Indiana Trauma Care Committee Meeting

May 9, 2014

Hospitals reporting to the Indiana Trauma Registry – Quarter 4 2013

District 1

Methodist Northlake

Methodist Southlake

Porter Regional (Valparaiso)

St. Anthony – Crown Point

St. Margaret – Dyer

St. Margaret - Hammond

District 2

Community Hospital of Bremen

Elkhart General

Kosciusko Community

Memorial Hospital South Bend

Pulaski Memorial

Hospitals reporting to the Indiana Trauma Registry – Quarter 4 2013

District 3

Cameron Memorial

Dukes Memorial

Lutheran

Parkview Huntington

Parkview LaGrange

Parkview Noble

Parkview Randallia

Parkview Regional Medical Center

Parkview Whitley

District 4

Franciscan St. Elizabeth – Lafayette Central

Franciscan St. Elizabeth – Lafayette East

IU Health – Arnett

IU Health – White Memorial

HOSPITALS REPORTING TO THE INDIANA TRAUMA REGISTRY – QUARTER 4 2013

District 5

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

Hospitals reporting to the Indiana Trauma Registry – Quarter 4 2013

District 6

Community Hospital of Anderson & Madison Co.

Henry County

IU Health – Ball Memorial

IU Health – Tipton

Marion General

Reid Hospital

St. Vincent Anderson

District 7

Greene County General

St. Vincent - Clay

~~Sullivan County Community~~

Terre Haute Regional

Union Hospital

Union - Clinton

District 8

IU Health - Bedford

IU Health – Bloomington

Monroe Hospital

Schneck Medical Center

Hospitals reporting to the Indiana Trauma Registry – Quarter 4 2013

District 9

Floyd Memorial

District 10

Daviess Community

Deaconess

Deaconess Gateway

Good Samaritan

Memorial Hospital & Health Care Center

Perry County Memorial

St. Mary's Medical Center

St. Mary's Warrick

Summary of Hospitals Reporting Status – Q4 2013

New to Reporting / Started Reporting Again

- Deaconess Gateway*
- Floyd Memorial*
- Greene County General*
- Kosciusko Community
- Pulaski Memorial
- St. Elizabeth - Central
- St. Margaret – Hammond*

Dropped off

- Sullivan County

* = New to Reporting

Hospitals Trained on the Trauma Registry (YTD)

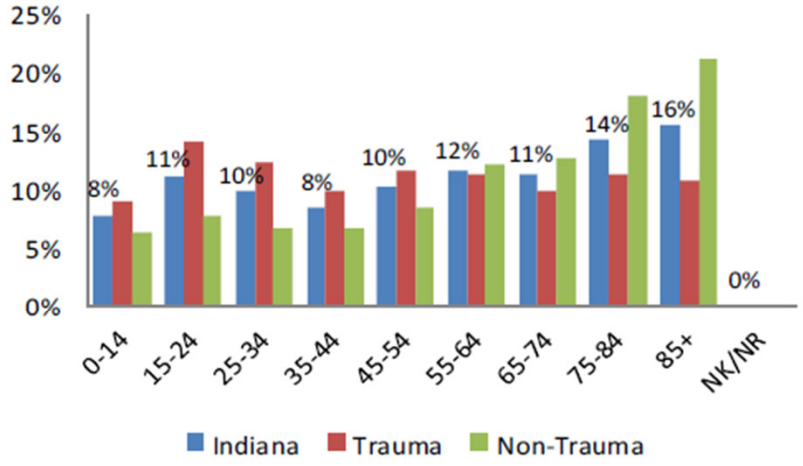
- Adams Memorial
- Clark Memorial
- Community - Anderson
- Community - Howard
- Community - North
- Daviess Community
- Deaconess Gateway
- DeKalb Memorial
- Dupont Hospital
- Floyd Memorial
- Gibson General
- Good Samaritan
- Greene County General
- IU Health – Bedford
- IU Health – Blackford
- IU Health - LaPorte
- IU Health - Morgan
- IU Health – Paoli
- Jay County
- King's Daughters' Health
- Kosciusko Community
- Margaret Mary Health
- Memorial (Jasper)
- Memorial (Logansport)
- Perry County Memorial
- Porter Regional
- Pulaski Memorial
- Putnam County
- Rush Memorial
- Scott Memorial
- Schneck Medical Center
- St. Anthony – Michigan City
- St. Catherine Regional (Charlestown)
- St. Joseph (Kokomo)
- St. Joseph RMC – Mishawaka
- St. Joseph RMC – Plymouth
- St. Mary's (Hobart)
- St. Mary's Warrick
- St. Vincent – Anderson
- St. Vincent - Randolph
- St. Vincent – Williamsport
- Wabash County
- Woodlawn Hospital

Quarter 4 2013 Statewide Report

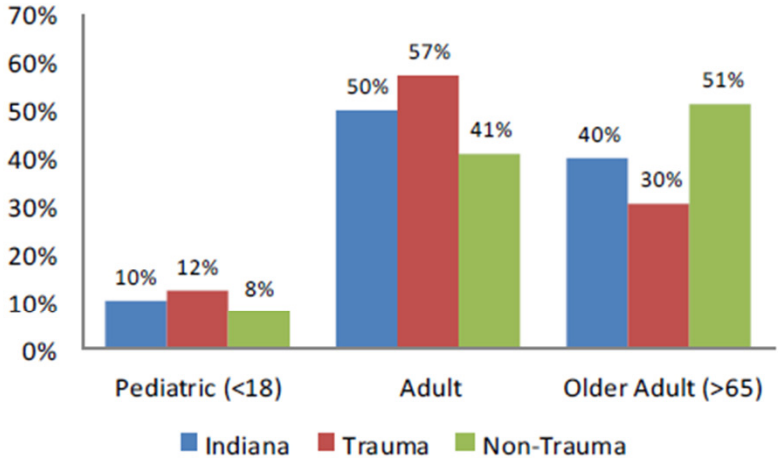
- 5,839 incidents
- October 1, 2013 to December 31, 2013
- 60 total hospitals reporting
  - 9 trauma centers
  - 51 hospitals

PATIENT DEMOGRAPHICS – PAGE 2

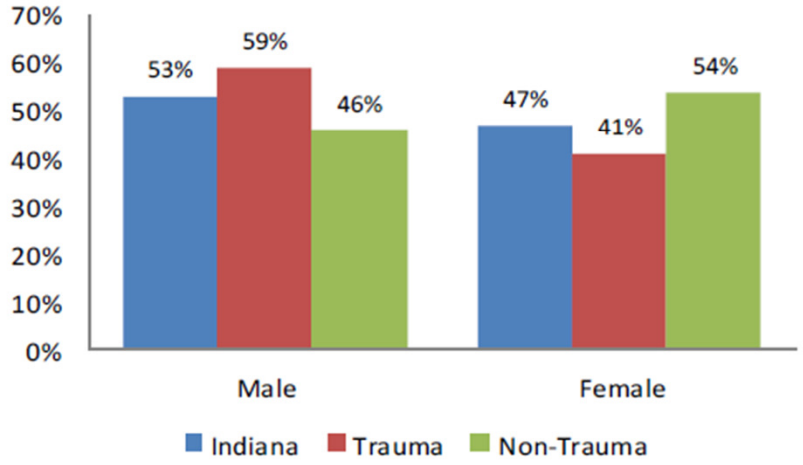
Patient Age (Years)



Patient Age Groupings

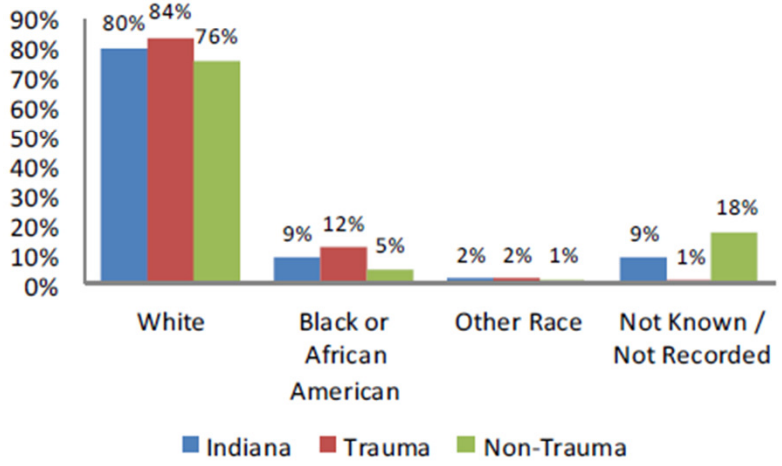


Patient Gender



There were two unknown ages reported, which represents 0.03% of the data.

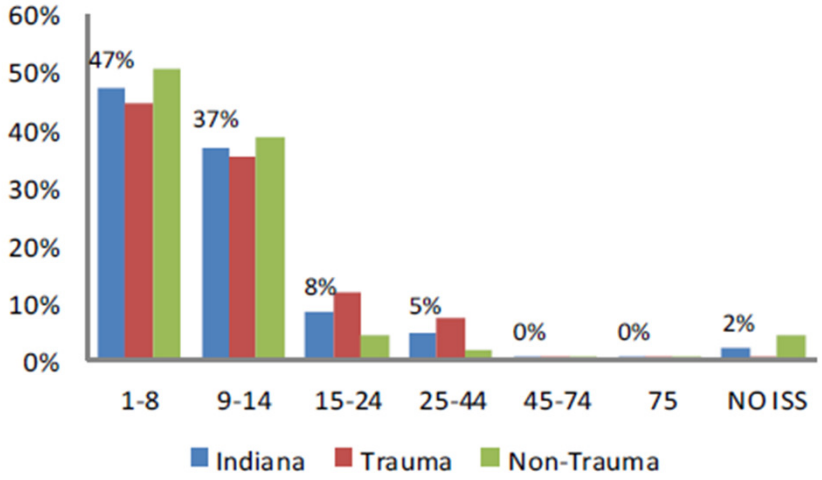
Patient Race



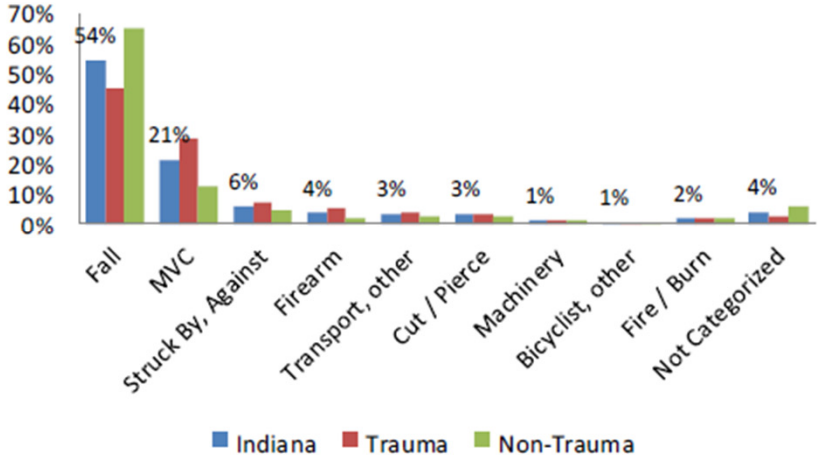
<1% Race - Asian, Native Hawaiian or Other Pacific Islander, American Indian or Alaska Native

INJURY – PAGE 3

Injury Severity Score (ISS)

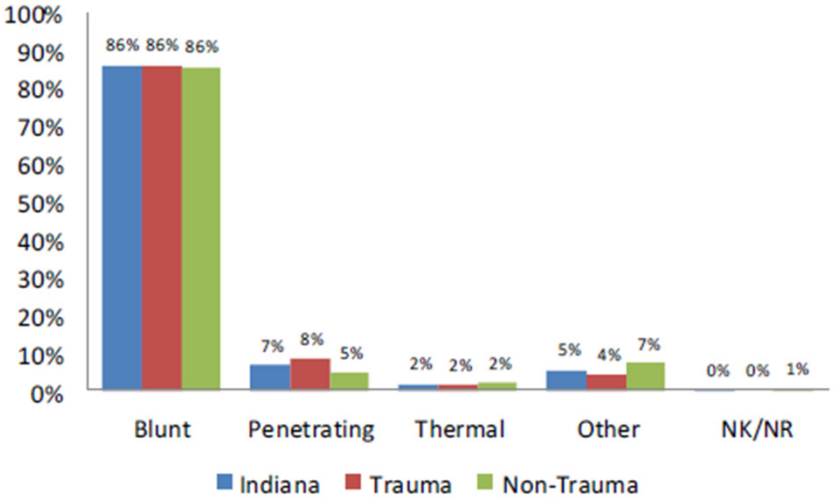


Cause of Injury

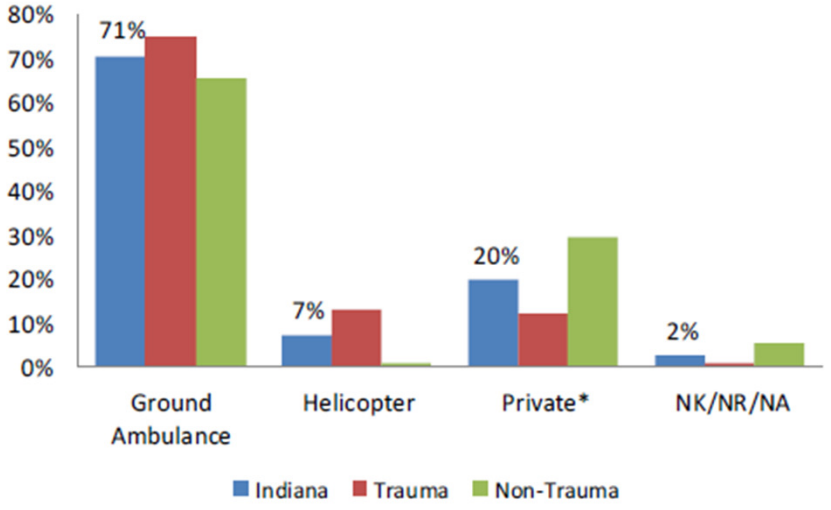


<1% COI: Pedestrian Traffic Accident, Natural/Environment, Fire/Burn, Overexertion, Bites/Stings, No E-Code

Trauma Type



Transport Mode

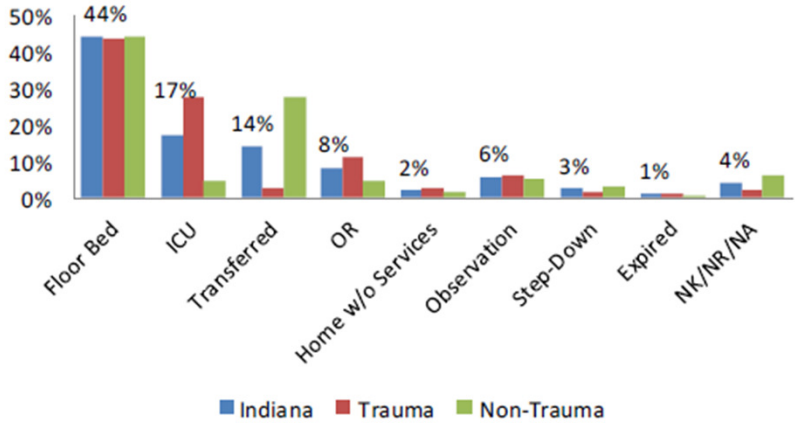


<1% Transport Mode: Police, Other

* Indicates Private/ Public Vehicle, Walk-in

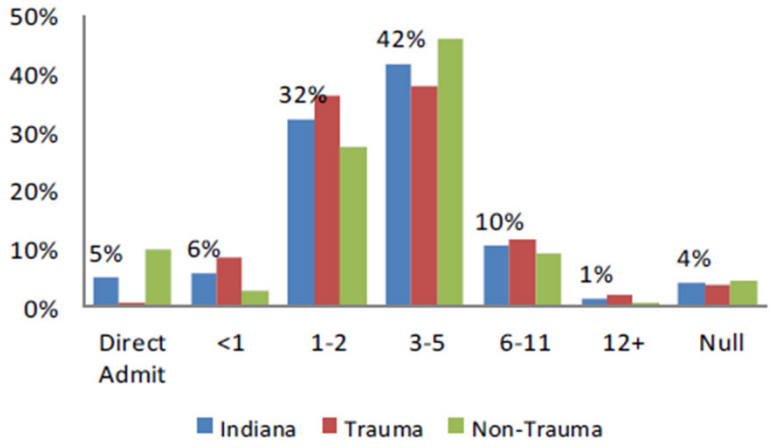
ED: Disposition / Length of Stay – Page 4

ED Disposition by Percentage

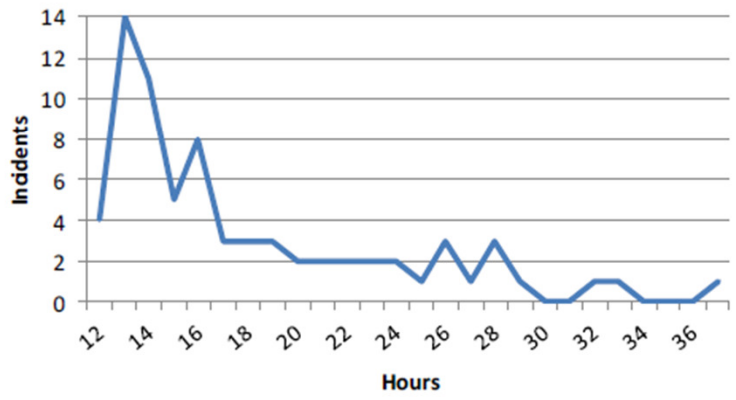


<1% ED Disposition: AMA; Home with Services; Other

ED Length of Stay (Hours)

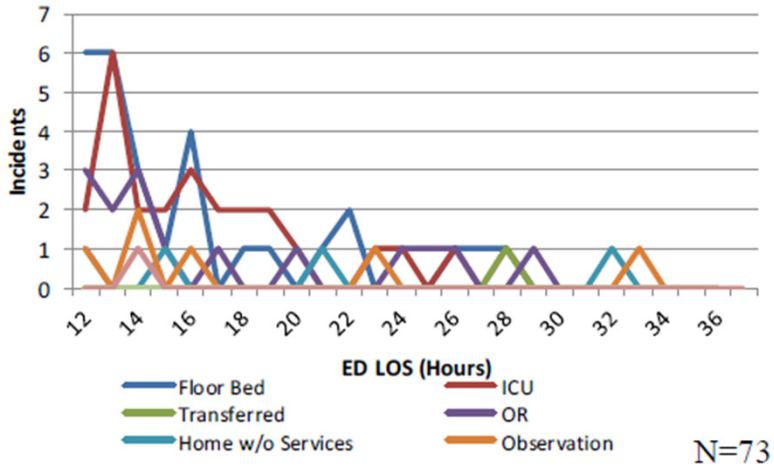


ED LOS >12 Hours



N=73

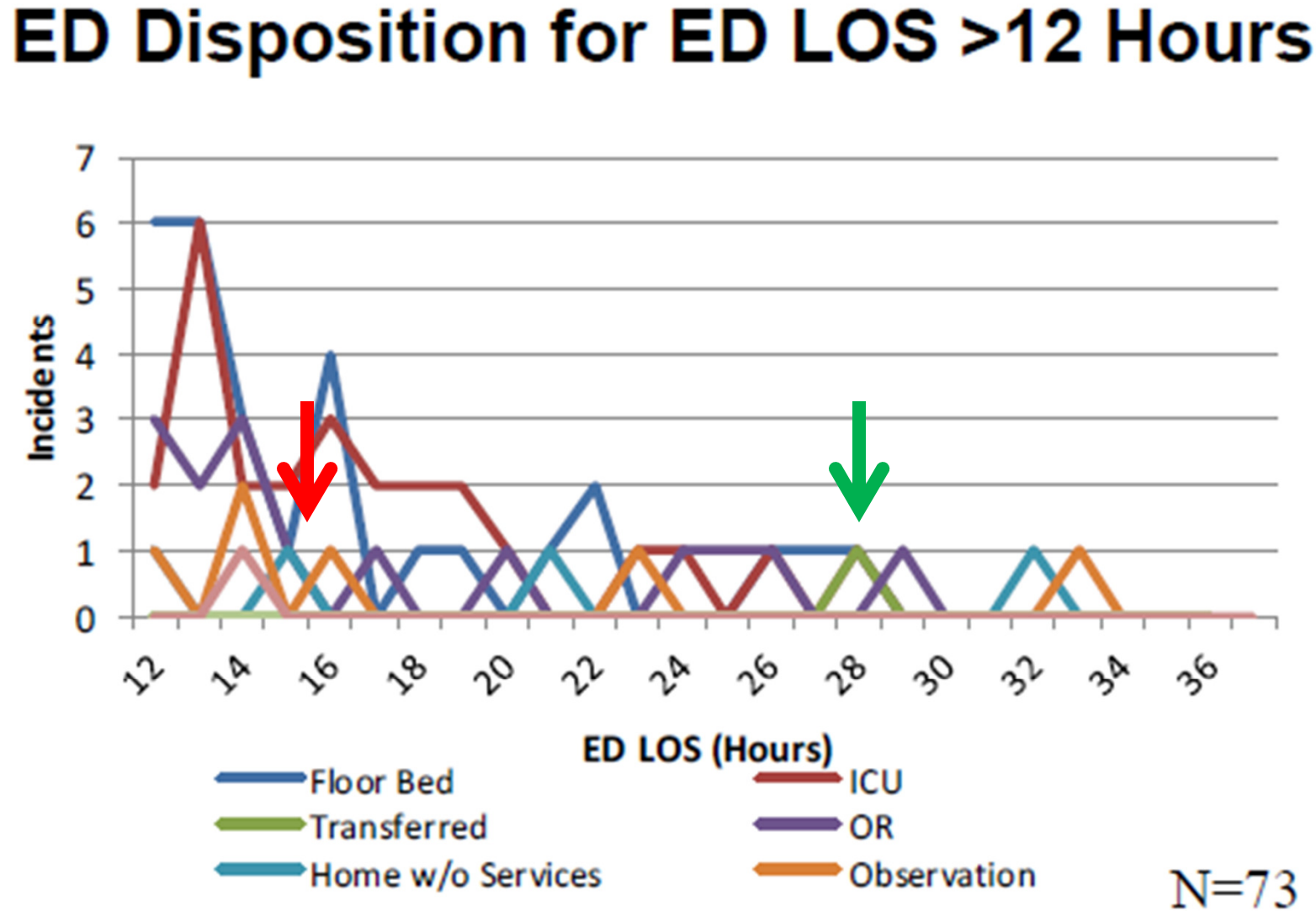
ED Disposition for ED LOS >12 Hours



N=73

One Patient Expired at 14 Hours

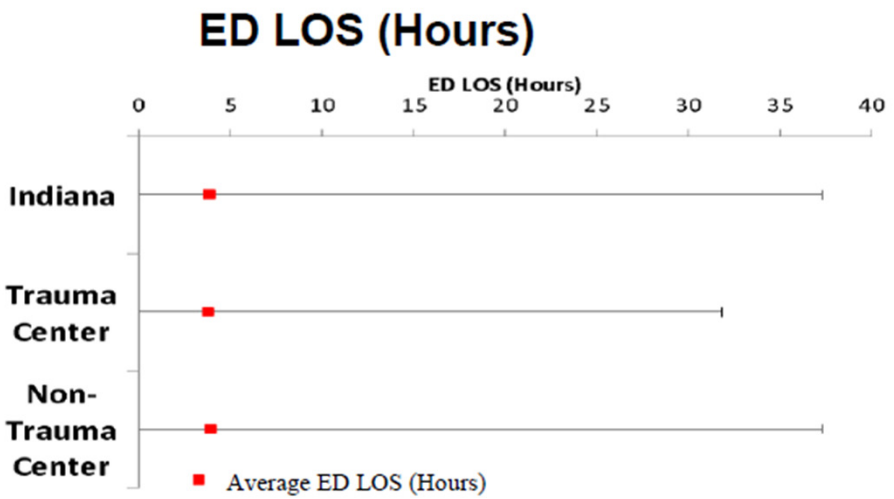
ED: Disposition / Length of Stay – Page 4

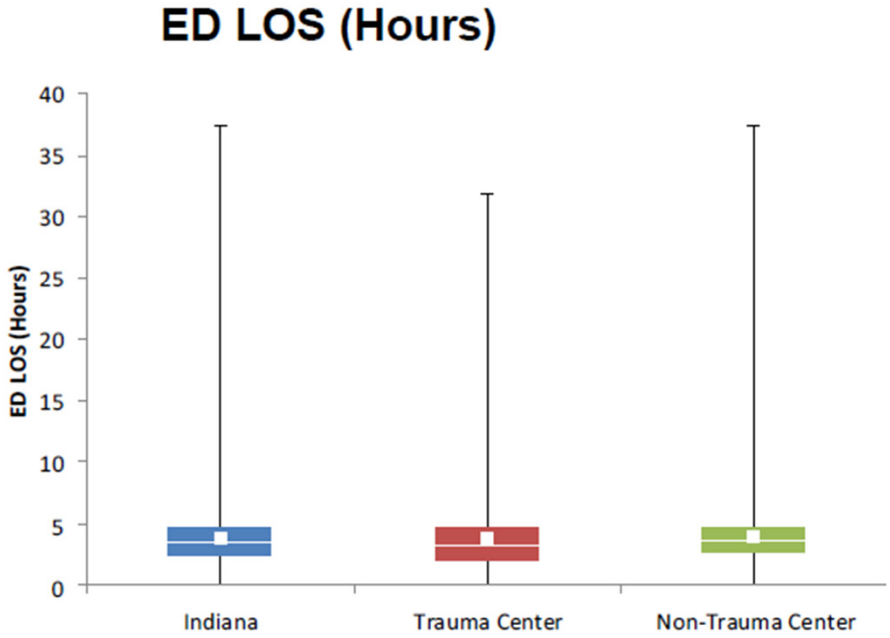


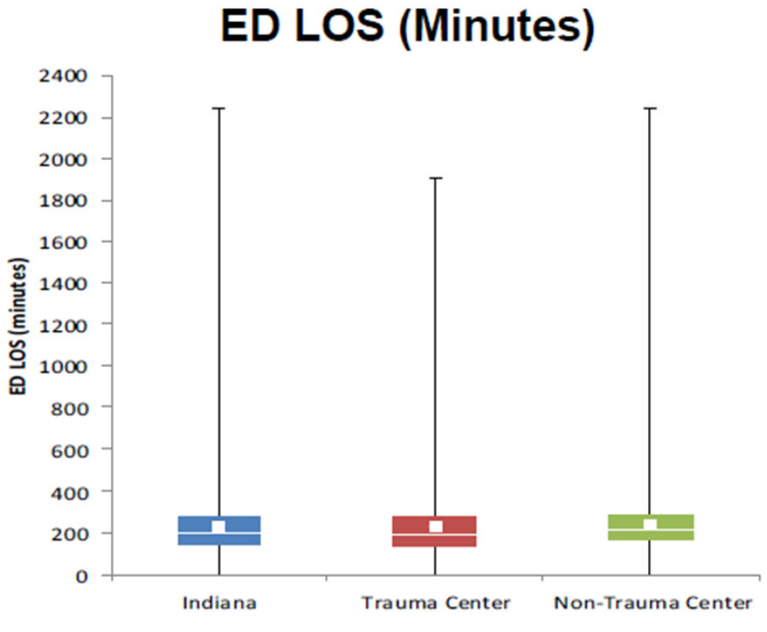
N=73

One Patient Expired at 14 Hours

ED Length of Stay: Bar & Whisker – Page 5

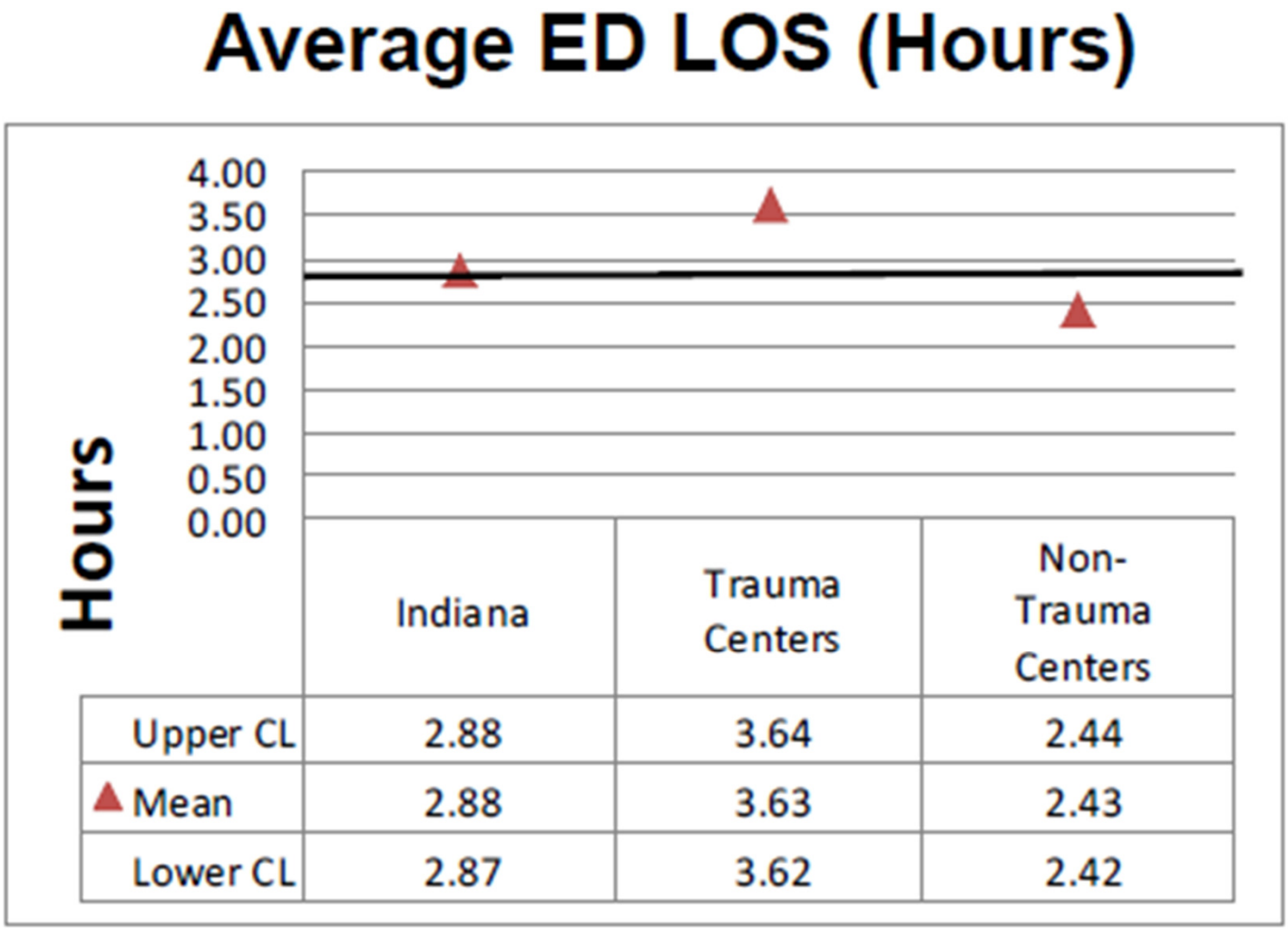






A table with all the values for ED LOS is found on page 22. An explanation and example of bar and whisker plots can be found on page 25.

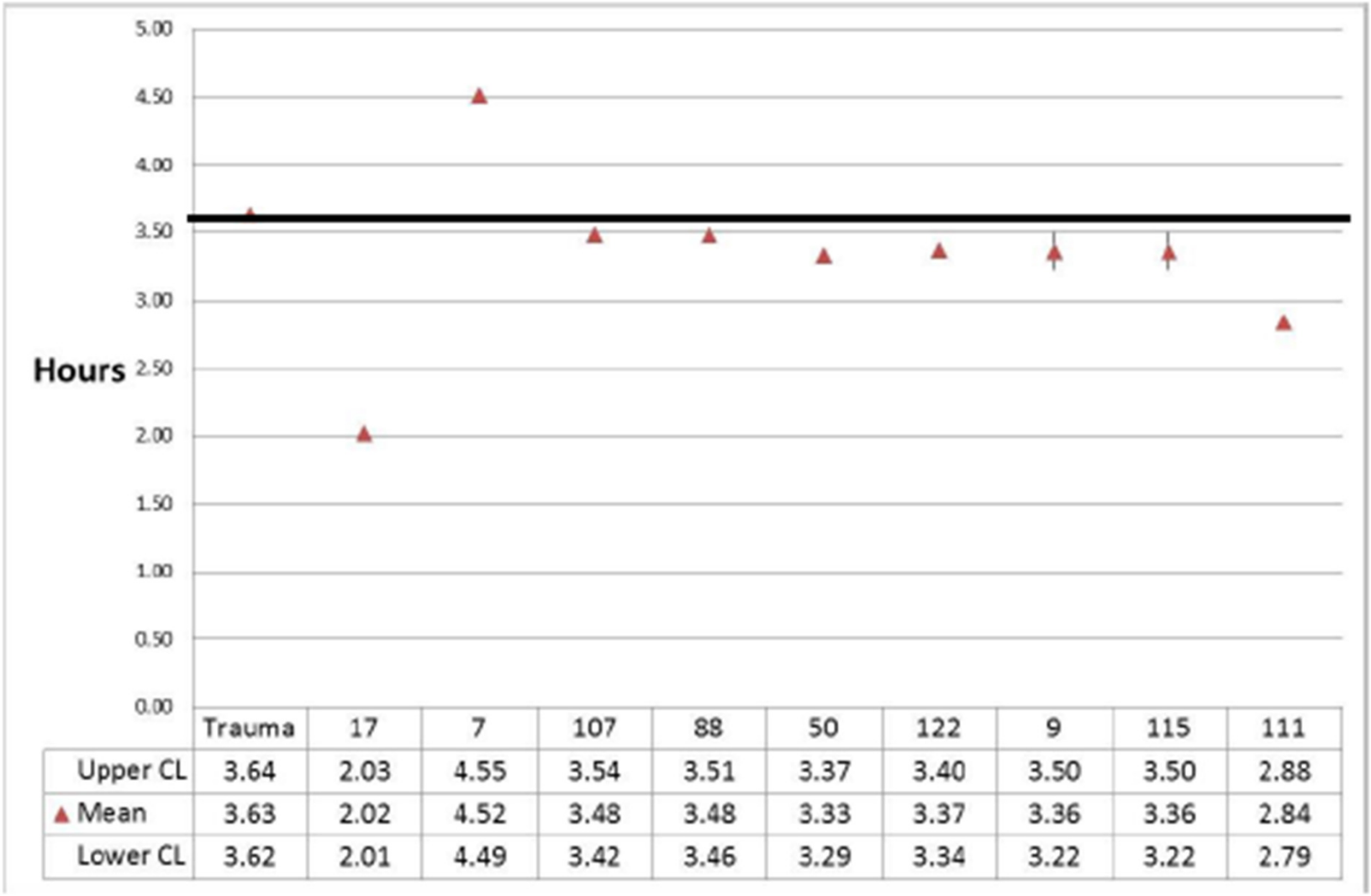
AVERAGE ED LOS: CATERPILLAR GRAPH – PAGE 6



	Indiana	Trauma Centers	Non-Trauma Centers
Upper CL	2.88	3.64	2.44
▲ Mean	2.88	3.63	2.43
Lower CL	2.87	3.62	2.42

AVERAGE ED LOS: CATERPILLAR GRAPH – PAGE 6

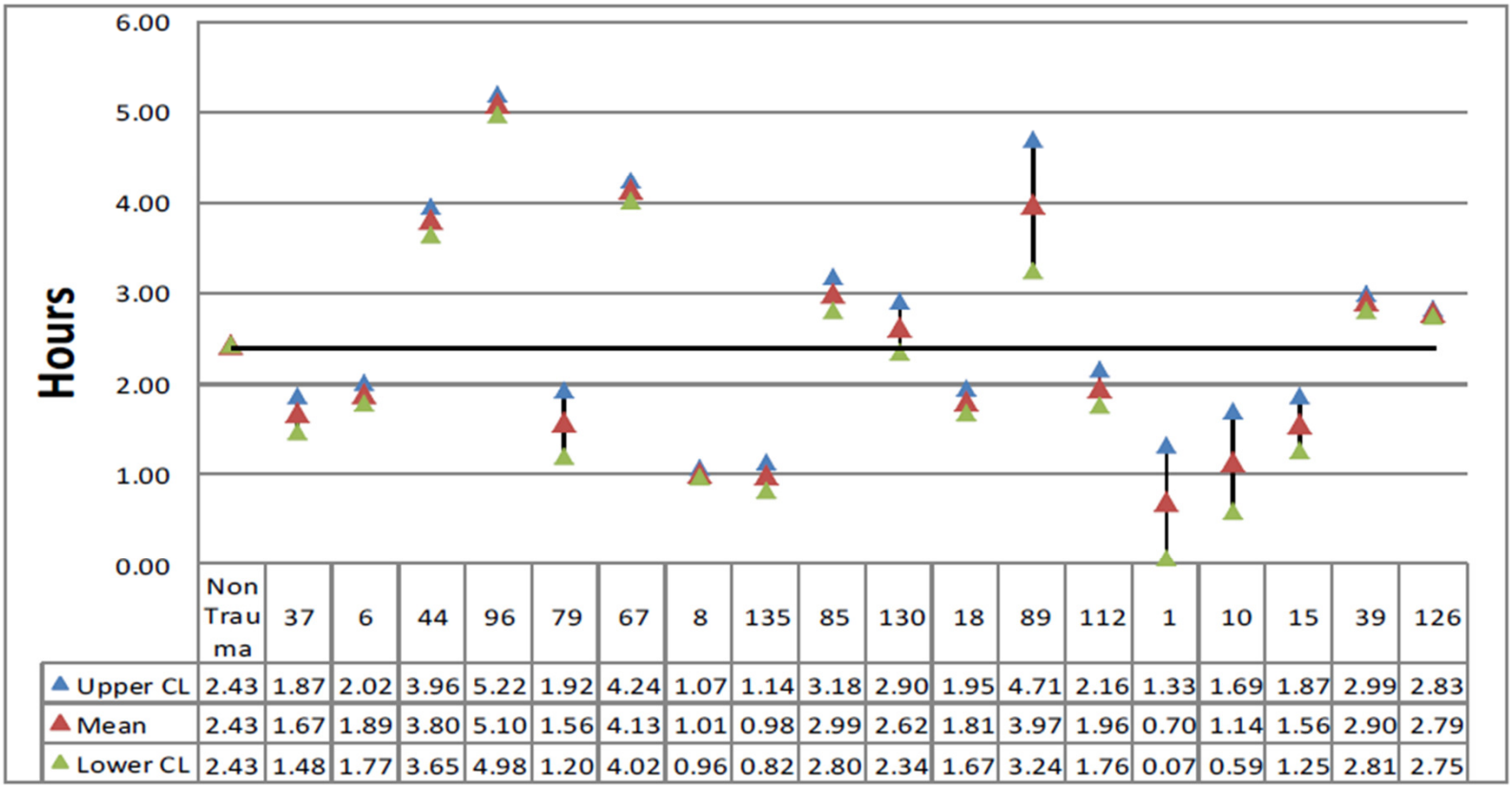
Trauma Centers-Average ED LOS (Hours)



	Trauma	17	7	107	88	50	122	9	115	111
Upper CL	3.64	2.03	4.55	3.54	3.51	3.37	3.40	3.50	3.50	2.88
▲ Mean	3.63	2.02	4.52	3.48	3.48	3.33	3.37	3.36	3.36	2.84
Lower CL	3.62	2.01	4.49	3.42	3.46	3.29	3.34	3.22	3.22	2.79

AVERAGE ED LOS: CATERPILLAR GRAPH – PAGE 7

Non-Trauma Centers- Average ED LOS (Hours)

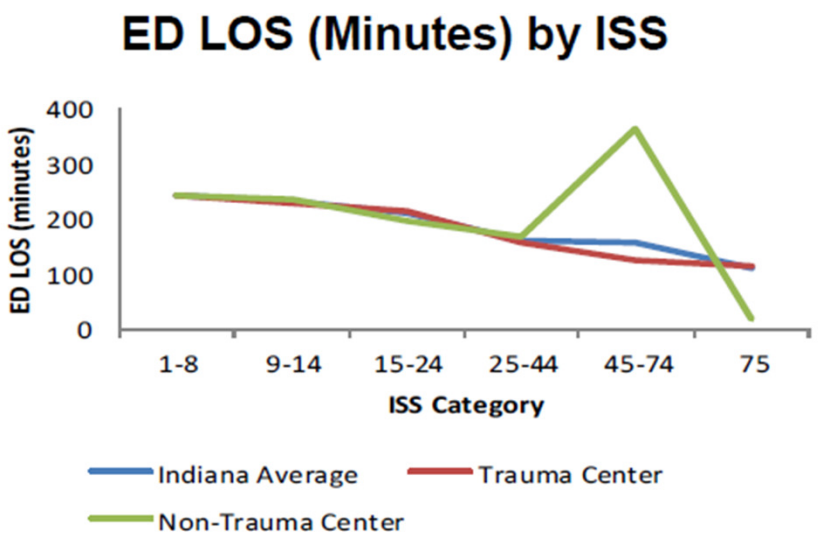


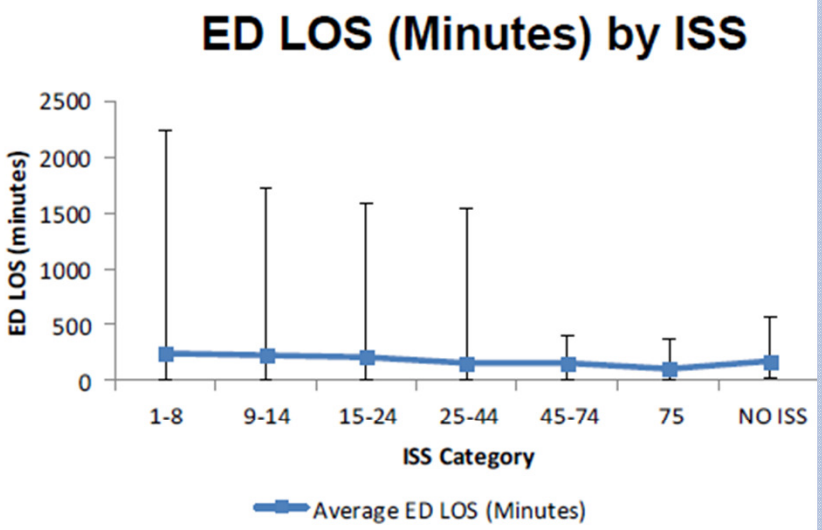
	Non Trauma	37	6	44	96	79	67	8	135	85	130	18	89	112	1	10	15	39	126
▲ Upper CL	2.43	1.87	2.02	3.96	5.22	1.92	4.24	1.07	1.14	3.18	2.90	1.95	4.71	2.16	1.33	1.69	1.87	2.99	2.83
▲ Mean	2.43	1.67	1.89	3.80	5.10	1.56	4.13	1.01	0.98	2.99	2.62	1.81	3.97	1.96	0.70	1.14	1.56	2.90	2.79
▲ Lower CL	2.43	1.48	1.77	3.65	4.98	1.20	4.02	0.96	0.82	2.80	2.34	1.67	3.24	1.76	0.07	0.59	1.25	2.81	2.75

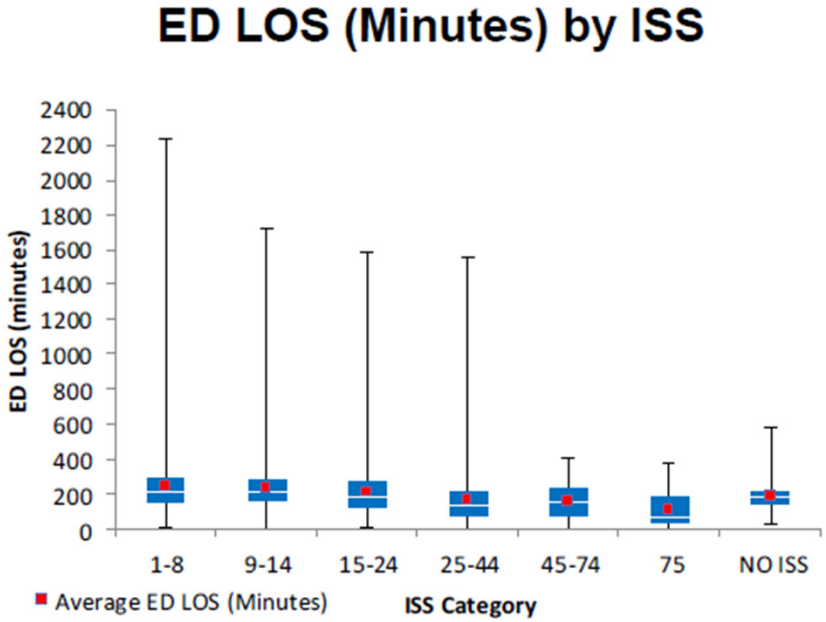
The purpose of the caterpillar graphs is to compare different groups to the average ED LOS. The Indiana mean is the comparison group, which is represented by the black line.

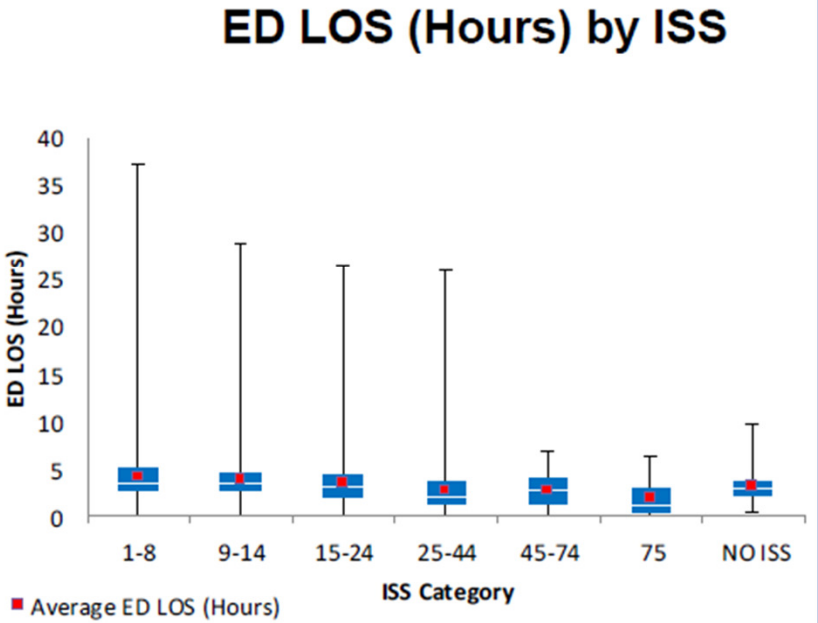
In the chart above, the data is for the non-trauma centers. The non-trauma center average is in the first column on the left side. Each non-trauma center has been assigned a random number for confidentiality. The mean, 95% confidence limit and lower confidence limit is listed for each group.

ED LOS BY ISS – PAGE 8



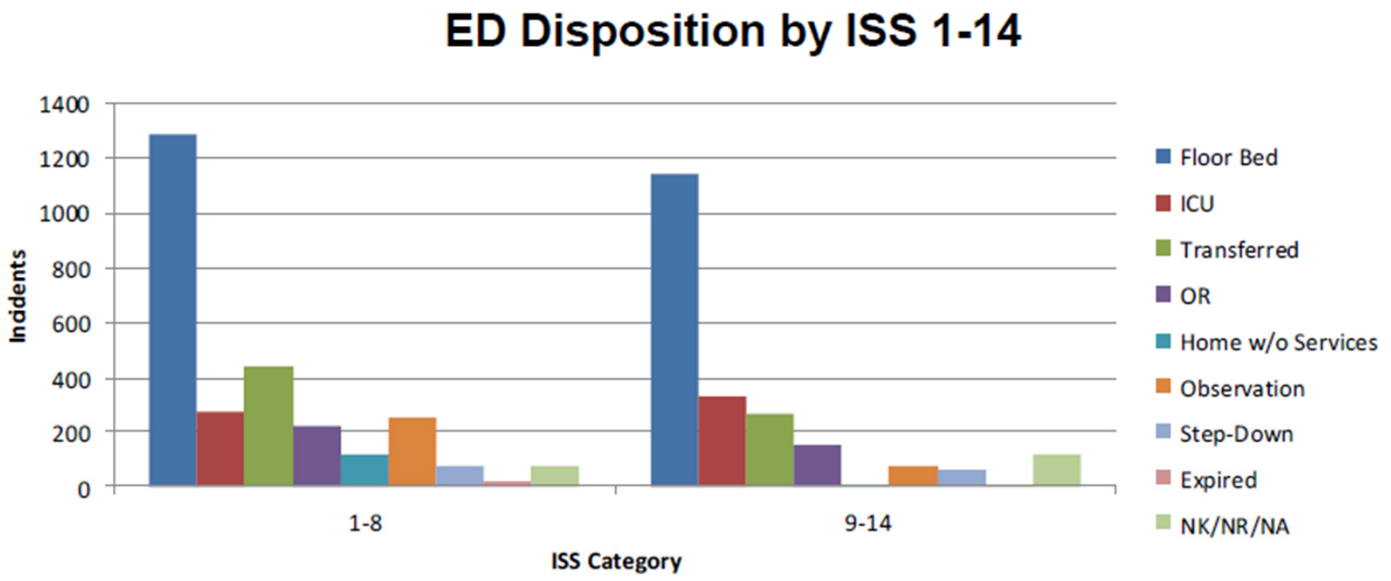


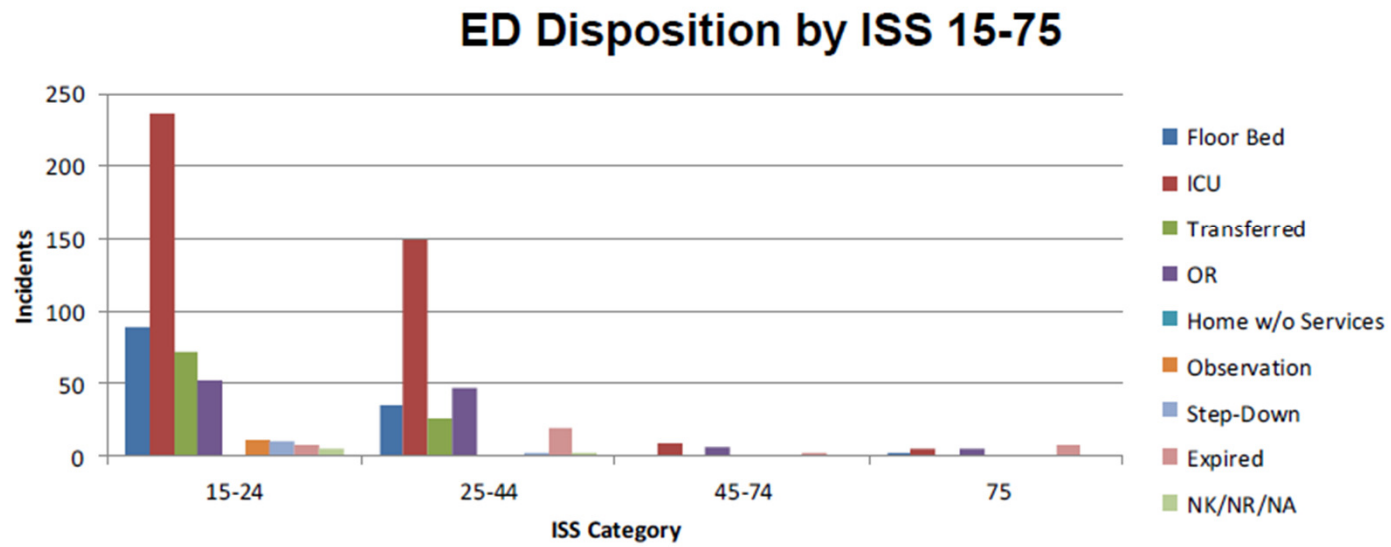




*A table with values for ED LOS by ISS is found on page 22. Note for ED LOS by ISS, there were 3 cases at Non-Trauma Centers with ISS greater than 45.

ED Disposition by ISS – Page 9

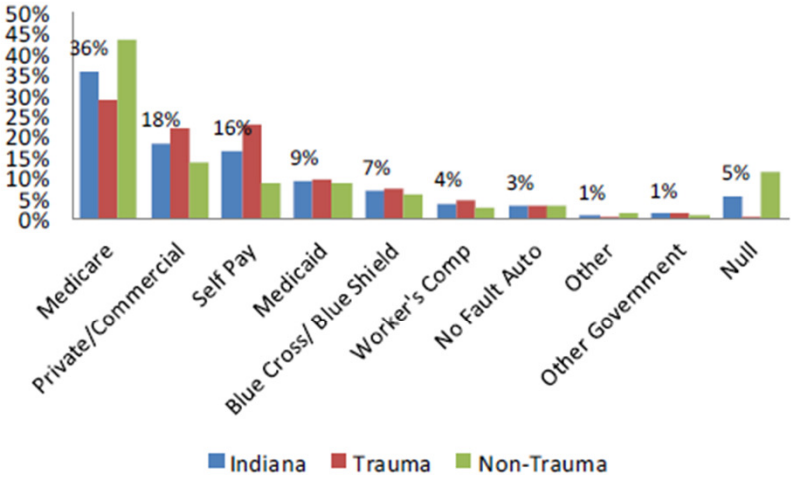




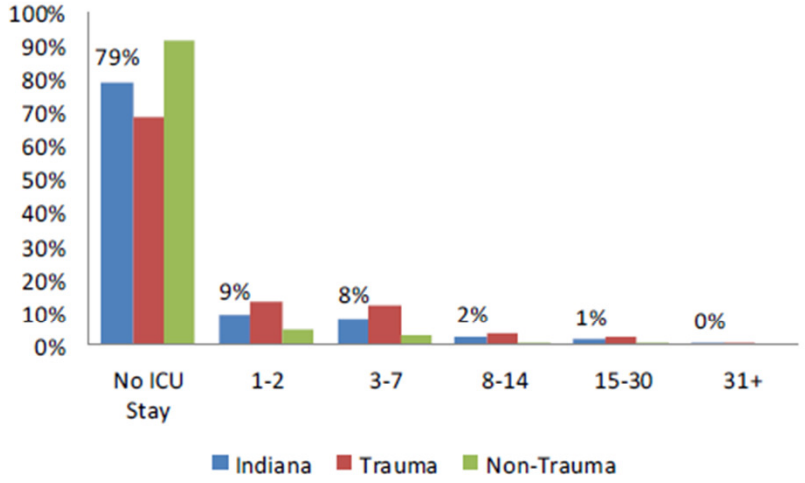
ED Disposition <1%: AMA; Home with services; Other (Jail, Mental Institution, etc.). Please note the difference in axis scale between the top and bottom graphs.
*A table with values for ED Disposition by ISS is found on page 23.

PATIENT OUTCOMES– PAGE 10

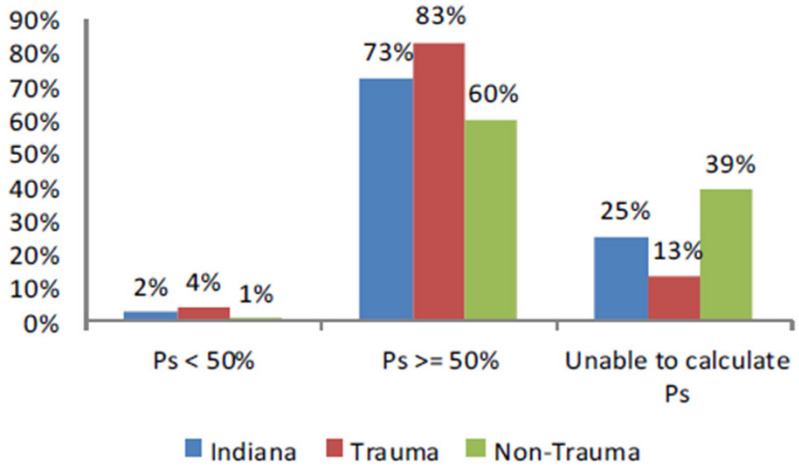
Primary Payer Mix



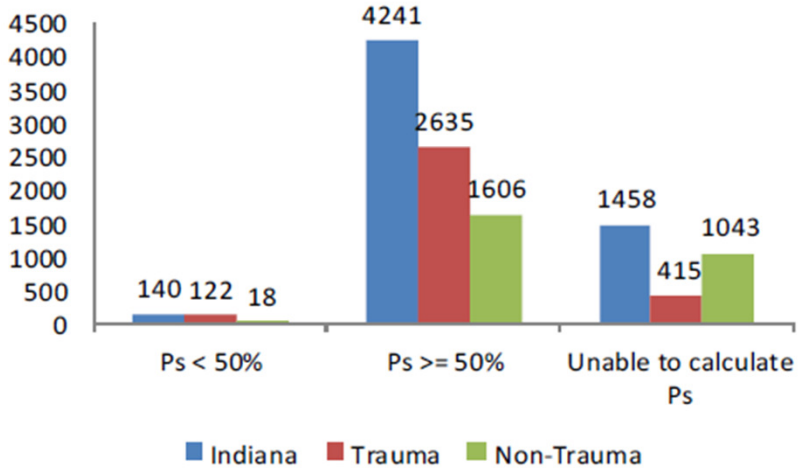
ICU Length of Stay (Days)



Probability of Survival (Ps) by Percent



Probability of Survival (Ps) by Count

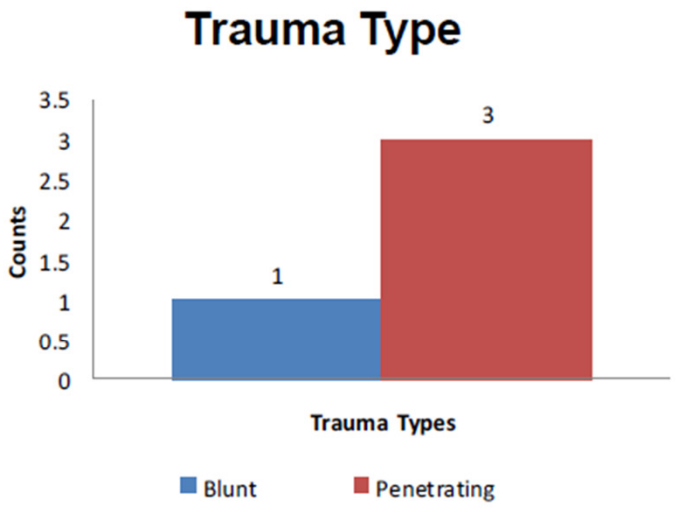


Due to the many data points required to calculate Ps, not every patient has a calculated Ps. These two graph represents 4,381 incidents with calculated Ps.

CASES TO REVIEW – PAGE 11

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

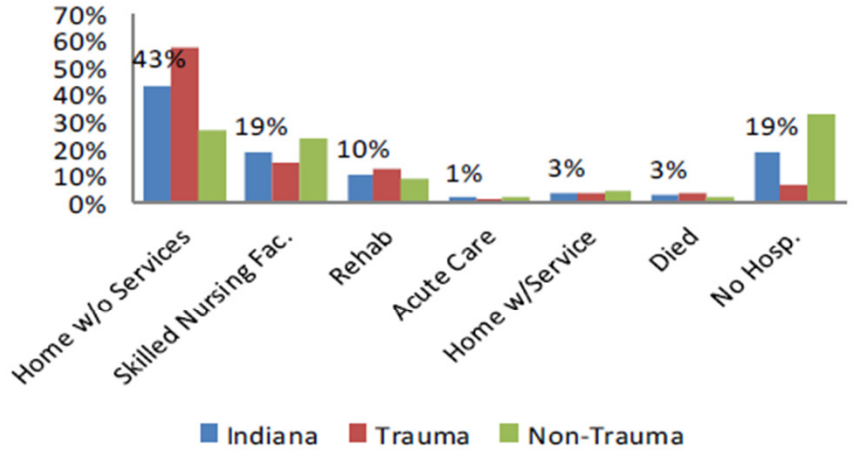
Patients with Ps ≥50% Expired in ED, N=4	
Gender	4 Males
Average Age	33.5 years (19-54 years)
Facilities	3 Non-Trauma Centers 1 Trauma Center
Transport Type	3 Ground ambulance; 1 Private/public vehicle/walk-in
Cause of Injury	1 MVC; 2 Cut/Pierce; 1 Firearm
Inter-Facility Transfer	0 Transfers
Average Distance from Scene to Facility	7.2 miles (2.9-13.3 miles)
Signs of Life	2 Arrived with no signs of life; 2 Arrived with signs of life



	Trauma Type	ISS	RTS- GCS Scale	RTS-Systolic Scale	RTS-Respiratory Scale	Revised Trauma Score (RTS)	B Value	PS	Signs of life
1	Penetrating	2	0	4	3	3.80	1.11	0.7525	Arrived with no signs of Life
2	Penetrating	26	4	4	3	7.55	3.27	0.9634	Arrived with signs of Life
3	Penetrating	14	3	4	3	6.61	3.12	0.9578	Arrived with signs of Life
4	Blunt	20	0	4	3	3.80	0.95	0.7221	Arrived with no signs of Life

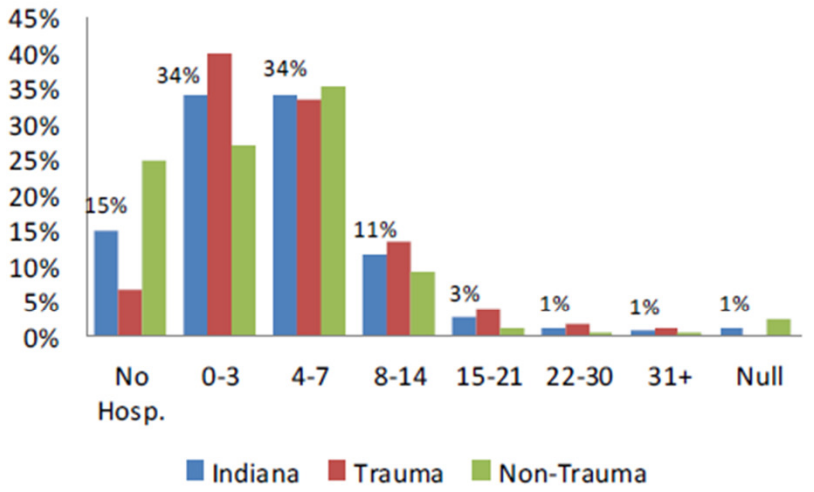
Hospital Disposition / Length of Stay – Page 12

Hospital Disposition

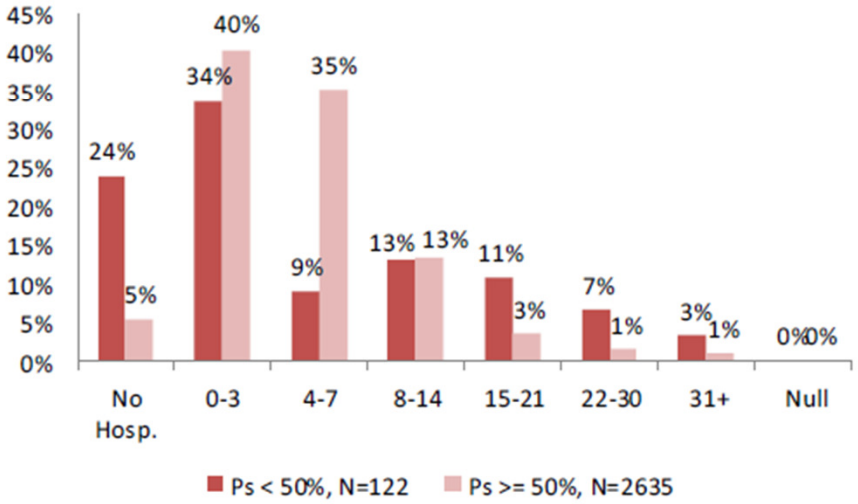


*<1% Hospital Disposition: Intermediate Care Center, Hospice Care, AMA

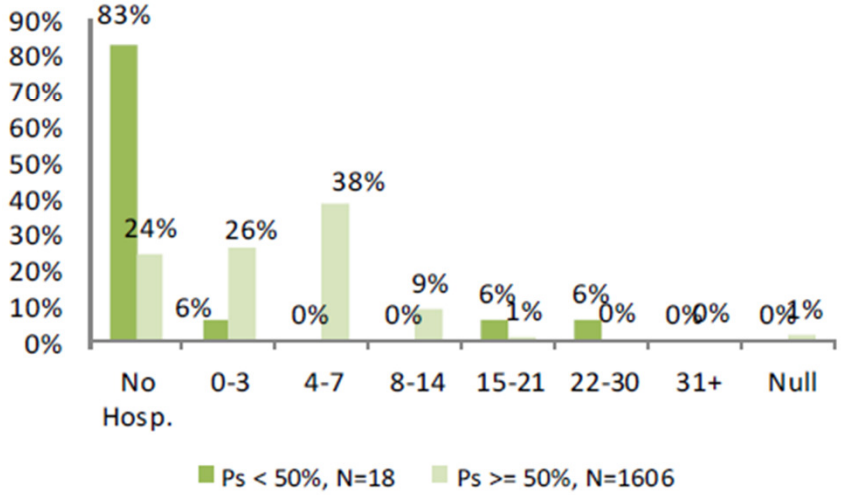
Hospital Length of Stay (days)



Hospital LOS (days) by Ps Trauma Centers



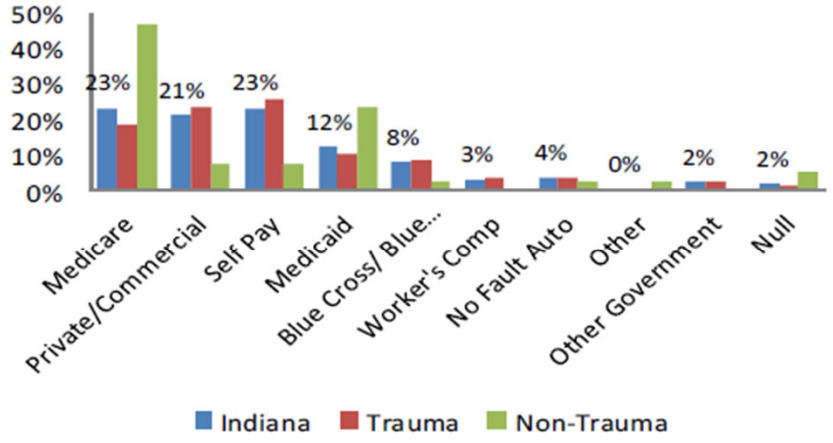
Hospital LOS (days) by Ps Non-Trauma Centers



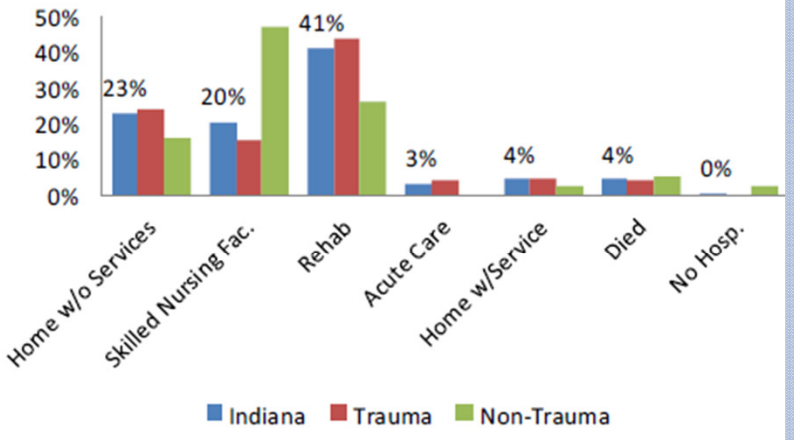
HOSPITAL LENGTH OF STAY > 15 DAYS – PAGE 13

Hospital Length of Stay > 15 days, N=249

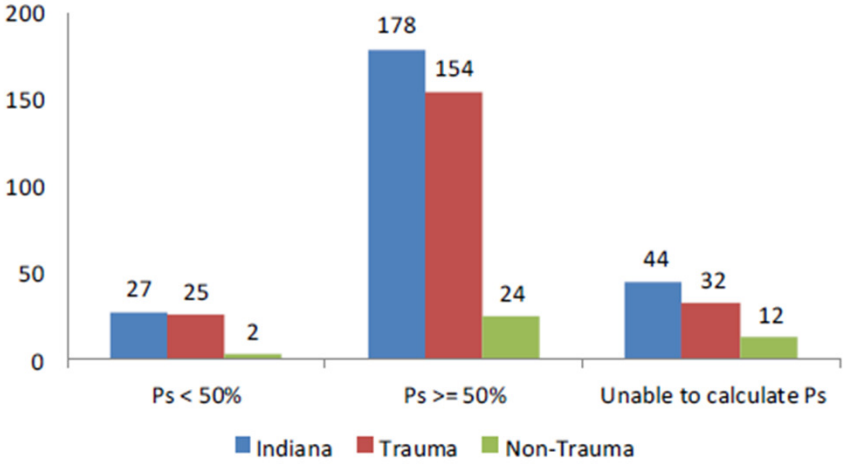
Primary Payer Mix



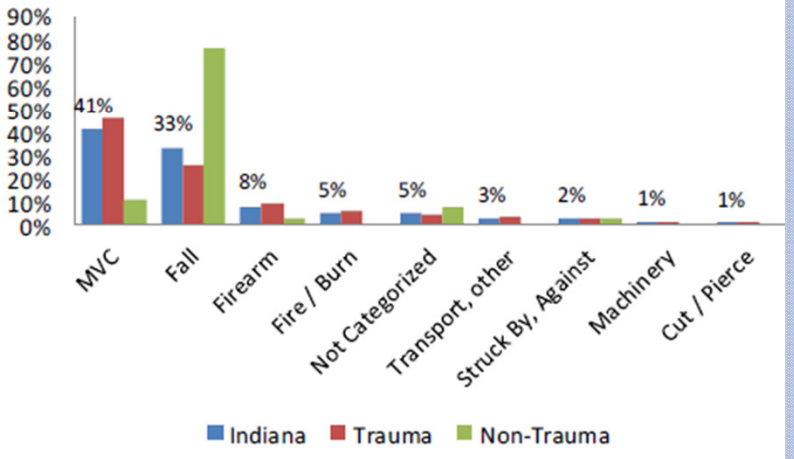
Hospital Disposition



Probability of Survival



Cause of Injury



Hospital Length of Stay > 15 Days: Total N=249; Trauma Center N= 211; Non-Trauma Center N=38

ADDED: TRANSFER CASES COVER PAGE – PAGE 14

Indiana Trauma Registry

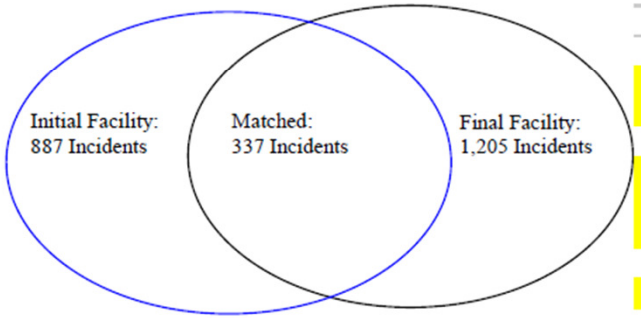
Statewide Quarter 4 Data Report

October 1, 2013 to December 31, 2013
5,839 Incidents-337 Linked Transfer Cases

60 Total Hospitals Reporting

Trauma Centers:	**9 facilities**	**54.3% of data**
(Non-Trauma) Hospitals:	**51 facilities**	**45.7% of data**

For Quarter 4 2013, of the 5,839 incidents reported to the Indiana Trauma Registry, 2,092 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, 337 cases were probabilistically matched. The linked cases make up 11.5% of the Q4 2013 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 then 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 this facility reported data for Quarter 4 2013.

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.

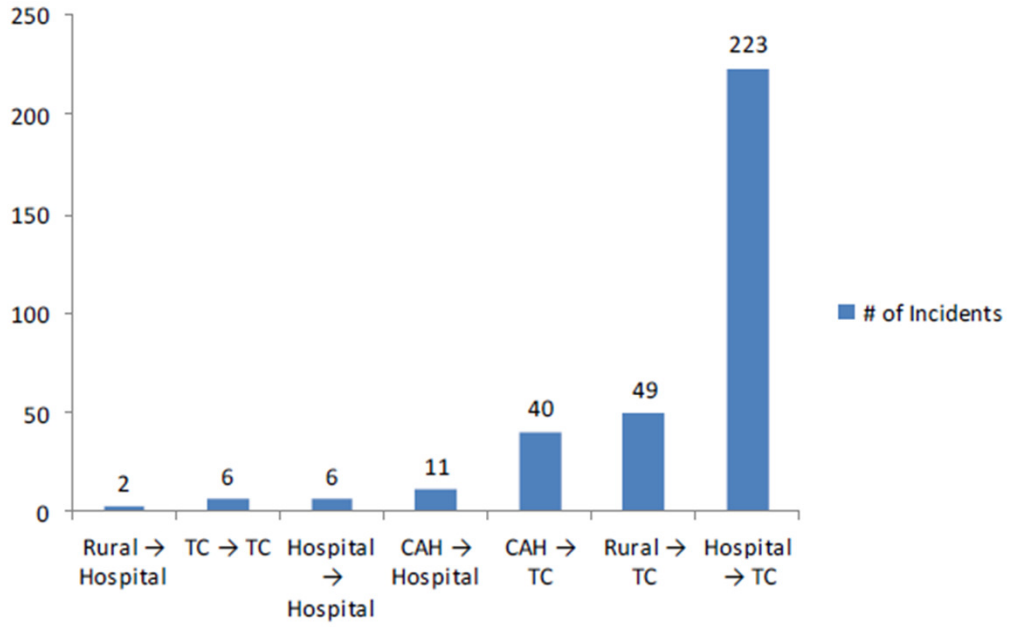
Indiana Critical Access Hospitals (CAHs)	
Adams Memorial Hospital	Pulaski Memorial Hospital
Cameron Memorial Community Hospital	Putnam County Hospital
Community Hospital of Bremen	Rush Memorial Hospital
Decatur County Memorial Hospital	Scott Memorial Hospital
Dukes Memorial Hospital	St. Mary's Warrick Hospital
Gibson General Hospital	St. Vincent – Clay Hospital
Greene County General Hospital	St. Vincent – Dunn Hospital
Harrison County Hospital	St. Vincent – Frankfort Hospital
IU Health – Bedford Hospital	St. Vincent – Jennings Hospital
IU Health – Blackford Hospital	St. Vincent – Mercy Hospital
IU Health – Paoli Hospital	St. Vincent – Randolph Hospital
IU Health – Tipton Hospital	St. Vincent- Salem Hospital
IU Health – White Memorial Hospital	St. Vincent – Williamsport Hospital
Jasper County Hospital	Sullivan County Community Hospital
Jay County Hospital	Union Hospital Clinton
Margaret Mary Community Hospital	Wabash County Hospital
Parkview LaGrange Hospital	Woodlawn Hospital
Perry County Memorial Hospital	
Indiana Rural Hospitals	
Columbus Regional Hospital	Kosciusko Community Hospital
Fayette Regional Health System	Marion General Hospital
Franciscan St. Anthony Health – Michigan City	Memorial Hospital (Logansport)
Franciscan St. Elizabeth Health – Crawfordsville	Memorial Hospital & Health Care Center (Jasper)
Good Samaritan Hospital	Parkview Noble Hospital
Henry County Memorial Hospital	Reid Hospital & Health Care Services
IU Health – LaPorte Hospital	St. Joseph's Regional Medical Center – Plymouth
IU Health – Starke Hospital	Schneck Medical Center
King's Daughters' Health	

Transfer Patient: Facility Type – Page 15

Facility to Facility Transfers

For Transfer Patients:		
Initial Hospital Type	**Final Hospital Type**	**Incident Counts**
Rural Hospital	Hospital	2
Hospital	Hospital	6
Trauma Center	Trauma Center	6
Critical Access Hospital	Hospital	11
Critical Access Hospital	Trauma Center	40
Rural Hospital	Trauma Center	49
Hospital	Trauma Center	233
Total		337

Facility Transfer Type



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

TRANSFER PATIENT DATA AVERAGES – PAGE 16

For Linked Transfer Patients:

For Transfer Patients:			
	All Transfer Patients	***Critical**** Transfer Patients	***Physiological Critical**** Transfer Patients
Number of Patients	337	101	64
EMS Notified to Scene	9 minutes	9 minutes	8 minutes
EMS Scene Arrival to Departure	16 minutes	15 minutes	14 minutes
EMS Scene Departure to Initial Hospital ED Arrival	19 minutes	20 minutes	16 minutes
Initial Hospital ED Arrival to Departure	2 hours 58 minutes	2 hours 42 minutes	2 hours 35 minutes
Initial Hospital ED Departure to Final Hospital ED Arrival	1 hour 10 minutes	59 minutes	56 minutes
TOTAL TIME	4 hours 52 minutes	4 hours 25 minutes	4 hours 6 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.

Transfer Patient Data Averages – Page 16

	All Transfer Patients
Number of Patients	337
EMS Notified to Scene	9 minutes
EMS Scene Arrival to Departure	16 minutes
EMS Scene Departure to Initial Hospital ED Arrival	19 minutes
Initial Hospital ED Arrival to Departure	2 hours 58 minutes
Initial Hospital ED Departure to Final Hospital ED Arrival	1 hour 10 minutes
TOTAL TIME	4 hours 52 minutes

Transfer Patient Data Averages – Page 16

	Critical* Transfer Patients
Number of Patients	101
EMS Notified to Scene	9 minutes
EMS Scene Arrival to Departure	15 minutes
EMS Scene Departure to Initial Hospital ED Arrival	20 minutes
Initial Hospital ED Arrival to Departure	2 hours 42 minutes
Initial Hospital ED Departure to Final Hospital ED Arrival	59 minutes
TOTAL TIME	4 hours 25 minutes

Critical Patient defined as:

- ISS > 15

OR

- GCS ≤ 12

OR

- Shock Index > 0.9

TRANSFER PATIENT DATA AVERAGES – PAGE 16

	Physiological Critical** Transfer Patients
Number of Patients	64
EMS Notified to Scene	8 minutes
EMS Scene Arrival to Departure	14 minutes
EMS Scene Departure to Initial Hospital ED Arrival	16 minutes
Initial Hospital ED Arrival to Departure	2 hours 35 minutes
Initial Hospital ED Departure to Final Hospital ED Arrival	56 minutes
TOTAL TIME	4 hours 6 minutes

Physiological Critical Patient defined as:

- GCS ≤ 12

OR

- Shock Index > 0.9

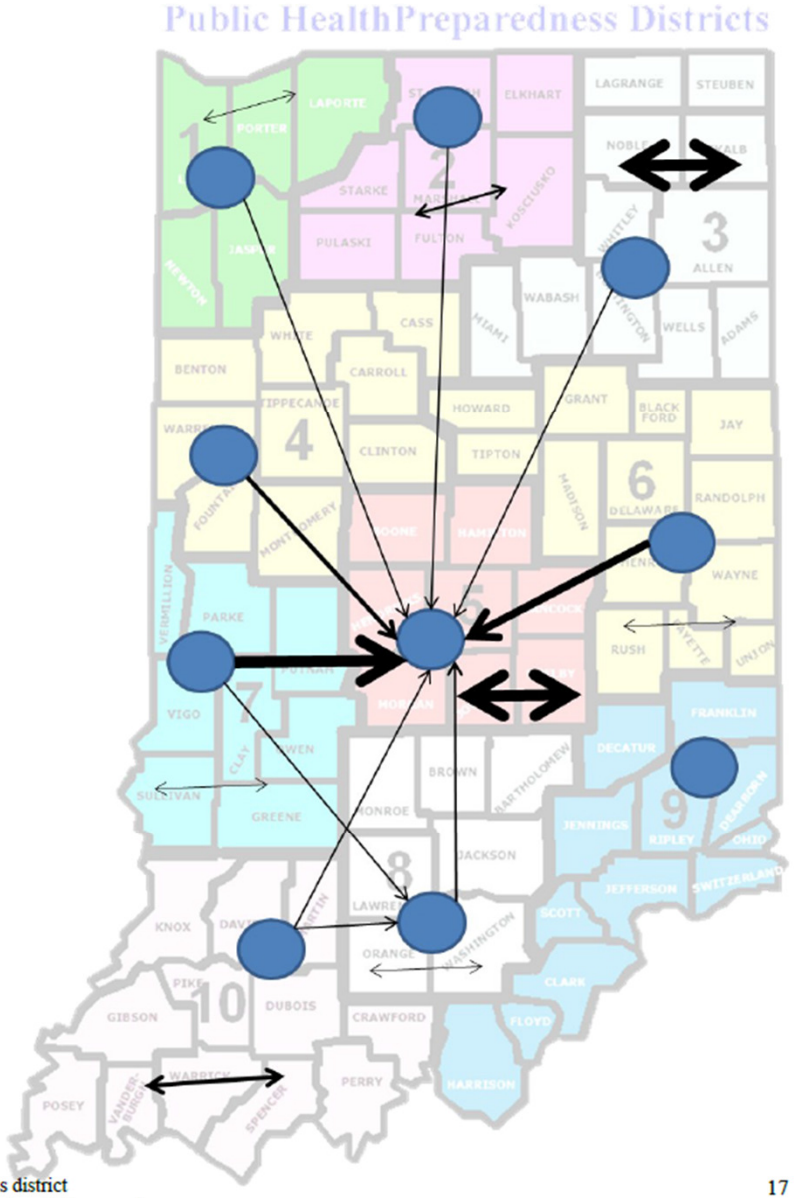
TRANSFER PATIENT DATA – PAGE 17

Statewide Quarter 4 Data Report

October 1, 2013 to December 31, 2013

5,839 Incidents-337 Linked Transfer Cases

For Transfer Patients:		
Public Health Preparedness District Initial Hospital	Public Health Preparedness District Final Hospital	Incident Counts
1	1	5
1	2	2
1	5	1
2	2	12
2	3	6
2	5	3
3	3	50
3	5	3
4	5	21
5	5	58
6	3	13
6	5	45
6	6	1
7	5	72
7	7	3
7	8	1
8	5	17
8	8	7
10	5	6
10	8	1
10	10	10



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

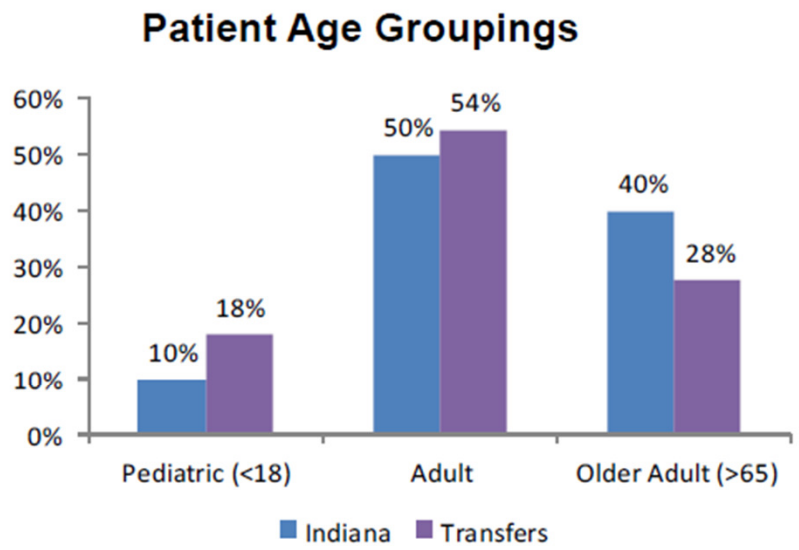
TRANSFER PATIENT DATA – PAGE 18

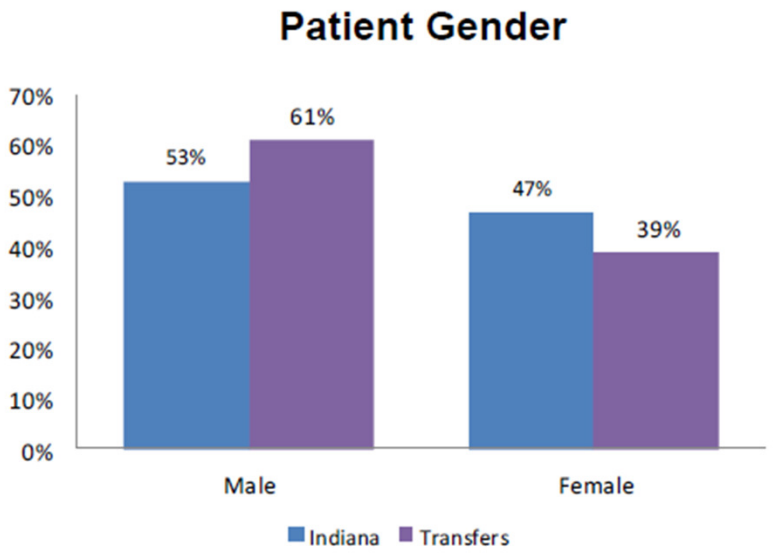
For Linked Transfer Patients:

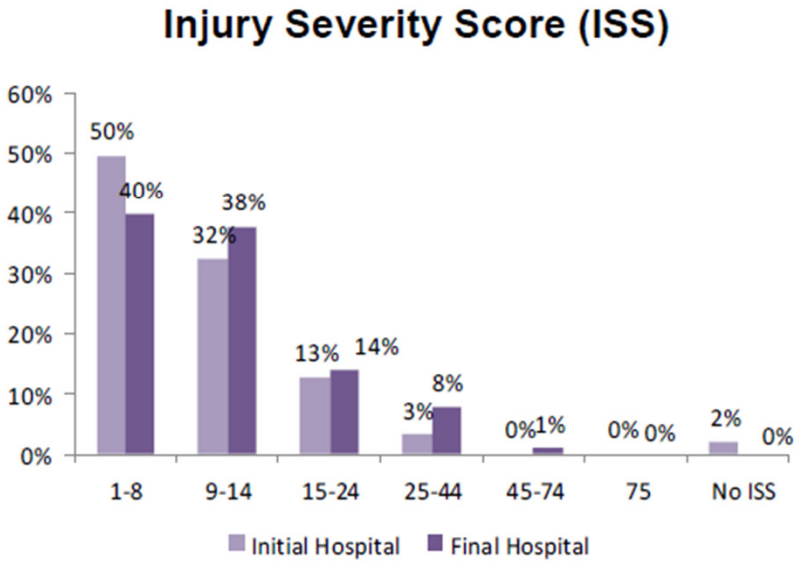
For All Transfer Patients:			
	All Transfer Patients	*Critical** Transfer Patients	*Physiological Critical*** Transfer Patients
Number of Patients	337	101	64
Total Time	4 hours 52 minutes	4 hours 25 minutes	4 hours 6 minutes
Total Mileage	59.67	74	72
Injury Scene to Initial Hospital Mileage***	9.98	15	14
Initial Hospital to Final Facility Mileage	49.69	59	58

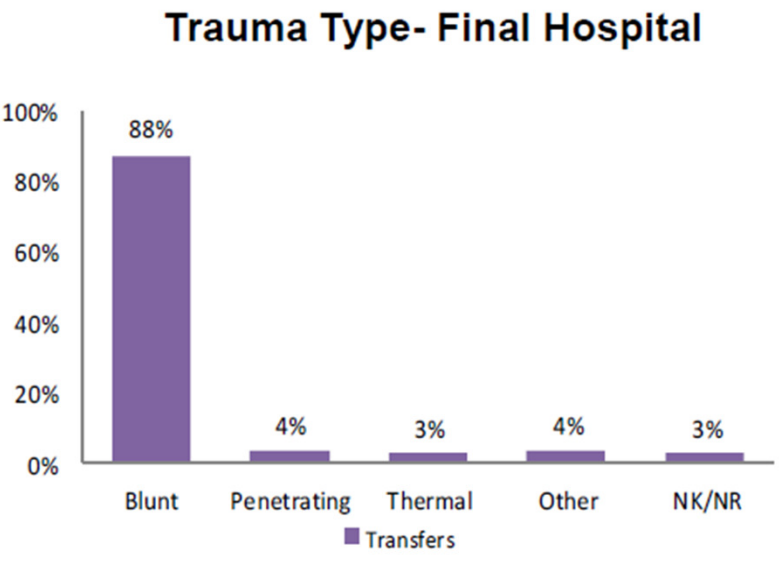
Estimated Average Distance (miles) by Region (region of final hospital):					
Region	Injury Scene to Initial Facility Mileage*	Initial Facility to Final Facility Mileage	Total Mileage	Drive Count	Air Count
Indiana Average	9.98	49.69**	59.67	273	57
North Region	6.27	32.61	38.88	79	6
Central Region	10.51	54.60	65.11	176	50
South Region	20.34	46.44	66.78	18	1

TRANSFER PATIENT POPULATION – PAGE 14



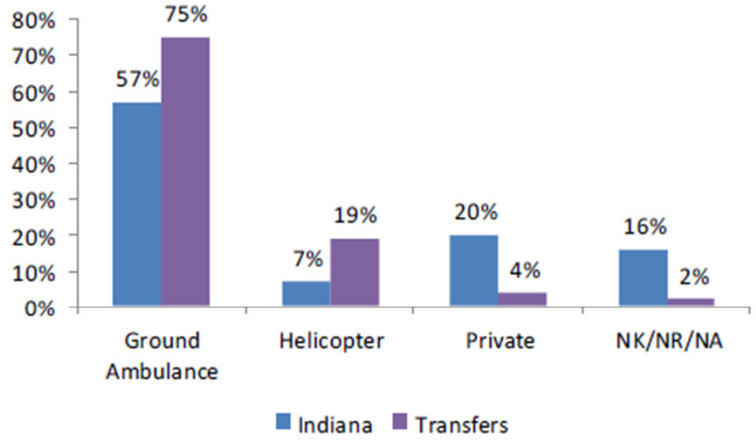






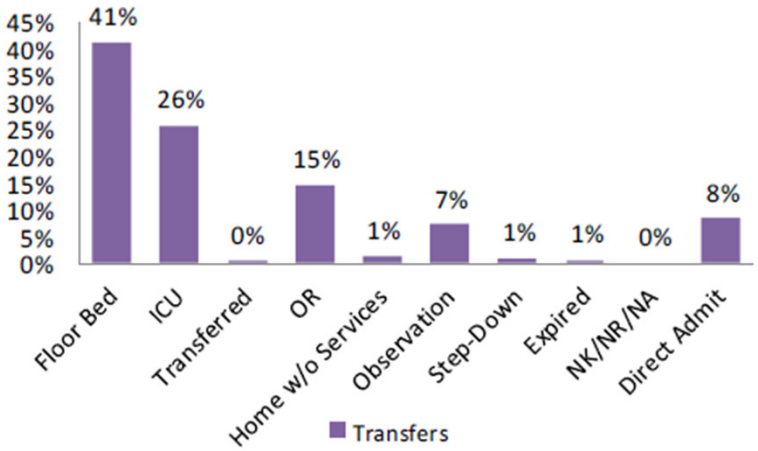
TRANSFER PATIENT POPULATION – PAGE 15

Transport Mode– Final Hospital



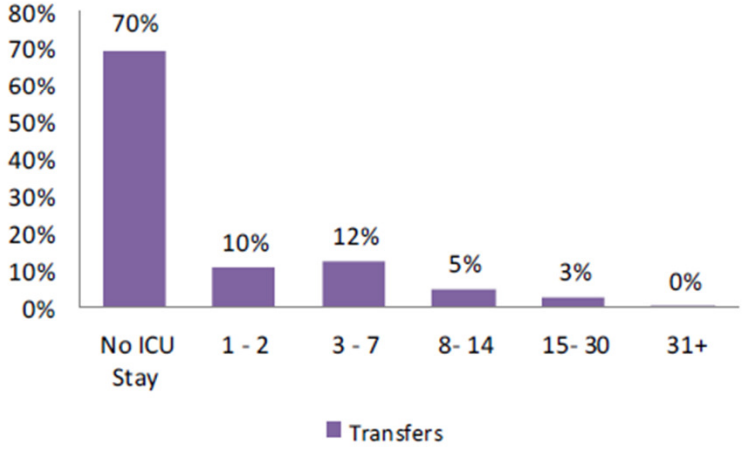
<1% Transport Mode: Police, Other * Indicates Private/ Public Vehicle, Walk-in

ED Disposition by Percentage- Final Hospital



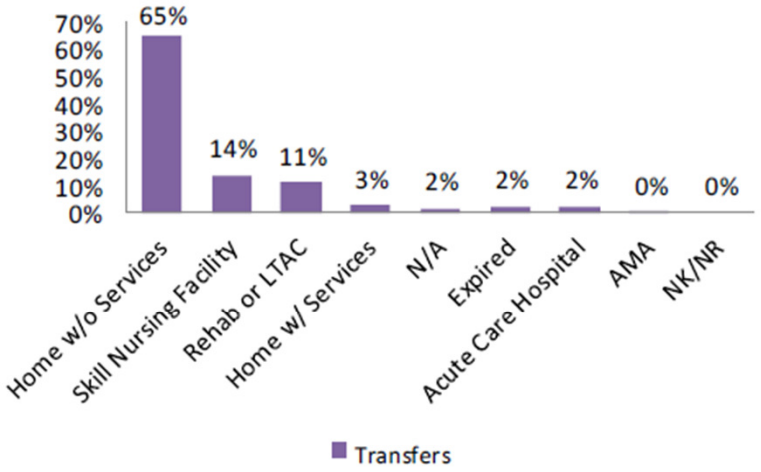
ED Length of Stay (hours)- Final Hospital

ICU Length of Stay (days)- Final Hospital

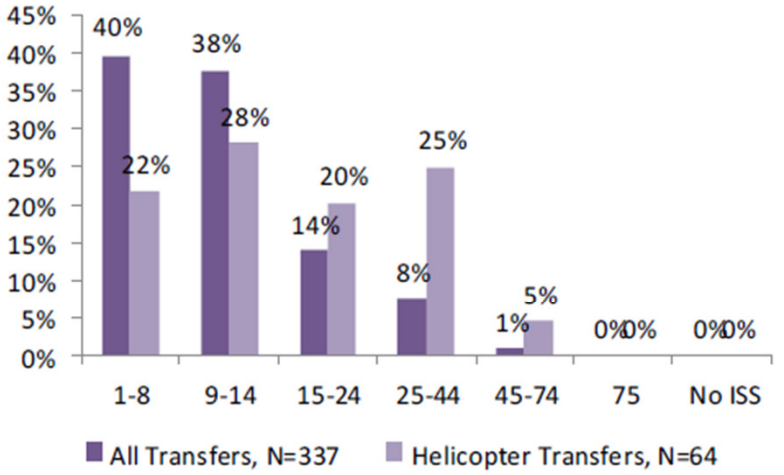


TRANSFER PATIENT POPULATION – PAGE 16

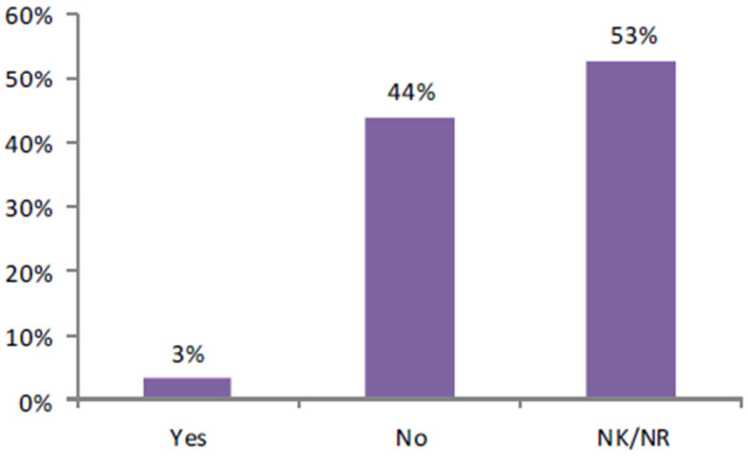
Discharge Disposition– Final Hospital



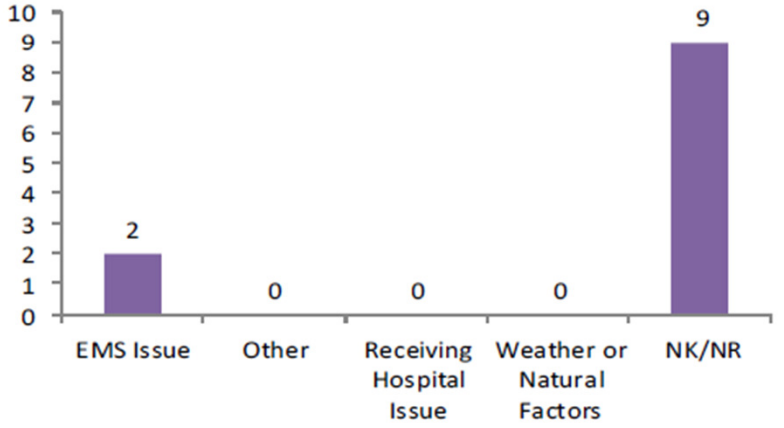
Helicopter Transfers by ISS



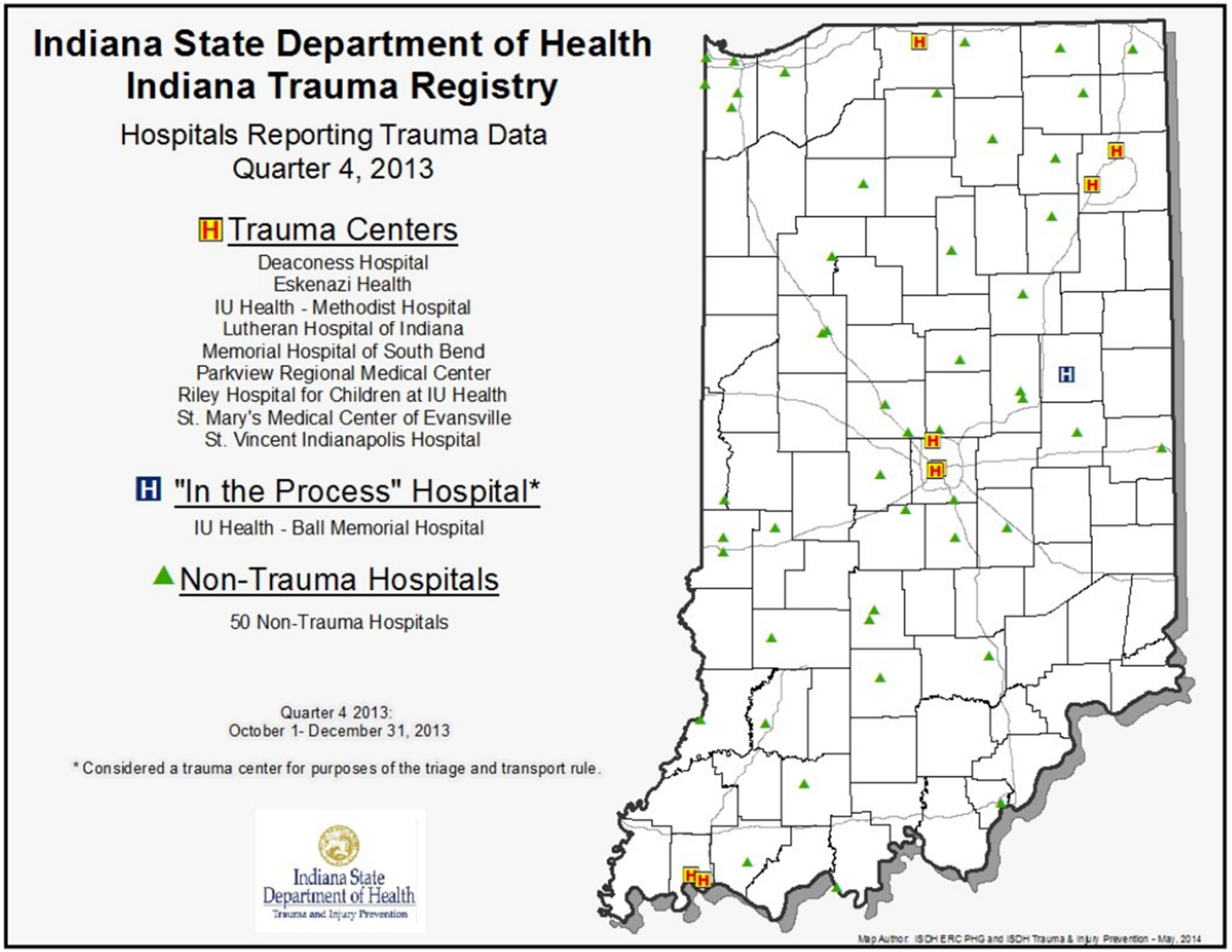
Transfer Delay Indicated- Initial Hospital



Initial Facility Transfer Delay Reason- Initial Hospital



TRAUMA CARE COMMITTEE REQUESTS – PAGE 24



QUESTIONS?

Linked Data Between Trauma & EMS

- 1,192 probabilistically linked cases for Q4 2013 between the EMS Registry and Trauma Registry!!!

What to do now?

Total GCS 1-10				Total GCS 11+		
Medication Given by EMS	Frequency	Percent		Medication Given by EMS	Frequency	Percent
Albuterol Sulfate	0	0.0%		Albuterol Sulfate	1	0.2%
Amiodorone (Cordarone)	0	0.0%		Amiodorone (Cordarone)	1	0.2%
Amyl Nitrate	0	0.0%		Amyl Nitrate	1	0.2%
Aspirin (ASA)	0	0.0%		Aspirin (ASA)	6	1.1%
Dextrose 10% (D10)	0	0.0%		Dextrose 10% (D10)	1	0.2%
Dextrose 50% (D50)	0	0.0%		Dextrose 50% (D50)	1	0.2%
Diphenhydramine (Benadryl)	0	0.0%		Diphenhydramine (Benadryl)	1	0.2%
Dopamine	1	1.9%		Dopamine	2	0.4%
Epinephrine 1:10,000	2	3.7%		Epinephrine 1:10,000	1	0.2%
Etomidate	0	0.0%		Etomidate	1	0.2%
Fentanyl	1	2.0%		Fentanyl	11	2.0%
Furosemide (Lasix)	0	0.0%		Furosemide (Lasix)	1	0.2%
Glucagon	0	0.0%		Glucagon	1	0.2%
Glucose (Oral)	0	0.0%		Glucose (Oral)	2	0.4%
Heparin	0	0.0%		Heparin	1	0.2%
Lactated Ringers	0	0.0%		Lactated Ringers	1	0.2%
Hydromorphone (Dilaudid)	0	0.0%		Hydromorphone (Dilaudid)	10	1.8%
Lorazepam (Ativan)	0	0.0%		Lorazepam (Ativan)	1	0.2%
Morphine Sulfate	0	0.0%		Morphine Sulfate	5	0.9%
Nitroglycerin	0	0.0%		Nitroglycerin	6	1.1%
Normal Saline	0	0.0%		Normal Saline	11	2.0%
Not Applicable	28	51.9%		Not Applicable	263	46.9%
Not Available	0	0.0%		Not Available	5	0.9%
Not Known	13	24.1%		Not Known	130	23.2%
Ondansetron (Zofran)	0	0.0%		Ondansetron (Zofran)	19	3.4%
Oxygen	7	13.0%		Oxygen	68	12.1%
Oxygen (non-rebreather mask)	0	0.0%		Oxygen (non-rebreather mask)	1	0.2%
Oxygen by Blow By	0	0.0%		Oxygen by Blow By	0	0.0%
Oxygen by Nasal Cannula	0	0.0%		Oxygen by Nasal Cannula	8	1.4%
Terbutaline (Brethine)	1	2.0%		Terbutaline (Brethine)	0	0.0%
Thiamine	1	2.0%		Thiamine	0	0.0%
Vasopressin	0	0.0%		Vasopressin	1	0.2%
	54	100%			561	100%

ISDH EMS Registry Data

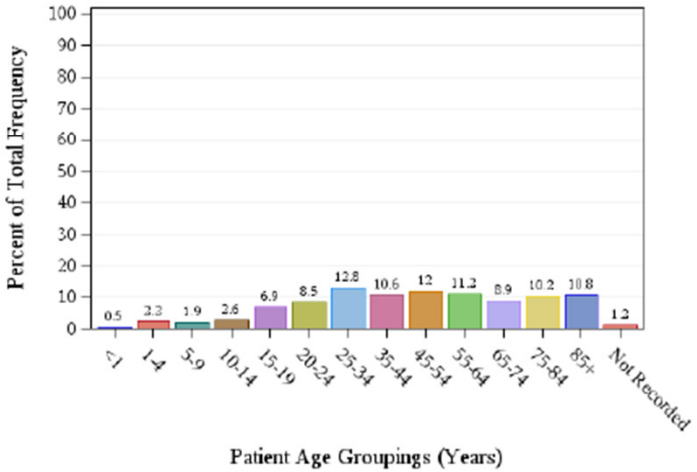
- 28,308 *traumatic injury* incidents
  - Possible Injury indicated
  - Provider Primary Impression
  - Provider Secondary Impression
  - Complaint Reported by Dispatch is trauma injury
- January 1, 2013 to April 30, 2014
- ***91*** total providers reporting

364,000+ runs in the ISDH EMS Registry

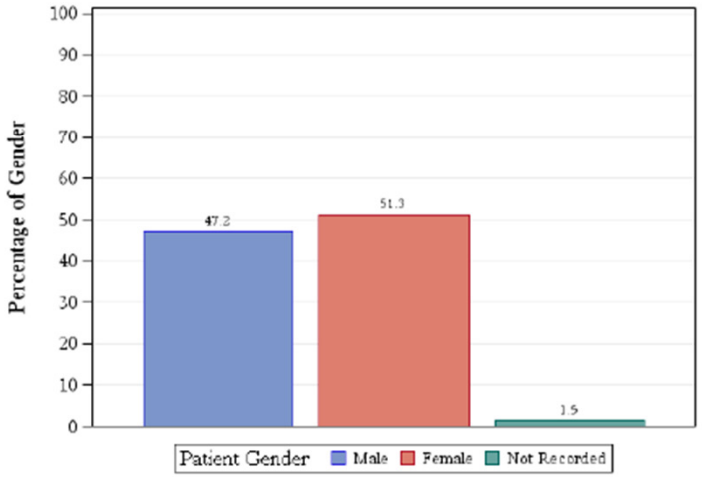
Indiana State Department of Health

Indiana Trauma Registry- Prehospital Data Report
28,308 Traumatic Injury Incidents*
01/01/2013 - 4/30/2014 91 Total Providers Reporting

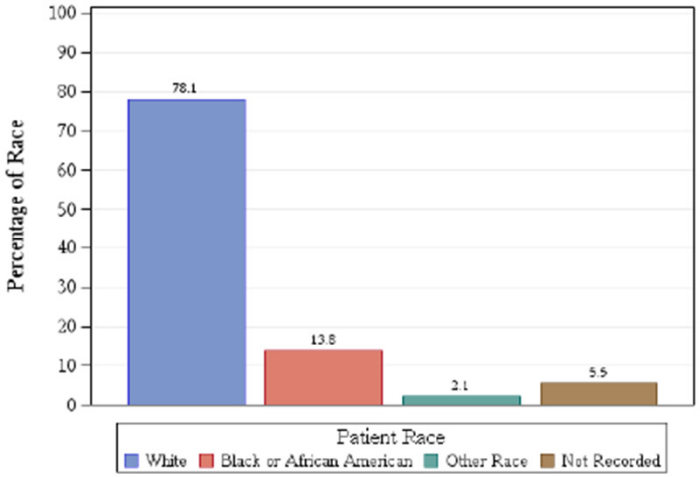
Patient Age Groupings (Years)



Patient Gender

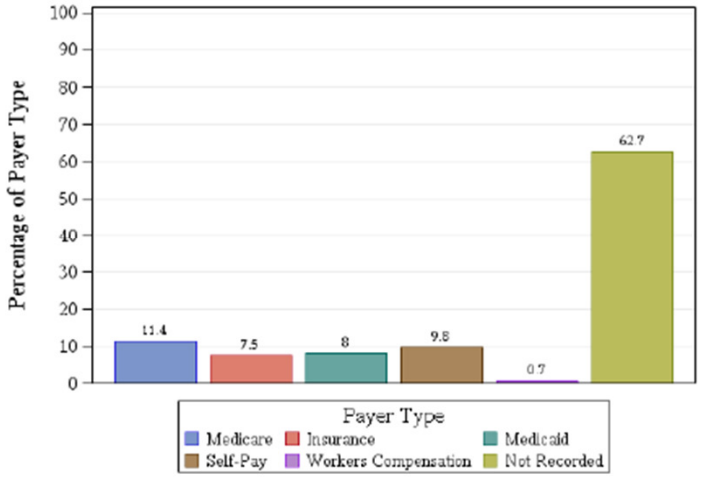


Patient Race



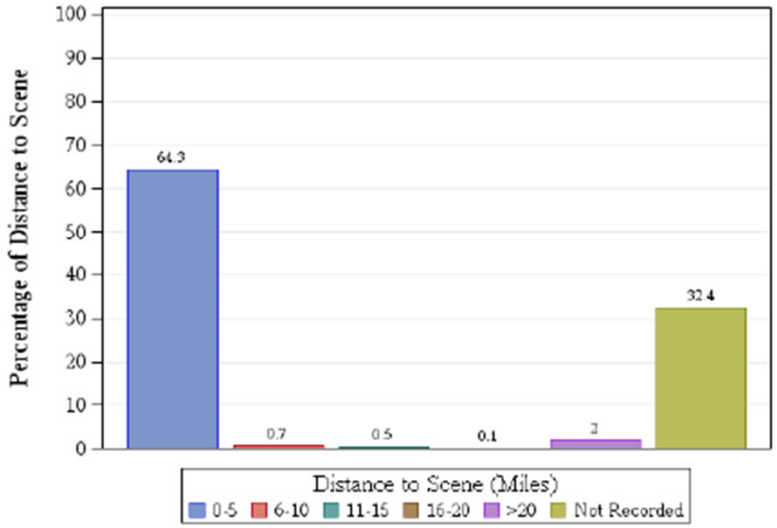
<1% Race: Asian, Native Hawaiian, American Indian/Alaskan Native

Payer Type

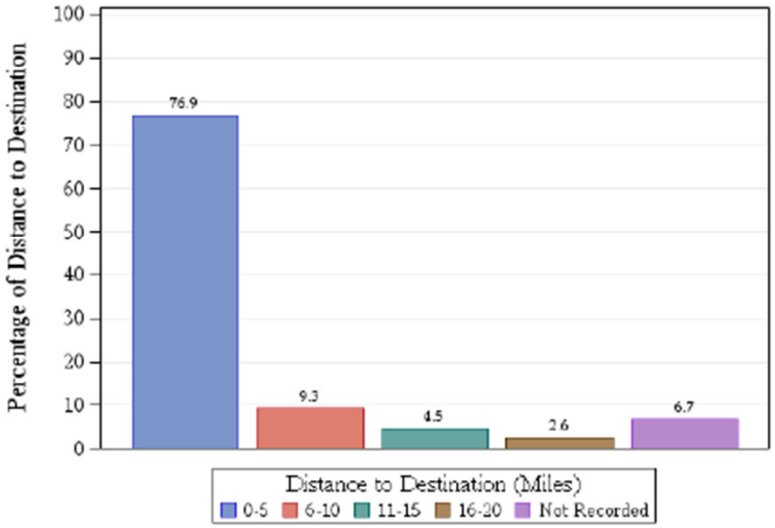


*Traumatic Injuries include the following criteria:
Possible Injury indicated, or Provider Primary or Secondary Impression is Traumatic Injury, or Complaint Reported by Dispatch is Traumatic Injury

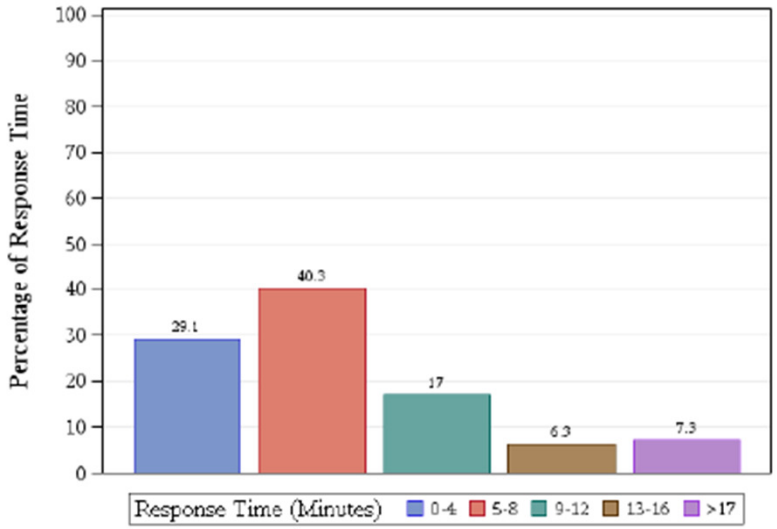
Distance to Scene (Miles)



Distance to Destination (Miles)

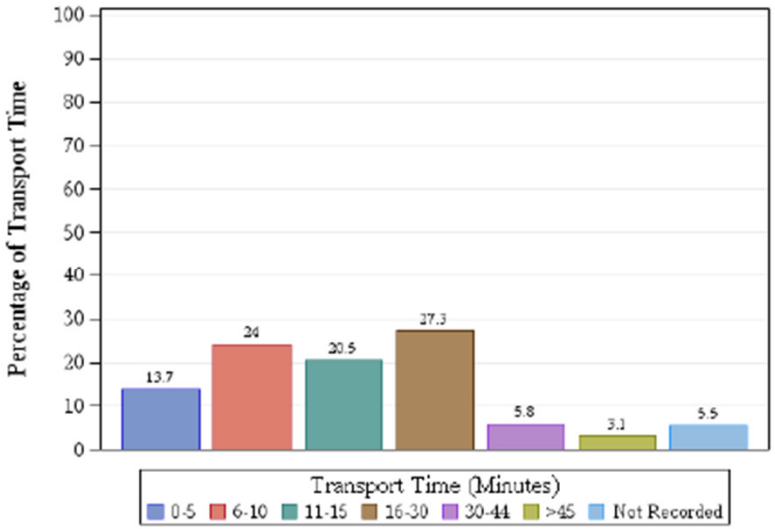


Response Time (Minutes)



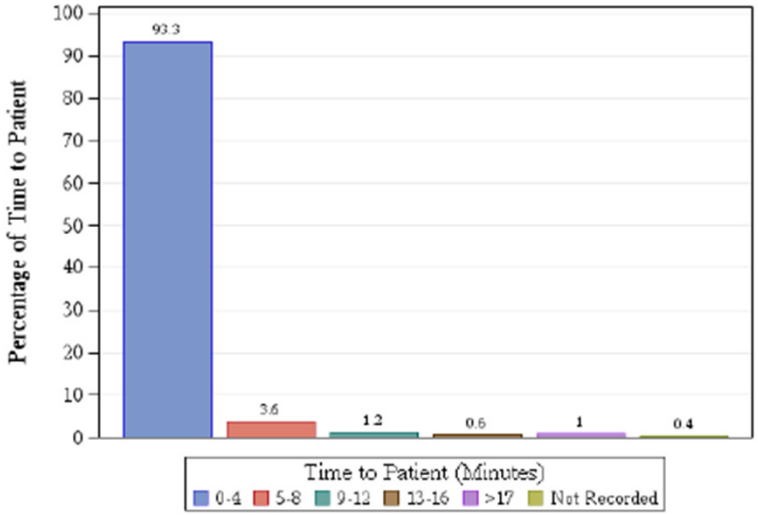
Response Time: Difference in Time from Dispatch to Arrival on Scene

Transport Time (Minutes)



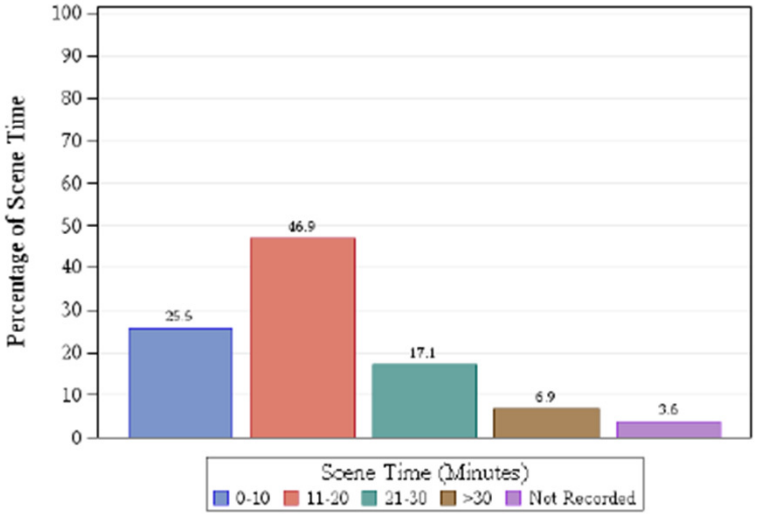
Transport Time: Difference in Time from Departure from Scene to Arrival At Destination

Time to Patient (Minutes)



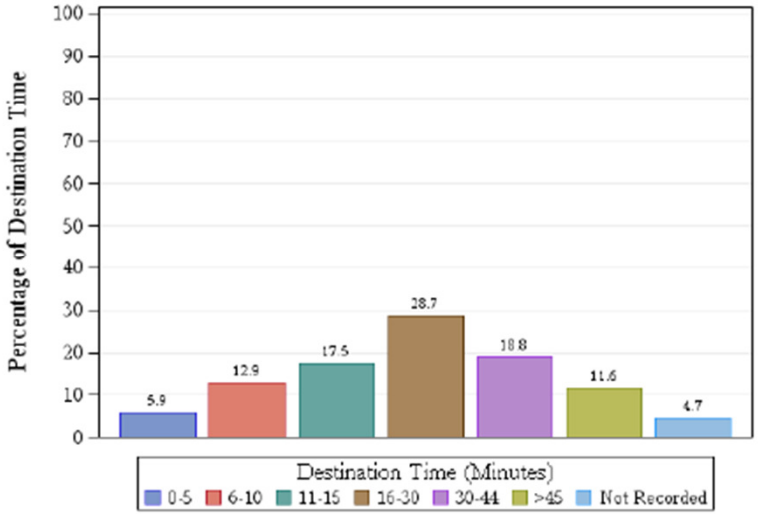
Time To Patient: Difference in Time from Arrival at Scene

Scene Time (Minutes)



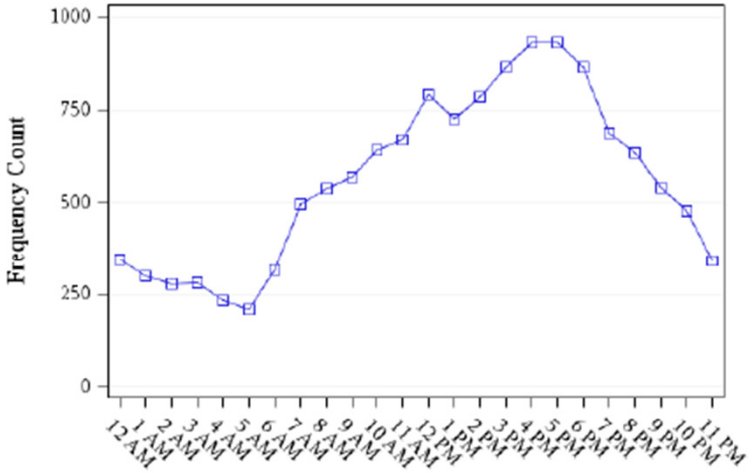
Scene Time: Difference in Time from Arrival at Scene

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 14,894 Incidents

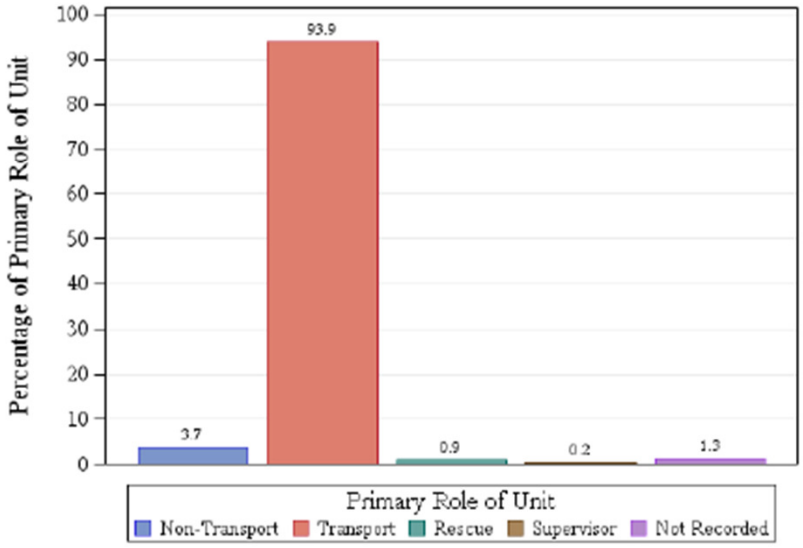
Average Run Mileage

Obs	Destination	Miles
1	Mileage to Scene	1.4
2	Mileage to Destination	2.8
3	Total Mileage	5.4

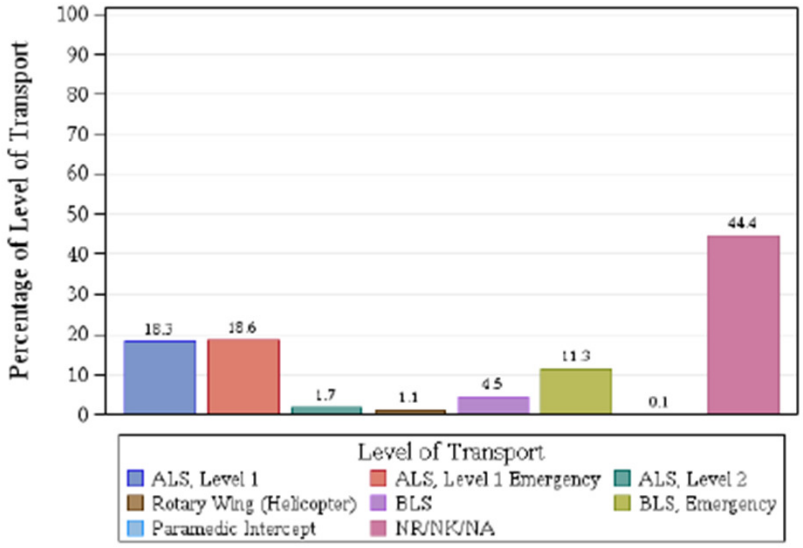
Average Run Time (Minutes)

Obs	Destination	Minutes
1	Time to Scene	8.19
2	Time to Patient	1.91
3	Time at Scene	16.45
4	Time to Destination	15.67
5	Back in Service	25.21
6	Total Run Time	59.77

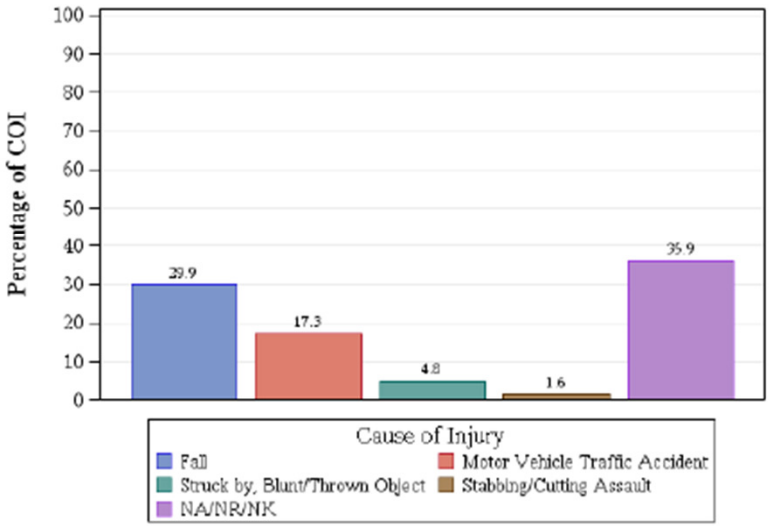
Primary Role of Unit



Level of Transport

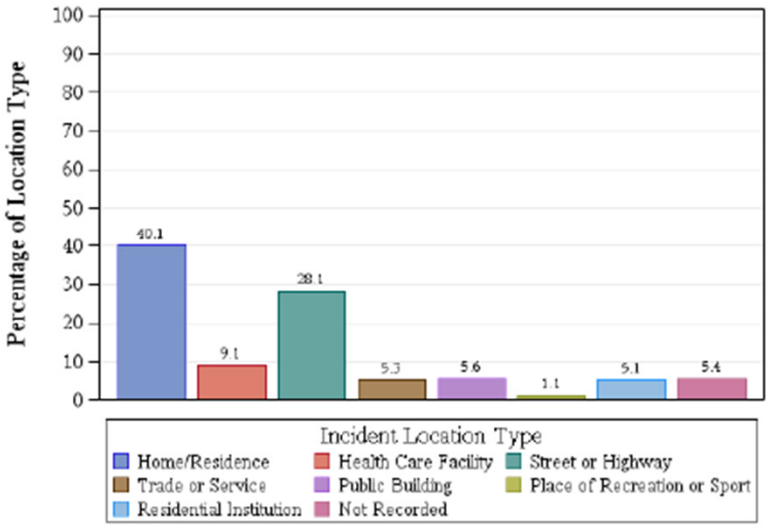


Cause of Injury (COI)



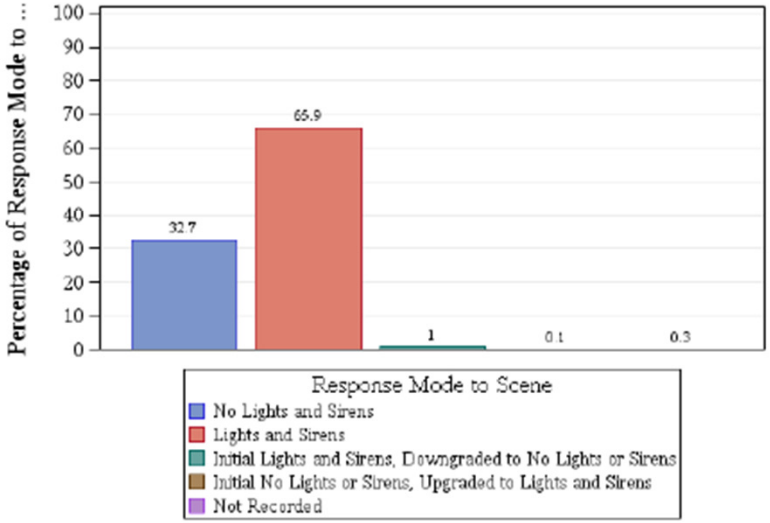
Causes of Injury <1.5% Not Listed

Incident Location Type

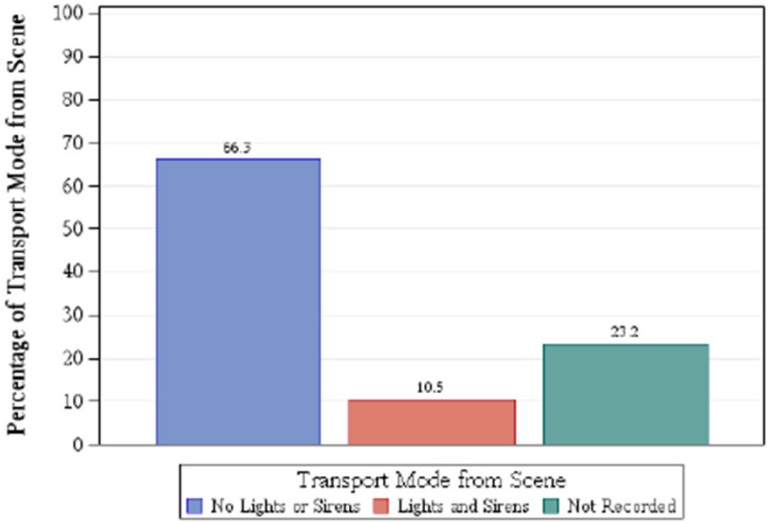


Incident Location Type <1% Not Listed

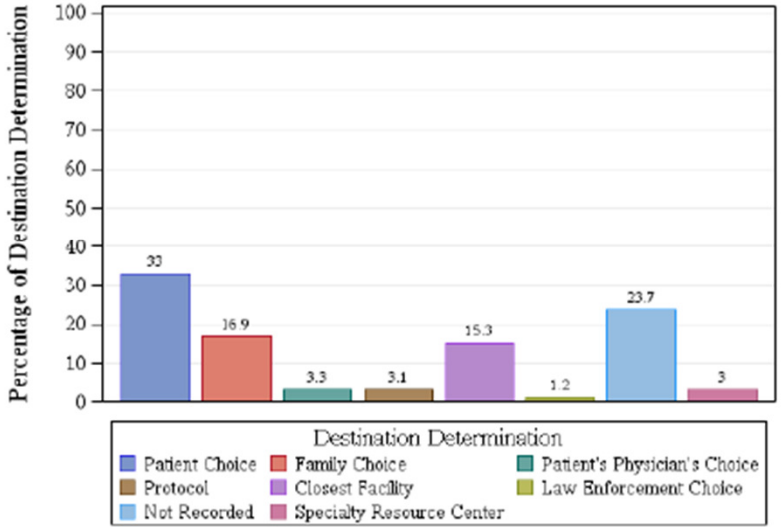
Response Mode to Scene



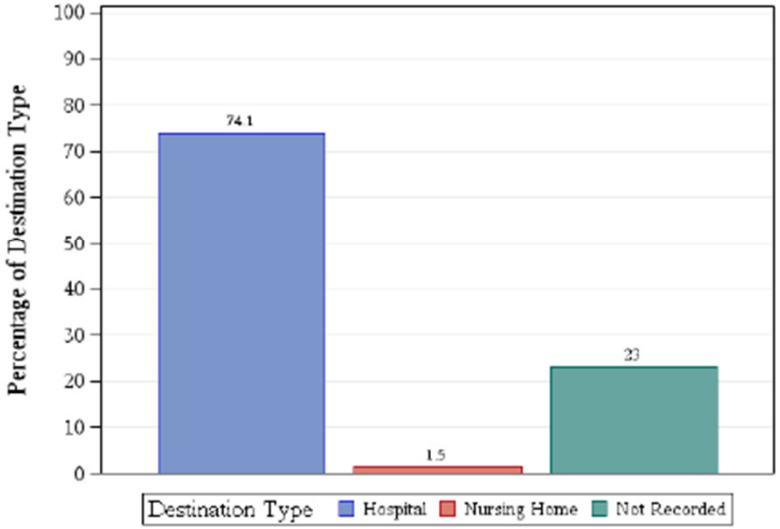
Transport Mode from Scene



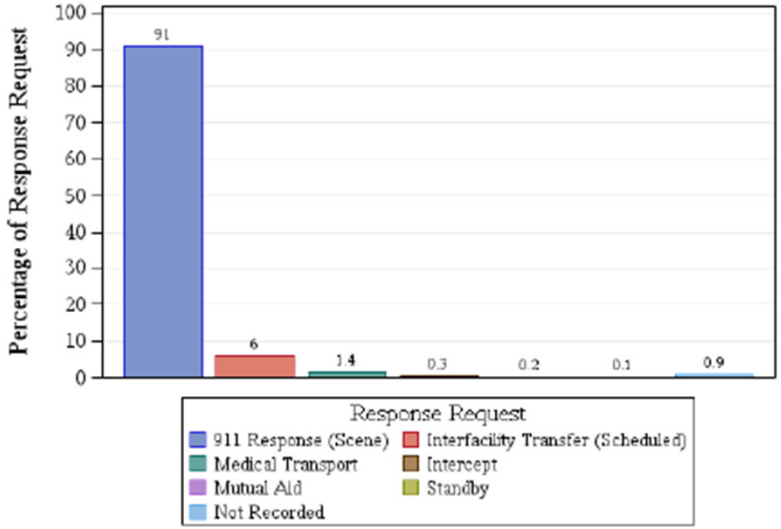
Destination Determination



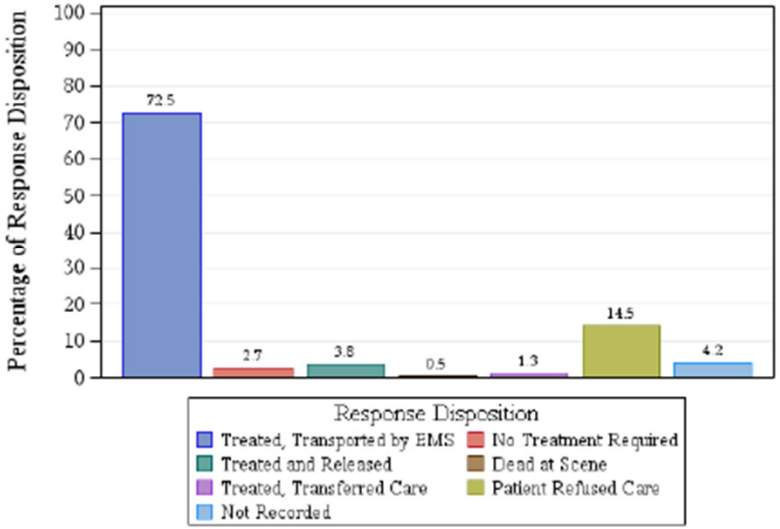
Destination Type



Response Request



Response Disposition



Response Disposition <0.5% Not Listed

QUESTIONS?