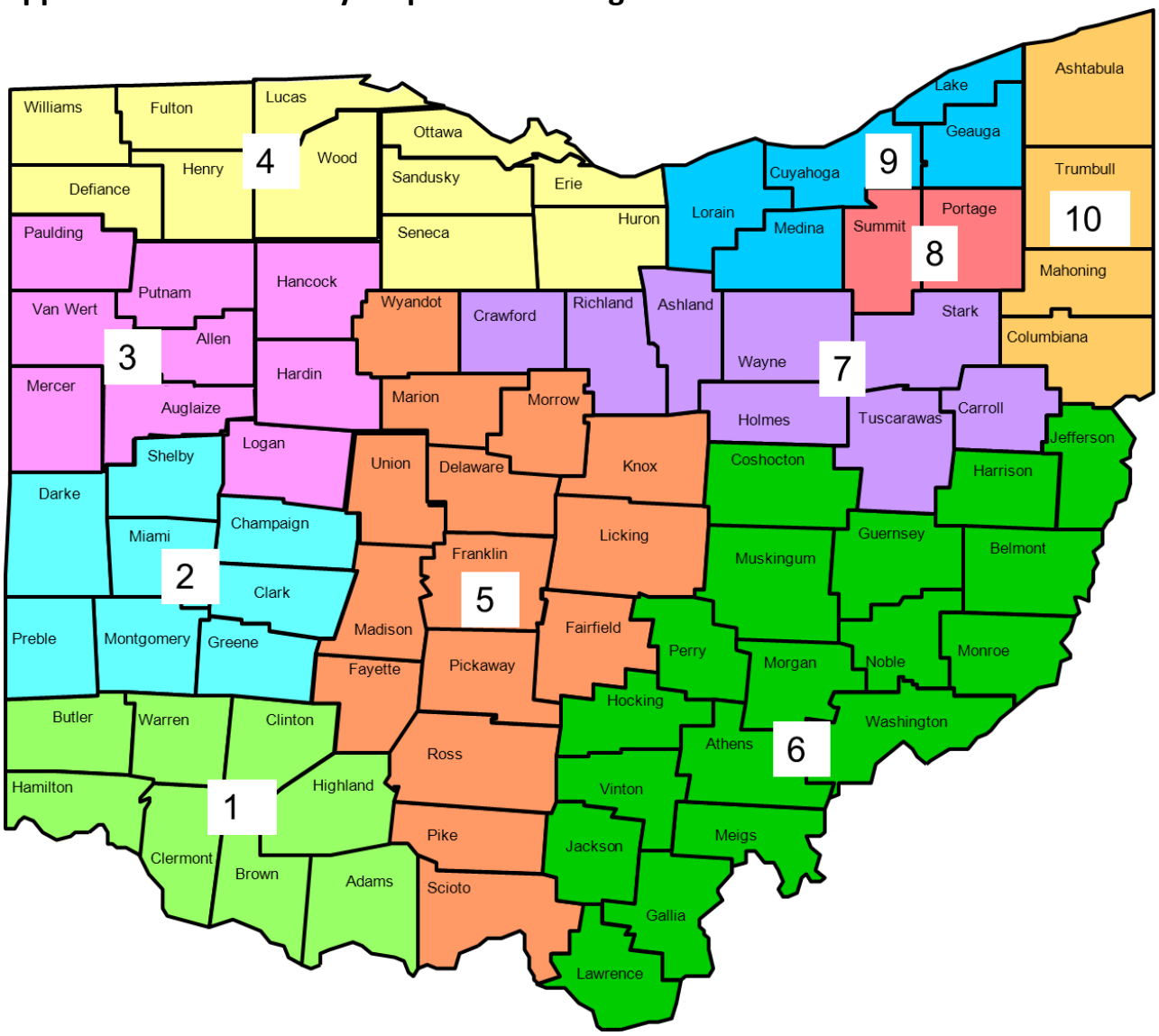
ICD-9-CM Diagnoses			**E-CODE**
348.1	Anoxic Brain Injury	**AND WITH ANY OF THE FOLLOWING External Cause Codes (E-Codes)**	E800 – E848.8 E878 – E905.0 E906.0 – E928.8 E950.0 – E998.9
348.4	Uncal herniation		
348.5,	Cerebral Edema		
348.8	Pneumocephalus		
372.72	Subconjunctival hemorrhage		
518.5	Traumatic ARDS		
784.7	Epistaxis		

ICD-9-CM Diagnoses Codes EXCLUDED	
820.00 – 820.9	Isolated hip fracture
905.0 – 909.9	Late effects of injury
910.0 – 910.9, 911.2 – 911.7, 912.2 - 912.9. 913.0 - 913.9, 914.0 - 914.9, 915-0 - 915.9, 916.2 - 916.9, 917.0 - 917.9, 918.0 - 918.9, 9.19.2 - 919.9	Blisters, insect bites
930 – 939	Foreign bodies

External Cause Codes EXCLUDED	
E849.0 – E849.9	Place of occurrence
E850.0 – E869.9	Poisonings
E870.0 – E879.9	Misadventures during surgical and medical care
E905.1 – E905.9	Venomous animals and plants (except snakes)
E929.0 – E929.9	Late effects of Accidental Injury
E930.0 – E949.9	Drugs, medicinal and biological substances causing adverse effects in therapeutic use

Codes separated by a hyphen indicate a range of codes including both codes AND all codes in between. Example 800.0 – 801.5
Codes separated by a comma indicate a single code. Example 901.1, 901.2, 901.8

Appendix B: Ohio County Map with EMS Regions



Appendix C: E-Code Groupings

MECHANISM / CAUSE	MANNER / INTENT				
	Unintentional	Self-inflicted	Assault	Undetermined	Other[1]
Cut/pierce	E920.0-.9	E956	E966	E986	E974
Drowning/submersion	E830.0-.9, E832.0-.9, E910.0-.9	E954	E964	E984	
Fall	E880.0-E886.9, E888	E957.0-.9	E968.1	E987.0-.9	
Fire/burn	E890.0-E899, E924.0-.9	E958.1,.2,.7	E961, E968.0,.3	E988.1,.2,.7	
Fire/flame	E890.0-E899	E958.1	E968.0	E988.1	
Hot object/substance	E924.0-.9	E958.2,.7	E961, E968.3	E988.2..7	
Firearm	E922.0-.3,.8,.9	E955.0-.4	E965.0-.4	E985.0-.4	E970
Machinery	E919 (0-.9)				
Motor vehicle traffic[2,3]	E810-E819 (.0-.9)	E958.5	E968.5	E988.5	
Occupant	E810-E819 (.0,.1)				
Motorcyclist	E810-E819 (.2,.3)				
Pedal cyclist	E810-E819 (.6)				
Pedestrian	E810-E819 (.7)				
Unspecified	E810-E819 (.9)				
Pedal cyclist, other	E800-E807(.3), E820-E825(.6), E826.1,.9, E827-E829(.1)				
Pedestrian, other	E800-E807(.2), E820-E825(.7), E826-E829(.0)				
Transport, other	E800-E807(.0,.1,.8,.9) E820-E825(.0-.5,.8,.9) E826.2-.8 E827-E829(.2-.9) E831.0-.9, E833.0-E845.9	E958.6		E988.6	
Natural/environmental	E900.0-E909, E928.0-.2	E958.3		E988.3	
Bites/stings[3]	E905.0-.6,.9 E906.0-.4,.5,.9				
Overexertion	E927				
Poisoning	E850.0-869.9	E950.0-E952.9	E962.0-.9	E980.0-E982.9	E972
Struck by, against	E916-E917.9		E960.0; E968.2		E973, E975
Suffocation	E911-E913.9	E953.0-.9	E963	E983.0-.9	
Other specified, classifiable[4]	E846-E848, E914-E915, E918, E921.0-.9, E922.4, E923.0-.9, E925.0-E926.9, E928.3, E929.0-.5	E955.5,.6,.9, E958.0,.4	E960.1, E965.5-.9, E967.0-.9, E968.4,.6,.7	E985.5,.6, E988.0,.4	E971, E978, E990-E994, E996, E997.0-.2
Other specified, NEC	E928.8, E929.8	E958.8, E959	E968.8, E969	E988.8, E989	E997, E995, E997.8, E998, E999
Unspecified	E887, E928.9, E929.9	E958.9	E968.9	E988.9	E976, E997.9
All injury	E800-E869, E880-E929	E950-E959	E960-E969	E980-E989	E970-E978, E990-E999

[1] Includes legal intervention (E970-E978) and operations of war (E990-E999).

[2] Three 4th-digit codes (.4 [occupant of streetcar], .5 [rider of animal], .8 [other specified person]) are not presented separately because of small numbers. However, because they are included in the overall motor vehicle traffic category, the sum of these categories can be derived by subtraction.

[3] E968.5 (assault by transport vehicle), E906.5 (bite from unspecified animal), E922.4 (unintentional injury [gunshot wound] with BB/pellet), E955.6 (suicide attempt/intentionally self-inflicted injury [gunshot wound] with BB/pellet gun), E968.6 (assault [gunshot wound] with BB/pellet gun), E985.6 (undetermined intent injury [gunshot wound] with BB/pellet gun), E928.3 (unintentional human bite), and E968.7 (assault by human bite), are specific to the ICD-9-CM and, therefore, only apply to morbidity coding.

[4] E849 (place of occurrence) has been excluded from the matrix. For mortality coding, an ICD-9 E849 code does not exist. For morbidity coding, an ICD-9-CM E849 code should never be first-listed E code and should only appear as an additional code to specify the place of occurrence of the injury incident.

E-Code groupings from the Centers for Disease Control and Prevention's National Center for Health Statistics

Appendix D: Barell Injury Diagnosis Matrix

The Barell Injury Diagnosis Matrix (complete name: Barell Injury Diagnosis Matrix, Classification by Body Region and Nature of the Injury) standardizes data selection and reports, using a two dimensional array (matrix) that includes all *International Classification of Diseases* (ICD)-9-CM codes describing trauma. It serves as a basic tool in epidemiological and clinical analyses of injury data.

The matrix displays nature of injury in columns and body region in rows placing each ICD-9-CM code in the range from 800-995 in a unique cell location in the matrix. Each cell includes the codes associated with a given injury. The matrix rows and columns can be easily collapsed to get broader groupings or expanded if more specific sites are required.

The full matrix is too complex to reprint here legibly. It can be found at the website of the Centers for Disease Control and Prevention's National Center for Health Statistics in the section on the International Collaborative Effort on Injury Statistics.

Appendix E: Members of the EMS Board, Trauma Committee, and Trauma Registry Advisory Subcommittee (TRAS)

Ohio State Board of Emergency Medical Services—2010

Pamela L. Bradshaw
Dr. Deanna L. Dahl Grove
*James E. Davis
Vickie Graymire
Deanna L. Harris
John A. Kubincaneck
William Mallory, Jr.
Mark L. Marchetta
Daryl McNutt
Dr. John A. Pakiela
James R. Parrish
Dr. Wendy J. Pomerantz
William E. Quinn, Jr.
**Mark N. Resanovich
Craig Self
Bruce Shade
Dr. Brian L. Springer
Dr. Steve M. Steinberg
William F. Vedra, Jr.

Trauma Committee of the EMS Board—2010

Nancie Bechtel
David Degnan
Vickie Graymire
Dr. Edward A. Michelson
Dr. Gregory Nemunaitis
Dr. Kevin J. Pugh
Dr. Michael Shannon
*Dr. John Crow
Gary Englehart
**Kathy Haley
Dr. Sidney Miller
Jennifer Piccione
John D. Ross
Diane Simon
Dr. Richard Ziegler
William Crum
Dr. Todd Glass
Brian Kuntz
Debra Myers
David Pohlman
Dr. Jonathan M. Saxe
Dr. Howard Werman

Trauma Registry Advisory Subcommittee—2010

**Nancie Bechtel
Dr. James Begley
Sally Betz
Roxanna Giambri
Vickie Graymire
Renae Kable
*Dr. F. Barry Knotts
Debra Myers
Dr. Wendy Pomerantz
Mike Smeltzer
Dr. Richard Treat

*Chair
** Vice-Chair

Appendix F: Participating Facilities for 2010

Adams County Hospital	East Liverpool City Hospital	Memorial Hospital-Fremont	Southeastern Ohio Regional Medical Center
Adena Regional Medical Center	EMH Regional Medical Center	Memorial Hospital-Geneva	Southern Ohio Medical Center
Affinity Medical Center, Massillon Campus	Euclid Hospital	Memorial Hospital-Union County	Southview Hospital & Family Health Center
Akron Children's Hospital Medical Center	Fairfield Medical Center	Mercer County Joint Twp. Community Hospital	Southwest General Health Center
Akron City Hospital	Fairview Hospital	Mercy Franciscan Hospital-Mt. Airy	Springfield Regional Medical Center
Alliance Community Hospital	FIrelands Regional Medical Center	Mercy Franciscan Hospital-Western Hills	St. Elizabeth Boardman Health Center
Amherst Hospital	Fisher-Titus Medical Center	Mercy Hospital-Anderson	St. Elizabeth's Health Center
Atrium Medical Center	Flower Hospital	Mercy Hospital-Clermont	St. John Medical Center
Aultman Hospital	Fort Hamilton-Hughes Memorial Hospital	Mercy Hospital-Fairfield	St. Joseph Health Center
Barberton Citizen's Hospital	Fostoria Community Hospital	Mercy Hospital-Willard	St. Luke's Hospital-Toledo
Barnesville Hospital Association	Fulton County Health Center	Mercy Medical Center-Canton	St. Rita's Medical Center
Bay Park Community Hospital	Galion Community Hospital	Mercy Memorial Hospital	St. Thomas Hospital
Belmont Community Hospital	Genesis Good Samaritan Hospital-Zanesville	Mercy St. Anne Hospital	St. Vincent Charity
Berger Hospital	Good Samaritan Hospital-Dayton	Mercy St. Charles Hospital	Sycamore Hospital
Bethesda North-Cincinncati	Grady Memorial Hospital	Mercy St. Vincent Medical Center	The Bellevue Hospital
Blanchard Valley Hospital	Grandview Hospital	MetroHealth Medical Center	The Christ Hospital
Bluffton Hospital	Grant Medical Center	Miami Valley Hospital	The Toledo Hospital
Brown County General Hospital	Greene Memorial Hospital	Morrow County Hospital	The University Hospital-Cincinnati
Brown Memorial Hospital	Hardin Memorial Hospital	Mount Carmel East Hospital	Tri-Health Good Samaritan Hospital- Cincinnati
Bucyrus Community Hospital	Highland District Hospital	Mount Carmel West Hospital	Trinity Medical Center-West
Cincinnati Children's Hospital Medical Center	Hillcrest Hospital	Mount Carmel St. Ann's Hospital	TriPoint Medical Center
Cleveland Clinic Foundation	Huron Hospital	Nationwide Children's Hospital	Trumbull Memorial Hospital
Clinton Memorial Hospital	Jewish Hospital Kenwood	New Albany Surgical Hospital	Twin City Hospital
Community Hospitals and Wellness Centers-Archbold	Joint Township District Memorial Hospital	O'Bleness Memorial Hospital	UH-University Hospital & Rainbow Babies/Children's Hospital
Community Hospitals and Wellness Centers-Bryan	Kettering Memorial Medical Center	Ohio State University Medical Center	UHHS-Bedford Medical Center
Community Hospitals and Wellness Centers-Montpelier	Knox Community Hospital	Ohio State University Medical Center-East	UHHS-Geauga Regional Hospital
Community Memorial Hospital	Lake West Hospital	Parma Community Hospital	University of Toledo Medical Center
Coshocton County Memorial Hospital	Lakewood Hospital	Paulding County Hospital	Upper Valley Medical Center
Cuyahoga Falls General Hospital	Licking Memorial Hospital	Pomerene Hospital	Wayne Hospital
Dayton Children's Medical Center	Madison County Hospital	Richmond Heights Hospital	West Chester Hospital
Defiance Regional Medical Center	Marietta Memorial Hospital	Riverside Methodist Hospital	Wilson Hospital
Diley Ridge Medical Center	Marion General Hospital	Robinson Memorial Hospital	Wood County Hospital
Doctor's Hospital West-Columbus	Marymount Hospital	Salem Community Hospital	Wyandot Memorial Hospital
Dublin Methodist Hospital	McCullough-Hyde Memorial Hospital	Samaritan Regional Health System	
Dunlap Community Hospital	Medina Hospital	Selby General Hospital	

Appendix G: Ohio Trauma Registry Data Element List

- Demographics
  - Hospital Code
  - Unique Patient Admission Number
  - Date Exported
  - Zip Code of Residence
  - Patient's Date of Birth
  - Gender
  - Race/Ethnicity
  - Work Relatedness of Injury
  - Safety Equipment
  - Site at Which Injury Occurred
  - E-Code (Description of Injury)
  - Date Injury Occurred
  - State in Which Injury Occurred
  - County in Which Injury Occurred
- Pre-Hospital
  - Glasgow Eye Component at Scene
  - Glasgow Verbal Component at Scene
  - Glasgow Motor Component at Scene
  - GCS Assessment Qualifier at Scene
  - Intubated-Scene
  - CPR-Scene
  - MAST-Scene
  - Fluids-Scene
  - Chest Decompression-Scene
  - Thoracentesis/Thoracostomy-Scene
  - Spinal Immobilization-Scene
- Emergency Department
  - ED Arrival Date
  - ED Arrival Time
  - Systolic Blood Pressure (First)
  - Respiratory Rate (Unassisted)
  - Injury Type
  - Glasgow Eye Component in ED
  - Glasgow Verbal Component in ED
  - Glasgow Motor Component in ED
  - GCS Assessment Qualifier in ED
  - Was Alcohol Present?
  - Alcohol Level Range
  - Were Drugs Present?
  - Drug Category
  - ED Disposition
  - ED Transfer to Hospital
  - ED Transfer Date
  - ED Transfer Time
  - First Temperature in ED
  - Intubated in ED
  - CPR-ED
  - MAST-ED
  - Fluids-ED
  - Chest Decompression-ED
  - Thoracentesis/Thoracostomy-ED
  - Spinal Immobilization-ED
  - Head CT Results-ED

- Abdominal Evaluation-ED

- Inpatient Course
  - Admitting Specialty
  - Total Days in ICU
  - Ventilator Support Days
  - ICD-9-CM Diagnosis Code/Description for Injuries
  - Complications
  - Pre-existing Comorbidity Factors
- OR Visits
  - OR Date
  - OR Time
  - ICD-9 Codes for OR Visit
- Disability Assessment / Discharge
  - Disability Assessment - Self-Feeding
  - Disability Assessment - Locomotion
  - Disability Assessment - Expression
  - Discharge Disposition
  - Transfer to Other Hospital
  - Date of Discharge or Death
  - Discharge Status
  - Billed Hospital Charges
  - Principal Payment Source
  - Length of Stay in Hospital
  - Organs/Tissue Requested
  - Organs/Tissue Granted
  - Organs/Tissue Taken
  - Was an Autopsy Performed?

Appendix H: Glossary

Barell Matrix: A system of classification of injury by body region and the nature of the injury.

CDC: Centers for Disease Control and Prevention

E-Code: External cause of injury code

ED: Emergency Department

EMS: Emergency Medical Services

Floor: A general medical-surgical room or bed in a hospital. Generally advanced patient monitoring is not performed on a floor bed.

GSW: Gunshot Wound

ICD-9-CM: International Classification of Disease, 9th Revision, Clinical Modification.

ICU: Intensive Care Unit

ISS: Injury Severity Score. A system for scoring the overall severity of injuries. Ranging from 1-75, an ISS of greater than 15 is generally considered a severe injury.

LOS: Length of Stay

MCC: Motorcycle Collision

MOI: Mechanism of Injury

MVC: Motor Vehicle Collision

Observation: A level of hospital care most frequently utilized for lower acuity, short stays, or during an intermediate period while a decision is being made to admit or release the patient.

OR: Operating Room.

OTR: Ohio Trauma Registry

Outcome: Used to describe the patient's outcome; alive or dead.

Step-Down: An intermediate level of care between the "floor" and the ICU.

Appendix I: Ohio Revised Code

§4765.06: Emergency medical services incidence reporting system—state trauma registry.

(B) The board shall establish a state trauma registry to be used for the collection of information regarding the care of adult and pediatric trauma victims in this state. The registry shall provide 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. All persons designated by the board shall submit to the board any information it determines is necessary for maintaining the state trauma registry. At the request of the board any state agency possessing information regarding adult or pediatric trauma care shall provide the information to the board. The board shall maintain the state trauma registry in accordance with rules adopted under section 4765.11 of the Revised Code. Rules relating to the state trauma registry adopted under this section and section 4765.11 of the Revised Code shall not prohibit the operation of other trauma registries and may provide for the reporting of information to the state trauma registry by or through other trauma registries in a manner consistent with information otherwise reported to the state trauma registry. Other trauma registries may report aggregate information to the state trauma registry, provided the information can be matched to the person that reported it. Information maintained by another trauma registry and reported to the state trauma registry in lieu of being reported directly to the state trauma registry is a public record and shall be maintained, made available to the public, held in confidence, risk adjusted, and not subject to discovery or introduction into evidence in a civil action as provided in section 149.43 of the Revised Code and this section. Any person who provides, maintains, or risk adjusts such information shall comply with this section and rules adopted under it in performing that function and has the same immunities with respect to that function as a person who performs that function with respect to the state trauma registry.

(C) The board and any employee or contractor of the board or the department of public safety shall not make public information it receives under Chapter 4765. of the Revised Code that identifies or would tend to identify a specific recipient of emergency medical services or adult or pediatric trauma care.

(D) Not later than two years after the effective date of this amendment, the board shall adopt and implement rules under section 4765.11 of the Revised Code that provide written standards and procedures for risk adjustment of information received by the board under Chapter 4765. of the Revised Code. The rules shall be developed in consultation with appropriate medical, hospital, and emergency medical service organizations and may provide for risk adjustment by a contractor of the board. Before risk adjustment standards and procedures are implemented, no member of the board and no employee or contractor of the board or the department of public safety shall make public information received by the board under Chapter 4765. of the Revised Code that identifies or would tend to identify a specific provider of emergency medical services or adult or pediatric trauma care. After risk adjustment standards and procedures are implemented, the board shall make public such information only on a risk adjusted basis.

(E) The board shall adopt rules under section 4765.11 of the Revised Code that specify procedures for ensuring the confidentiality of information that is not to be made public under this section. The rules shall specify the circumstances in which deliberations of the persons performing risk adjustment functions under this section are not open to the public and records of those deliberations are maintained in confidence. Nothing in this section prohibits the board from making public statistical information that does not identify or tend to identify a specific recipient or provider of emergency medical services or adult or pediatric trauma care.

(F) No provider that furnishes information to the board with respect to any patient the provider examined or treated shall, because of this furnishing, be deemed liable in damages to any person or be held to answer for betrayal of a professional confidence in the absence of willful or wanton misconduct. No such information shall be subject to introduction in evidence in any civil action against the provider. No provider that furnishes information to the board shall be liable for the misuse or improper release of the information by the board or any other person. No person who performs risk adjustment functions under this section shall, because of performing such functions, be held liable in a civil action for betrayal of professional confidence or otherwise in the absence of willful or wanton misconduct.

Effective Date: 11-03-2000

Appendix J: Counties by Population Density Designation

High Density (>1000 people per square mile)	Medium-High Density (300-999 people per square mile)	Medium-Low Density (100-299 people per square mile)	Low Density (<100 people per square mile)
Cuyahoga	Lake	Allen	Preble
Franklin	Butler	Richland	Washington
Hamilton	Stark	Delaware	Clinton
Lucas	Mahoning	Fairfield	Defiance
Montgomery	Lorain	Miami	Union
Summit	Warren	Geauga	Williams
	Clermont	Licking	Holmes
	Trumbull	Columbiana	Champaign
	Clark	Wayne	Darke
	Medina	Wood	Mercer
	Greene	Jefferson	Madison
	Erie	Marion	Brown
	Portage	Ottawa	Perry
		Tuscarawas	Guernsey
		Sandusky	Morrow
		Ashtabula	Jackson
		Lawrence	Highland
		Hancock	Carroll
		Belmont	Van Wert
		Scioto	Putnam
		Muskingum	Henry
		Ashland	Fayette
		Athens	Hardin
		Huron	Hocking
		Shelby	Gallia
		Crawford	Coshocton
		Auglaize	Pike
		Ross	Wyandot
		Seneca	Meigs
		Pickaway	Paulding
		Knox	Adams
		Fulton	Harrison
		Logan	Morgan
			Noble
			Monroe
			Vinton

Population density data from the US Census Bureau, 2000 census
Density designations by the EMS Office of Research and Analysis


OHIO DEPARTMENT
OF PUBLIC SAFETY
EDUCATION • SERVICE • PROTECTION


EMS
Ohio Emergency
Medical Services


EMS
Office of
Research & Analysis