Indiana Trauma Care Committee Meeting

February 20, 2015

Indiana State Department of Health

Division of Trauma and Injury Prevention

Indiana State Department of Health

Email questions to: **indianatrauma@isdh.in.gov**

Hospitals reporting to the Indiana Trauma Registry - Quarter 3 2014

District 1

Franciscan St. Anthony – Crown Point

Franciscan St. Anthony – Michigan City

Franciscan St. Margaret –Dyer

Franciscan St. Margaret - Hammond

IU Health – LaPorte

Jasper County

Methodist Northlake

Methodist Southlake

Portage

Porter Regional (Valparaiso)

District 2

Community Hospital of Bremen

Elkhart General

IU Health – Goshen

Kosciusko Community

Memorial Hospital South Bend

Pulaski Memorial

St. Joseph RMC-Mishawaka

St. Joseph RMC-Plymouth

Email questions to: **indianatrauma@isdh.in.gov**

Hospitals reporting to the Indiana Trauma Registry - Quarter 3 2014

District 3

Cameron Memorial

DeKalb Health

Dukes Memorial

Dupont

Lutheran

Parkview Huntington

Parkview LaGrange

Parkview Noble

Parkview Randallia

Parkview Regional Medical Center

Parkview Whitley

District 4

Franciscan St. Elizabeth - Crawfordsville

Franciscan St. Elizabeth – Lafayette Central

Franciscan St. Elizabeth – Lafayette East

IU Health – Arnett

~~IU Health – White Memorial~~

Memorial Hospital-Logansport

~~St. Vincent Frankfort~~

St. Vincent Williamsport

Email questions to: **indianatrauma@isdh.in.gov**

Hospitals reporting to the Indiana Trauma Registry - Quarter 3 2014

District 5

Community East
Community North
Community South
Eskenazi Health
St. Francis – Indianapolis
St. Francis – Mooresville
Hancock Regional
Hendricks Regional Health
IU Health – Methodist
IU Health – Morgan
IU Health – North
IU Health – Riley for Children
Johnson Memorial
Major Hospital
St. Vincent - Indianapolis
Witham Health Services
Witham at Anson

Email questions to: **indianatrauma@isdh.in.gov**

Hospitals reporting to the Indiana Trauma Registry - Quarter 3 2014

District 6

Community Hospital of Anderson & Madison Co.
Community Howard
Henry County
IU Health – Ball Memorial
IU Health - Blackford
IU Health – Tipton
Jay County
Marion General
~~Reid Hospital~~
Rush Memorial
St. Vincent Anderson
St. Vincent Mercy

District 7

Greene County General
Putnam County
St. Vincent Clay
Sullivan County Community
Terre Haute Regional
Union Hospital
Union - Clinton

Email questions to: **indianatrauma@isdh.in.gov**

Hospitals reporting to the Indiana Trauma Registry - Quarter 3 2014

District 8

Columbus Regional
IU Health - Bedford
IU Health – Bloomington
IU Health – Paoli
Monroe Hospital
Schneck Medical Center
St. Vincent Salem

District 9

Clark Memorial
Dearborn County
Floyd Memorial
King's Daughters' Health
Margaret Mary Community
St. Catherine Regional
Scott County Memorial

Email questions to: **indianatrauma@isdh.in.gov**

Hospitals reporting to the Indiana Trauma Registry - Quarter 3 2014

District 10

Daviess Community

Deaconess

Deaconess Gateway

Gibson General

Good Samaritan

Memorial Hospital & Health Care Center

Perry County Memorial

St. Mary's Medical Center

St. Mary's Warrick

Email questions to: **indianatrauma@isdh.in.gov**

Summary of Hospitals Reporting Status- Q3 2014

New to Reporting / Started Reporting Again

- Franciscan St. Elizabeth – Lafayette Central*
- Harrison County Hospital*
- St. Joseph Hospital and Health Center - Kokomo
- Woodlawn Hospital

Dropped off

- IU health – White Memorial Hospital
- St. Vincent Frankfort
- Reid Hospital

* = New to Reporting

Email questions to: **indianatrauma@isdh.in.gov**

Quarter 3 2014 Statewide Report

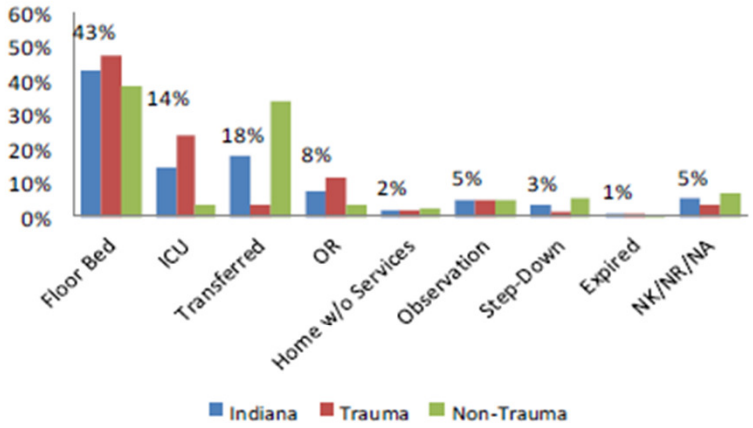
- 8,812 incidents
- July 1, 2014 to September 30, 2014
- 95 total hospitals reporting
  - 11 trauma centers
  - 84 hospitals

Indiana State Department of Health

Email questions to: **indianatrauma@isdh.in.gov**

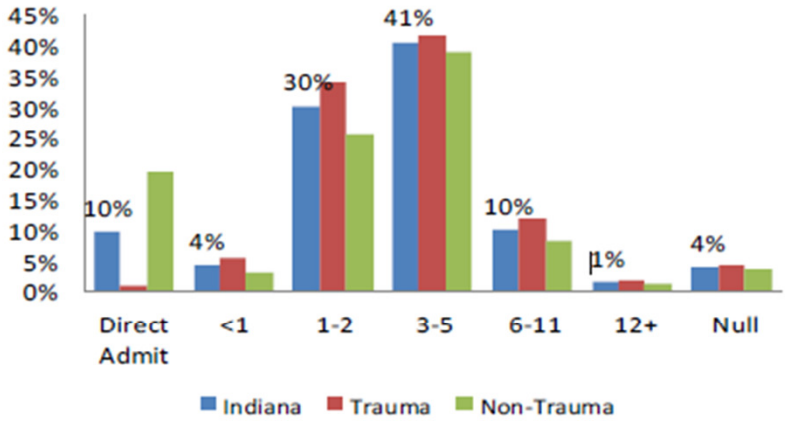
ED: Disposition / Length of Stay - Page 2

ED Disposition by Percentage

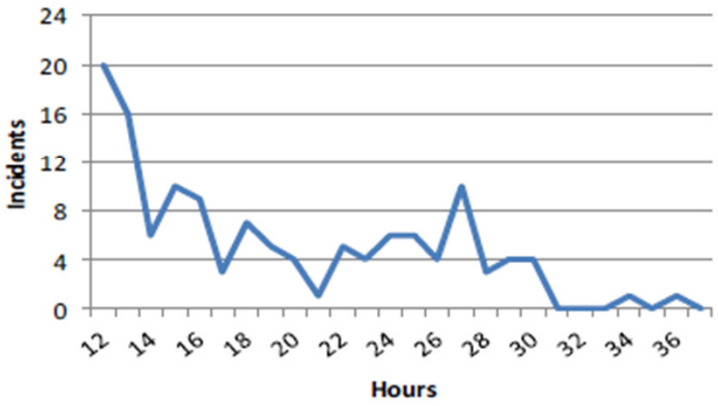


<1% ED Disposition: AMA; Home with Services; Other

ED Length of Stay (Hours)

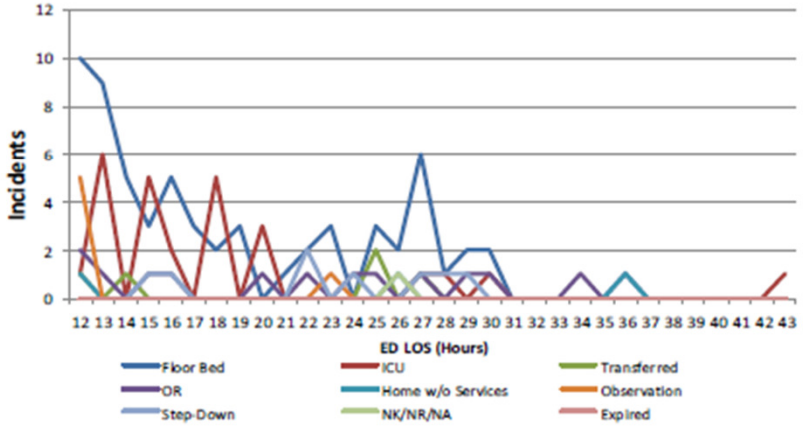


ED LOS >12 Hours



N=130

ED Disposition for ED LOS >12 Hours



N=125

*No cases expired > 12 hours

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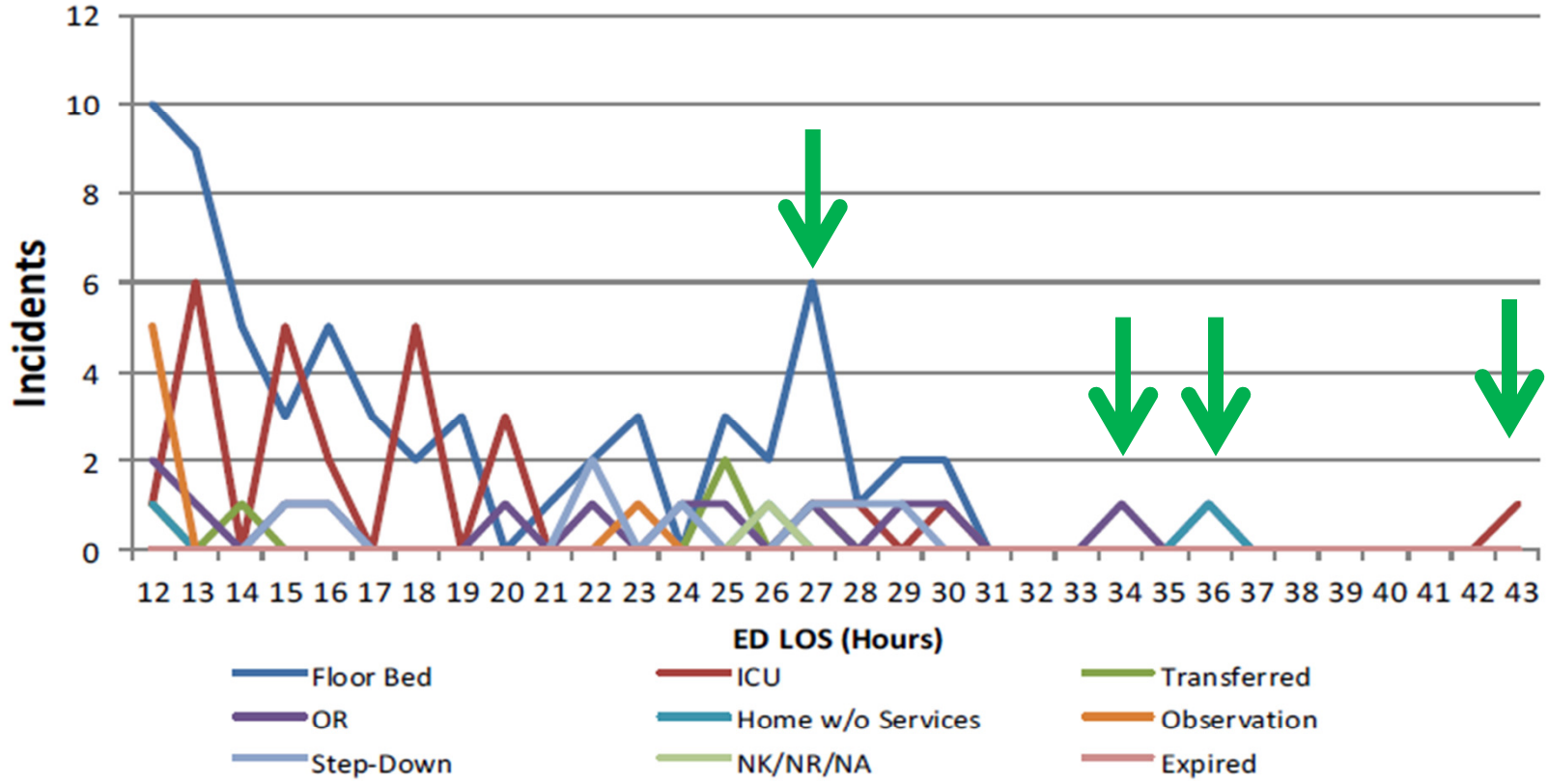
ED: Disposition / Length of Stay - Page 2

ED Disposition for ED LOS >12 Hours



N=125

*No cases expired > 12 hours

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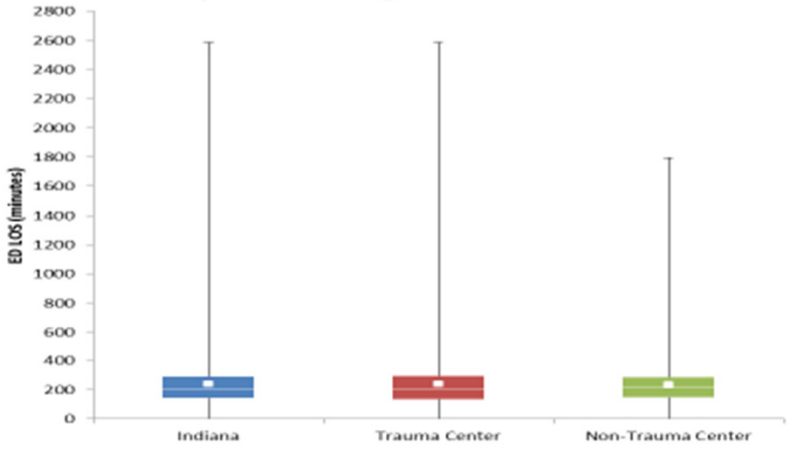
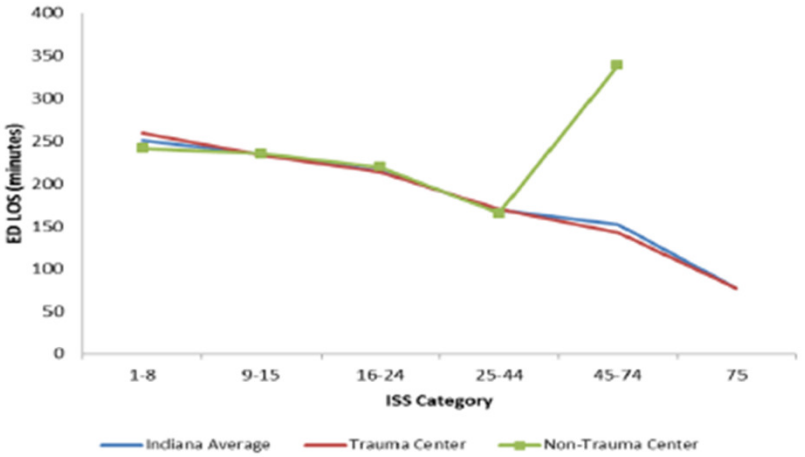
ED Length of Stay: Bar & Whisker – Page 3

ED LOS (Minutes) - All Patients



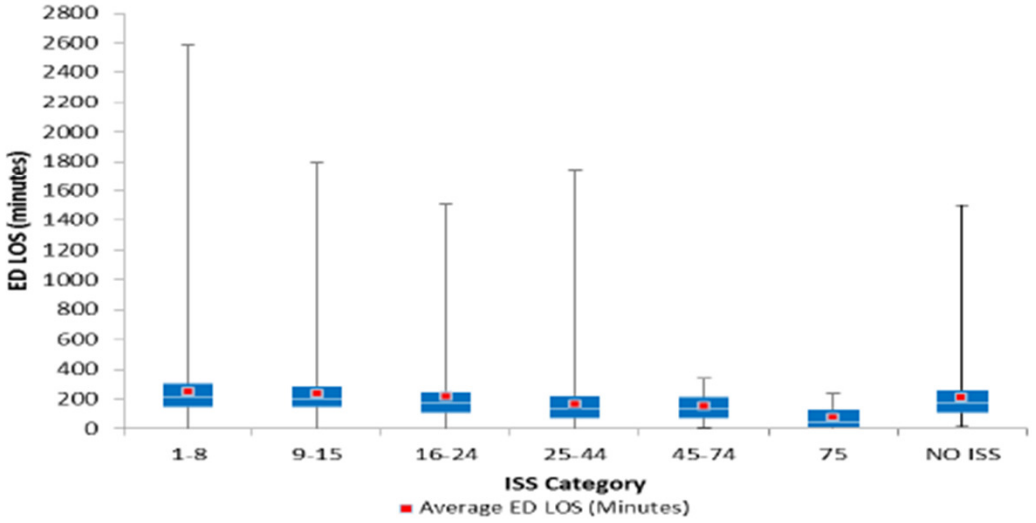
A table with all the values for ED LOS is found on page 31.

ED LOS (Minutes) by ISS



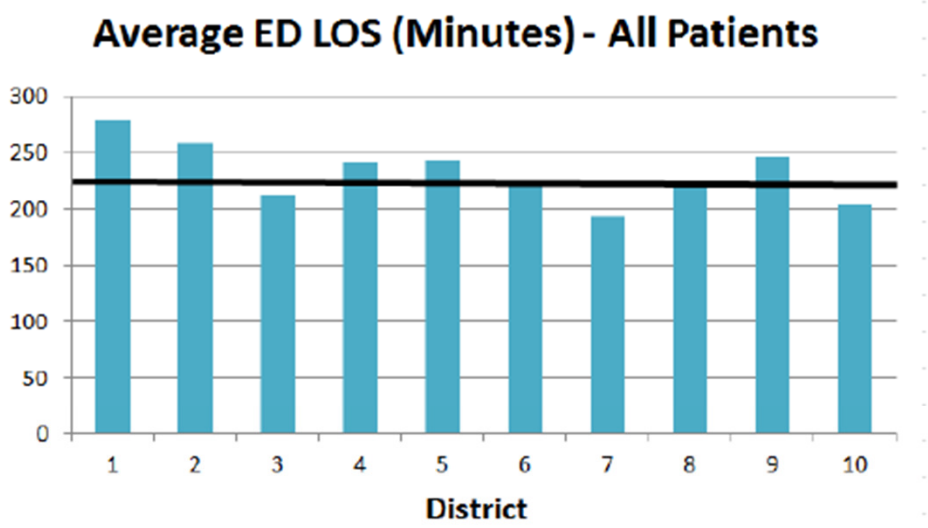
Note for EDLOS by ISS, there were 2 cases at Non-Trauma Centers with ISS greater than 45.

ED LOS (Minutes) by ISS

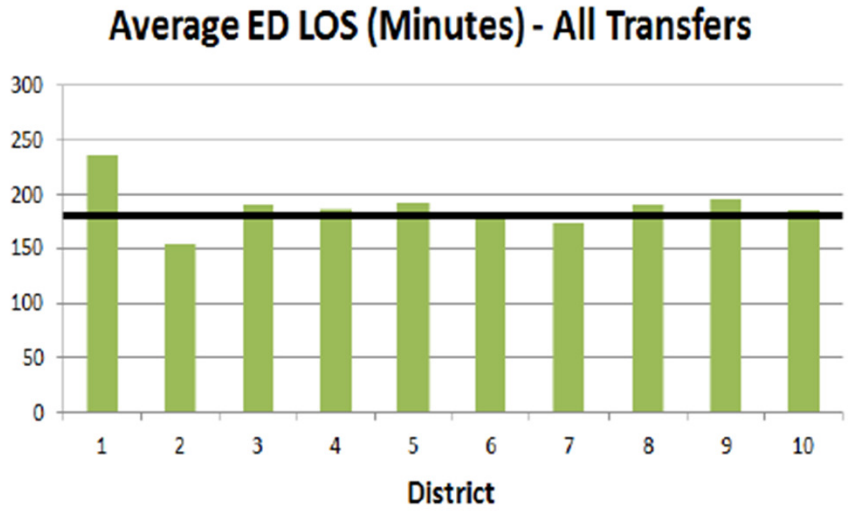


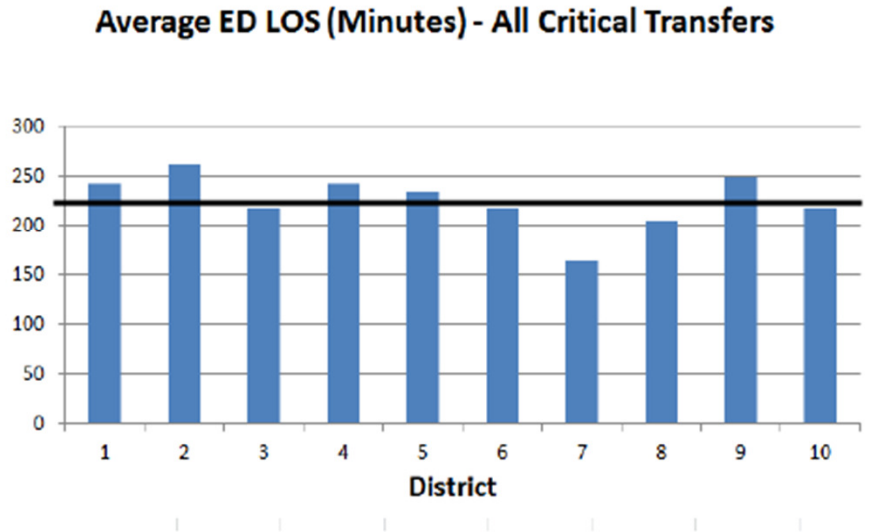
A table with values for ED LOS by ISS may be found on page 31.

Average ED LOS - Page 4



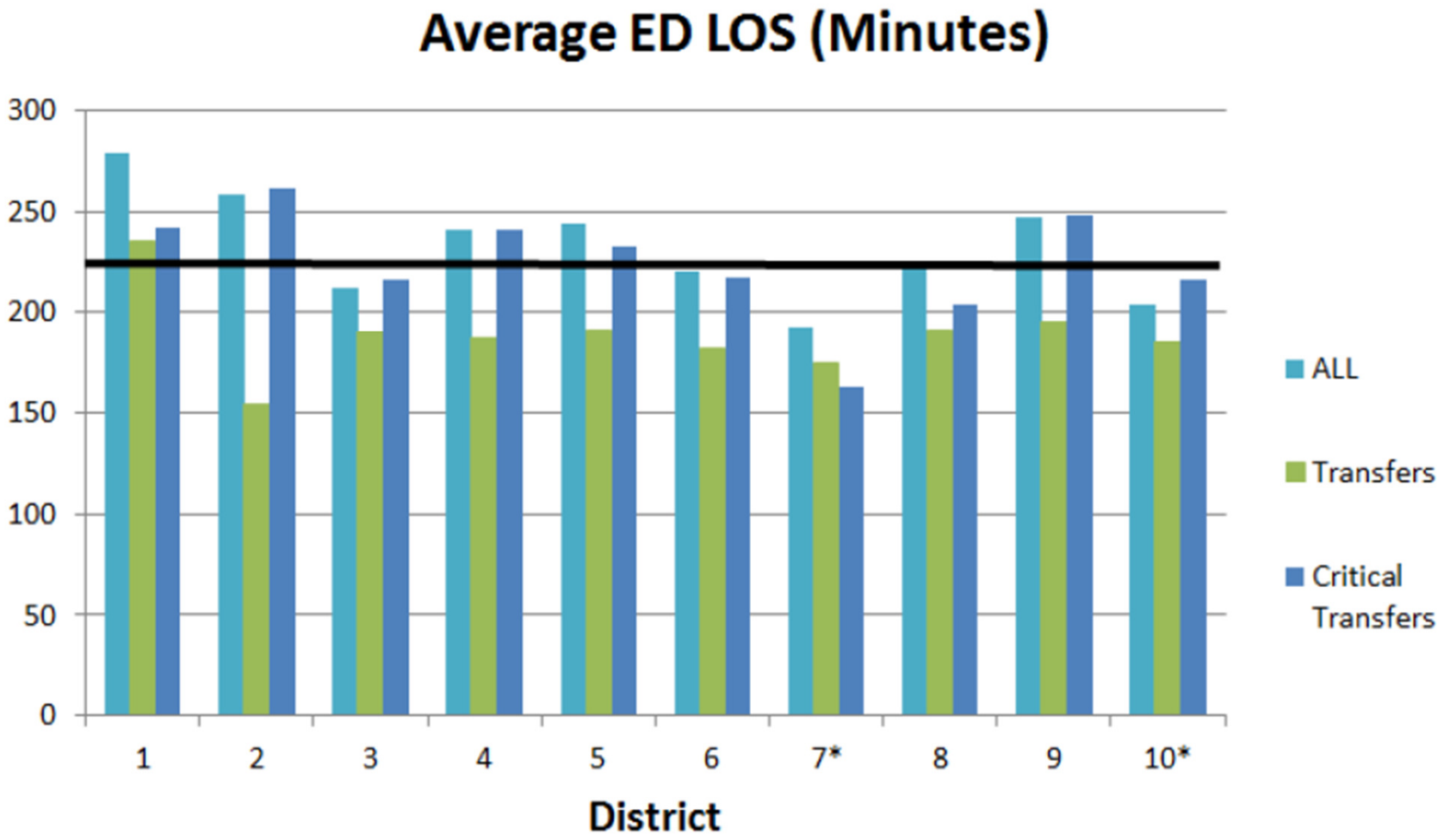
The black bar represents the average for each group.





Critical Transfers have a GCS <=12 or a Shock Index > 0.9 or ISS >15.

Average ED LOS - Page 5



*Districts 7 and 10 have all hospitals reporting. The average bar is for all patients.

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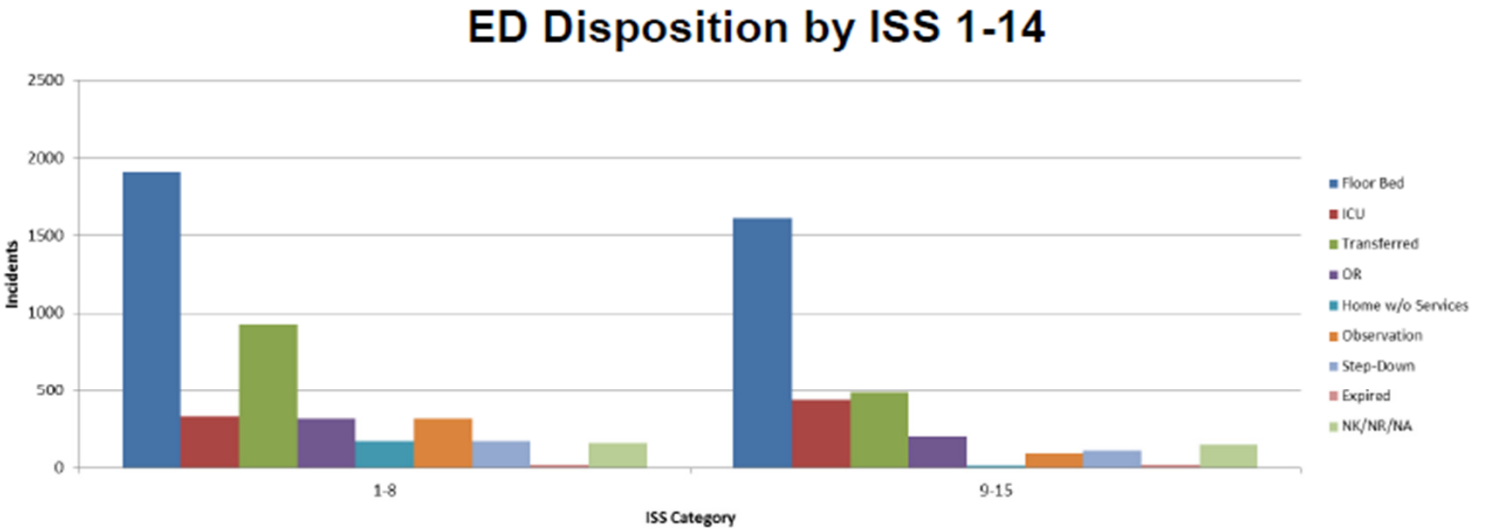
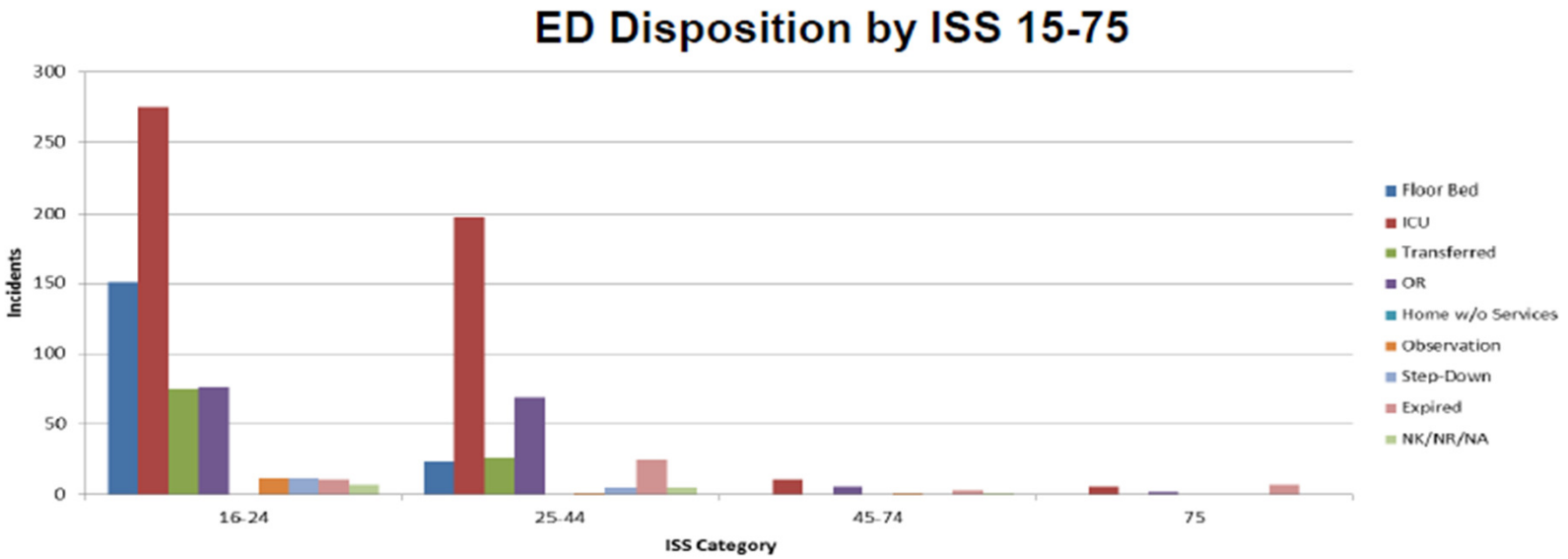
ED Disposition by ISS – Page 6

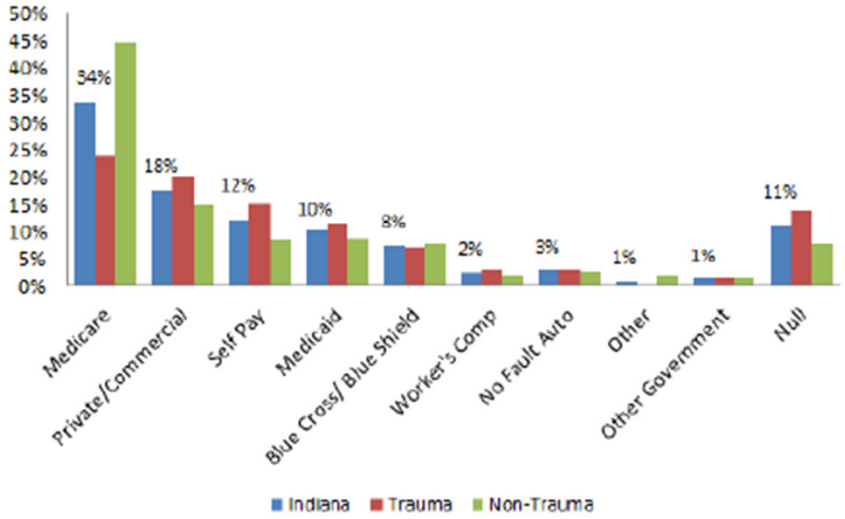




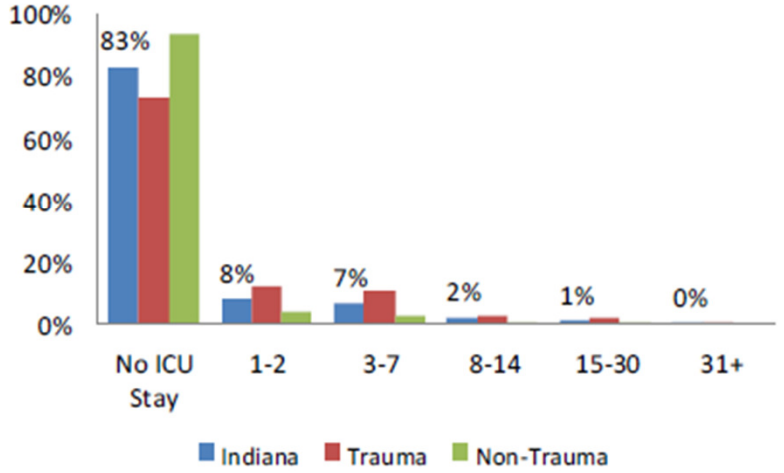
ED Disposition <1%: AMA; Home with services; Other (Jail, Mental Institution, etc.). Please note the difference in axis scale between the top and bottom graphs.
*A table with values for ED Disposition by ISS is found on page 32.

Patient Outcomes- Page 7

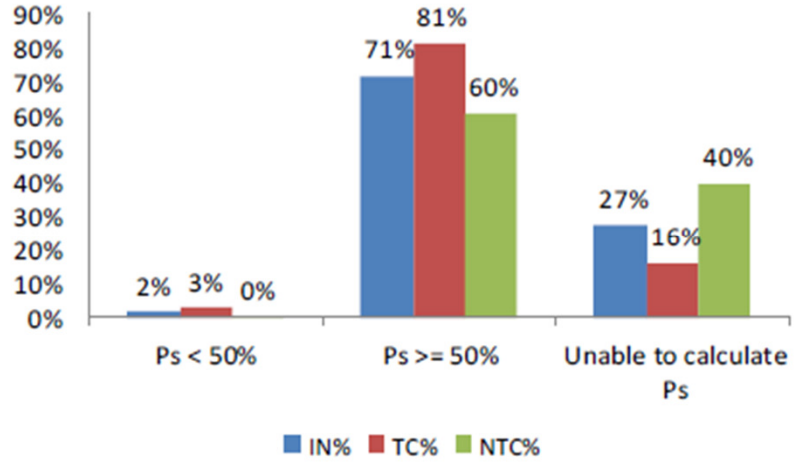
Primary Payer Mix



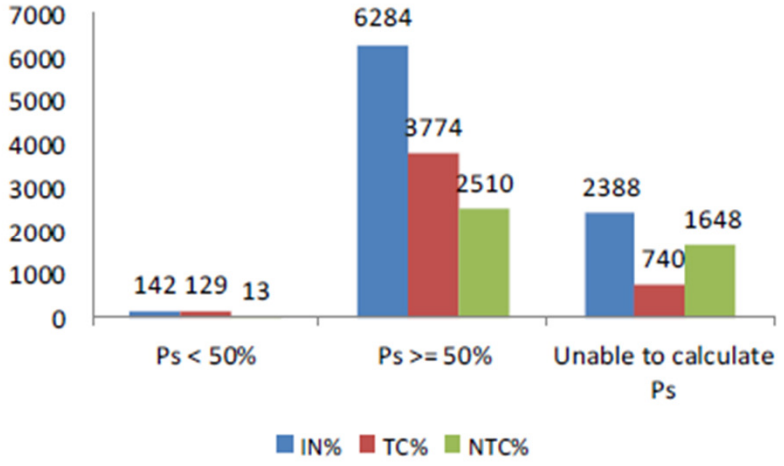
ICU Length of Stay (Days)



Probability of Survival (Ps) by Percent



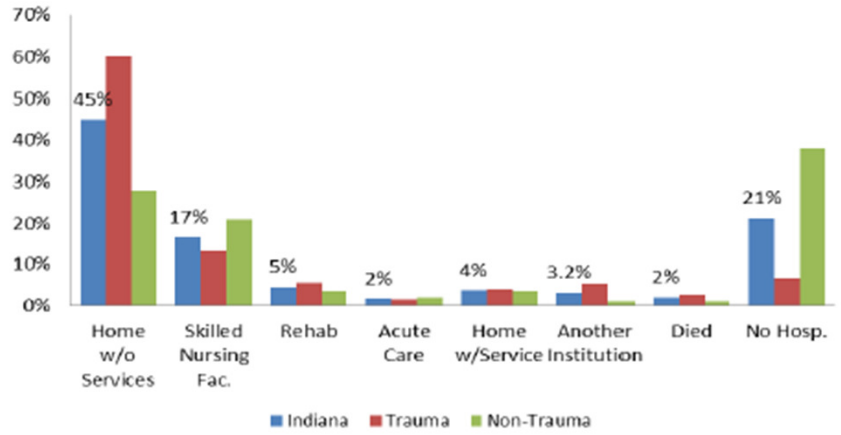
Probability of Survival (Ps) by Count



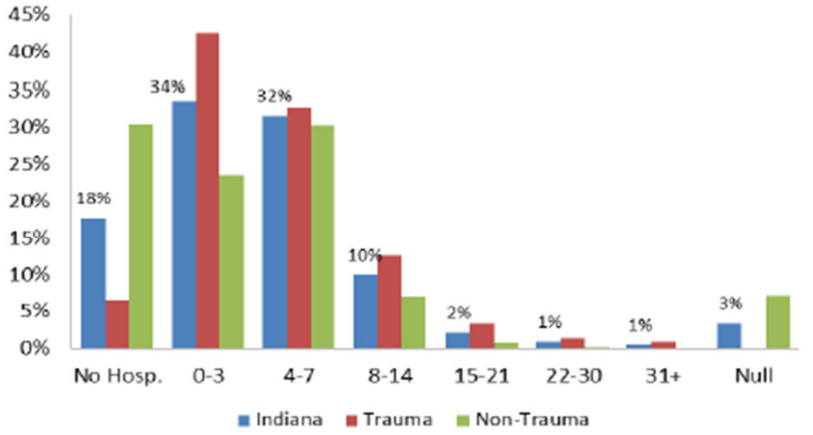
Due to the many data points required to calculate Ps, not every patient has a calculated Ps. These two graph represents 6,426 incidents with calculated Ps.

Hospital Disposition / Length of Stay - Page 8

Hospital Disposition

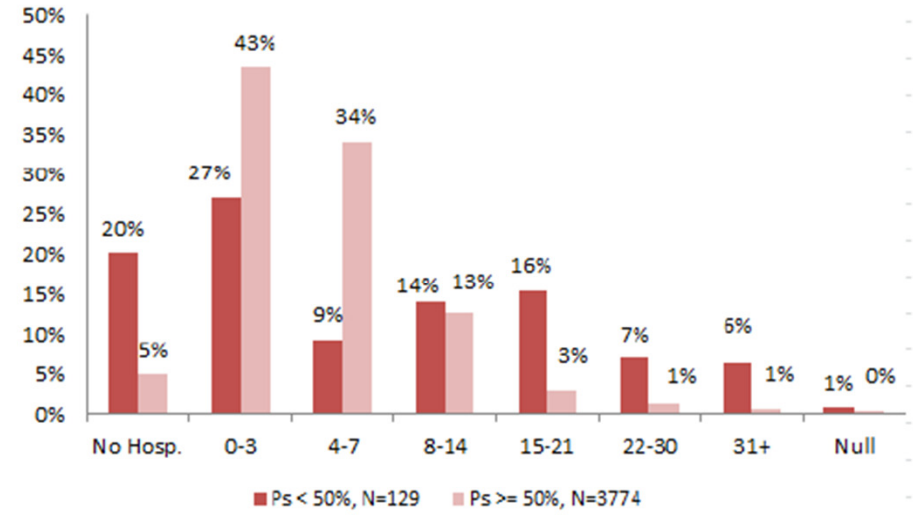


Hospital Length of Stay (days)

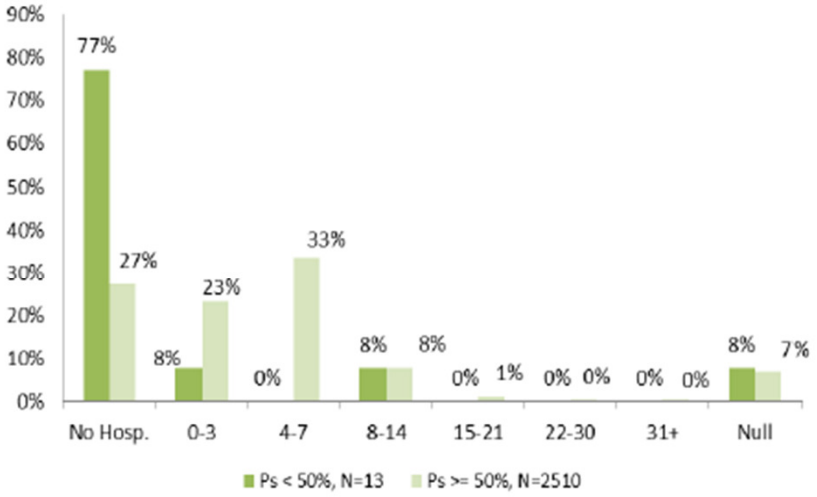


*There are new categories for the Hospital Disposition for the 2014 Data Dictionary
<1%: null, psych., long term care hospital, AMS, hospice and intermediate care

Hospital LOS (days) by Ps Trauma Centers



Hospital LOS (days) by Ps Non-Trauma Centers



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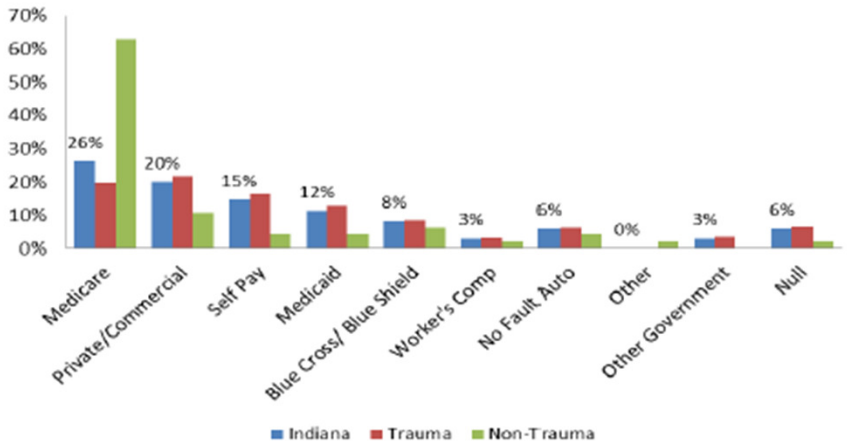
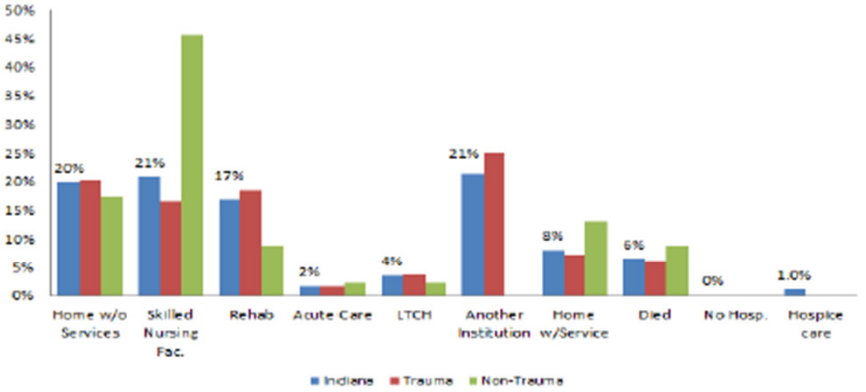
Hospital Length of Stay > 15 Days - Page 9

Hospital Length of Stay > 15 days, N=312

Primary Payer Mix

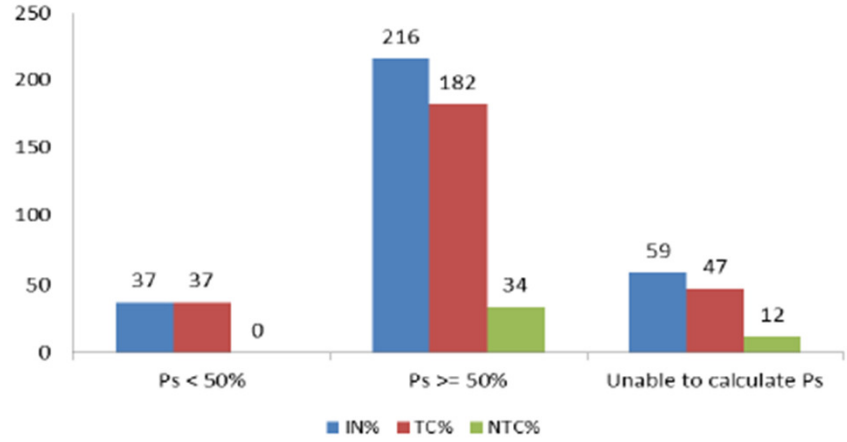


Hospital Disposition

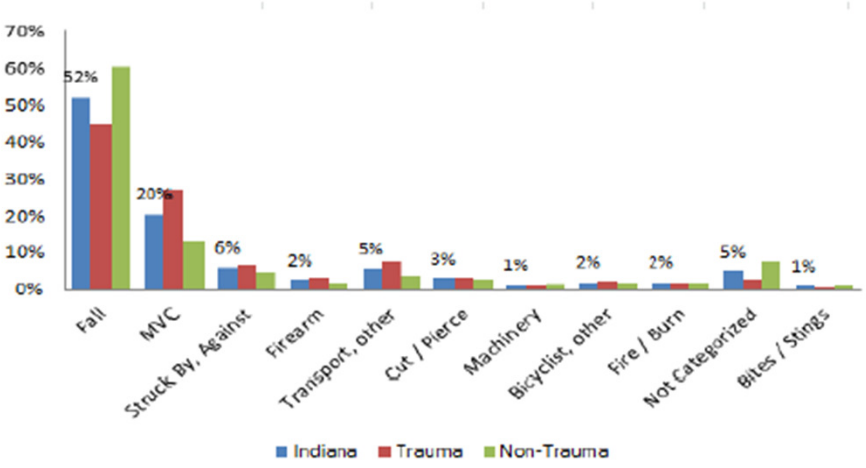


Another Institution includes any other medical facility not defined in the other categories

Probability of Survival



Cause of Injury



Hospital Length of Stay > 15 Days: Total N=312 Trauma Center N= 266; Non-Trauma Center N=46

ED Disposition = Expired - Page 10

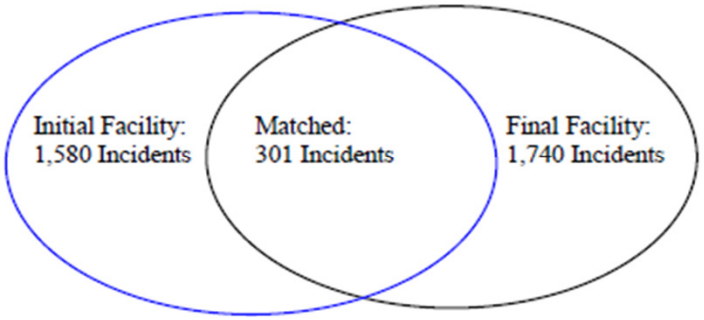
ED Disposition of Expired for Ps ≥ 50%, N=4

Patients with Ps ≥50% Expired in ED, N=4			
Gender	1 Female, 3 Males	Interfacility Transfer	1 Yes; 3 No
Average Age	68.3 years (21-92 years)	Average Distance from Scene to Facility	15.9 miles (1.4-44 miles)
Facilities	2 Non-Trauma Centers 2 Trauma Centers	Signs of Life	4 Arrived with signs of life
Transport Type	3 Ground ambulance; 1 Not Known	Trauma Type	4 Blunt
Cause of Injury	3 Falls, 1 MVC		

	Trauma Type	ISS	RTS- GCS Scale	RTS- Systolic Scale	RTS- Respiratory Scale	Revised Trauma Score (RTS)	B Value	PS	Signs of life
1	Blunt	25	4	4	3	7.55	1.82	0.86	Arrived with signs of Life
2	Blunt	4	3	4	3	6.61	2.82	0.94	Arrived with signs of Life
3	Blunt	29	0	4	4	4.09	0.44	0.61	Arrived with signs of Life
4	Blunt	9	2	4	3	5.68	1.64	0.84	Arrived with signs of Life

Transfer Cases - Page 11

For Quarter 3, 2014, of the 8,814 incidents reported to the Indiana Trauma Registry, 1580 cases that had an ED Disposition of "Transferred to another acute care facility" at the initial facility or that had the Inter-Facility Transfer equal to "Yes" at the Trauma Center. Of those transferred, 301 cases were probabilistically matched. The linked cases make up 9.1% of the Q3 2014 data. All public health preparedness districts are represented. The diagram below illustrates the overlap between the transfers reported from the initial facility and from the final facility that can be matched.



The initial facility in which transfers come from may be considered Critical Access Hospitals (CAHs). All Indiana CAHs are considered Rural, and must meet additional requirements to have a CAH designation, such as having no more than 25 inpatient beds and being located in a rural area. Facilities that are highlighted indicate that these facilities reported data for Quarter 3, 2014.

Within this transfer data section, the purple columns represent the transfer cases and the single percentages represent the percent for the transfer cases. For two demographic variables, patient age groupings and gender, the Indiana average is included to provide more insight to this transfer population.

Indiana Critical Access Hospitals (CAHs)

Adams Memorial Hospital	Pulaski Memorial Hospital
Cameron Memorial Community Hospital Inc	Putnam County Hospital
Community Hospital of Bremen Inc	Rush Memorial Hospital
Decatur County Memorial Hospital	Scott Memorial Hospital
Dukes Memorial Hospital	St Vincent Frankfort Hospital Inc
Gibson General Hospital	St Vincent Jennings Hospital Inc
Greene County General Hospital	St Vincent Mercy Hospital
Harrison County Hospital	St Vincent Randolph Hospital Inc
IU Health Bedford Hospital	St Vincent Salem Hospital Inc
IU Health Blackford Hospital	St. Mary's Warrick Hospital Inc
IU Health Paoli Hospital	St. Vincent Clay Hospital Inc
IU Health Tipton Hospital	St. Vincent Dunn Hospital Inc
IU Health White Memorial Hospital	St. Vincent Williamsport Hospital, Inc.
Jasper County Hospital	Sullivan County Community Hospital
Jay County Hospital	Union Hospital Clinton
Margaret Mary Community Hospital Inc	Wabash County Hospital
Parkview LaGrange Hospital	Woodlawn Hospital
Perry County Memorial Hospital	

Rural Hospitals

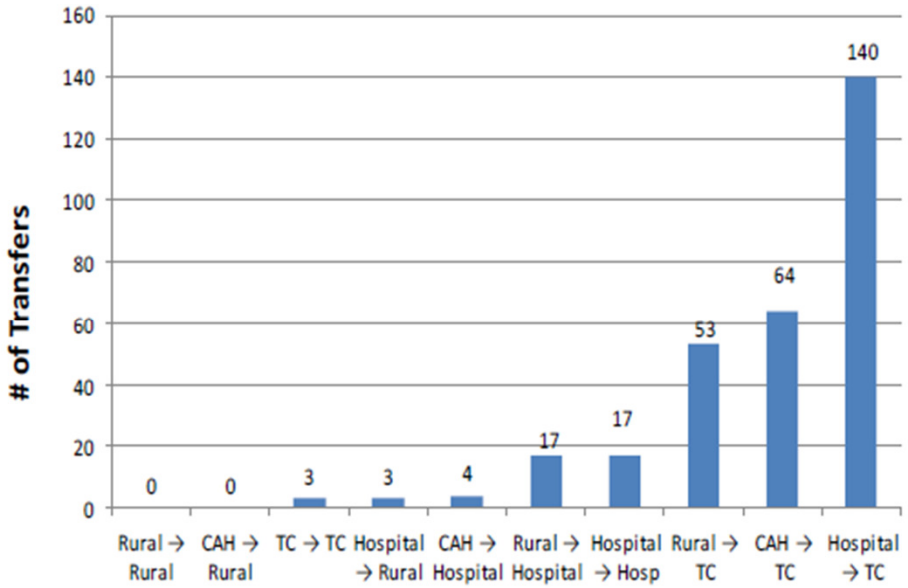
Columbus Regional Hospital	King's Daughters' Health
Daviess Community Hospital	Kosciusko Community Hospital
Doctor's Neuromedical	Marion General Hospital
Fayette Regional Health System	Memorial Hospital
Franciscan St Anthony Health - Michigan City	Memorial Hospital and Health Care Center
Franciscan St Elizabeth Health - Crawfordsville	Parkview Noble Hospital
Good Samaritan Hospital	Reid Hospital & Health Care Services
Henry County Memorial Hospital	Saint Joseph RMC - Plymouth
Indiana University Health La Porte Hospital	Schneck Medical Center
Indiana University Health Starke Hospital	

Transfer Patient: Facility Type – Page 24

Facility to Facility Transfers

For Transfer Patients:		
Initial Hospital Type	**Final Hospital Type**	**Incident Counts**
Rural Hospital	Rural Hospital	0
Critical Access Hospital	Rural Hospital	0
Trauma Center	Trauma Center	3
Hospital	Rural	3
Critical Access Hospital	Hospital	4
Rural Hospital	Hospital	17
Hospital	Hospital	17
Rural Hospital	Trauma Center	53
Critical Access Hospital	Trauma Center	64
Hospital	Trauma Center	140

Facility Transfer Type



Rural = Rural Hospital; TC = ACS Verified Trauma Center; CAH = Critical Access Hospital; Hospital = does not fall into above categories

*There were four hospitals deemed "in the process" trauma centers for the purposes of the triage and transport rule during Q3, 2014. Because this report spans data from July 1, 2014 through September 30, 2014, and there were fewer than five hospitals with "in the process" status during the entire quarter, we cannot separate the "in the process" trauma centers from "hospitals" because of respect for patient privacy. Patients may be able to be identified due to isolating one hospital's data.

Transfer Patient Data Averages - Page 13

For Linked Transfer

For Transfer Patients:				
	All Transfer Patients	*Critical** Transfer Patients	*Physiological Critical*** Transfer Patients	*ISS Critical**** Transfer Patients
Number of Patients	301	113	100	52
EMS Notified to Scene	8.2 minutes	8.3 minutes	8.1 minutes	7.9 minutes
EMS Scene Arrival to Departure	16.4 minutes	16.5 minutes	16.3 minutes	15.2 minutes
EMS Scene Departure to Initial Hospital ED Arrival	16.7 minutes	15.6 minutes	15.1 minutes	18.9 minutes
Initial Hospital ED Arrival to Departure	2 hours 52.4 minutes	2 hours 50 minutes	2 hours 50 minutes	2 hours 15 minutes
Initial Hospital ED Departure to Final Hospital ED Arrival	58.1 minutes	55.9 minutes	55.8 minutes	1 hour 14.7 minutes
TOTAL TIME	4 hours 2 minutes	4 hours 26 minutes	4 hours 25 minutes	4 hours 12 minutes

*Critical patient is defined as having a GCS ≤ 12, OR Shock Index > 0.9 OR ISS >15 at the initial hospital.
**Physiological Critical Transfer patient is defined as having a Shock Index > 0.9 OR GCS ≤ 12 at the initial hospital.
***ISS Critical Transfer patient is defined as having an ISS > 15.

Transfer Patient Data Averages - Page 13

For Transfer Patients:	
	All Transfer Patients
Number of Patients	301
EMS Notified to Scene	8.2 minutes
EMS Scene Arrival to Departure	16.4 minutes
EMS Scene Departure to Initial Hospital ED Arrival	16.7 minutes
Initial Hospital ED Arrival to Departure	2 hours 52.4 minutes
Initial Hospital ED Departure to Final Hospital ED Arrival	58.1 minutes
TOTAL TIME	4 hours 2 minutes

Transfer Patient Data Averages – Page 13

	*Critical** Transfer Patients
Number of Patients	113
EMS Notified to Scene	8.3 minutes
EMS Scene Arrival to Departure	16.5 minutes
EMS Scene Departure to Initial Hospital ED Arrival	15.6 minutes
Initial Hospital ED Arrival to Departure	2 hours 50 minutes
Initial Hospital ED Departure to Final Hospital ED Arrival	55.9 minutes
TOTAL TIME	4 hours 26 minutes

Critical Patient defined as:

- ISS > 15

OR

- GCS ≤ 12

OR

- Shock Index > 0.9

Email questions to: **indianatrauma@isdh.in.gov**

Transfer Patient Data Averages – Page 13

	*Physiological Critical*** Transfer Patients
Number of Patients	100
EMS Notified to Scene	8.1 minutes
EMS Scene Arrival to Departure	16.3 minutes
EMS Scene Departure to Initial Hospital ED Arrival	15.1 minutes
Initial Hospital ED Arrival to Departure	2 hours 50 minutes
Initial Hospital ED Departure to Final Hospital ED Arrival	55.8 minutes
TOTAL TIME	4 hours 25 minutes

Physiological Critical Patient defined as:

- GCS ≤ 12

OR

- Shock Index > 0.9

Transfer Patient Data Averages – Page 13

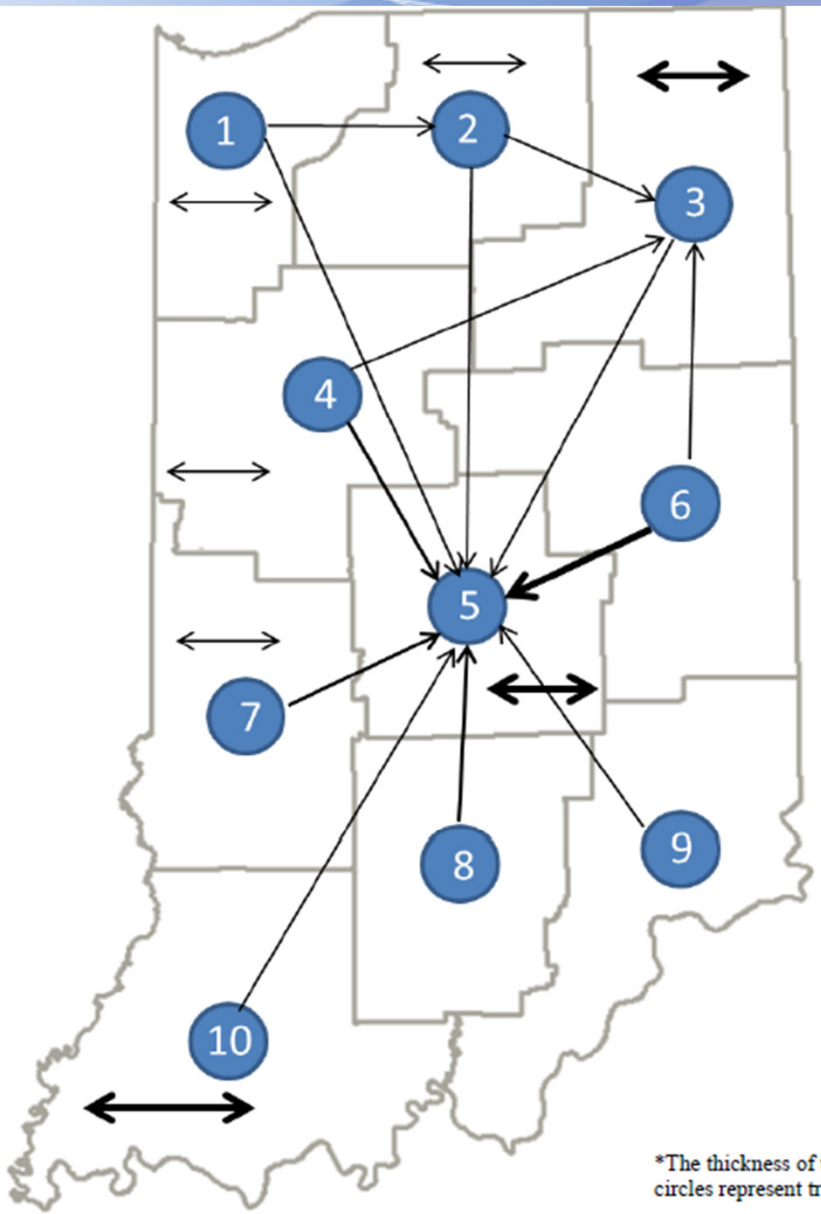
	ISS Critical* Transfer Patients
Number of Patients	52
EMS Notified to Scene	7.9 minutes
EMS Scene Arrival to Departure	15.2 minutes
EMS Scene Departure to Initial Hospital ED Arrival	18.9 minutes
Initial Hospital ED Arrival to Departure	2 hours 15 minutes
Initial Hospital ED Departure to Final Hospital ED Arrival	1 hour 14.7 minutes
TOTAL TIME	4 hours 12 minutes

ISS Critical Patient defined as:

- ISS > 15

Email questions to: **indianatrauma@isdh.in.gov**

Transfer Patient Data - Page 14



For Transfer Patients:		
Public Health Preparedness District Initial Hospital	Public Health Preparedness District Final Hospital	Incident Counts
1	1	8
1	2	10
1	5	2
2	2	2
2	3	7
2	5	2
3	3	48
3	5	2
4	3	3
4	4	2
4	5	12
5	5	77
6	3	2
6	5	45
7	5	28
7	7	4
8	5	13
9	5	1
10	5	1
10	10	32

*The thickness of the line indicates the frequency of transfers out of or within the public health preparedness district The circles represent transfers from a specific Public Health Preparedness District, not of a specific hospital or county.

Transfer Patient Data – Page 15

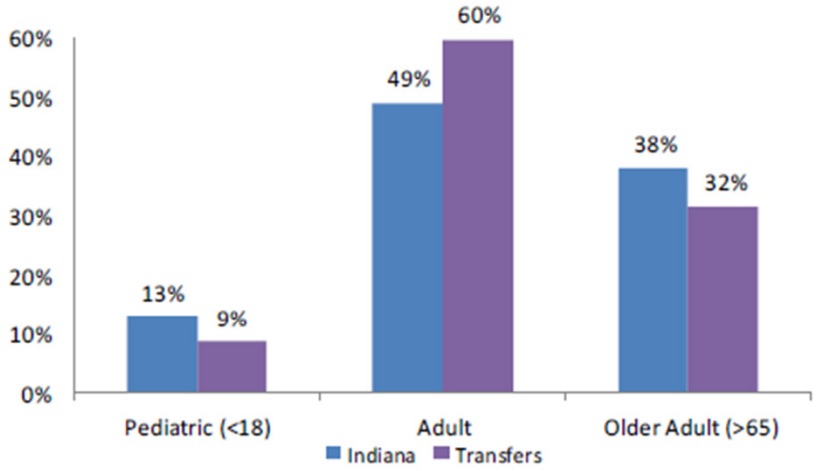
For Transfer Patients:	All Transfer Patients	*Critical** Transfer Patients	*Physiological Critical*** Transfer Patients	*ISS Critical**** Transfer Patients
Number of Patients	301	113	100	52
Total Time	4 hours 2 minutes	4 hours 26 minutes	4 hours 25 minutes	4 hours 12 minutes
Total Mileage	54.7	54.8	54.7	60.3
Injury Scene to Initial Hospital Mileage***	7.9	8.0	7.9	7.1
Initial Facility to Final Facility Mileage	46.8	46.8	46.8	53.2

Estimated Average Distance (miles) by Region (region of final hospital):					
Region	Injury Scene to Initial Facility Mileage†	Initial Facility to Final Facility Mileage	Total Mileage	Drive Count	Air Count
Indiana Average	7.9	46.8	54.7	256	45
North Region	7.2	40.9	48.0	127	17
Central Region	9.5	52.2	61.7	101	25
South Region	5	52.8	57.8	28	3

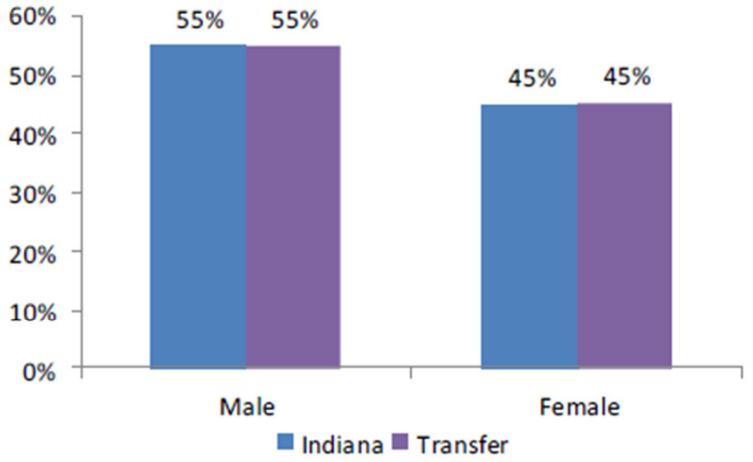
*Critical patient is defined as having a GCS ≤ 12, OR Shock Index > 0.9 OR ISS >15 at the initial hospital.
**Physiological Critical Transfer patient is defined as having a Shock Index > 0.9 OR GCS ≤ 12 at the initial hospital.
*** ISS Critical Transfer patient is defined as ISS > 15 at the initial hospital.
†Injury Scene to Initial Facility Mileage location estimated by zip code centroid
Statistics for Estimated Average Distance by Region calculated by Public Health Geographics, Epidemiology Resource Center, ISDH

Transfer Patient Population - Page 16

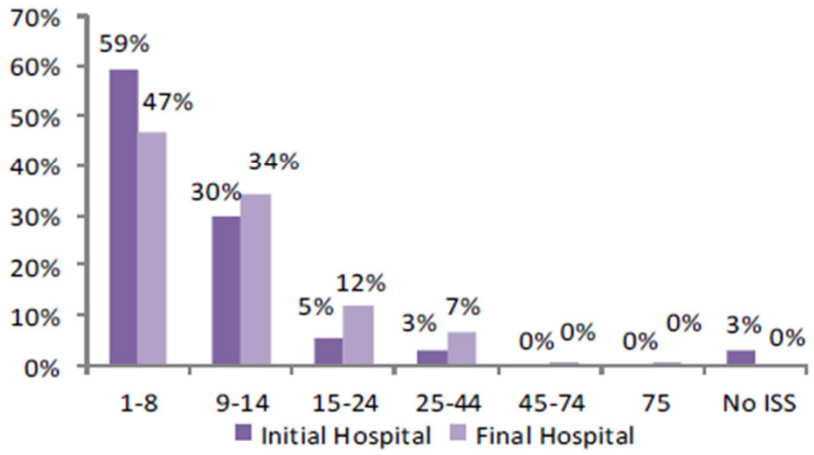
Patient Age Groupings



Patient Gender

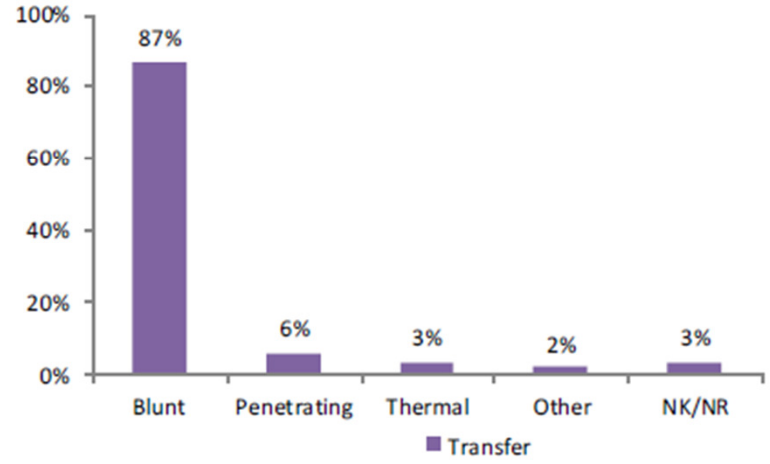


Injury Severity Score (ISS)



There was 1 case in the ISS 45-74 category and 1 case in the 75+ ISS category

Trauma Type- Final Hospital



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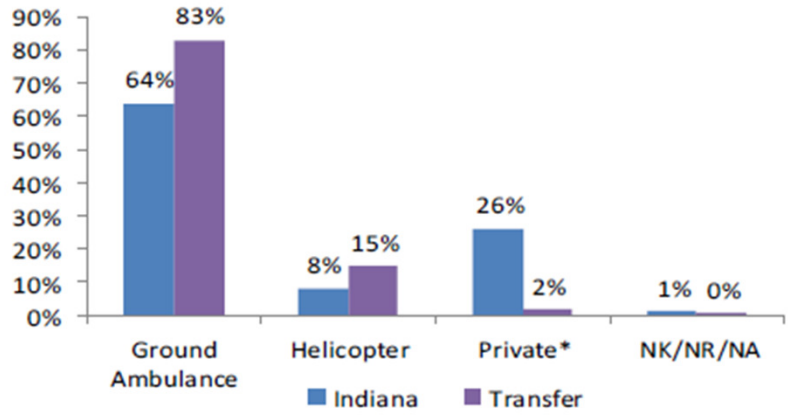
Transfer Patient Population - Page 17

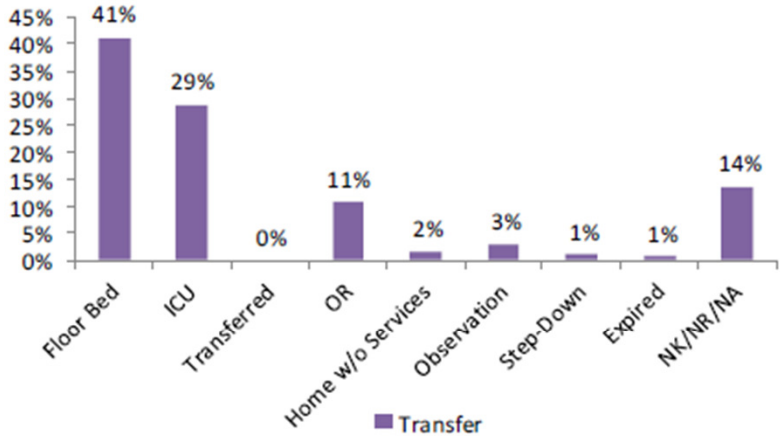
Transport Mode– Final Hospital



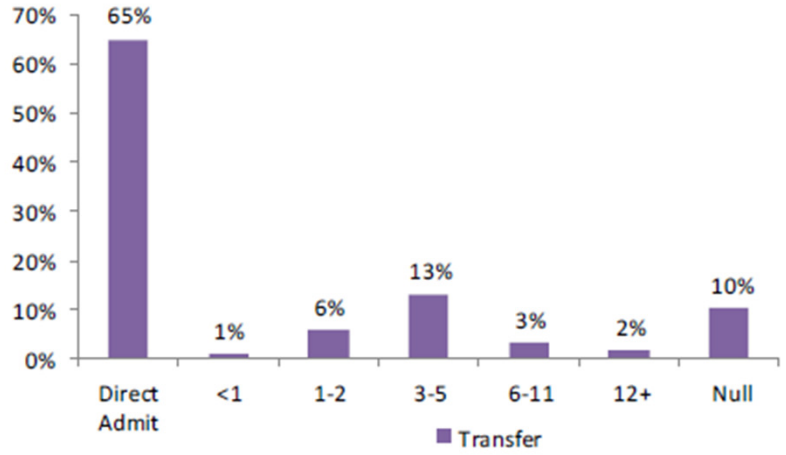
<1% Transport Mode: Police, Other

* Indicates Private/ Public Vehicle, Walk-in

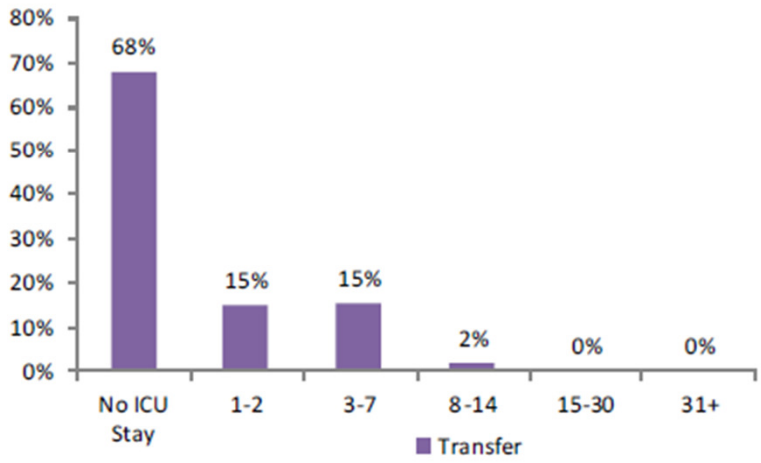
ED Disposition by Percentage- Final Hospital



ED Length of Stay (hours)- Final Hospital



ICU Length of Stay (days)- Final Hospital



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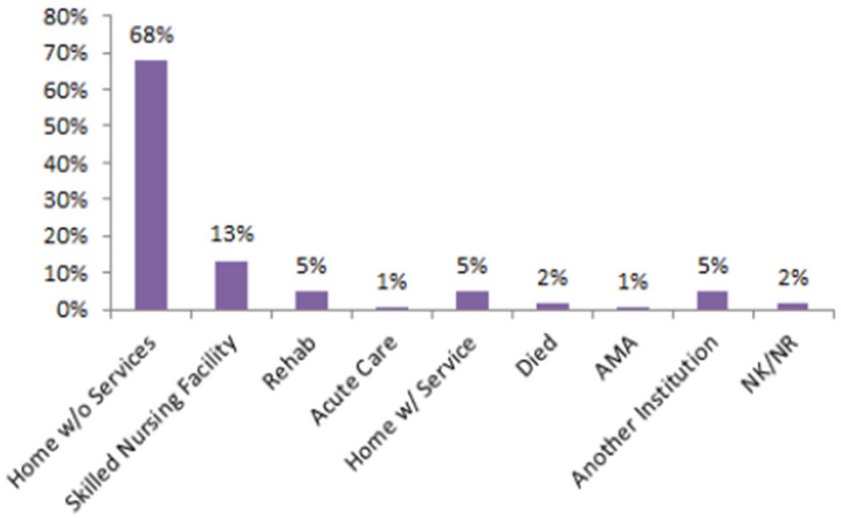
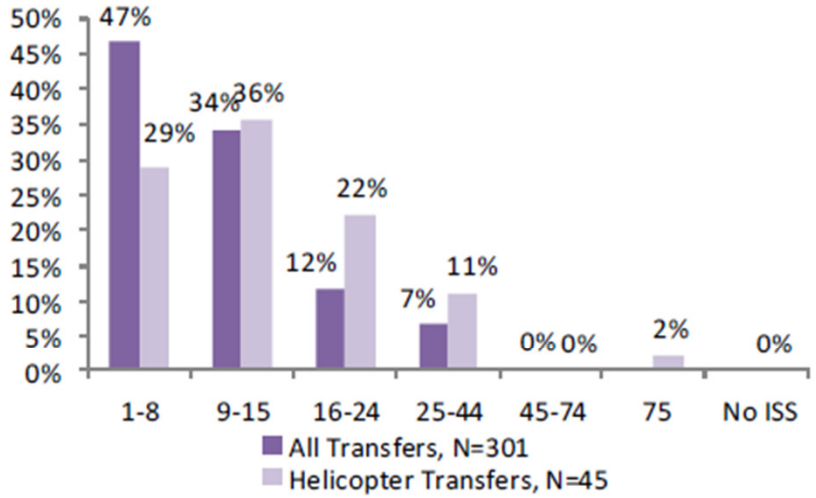
Transfer Patient Population - Page 18

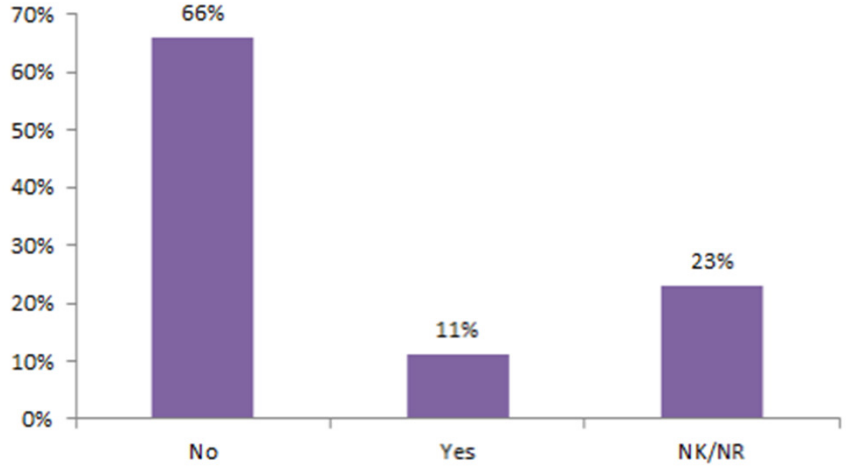
Discharge Disposition– Final Hospital



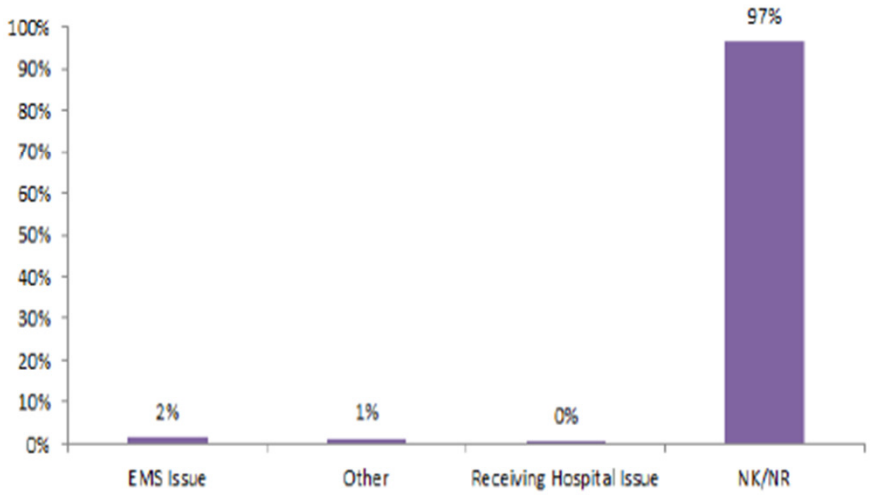
Helicopter Transfers by ISS– Final Hospital



Transfer Delay Indicated- Initial Hospital

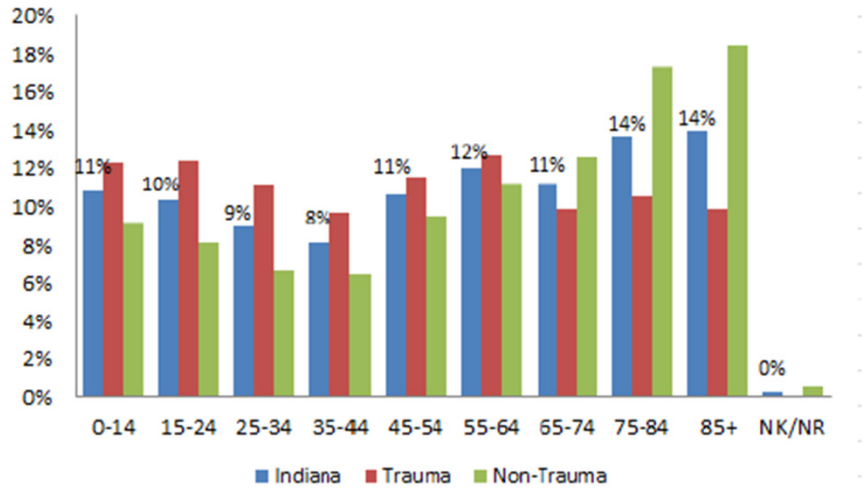


Initial Facility Transfer Delay Reason -

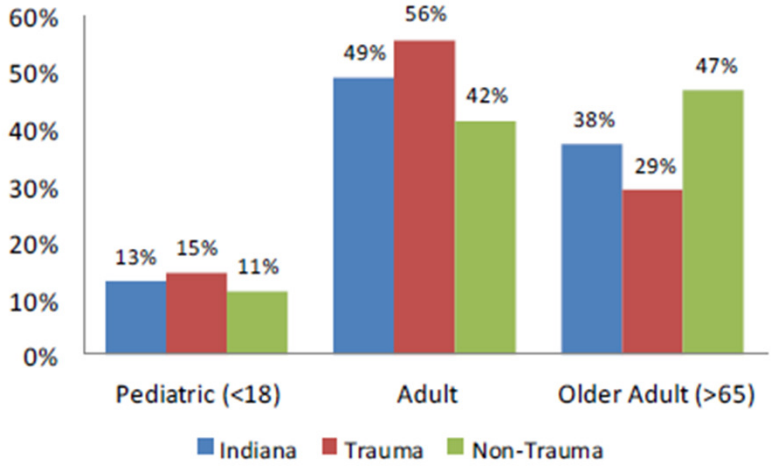


Patient Demographics - Page 19

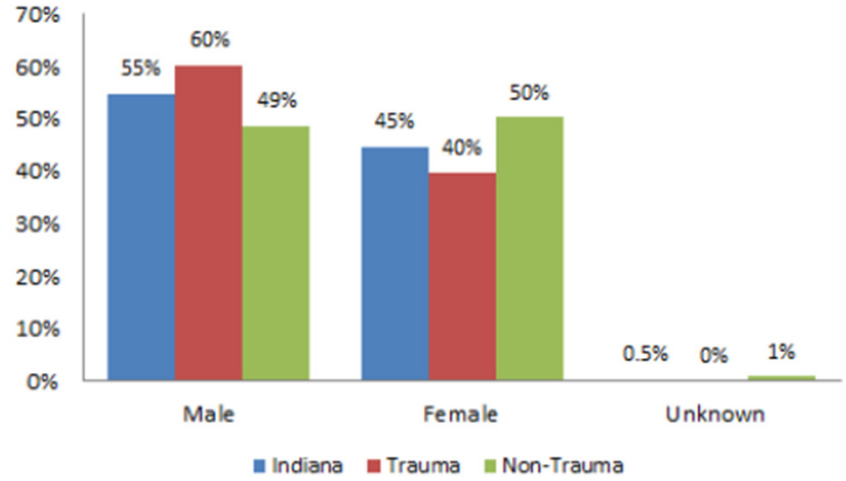
Patient Age (Years)



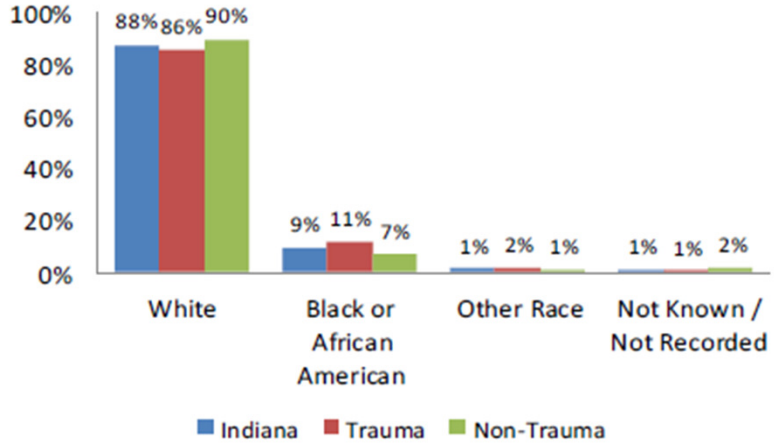
Patient Age Groupings



Patient Gender



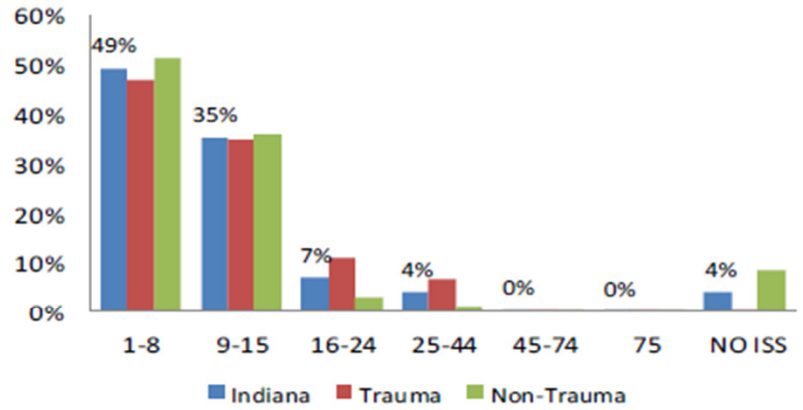
Patient Race



<1% Race - Asian, Native Hawaiian or Other Pacific Islander, American Indian or Alaska Native

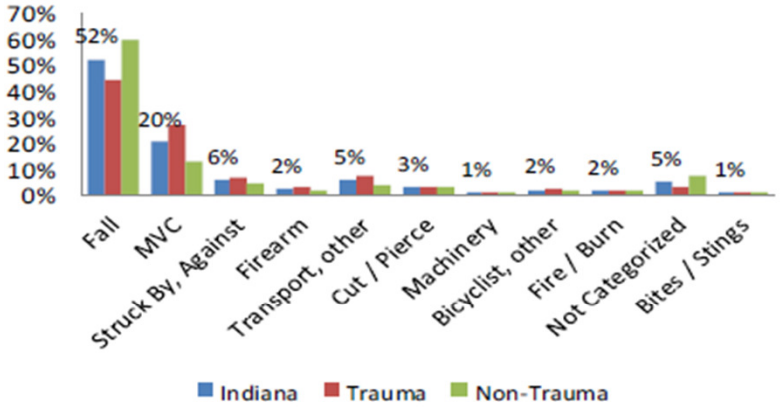
Injury - Page 20

Injury Severity Score (ISS)



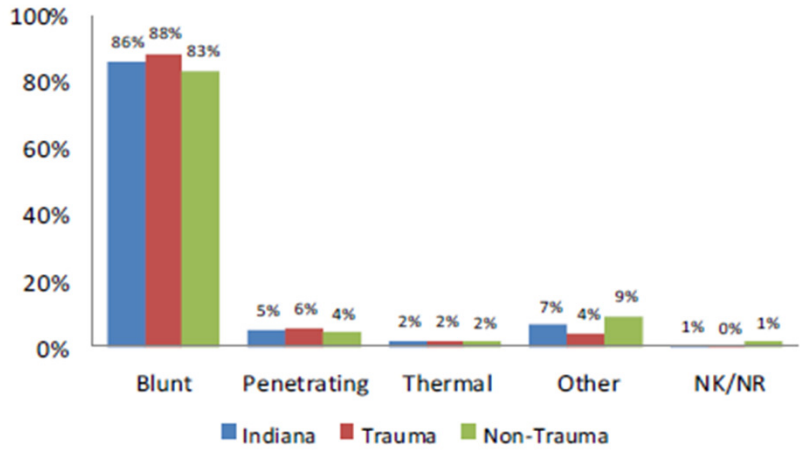
There was one case in both the 45-74 and 75+ categories.

Cause of Injury

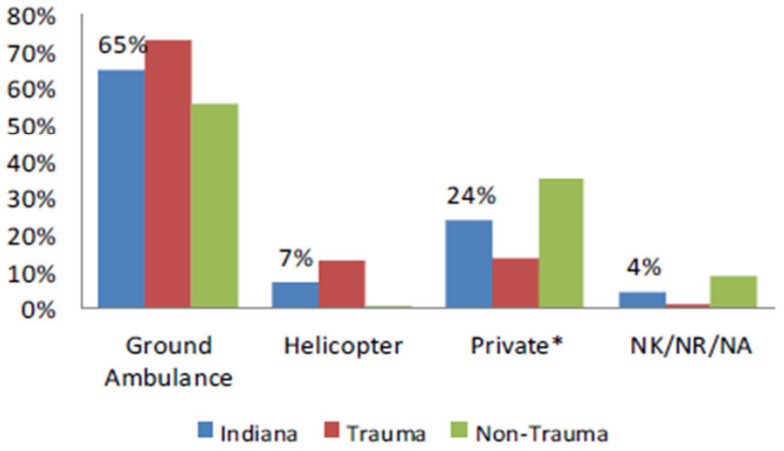


<1% COI: Pedestrian Traffic Accident, Natural/Environment, Overexertion, No E-Code

Trauma Type



Transport Mode

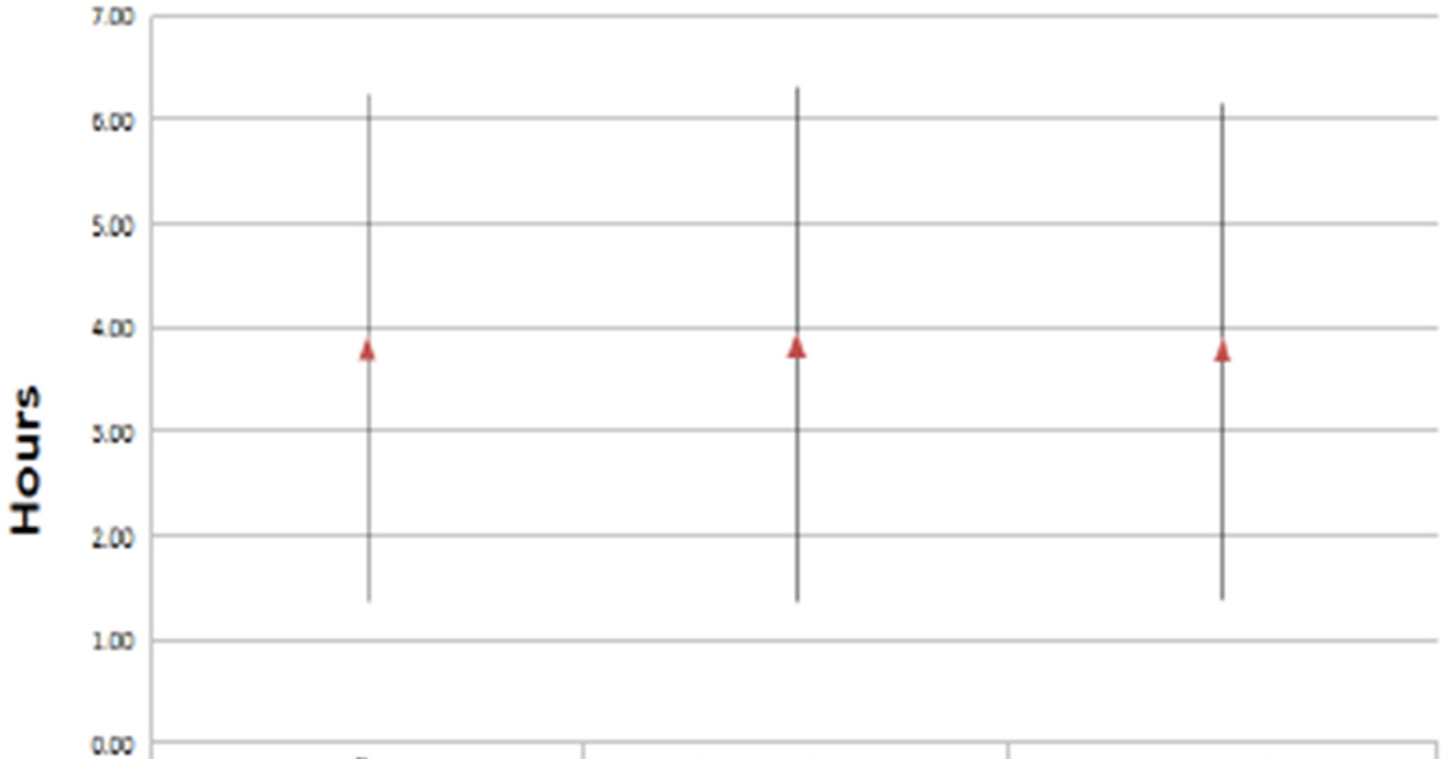


<1% Transport Mode: Police, Other

* Indicates Private/ Public Vehicle, Walk-in

Average ED LOS: Caterpillar Graph - Page 21

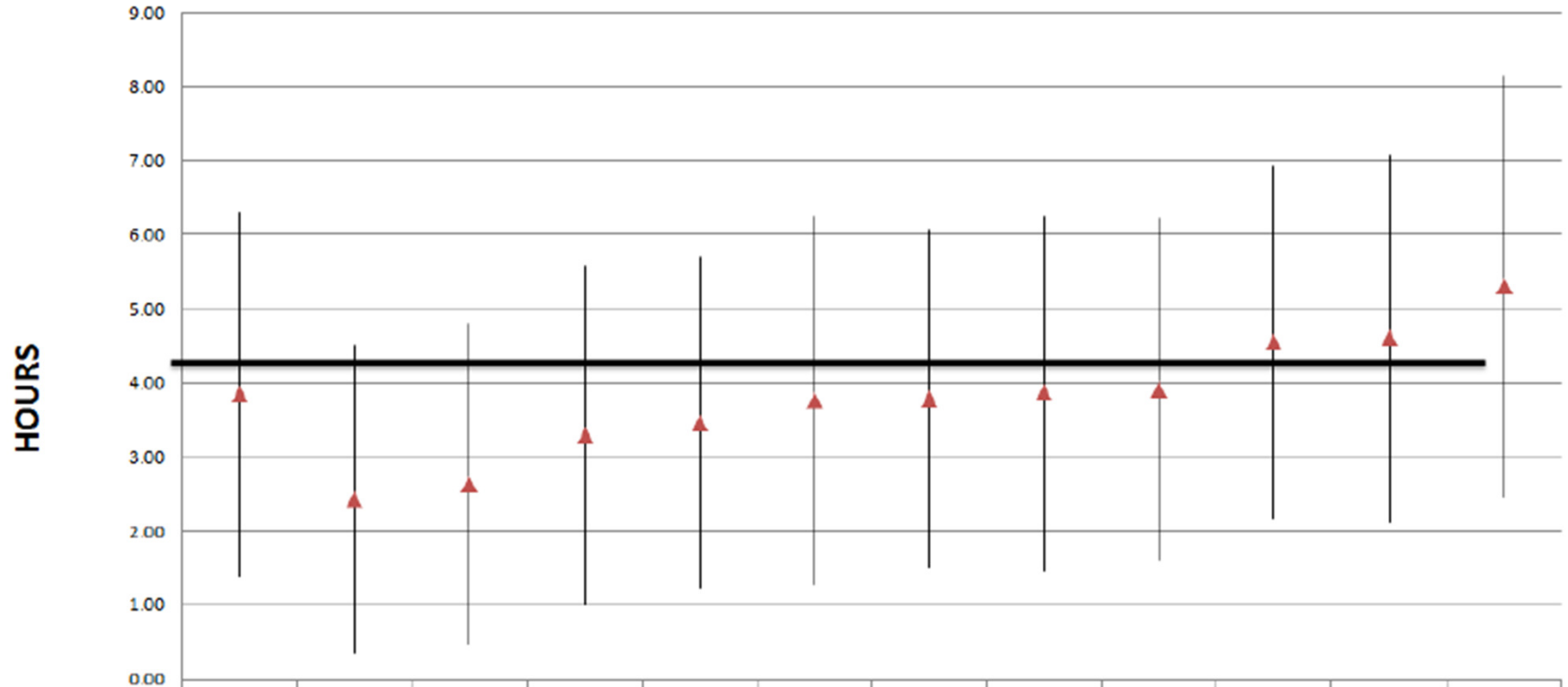
Average ED LOS (Hours)



	Indiana	Trauma Centers	Non-Trauma Centers
Upper CL	6.25	6.31	6.16
▲ Mean	3.82	3.85	3.79
Lower CL	1.39	1.39	1.42

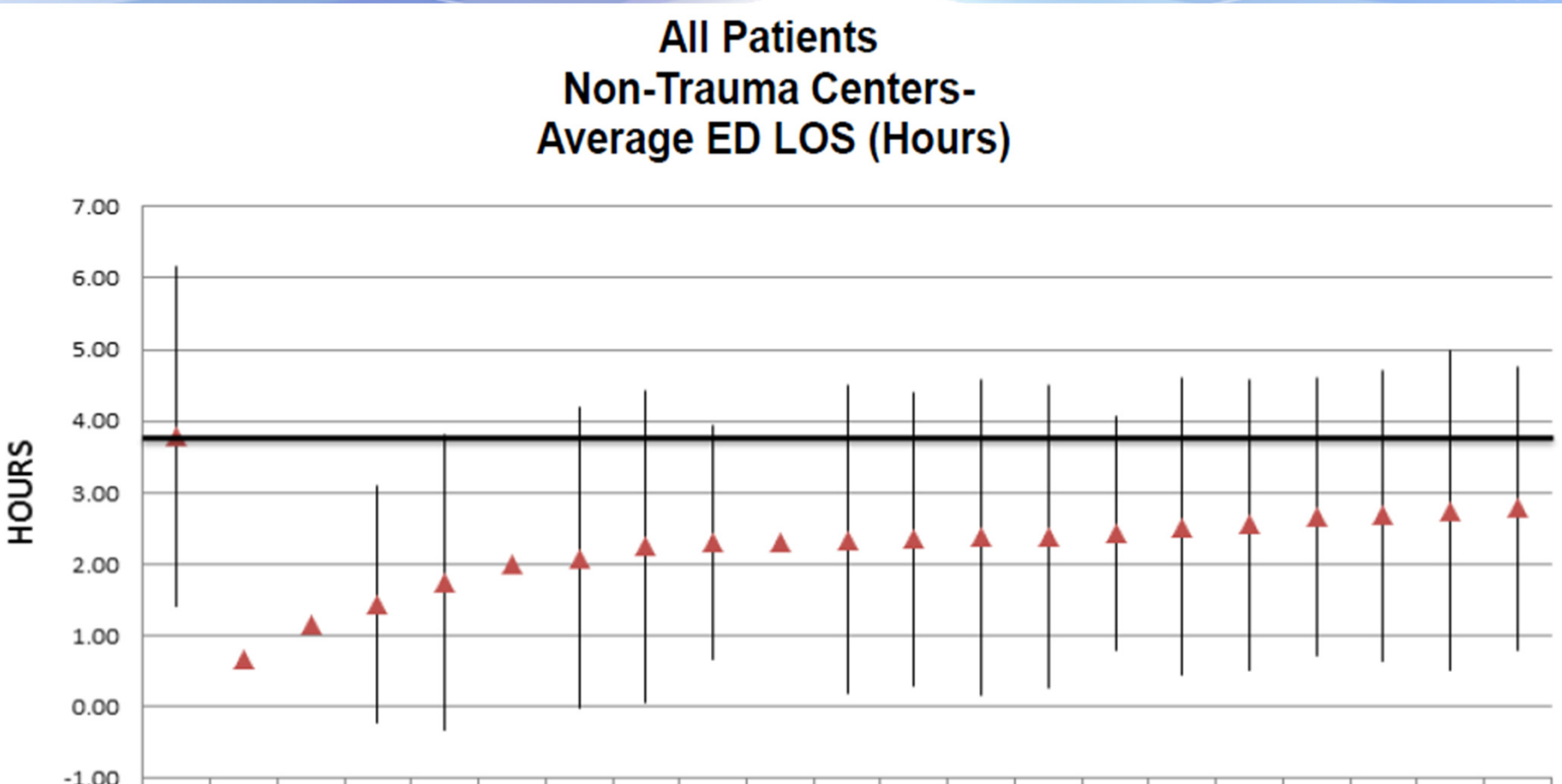
Average ED LOS: Caterpillar Graph - Page 21

Trauma Centers-Average ED LOS (Hours)



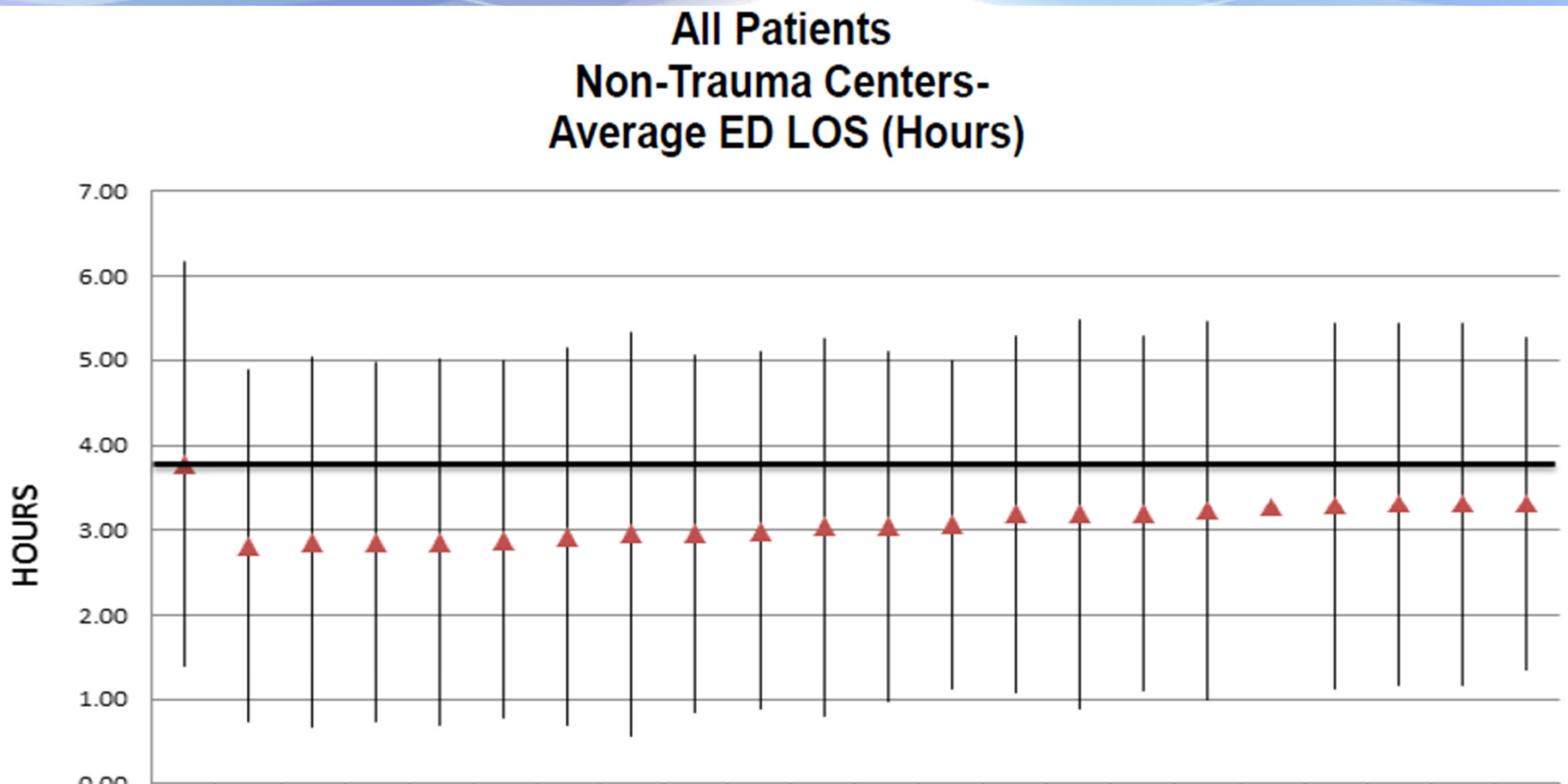
	Trauma	40	135	123	107	136	37	24	59	132	85	97
Upper CL	6.31	4.50	4.79	5.58	5.69	6.25	6.07	6.24	6.24	6.92	7.08	8.14
▲ Mean	3.85	2.43	2.63	3.29	3.46	3.77	3.79	3.86	3.92	4.54	4.60	5.30
Lower CL	1.39	0.36	0.47	1.00	1.23	1.29	1.51	1.48	1.60	2.16	2.12	2.46

Average ED LOS: Caterpillar Graph - Page 22



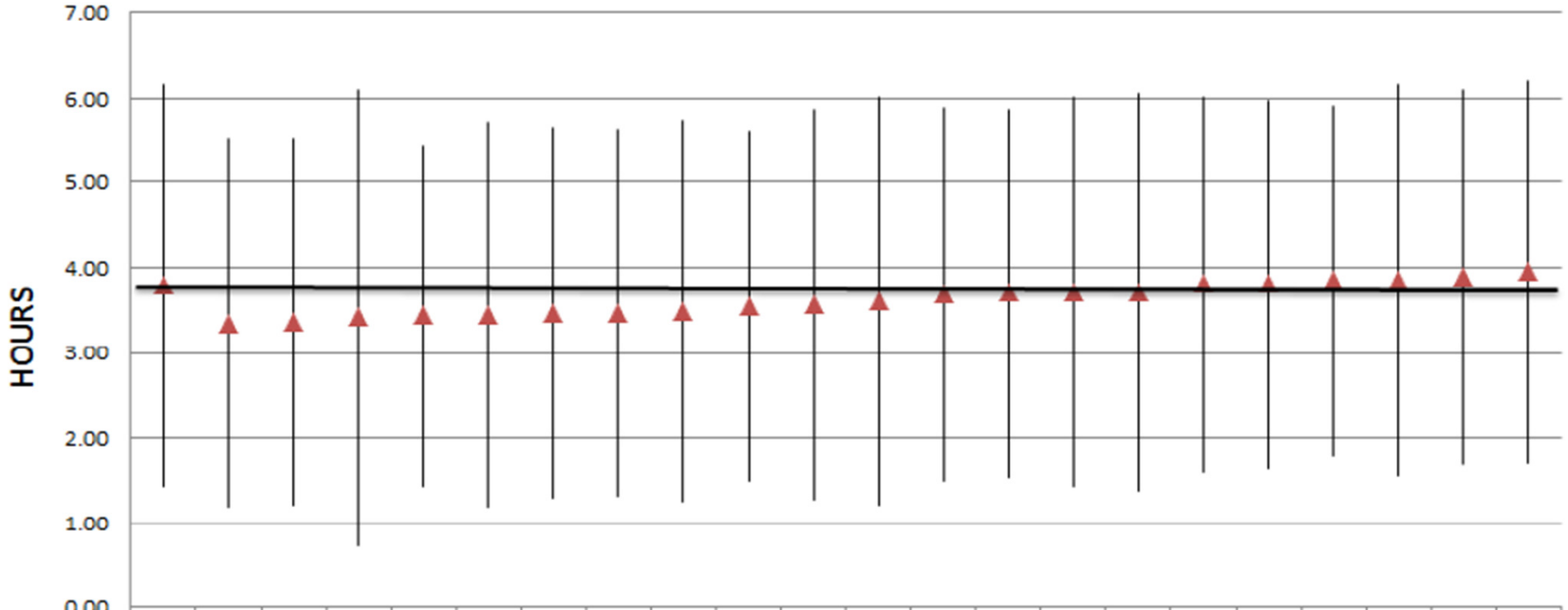
	Non-Trauma	NTC 91	NTC 60	NTC 118	NTC 29	NTC 16	NTC 96	NTC 55	NTC 90	NTC 68	NTC 129	NTC 8	NTC 84	NTC 14	NTC 28	NTC 67	NTC 3	NTC 26	NTC 89	NTC 134	NTC 126
Upper CL	6.16	0.68	1.17	3.09	3.81	2.00	4.19	4.43	3.94	2.32	4.51	4.40	4.59	4.51	4.07	4.61	4.58	4.61	4.72	4.99	4.77
▲ Mean	3.79	0.68	1.17	1.43	1.75	2.00	2.09	2.25	2.30	2.32	2.34	2.35	2.38	2.39	2.44	2.52	2.55	2.67	2.68	2.75	2.79
Lower CL	1.42	0.68	1.17	-0.23	-0.31	2.00	-0.01	0.07	0.66	2.32	0.17	0.30	0.17	0.27	0.81	0.43	0.52	0.73	0.64	0.51	0.81

Average ED LOS: Caterpillar Graph - Page 23



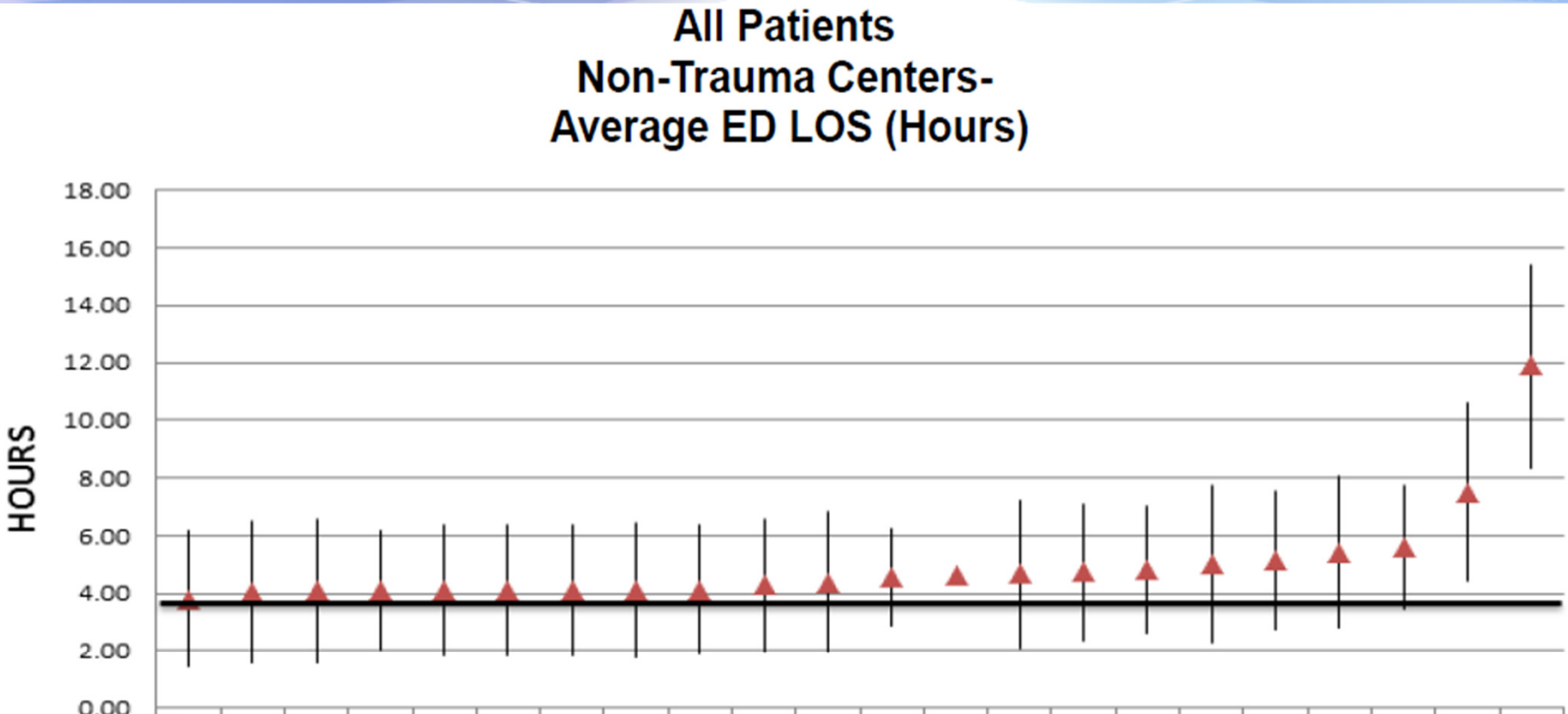
	Non-Trauma	NTC 52	NTC 66	NTC 70	NTC 121	NTC 106	NTC 112	NTC 53	NTC 115	NTC 95	NTC 38	NTC 131	NTC 78	NTC 25	NTC 43	NTC 83	NTC 4	NTC 103	NTC 109	NTC 32	NTC 120	NTC 110
Upper CL	6.16	4.88	5.04	4.97	5.01	5.00	5.14	5.34	5.06	5.09	5.27	5.10	4.99	5.31	5.49	5.30	5.48	3.28	5.46	5.46	5.45	5.29
▲ Mean	3.79	2.81	2.86	2.86	2.86	2.89	2.92	2.96	2.96	2.99	3.04	3.04	3.06	3.19	3.19	3.20	3.24	3.28	3.29	3.31	3.31	3.32
Lower CL	1.42	0.74	0.68	0.75	0.71	0.78	0.70	0.58	0.86	0.89	0.81	0.98	1.13	1.07	0.89	1.10	1.00	3.28	1.12	1.16	1.17	1.35

Average ED LOS: Caterpillar Graph - Page 24



	Non-Trauma	NTC 105	NTC 18	NTC 108	NTC 122	NTC 30	NTC 9	NTC 22	NTC 7	NTC 41	NTC 2	NTC 13	NTC 75	NTC 65	NTC 48	NTC 61	NTC 19	NTC 104	NTC 39	NTC 69	NTC 12	NTC 6
Upper CL	6.16	5.52	5.53	6.10	5.45	5.71	5.65	5.62	5.72	5.61	5.86	6.02	5.90	5.88	6.02	6.06	6.02	5.98	5.91	6.15	6.10	6.20
▲ Mean	3.79	3.35	3.37	3.42	3.44	3.45	3.47	3.47	3.48	3.55	3.56	3.61	3.69	3.71	3.72	3.72	3.81	3.81	3.85	3.85	3.90	3.96
Lower CL	1.42	1.18	1.21	0.74	1.43	1.19	1.29	1.32	1.24	1.49	1.26	1.20	1.48	1.54	1.42	1.38	1.60	1.64	1.79	1.55	1.70	1.72

Average ED LOS: Caterpillar Graph - Page 25

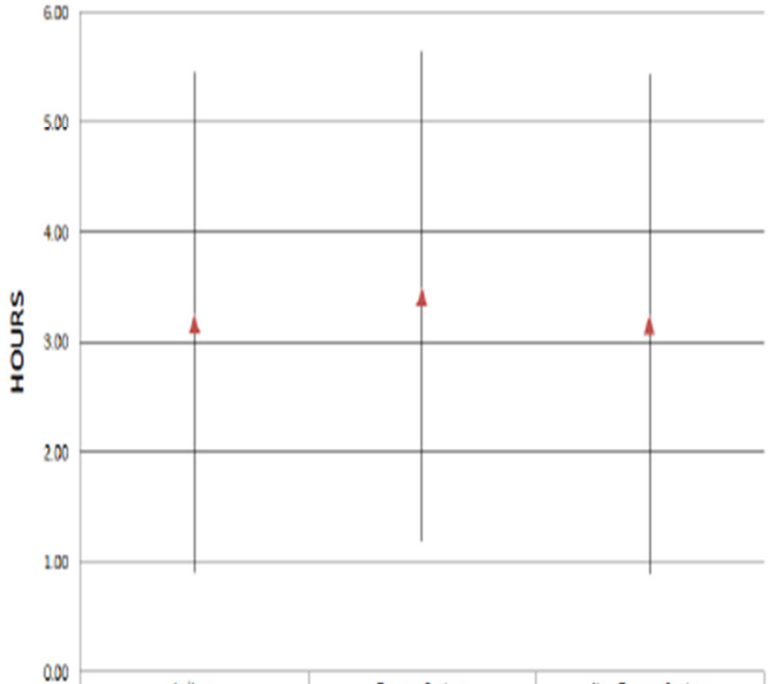


	Non-Trauma	NTC 113	NTC 100	NTC 111	NTC 35	NTC 11	NTC 57	NTC 102	NTC 46	NTC 20	NTC 64	NTC 116	NTC 34	NTC 82	NTC 74	NTC 87	NTC 117	NTC 21	NTC 86	NTC 119	NTC 56	NTC 42
Upper CL	6.16	6.54	6.61	6.16	6.40	6.41	6.39	6.47	6.38	6.60	6.84	6.22	4.62	7.24	7.11	7.03	7.78	7.55	8.06	7.73	10.5	15.4
▲ Mean	3.79	4.06	4.09	4.09	4.10	4.11	4.12	4.13	4.14	4.28	4.40	4.56	4.62	4.67	4.74	4.82	5.03	5.16	5.42	5.61	7.49	11.8
Lower CL	1.42	1.58	1.57	2.02	1.80	1.81	1.85	1.79	1.90	1.96	1.96	2.90	4.62	2.10	2.37	2.61	2.28	2.77	2.78	3.49	4.40	8.36

Average ED LOS: Caterpillar Graph - Page 26

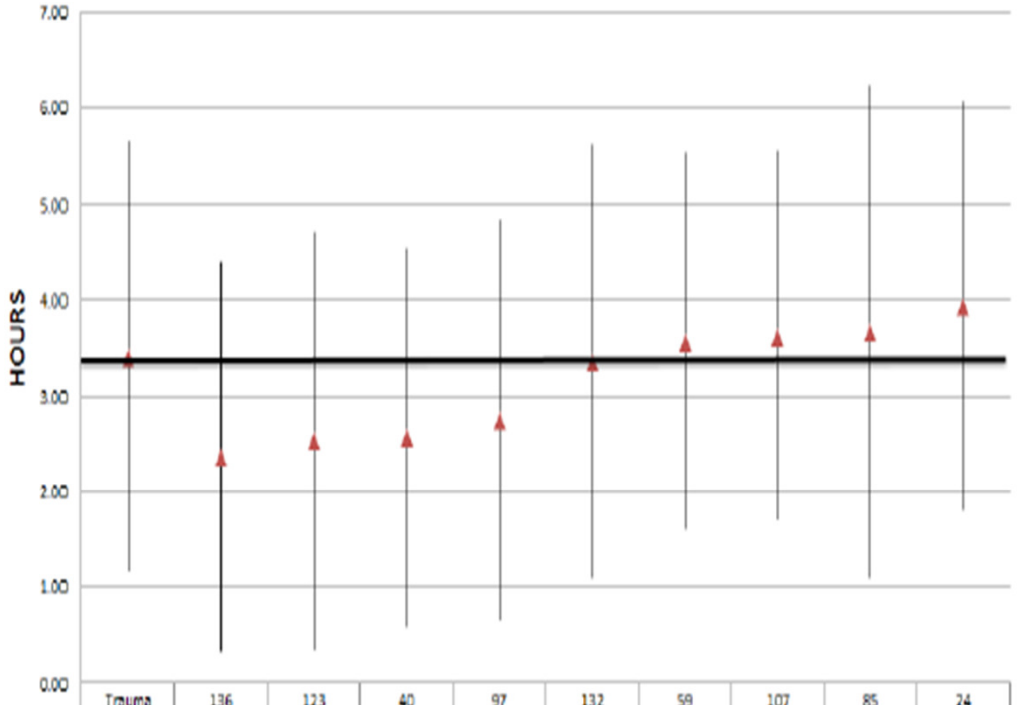
ED Disposition = Transferred

Average ED LOS (Hours)



	Indiana	Trauma Centers	Non-Trauma Centers
Upper CL	5.45	5.64	5.44
Mean	3.18	3.41	3.16
Lower CL	0.91	1.18	0.88

Trauma Centers-Average ED LOS (Hours)

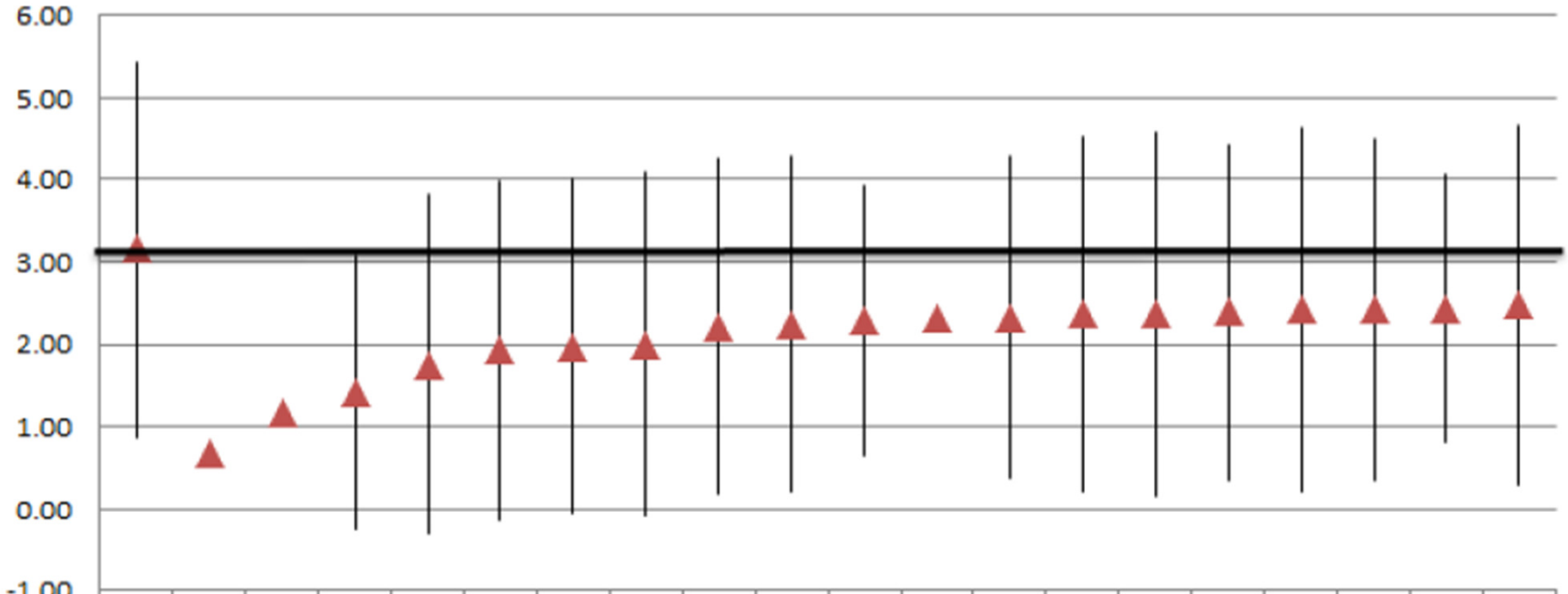


	Trauma	136	123	40	97	132	59	107	85	24
Upper CL	5.64	4.39	4.72	4.54	4.84	5.61	5.52	5.53	6.23	6.06
Mean	3.41	2.37	2.54	2.57	2.75	3.35	3.57	3.62	3.67	3.94
Lower CL	1.18	0.34	0.36	0.59	0.66	1.09	1.61	1.71	1.11	1.82

Average ED LOS: Caterpillar Graph - Page 27

ED Disposition = Transferred

Non-Trauma Centers-
Average ED LOS (Hours)

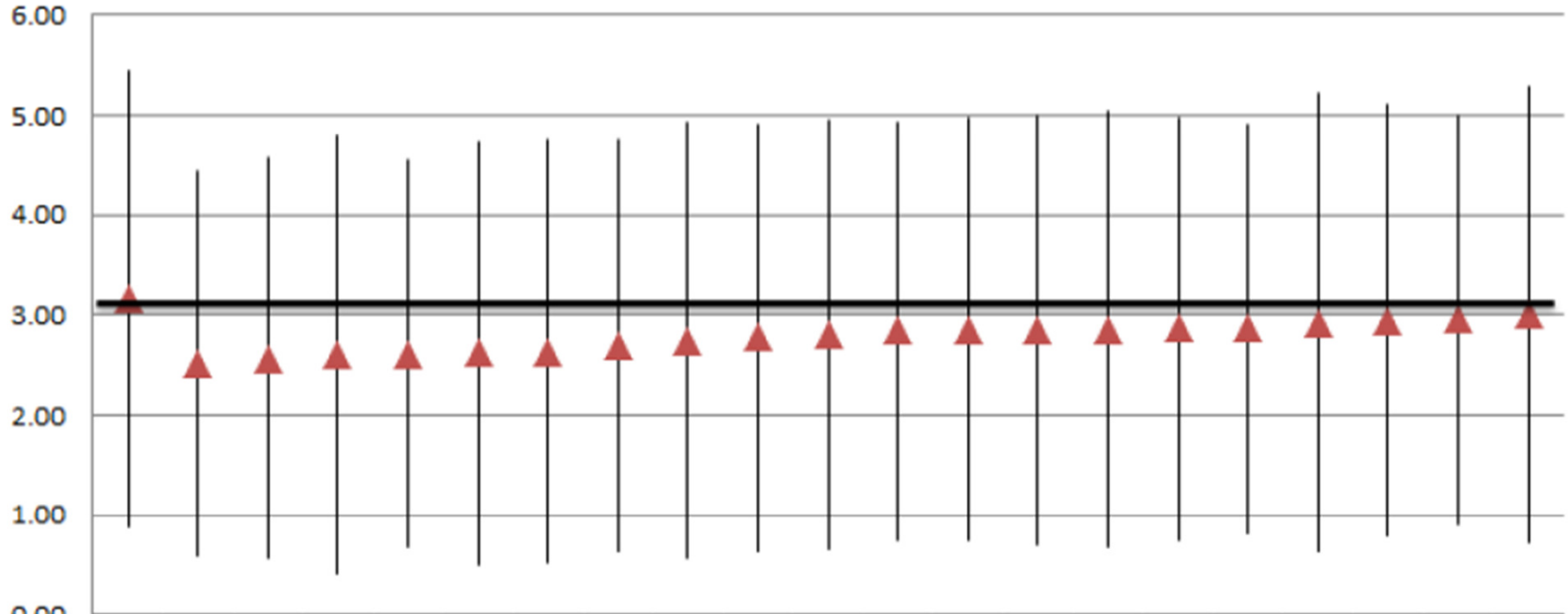


	Non-Trauma	NTC 91	NTC 60	NTC 118	NTC 29	NTC 129	NTC 14	NTC 96	NTC 8	NTC 55	NTC 90	NTC 68	NTC 126	NTC 67	NTC 84	NTC 4	NTC 112	NTC 134	NTC 28	NTC 106
Upper CL	5.44	0.68	1.17	3.09	3.81	3.99	4.01	4.10	4.26	4.28	3.94	2.32	4.28	4.54	4.59	4.41	4.65	4.52	4.07	4.67
▲ Mean	3.16	0.68	1.17	1.43	1.75	1.93	1.97	2.00	2.22	2.25	2.30	2.32	2.33	2.38	2.38	2.39	2.44	2.44	2.44	2.48
Lower CL	0.88	0.68	1.17	-0.2	-0.3	-0.1	-0.0	-0.1	0.18	0.22	0.66	2.32	0.38	0.21	0.17	0.36	0.23	0.36	0.81	0.29

Average ED LOS: Caterpillar Graph - Page 28

ED Disposition = Transferred

Non-Trauma Centers-
Average ED LOS (Hours)

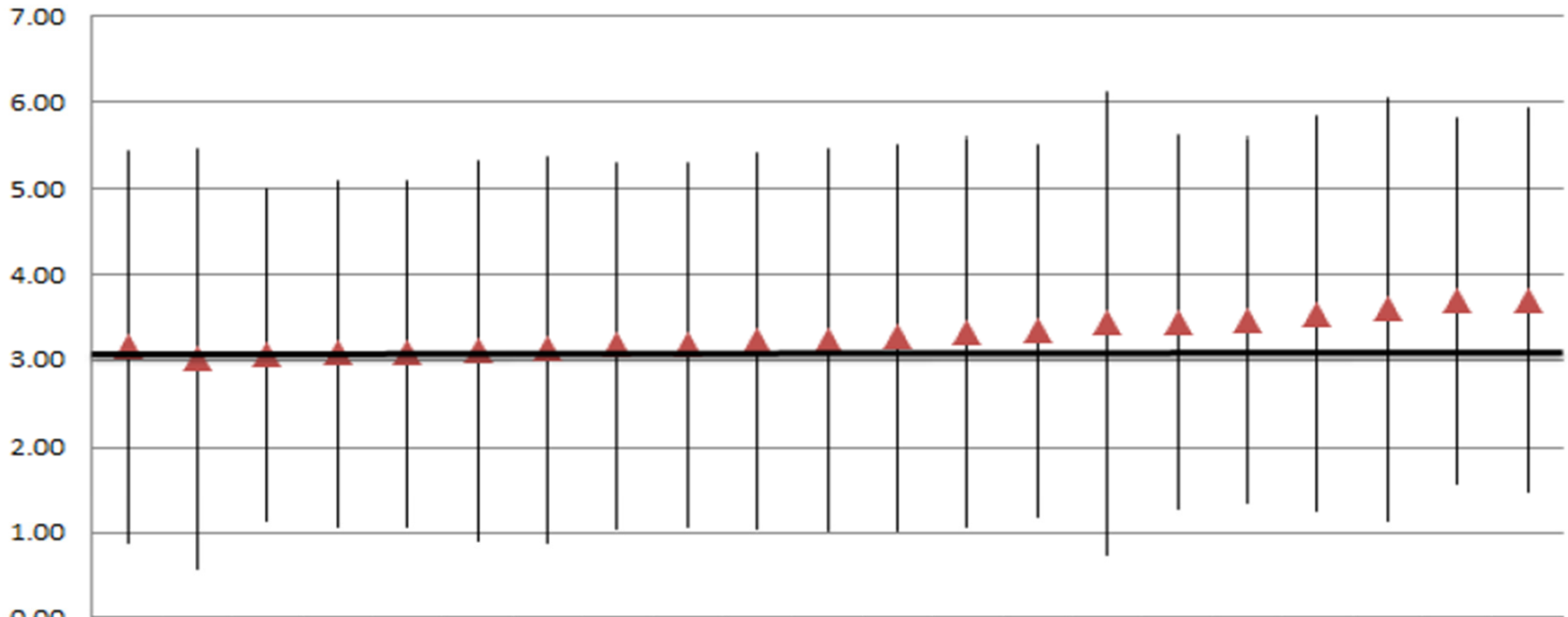


	Non-Trauma	NTC 26	NTC 89	NTC 61	NTC 122	NTC 32	NTC 52	NTC 115	NTC 41	NTC 131	NTC 95	NTC 30	NTC 22	NTC 121	NTC 66	NTC 70	NTC 83	NTC 19	NTC 38	NTC 53	NTC 43
Upper CL	5.44	4.45	4.56	4.79	4.54	4.73	4.74	4.76	4.93	4.92	4.94	4.94	4.97	5.01	5.04	4.98	4.92	5.23	5.12	5.01	5.29
▲ Mean	3.16	2.53	2.57	2.60	2.61	2.62	2.63	2.70	2.75	2.78	2.81	2.85	2.86	2.86	2.86	2.86	2.87	2.93	2.95	2.96	3.01
Lower CL	0.88	0.60	0.57	0.42	0.68	0.51	0.51	0.63	0.57	0.64	0.67	0.75	0.74	0.71	0.68	0.75	0.82	0.63	0.78	0.92	0.73

Average ED LOS: Caterpillar Graph - Page 29

ED Disposition = Transferred

Non-Trauma Centers-
Average ED LOS (Hours)

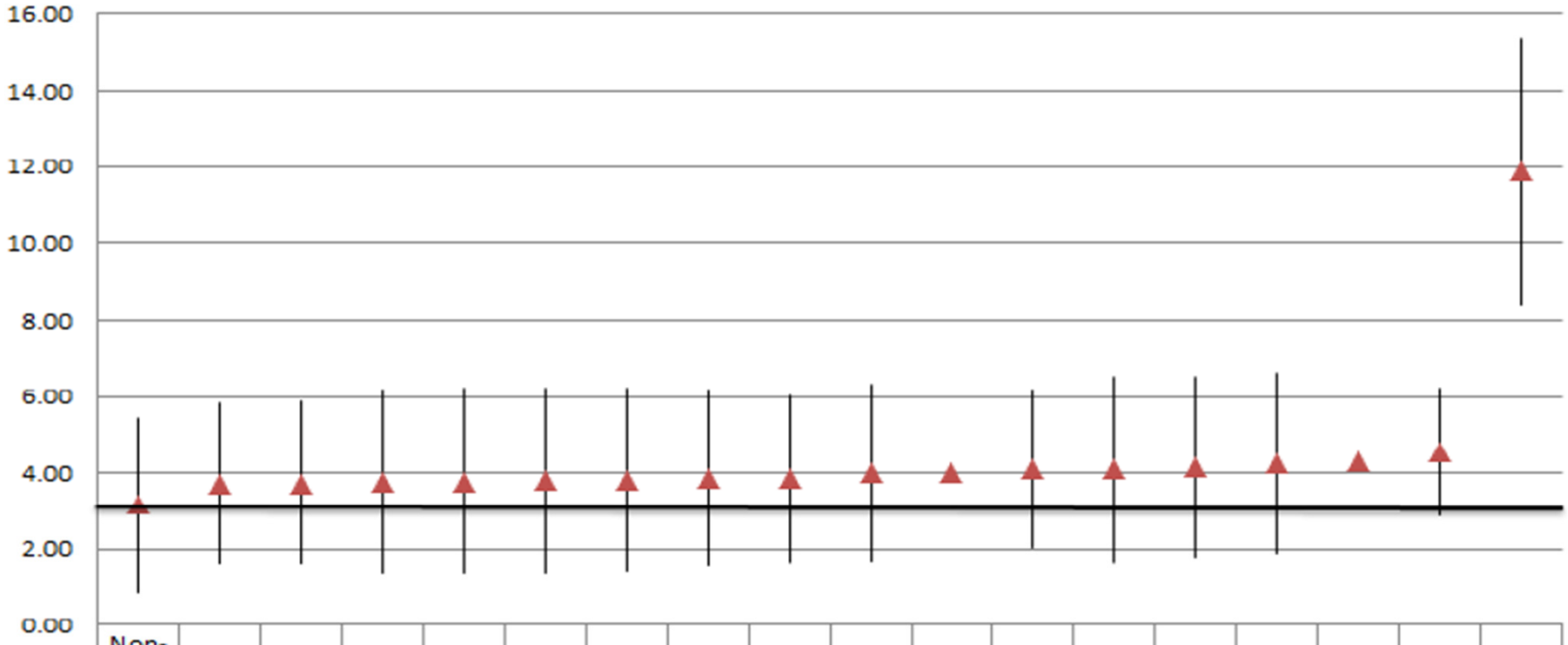


	Non-Trauma	NTC 64	NTC 78	NTC 39	NTC 9	NTC 11	NTC 7	NTC 48	NTC 25	NTC 109	NTC 20	NTC 2	NTC 75	NTC 18	NTC 108	NTC 120	NTC 46	NTC 100	NTC 117	NTC 12	NTC 21
Upper CL	5.44	5.47	4.99	5.09	5.11	5.32	5.38	5.32	5.31	5.41	5.47	5.52	5.59	5.51	6.12	5.60	5.59	5.83	6.06	5.83	5.93
▲ Mean	3.16	3.02	3.06	3.08	3.09	3.11	3.13	3.18	3.19	3.22	3.24	3.27	3.33	3.34	3.43	3.44	3.46	3.54	3.60	3.70	3.70
Lower CL	0.88	0.56	1.13	1.07	1.06	0.90	0.88	1.04	1.07	1.03	1.01	1.01	1.07	1.17	0.74	1.28	1.33	1.25	1.14	1.56	1.48

Average ED LOS: Caterpillar Graph - Page 30

ED Disposition = Transferred

Non-Trauma Centers-
Average ED LOS (Hours)



	Non-Trauma	NTC 65	NTC 104	NTC 13	NTC 82	NTC 35	NTC 113	NTC 69	NTC 57	NTC 105	NTC 119	NTC 111	NTC 74	NTC 102	NTC 86	NTC 6	NTC 116	NTC 42
Upper CL	5.44	5.81	5.88	6.16	6.20	6.23	6.25	6.15	6.04	6.30	4.02	6.16	6.54	6.54	6.61	4.28	6.22	15.40
▲ Mean	3.16	3.71	3.74	3.76	3.78	3.79	3.82	3.85	3.85	4.01	4.02	4.09	4.09	4.18	4.25	4.28	4.56	11.88
Lower CL	0.88	1.60	1.60	1.36	1.36	1.35	1.40	1.54	1.66	1.72	4.02	2.02	1.64	1.82	1.89	4.28	2.90	8.37

Tables - Page 31

ED Length of Stay

ED Length of Stay (minutes)			
	Indiana Average	Trauma Center	Non-Trauma Center
N=	7647	4432	3215
Average	236.7	237.4	235.9
Std. Deviation	175.6	182.2	165.9
Minimum	0	0	0
Quartile 1	140	133.5	147
Median	207	204	211
Quartile 3	290	294	285
Maximum	2582	2582	1793

ED Length of Stay by ISS

ED Length of Stay (minutes)						
ISS Category	Indiana Average	Indiana Average	Trauma Center	Trauma Center	Non-Trauma Center	Non-Trauma Center
	Counts	Minutes	Counts	Minutes	Counts	Minutes
1-8	3808	251	2063	259	1745	241.4
9-15	2748	234.5	1528	233.9	1220	235.1
16-24	589	214.4	492	313.4	97	220
25-44	330	169.4	292	170	38	165.2
45-74	21	152.2	20	142.9	1	339
75	14	77.7	14	77.7	0	-
No ISS	115	208.5	109	280.3	115	204.6

ED Disposition

ED Disposition (count)			
	Indiana	Trauma Center	Non-Trauma Center
Floor Bed	3823	2218	1605
ICU	1267	1113	154
Transferred	1578	156	1422
OR	667	531	136
Home w/o Services	185	91	94
Observation	432	232	200
Step-Down	305	77	228
Expired	79	51	28
AMA	1	0	1
Home W/ Services	3	0	3
Other	10	3	7
NK/NR/NA	464	171	293

*A bar graph of ED Disposition is found on page 2.
*A bar graph of ED Length of Stay is found on page 2.
*A Box and Whisker plot of ED LOS is found on page 3.
*A Box and Whisker plot of ED Length of Stay by ISS is found on page 3.

Tables - Page 32

ED Disposition (count) by ISS Category

	Floor Bed	ICU	Transferred	OR	Observation	NK/NR/ NA	Step-Down	Home w/o Services	Expired	Other	AMA	Home w/ Services	Total
1-8	1910	332	927	315	315	158	172	170	16	7	1	2	4325
9-15	1615	436	484	197	94	150	111	12	16	1	0	1	3117
16-24	151	275	75	76	12	7	12	0	11	1	0	0	620
25-44	24	198	26	69	1	5	5	0	25	0	0	0	353
45-74	0	11	0	6	1	1	0	0	3	00	0	0	22
75	0	6	0	2	0	0	0	0	7	00	0	0	15
NO ISS	123	9	66	2	9	143	5	3	1	1	0	0	362
Total	3823	1267	1578	667	432	464	305	185	79	10	1	3	8814

*Bar graph of ED Disposition by ISS is found on page 6.

Reporting Hospital Map – Page 33

Indiana State Department of Health
Indiana Trauma Registry

Hospitals Reporting Trauma Data
Quarter 3, 2014
July 1- September 30, 2014

H Trauma Centers

Deaconess Hospital
Eskenazi Health
IU Health - Arnett Hospital
IU Health - Ball Memorial Hospital
IU Health - Methodist Hospital
Lutheran Hospital of Indiana
Memorial Hospital of South Bend
Parkview Regional Medical Center
Riley Hospital for Children at IU Health
St. Mary's Medical Center of Evansville
St. Vincent Indianapolis Hospital

H "In the Process" Hospital*

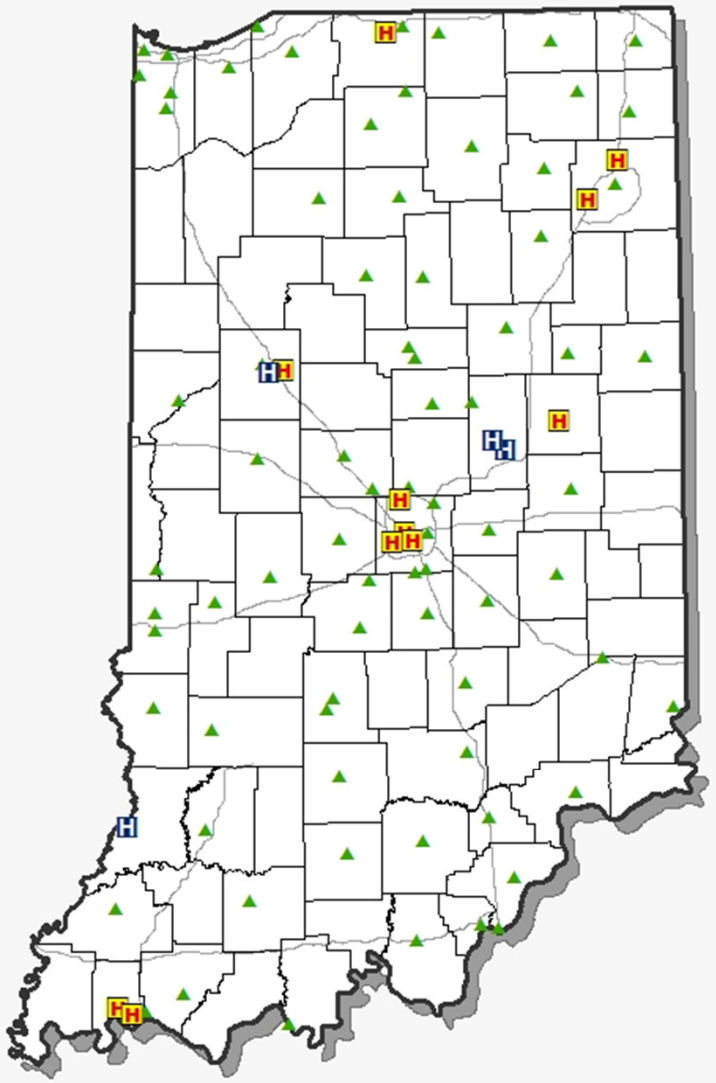
Community Hospital of Anderson
Good Samaritan Hospital
St. Elizabeth East Hospital
St. Vincent Anderson Hospital

▲ Non-Trauma Hospitals

84 Non-Trauma Hospitals

* Considered a trauma center for purposes of the triage and transport rule.

Indiana State Department of Health
Trauma and Injury Prevention



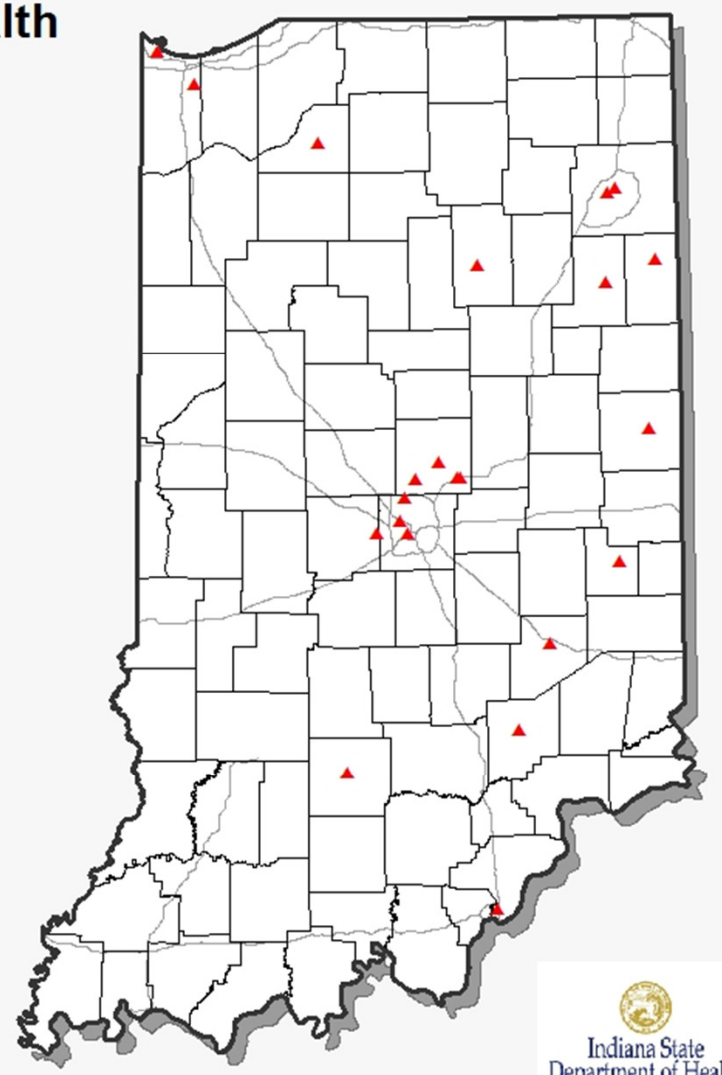
Map Author: ISDH ERC PHG and ISDH Trauma & Injury Prevention - February 2015

Hospitals Not Reporting Map

Indiana State Department of Health
Indiana Trauma Registry

Hospitals Not Reporting Trauma Data
to the Indiana Trauma Registry

Adams Memorial Hospital
Bluffton Regional Medical Center
Community Westview Hospital
Decatur County Memorial Hospital
Fayette Regional Health System
IU Health - Saxony Hospital
IU Health - Starke Hospital
IU Health - West Hospital
Kentuckiana Medical Center
Parkview Wabash Hospital
Richard L Roudebush VA Medical Center
Riverview Hospital
St. Catherine Hospital
St. Joseph Hospital (Fort Wayne)
St. Mary Medical Center Hobart
St. Vincent - Carmel Hospital
St. Vincent - Dunn Hospital
St. Vincent - Fishers Hospital
St. Vincent - Jennings Hospital
St. Vincent - Peyton Manning Children's Hospital
St. Vincent - Randolph Hospital
VA Northern IN Healthcare System



Not reporting as of 1/29/2015

Map Author: ISDH ERC PHG and ISDH Trauma & Injury Prevention - February 201

Questions?

Indiana State Department of Health

Linked Data Between Trauma & EMS

- 383 probabilistically linked cases for Q3 2014 between the EMS Registry and Trauma Registry

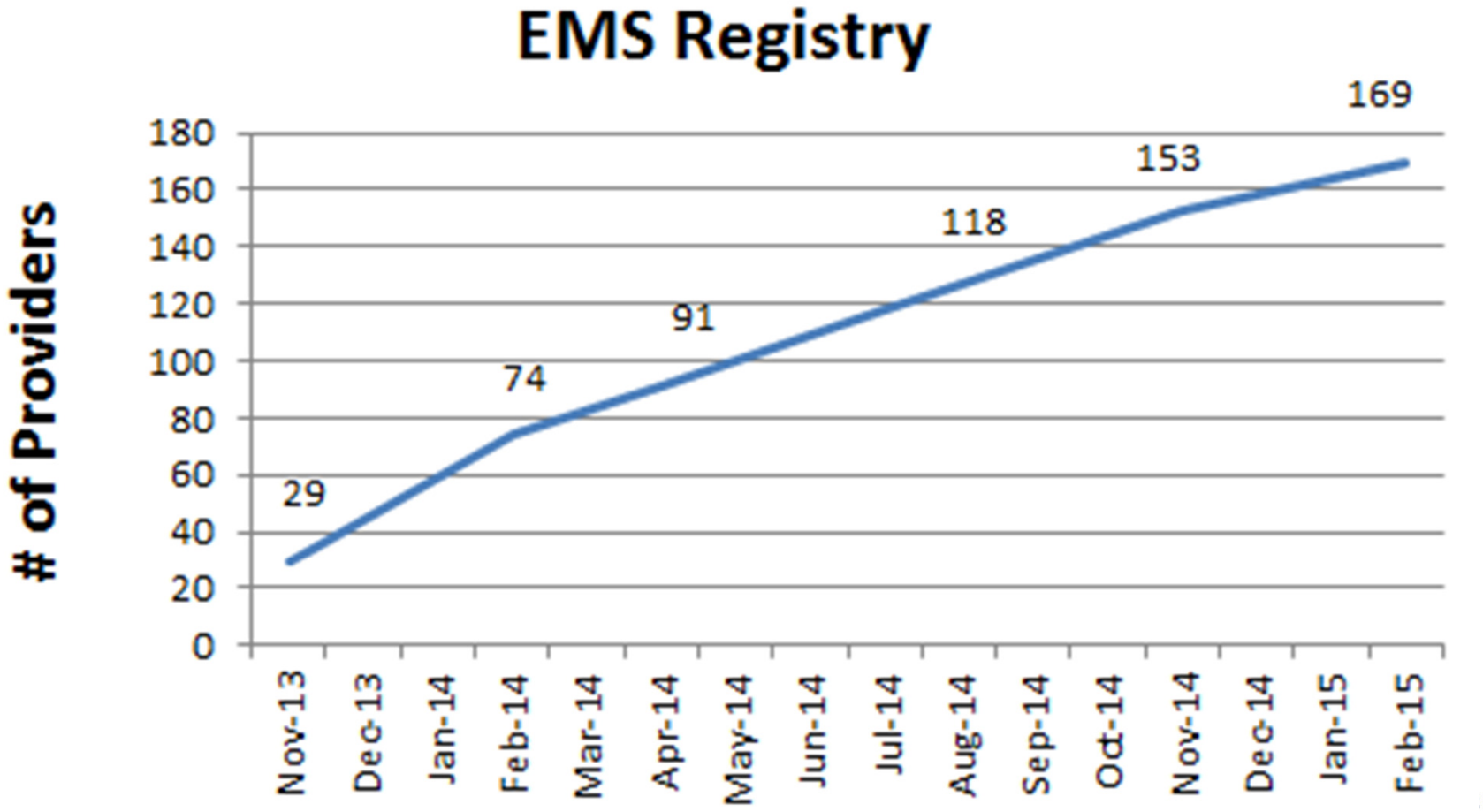
ISDH EMS Registry Data

- 101,633 traumatic injury incidents
  - Possible Injury indicated
  - Provider Primary Impression
  - Provider Secondary Impression
  - Complaint Reported by Dispatch is trauma injury
- January 1, 2013 to December 31, 2014
- 169 total providers reporting

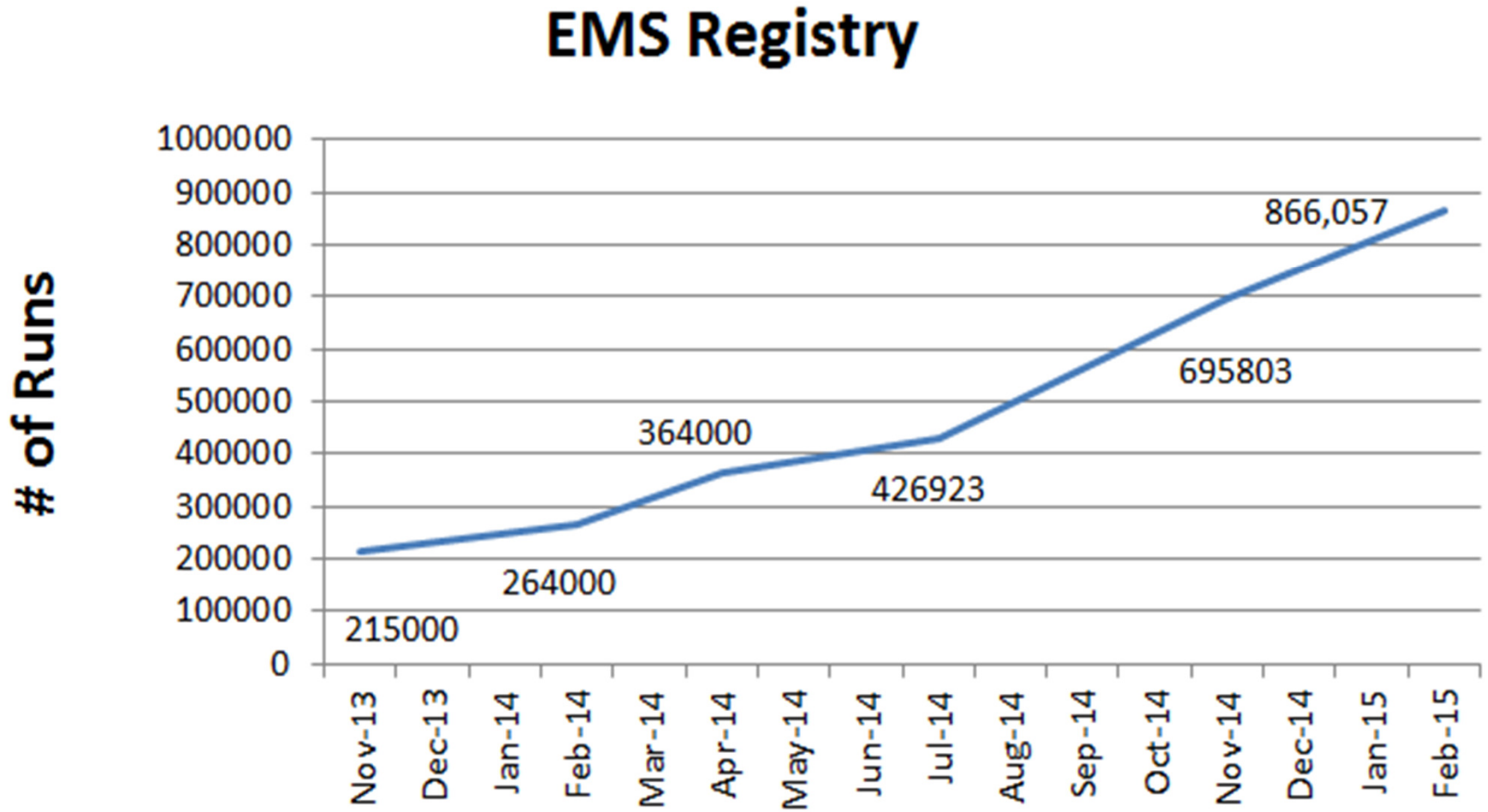
866,057 runs in the ISDH EMS Registry

Indiana State Department of Health

ISDH EMS Registry Data



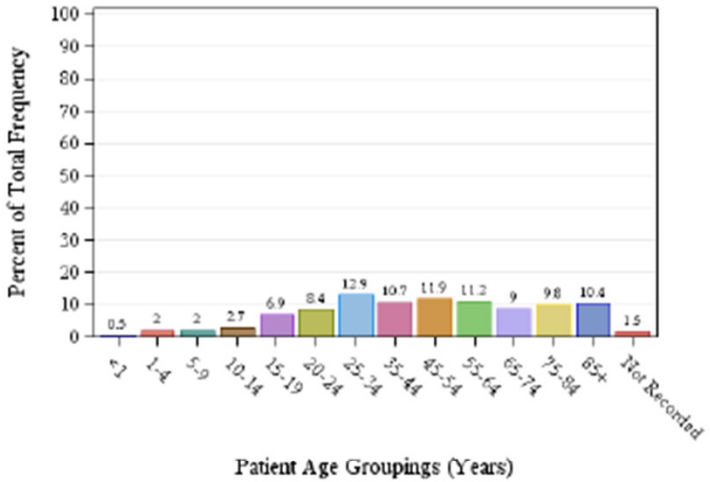
ISDH EMS Registry Data



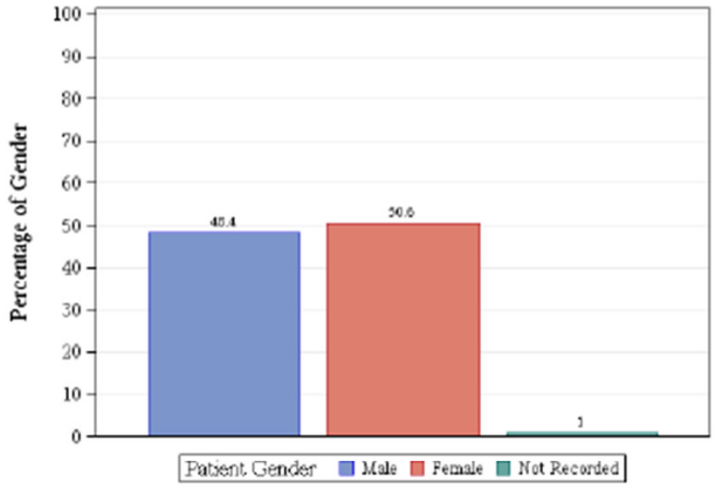
Indiana State Department of Health

Indiana Trauma Registry - Prehospital Data Report
*101,633 Traumatic Injury Incidents**
01/01/2013 - 12/31/2014 169 Total Providers Reporting

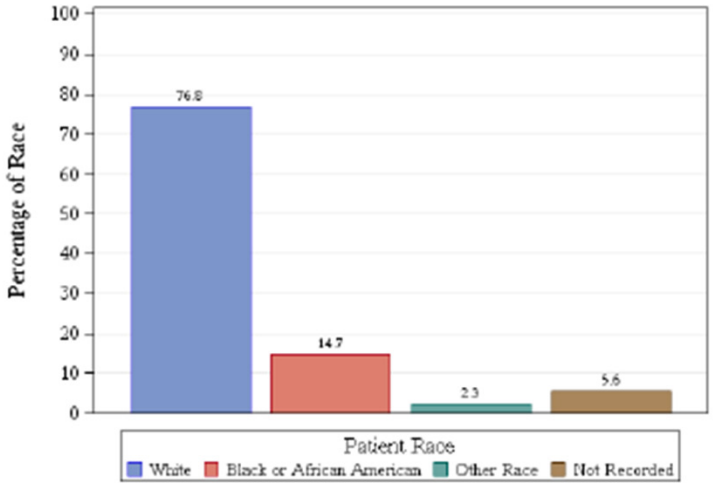
Patient Age Groupings (Years)



Patient Gender

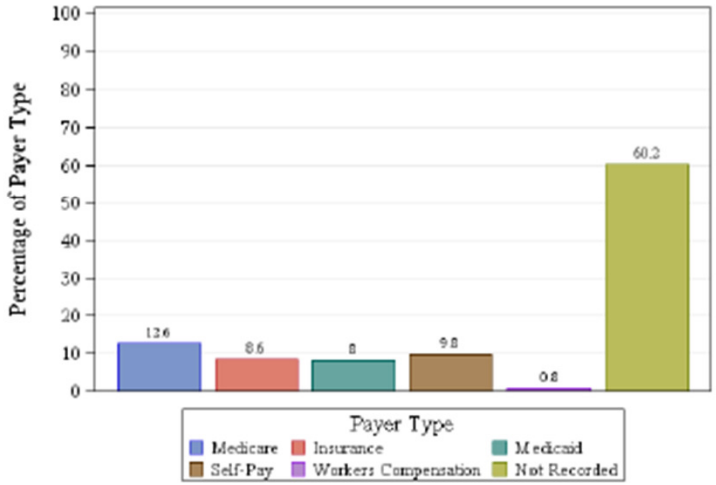


Patient Race



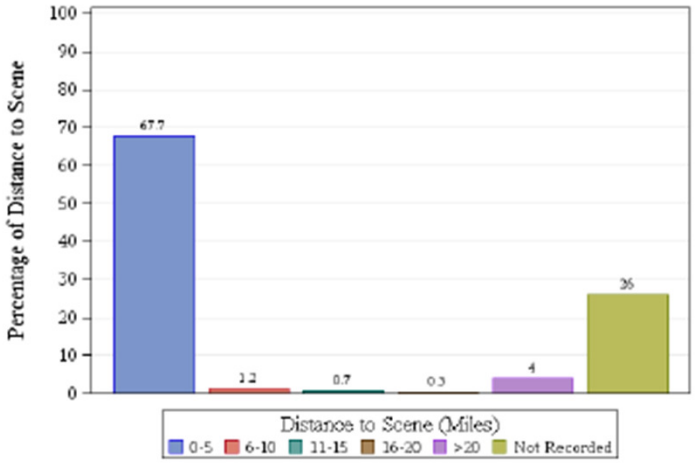
<1% Race: Asian, Native Hawaiian, American Indian/Alaskan Native

Payer Type

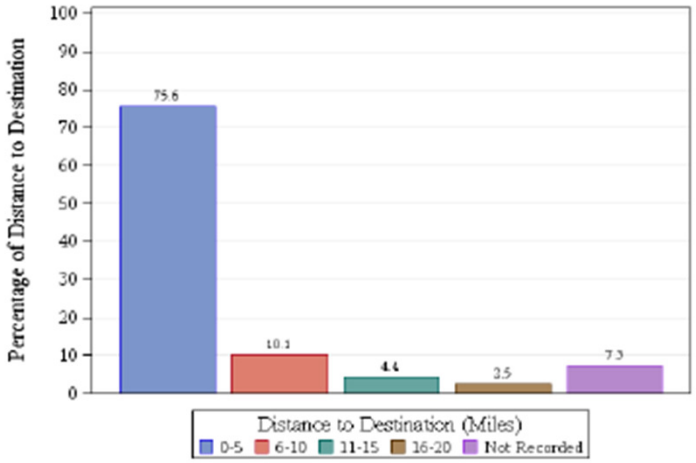


*Traumatic Injuries include the following criteria:
Possible Injury indicated, or Provider Primary or Secondary Impression

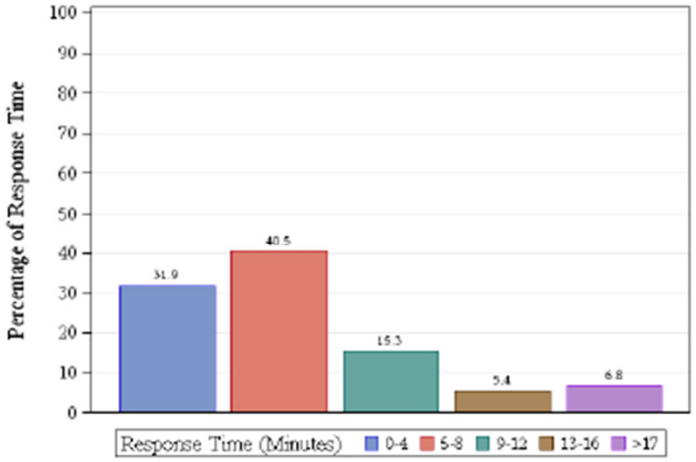
Distance to Scene (Miles)



Distance to Destination (Miles)

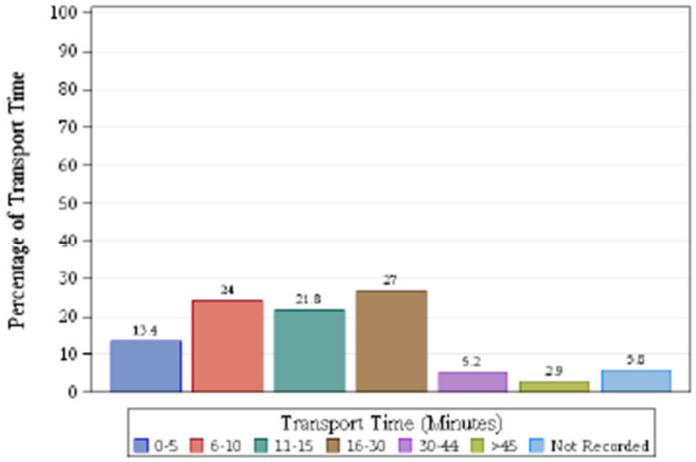


Response Time (Minutes)



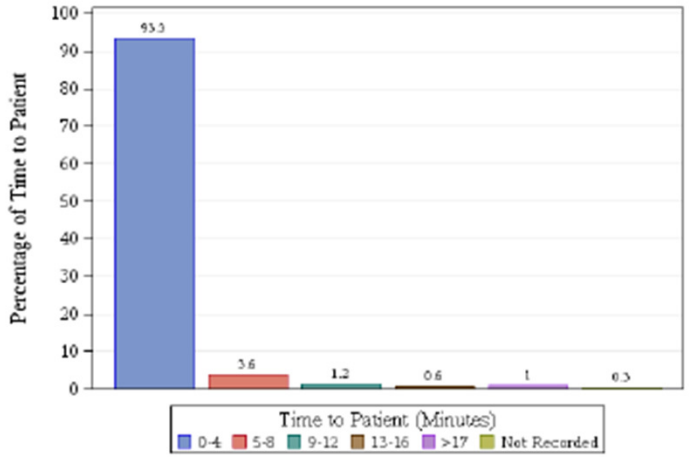
Response Time: Difference in Time from Dispatch to Arrival on Scene

Transport Time (Minutes)



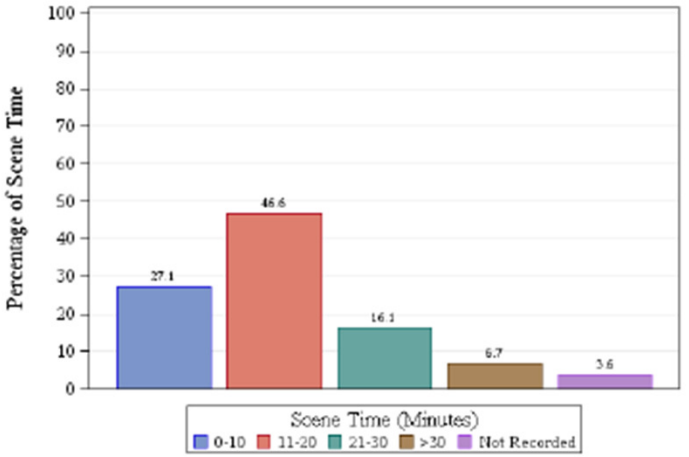
Transport Time: Difference in Time from Departure from Scene to Arrival At Destination

Time to Patient (Minutes)



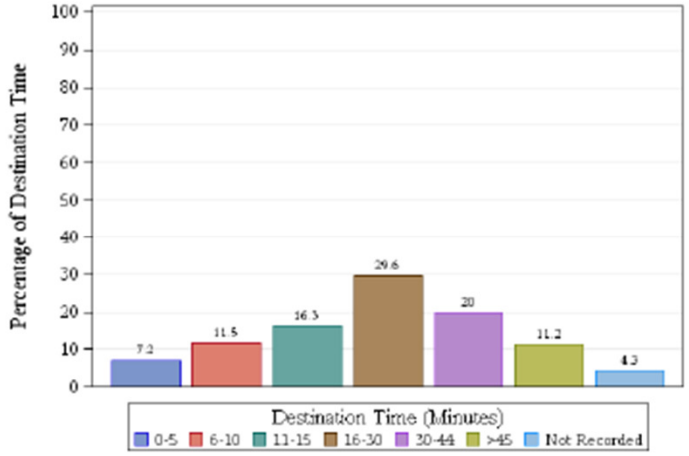
Time To Patient: Difference in Time from Arrival at Scene

Scene Time (Minutes)



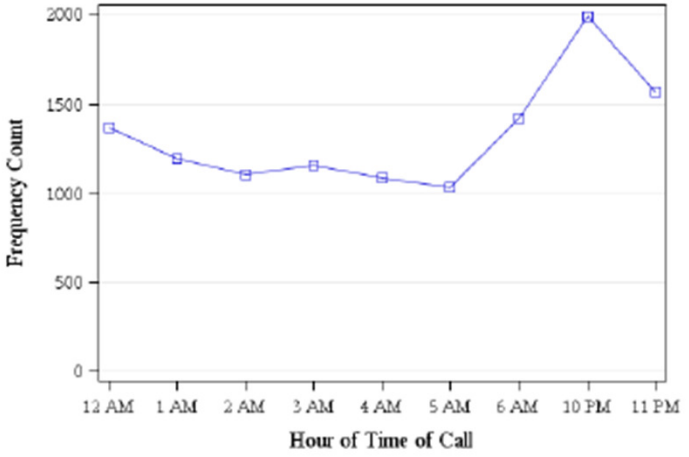
Scene Time: Difference in Time from Arrival at Scene

Destination Time (Minutes)



Scene Time: Difference in Time from Arrival at Destination to Unit Back in Service

Time of Call



Time of Call Not Recorded for 45,368 Incidents

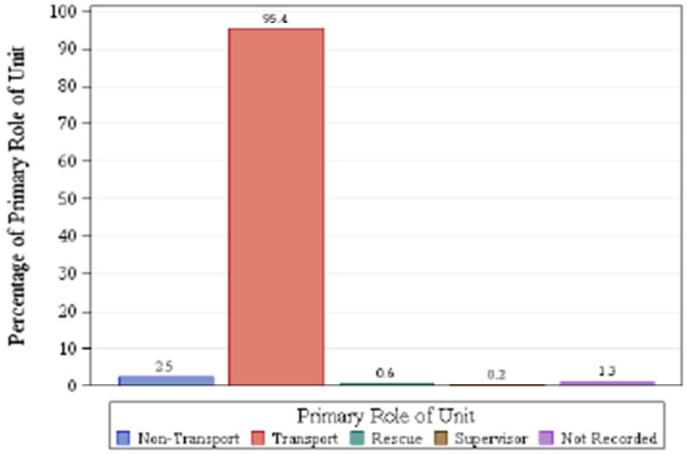
Average Run Mileage

Obs	Destination	Miles
1	Mileage to Destination	2.9
2	Mileage to Scene	3.1
3	Total Mileage	6.8

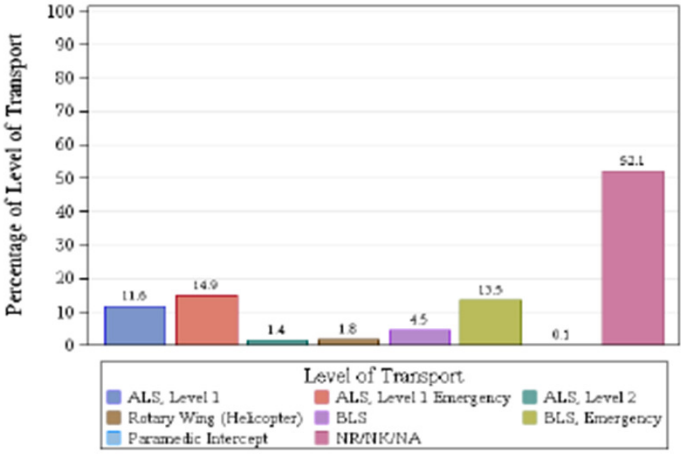
Average Run Time (Minutes)

Obs	Destination	Minutes
1	Time to Scene	7.87
2	Time to Patient	1.89
3	Time at Scene	16.21
4	Time to Destination	15.34
5	Back in Service	25.30
6	Total Run Time	61.42

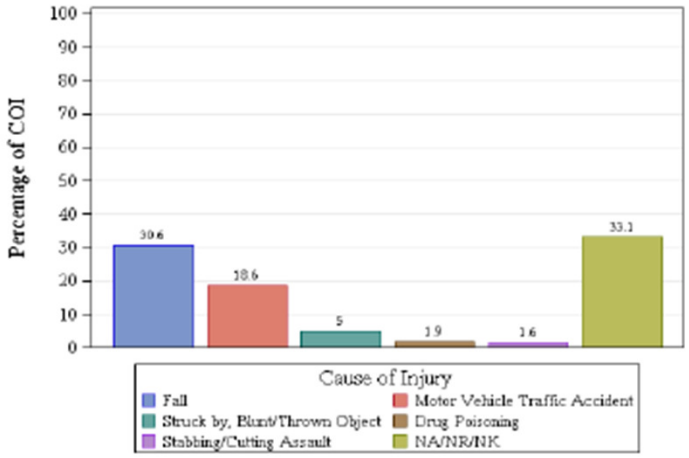
Primary Role of Unit



Level of Transport

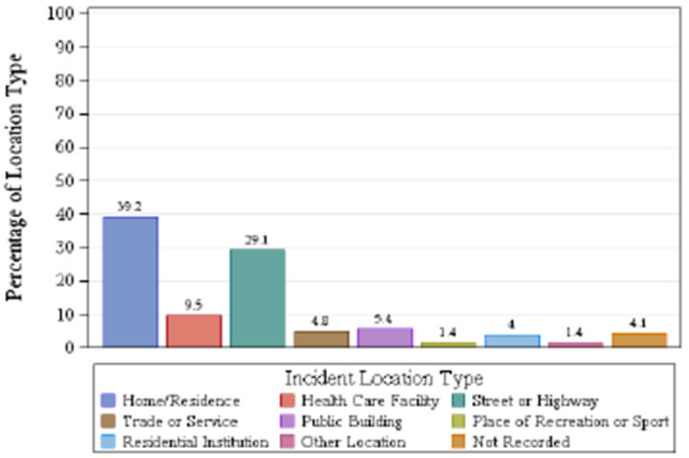


Cause of Injury (COI)



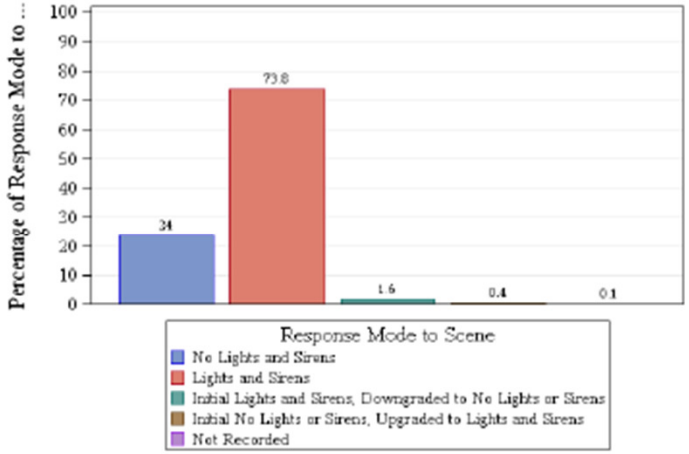
Causes of Injury <1.5% Not Listed

Incident Location Type

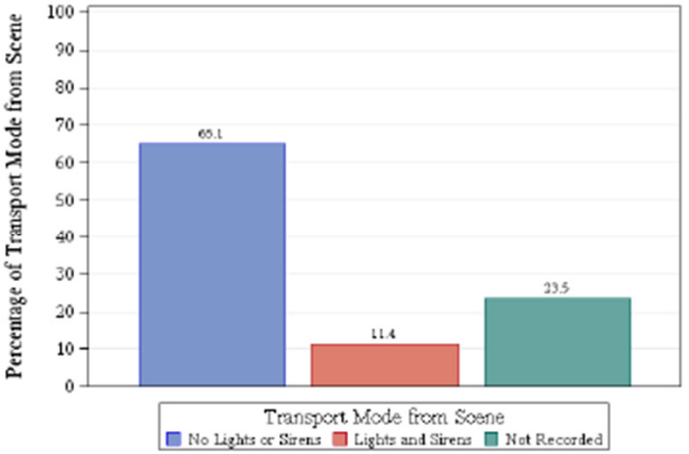


Incident Location Type <1% Not Listed

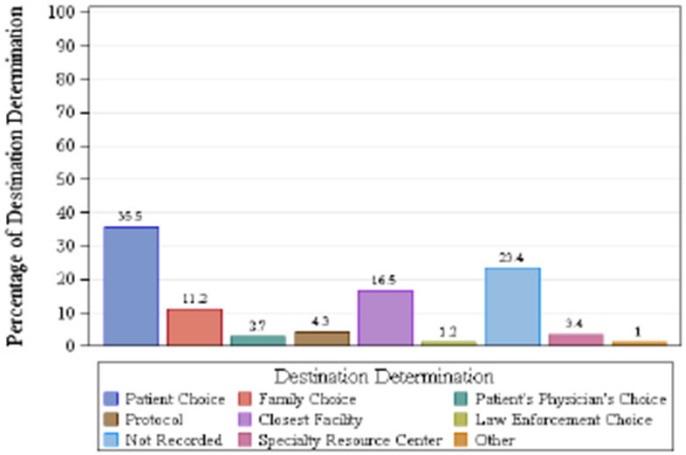
Response Mode to Scene



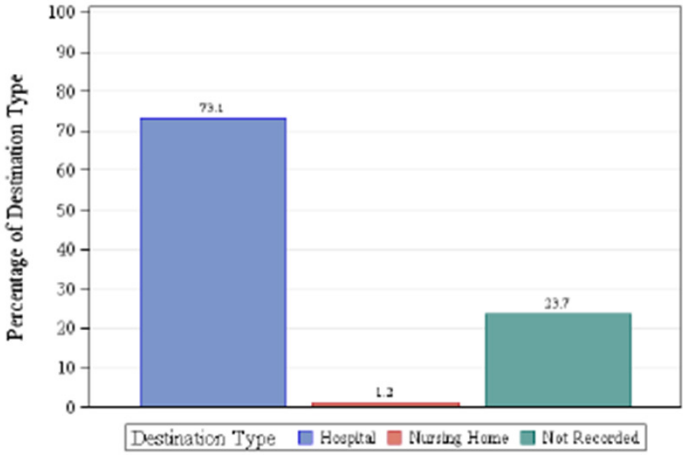
Transport Mode from Scene



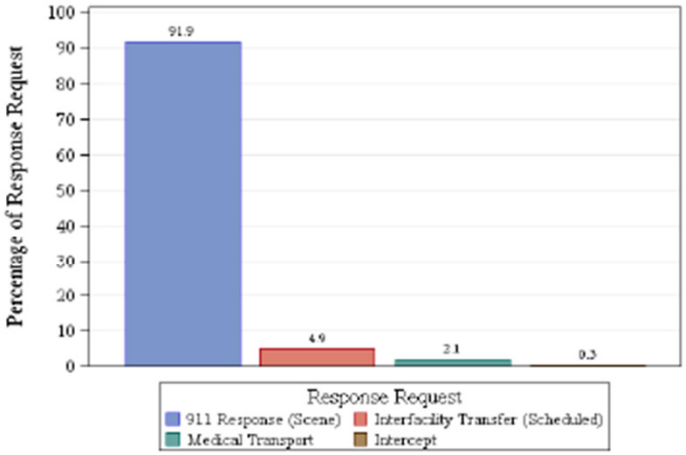
Destination Determination



Destination Type

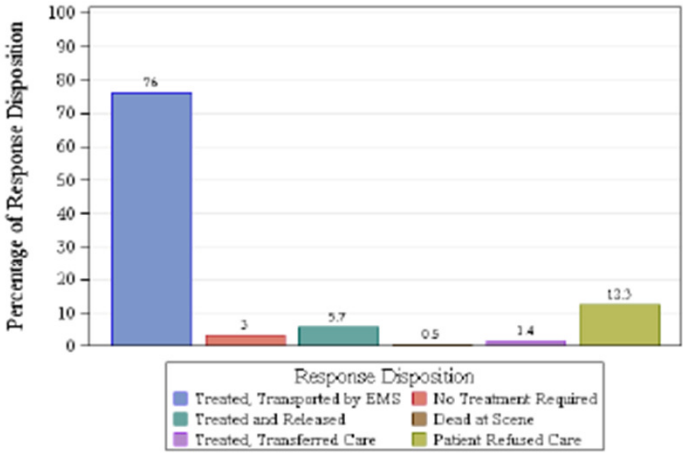


Response Request



Response Request <0.25% Not Listed

Response Disposition



Response Disposition <0.5% Not Listed

Questions?

Indiana State Department of Health

Risk factors associated with death in the emergency department in Indiana, 2013-2014

C. Hess[1], J. Skiba[1]

[1]Indiana State Department of Health, Indianapolis, IN

BACKGROUND

A trauma system is an organized, coordinated approach to treating individuals who have sustained severe injuries that require rapid evaluation and transport to specific hospitals with trauma care capabilities, staff and equipment to provide the comprehensive care needed. Indiana's trauma system is developing, and currently has components of a system, including 11 trauma centers around the state (Figure 1).

Figure 1. Indiana's Model Trauma System

The Indiana Patient Registry was implemented in 2007, with initial participation by the seven American College of Surgeons (ACS) trauma centers. The Trauma Registry rule, requiring all hospitals with Emergency Departments (ED), Emergency Medical Service (EMS) providers, and rehabilitation hospitals, to report trauma cases to the Indiana Patient Registry, became effective November 2013. This dynamic data registry can assess system improvement and outcomes. As Indiana continues to build its trauma system, reviewing, measuring and analyzing registry data and outcomes will be instrumental to improving patient care by ensuring highest quality of care is provided to all.

PURPOSE

The aim of the study was to identify risk factors associated with an increased risk of expiring in the ED for trauma patients, specifically examining trauma type (blunt, penetrating, or other) and trauma center status of the treating hospital. Previous studies have found strong associations between alcohol and injury, often resulting in the "Perfect Storm" of catastrophic outcomes.[1] In response, the ACS requires universal screening and brief intervention for alcohol use for all injured patients at verified trauma centers.[2] We also sought to describe the effect of alcohol consumption on the risk of dying in the ED.

METHODS

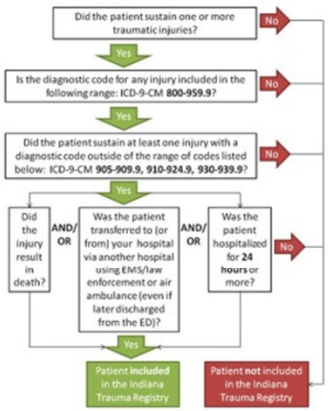
Data for all trauma cases in Indiana EDs from January 1, 2013 through June 30, 2014 were obtained from the Indiana Patient Registry and were analyzed retrospectively. Data were collected for 43,379 patients who were treated at the ED, of which 42,745 trauma incidents had available ED acute care disposition data.

Logistic regression modeling was performed with ED acute care disposition as the outcome variable. ED acute care disposition was dichotomized as expired or did not expire, and age, race, gender, alcohol use, trauma type and trauma center status were the independent variables. SAS 9.2 software was used during analysis.

Study Inclusion Criteria:

- Trauma incident occurred between January 1, 2013 and June 30, 2014
- Trauma patient treated in ED in Indiana
- Trauma incident met Indiana Patient Registry criteria and captured by registry[2] (Figure 2)
- Incident had recorded ED acute care disposition

Figure 2. Indiana Patient Registry Inclusion/ Exclusion Criteria



Indiana Patient Registry follows the strict definition of trauma defined by the American College of Surgeons – Committee on Trauma

RESULTS

Between January 1, 2013 and June 30, 2014 there were 42,745 trauma incidents with available ED acute care disposition data, of which 333 (0.78%) of these resulted in death. Gender, trauma type and alcohol were statistically significant, and age approached statistical significance (Table 1) .

Table 1. Results of Bivariate Analysis by Trauma Variables

Variable	Count/Mean (st dev)	p-value
N	42,745	
ED Acute Care Disposition		
Expired	333	
Did not expire	42412	
Age	52.8 (26.5)	0.054
Gender		0.0004*
Male	23446	
Female	19276	
Not Known/Not Recorded	23	
Alcohol Consumption		0.002*
Yes	3973	
No	32415	
NK/NR/ NA	6357	
Race		0.128
White	35586	
Black	4120	
Other	3039	
Trauma Type		<0.0001*
Blunt	35212	
Penetrating	2591	
Other	4942	
Trauma Center Status		0.119
Verified Trauma Center	21900	
Non-Trauma Center	20845	

*Indicates significance at the α=0.05 level.

Trauma incidents with 'Penetrating' trauma type have 6.73 times the odds of expiring in the ED compared to 'Blunt' trauma type (Table 2).

Trauma incidents where alcohol was consumed had 0.46 the odds of expiring in the ED compared to those with no alcohol consumption (Table 2).

Table 2. Odds from Logistic Regression Analysis

Trauma Variable	Odds
Trauma Type	
Other vs Blunt	1.60
Penetrating vs Blunt	6.73
Alcohol Consumption	
Not Known/Not Recorded/Not Applicable vs No	0.99
Yes vs No	0.46

CONCLUSIONS

Patients that experienced penetrating trauma were 6.73 times more likely to die in the ED than those with blunt trauma. Penetrating injuries may have higher morbidity and mortality, as these injuries frequently involve large-caliber, high-velocity weapons.[2] Identifying these predictors of mortality in the ED among trauma patients may help improve outcomes, especially through effective injury prevention focused on contributing factors and proximate causes of injury.

It is estimated that 30 to 50 percent of injured patients have a positive blood alcohol concentration at the time of trauma center admission, which suggests alcohol consumption contributes to severe injury requiring specialized trauma care.[3] Alcohol may affect the injury process by mediating the body's response to the traumatic injury, thereby reducing mortality.[4,5] While these findings may suggest the consumption of alcohol to be slightly protective to trauma patients against death in the ED, consumption of alcohol carries other significant health and safety risks, including increasing the risk of fatally or non-fatally injuring oneself and others.[4]

Further research with larger sample sizes could identify risk factors related to ED outcomes other than the dichotomous expired versus not expired. Limitations include ED acute care disposition was not completed on all trauma forms. There could be other factors in pre-hospital care that influence ED disposition, such as level of EMS response and procedures performed which are not included in this study.

REFERENCES

1. Moore EE. Alcohol and trauma: the perfect storm. *J Trauma*. 2005 Sep;59(3 Suppl):S53-6; discussion S67-75.

2. American College of Surgeons Committee on Trauma. Resources for Optimal Care of the Injured Patient 2014 (6th edition) [Electronic].

3. Soderstrom CA, Dischinger PC, Smith GS, et al. Psychoactive substance dependence among trauma center patients. *JAMA*. 1992;267:2756-2759.

4. Friedman LS. Complications associated with blood alcohol concentration following injury. *Alcohol*. 2014 Jun;48(4):391-400. doi: 10.1016/j.alcohol.2014.01.008.

5. Yaghoubian A, Kaji A, Putnam B, De Virgilio N, De Virgilio C. Elevated blood alcohol level may be protective of trauma patient mortality. *Am Surg*. 2009 Oct;75(10):950-3.

CONTACT INFORMATION

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