

Indiana Trauma Registry

Statewide Quarter 3 Data Report

July 1, 2015—September 30, 2015

9,555 Incidents

99 Total Hospitals Reporting

Level I and II:	9 facilities	48.4% of data
Level III:	7 facilities	9.9% of data
(Non-Trauma) Hospitals:	83 facilities	41.6% of data

For Quarter 3 2015, which spanned from July 1, 2015 to September 30, 2015, there were 9,555 incidents reported to the Indiana Trauma Registry at the Indiana State Department of Health. There were 99 hospitals that reported data, of which 9 were level I or II trauma centers, 7 were level III trauma centers and 83 were non-trauma centers. There were 6 hospitals that either started to report again or were new to reporting during this quarter compared to the previous quarter, while 2 hospitals dropped off from reporting. A map of the state with the reporting hospitals can be found on page 52. Trauma centers represented 58.4% of the data. There were 3,194 incidents reported for July, 3,004 reported for August, and 3,357 incidents reported for September.

The content of this report has changed due to suggestions and additions requested by the Indiana State Trauma Care Committee at the August 21, 2015 meeting. Explanations of the changes requested and adapted from the ISTCC meeting can be found on page 21.

Some general reminders include that the blue columns represent an Indiana average, red columns represent level I and II trauma centers, green columns represent level III trauma centers and orange non-trauma centers. If a single percent is listed above a group of bars, the percent listed represents the average for Indiana. If a number is listed above a group of bars, it represents the count for Indiana. The category 'All Transfers' denotes the patient group where ED Disposition = Transferred to Another Hospital. **The category 'Linked Transfers' represents the patient group for whom the initial hospital and final hospital information could be linked.**

The E-codes used in this report follow the ICD-9 CDC matrix of external cause of injury.

Definitions:

Direct Admit: Patient is admitted directly to the hospital and does not spend time in Emergency Department. The ED Length of Stay should reflect a direct admittance.

External Cause of Injury: ICD-9-CM codes that are used to describe the mechanism or external factor that caused the injury event.

Trauma Type: The classification of the force applied to the body. Trauma type categories include blunt, penetrating, thermal, and other trauma.

Injury Severity Score: An anatomical scoring system defined as the sum of the three highest squared maximum Abbreviated Injury Scale (AIS) values to account for multiple injuries in the six body regions.

Acronyms:

E-code: External Cause of Injury	MVC: Motor Vehicle Collision
ED: Emergency Department	OR: Operating Room
ICU: Intensive Care Unit	Ps: Probability of Survival
ISS: Injury Severity Score	CAHs: Critical Access Hospital
LOS: Length of Stay	

Calculations:

$P_s = 1/(1+e^{-b})$ where $b=b_0+b_1(RTS) + b_2(ISS) + b_3(\text{Age Index})$

Total GCS = Verbal GCS + Motor GCS + Eye GCS

$RTS = 0.94 * GCS + 0.73 * SBP + 0.29 * RR$

$ISS = (AIS)^2 + (AIS)^2 + (AIS)^2$



Indiana State
Department of Health
Trauma and Injury Prevention

Indiana Trauma Registry

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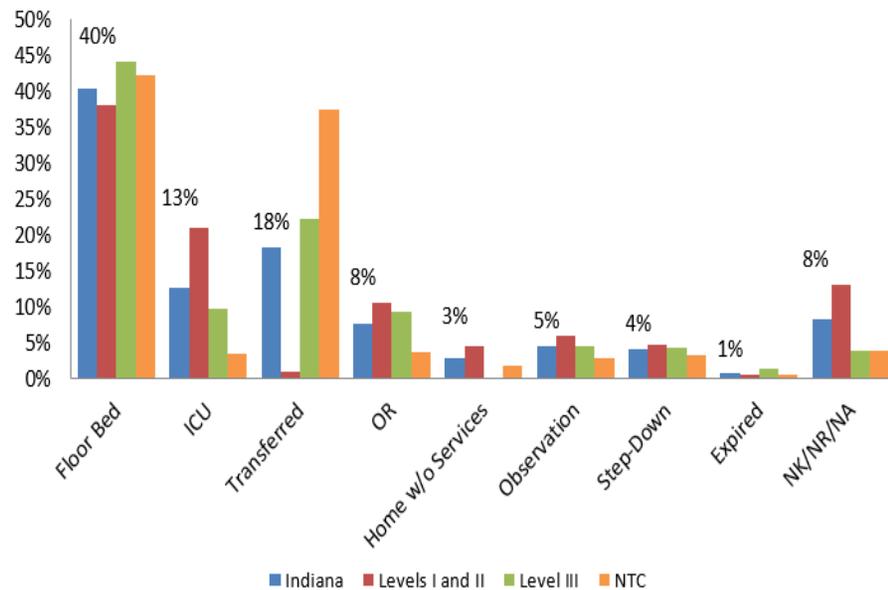
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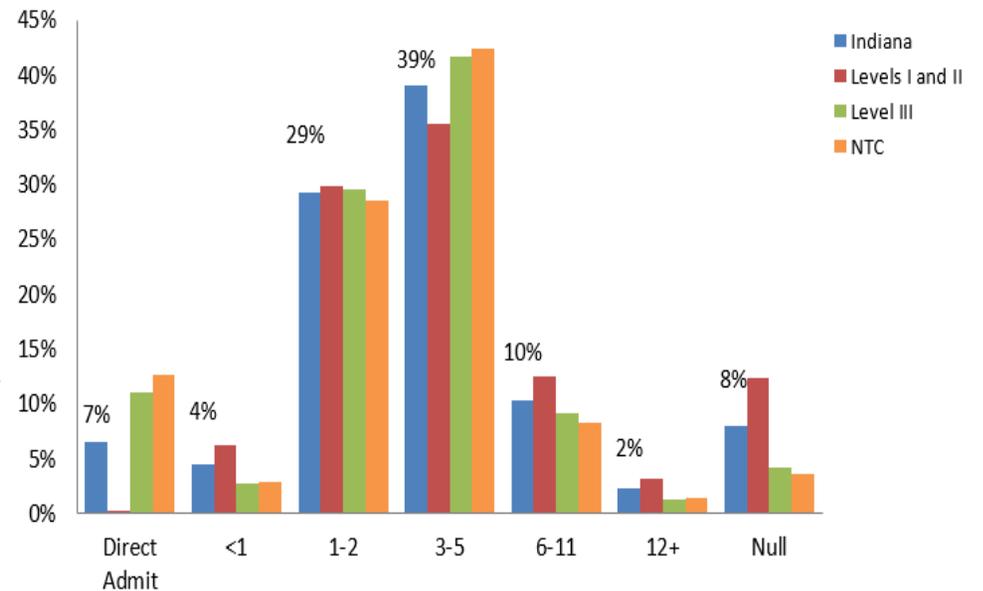
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ED Disposition by Percentage



ED Length of Stay (Hours)



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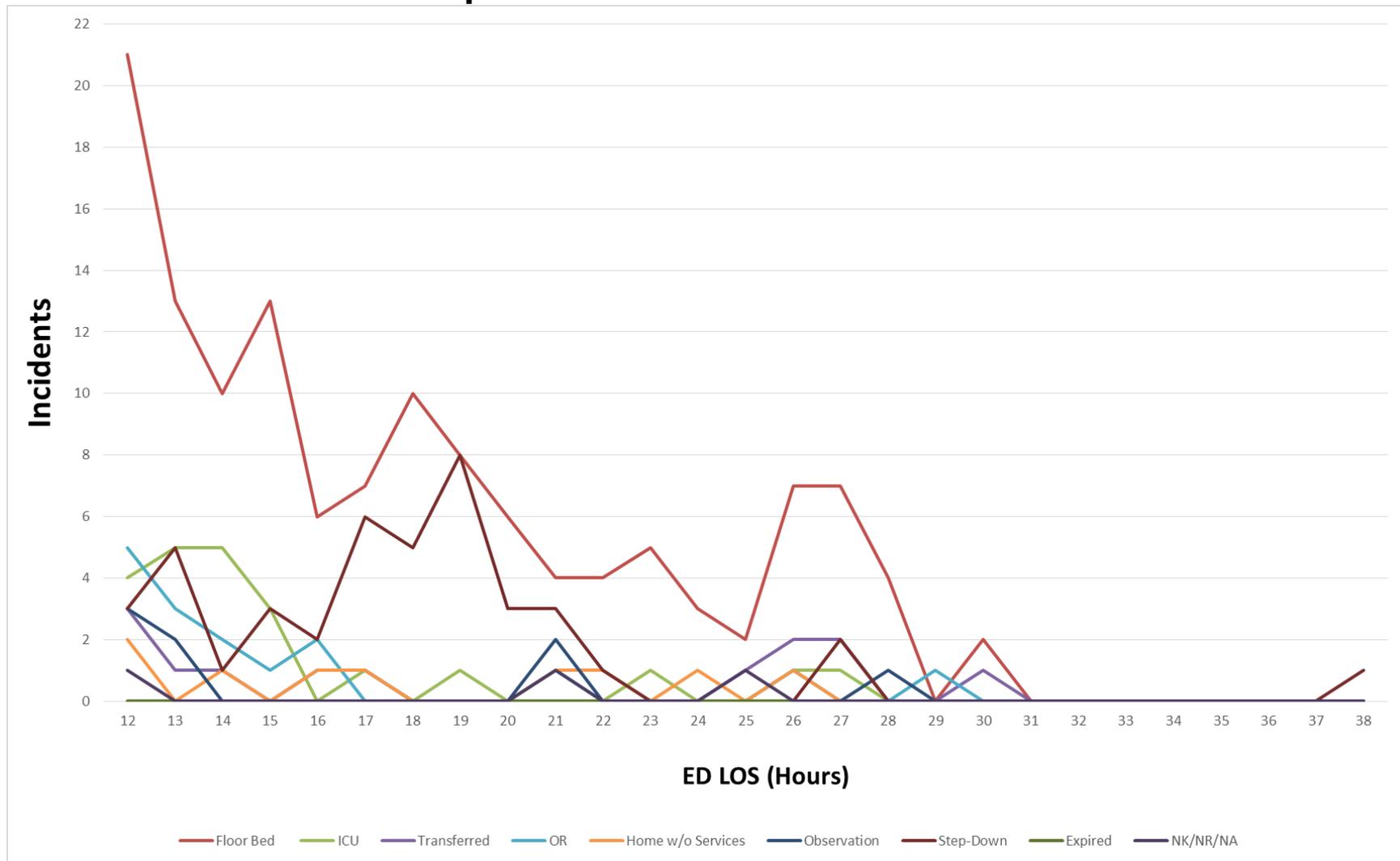
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ED Disposition for ED LOS >12 Hours



N=219

*No cases expired

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ED LOS > 12 Hours, N=218

Facilities	147 Level I and II 13 Level III 58 Non-trauma Centers	ISS	99 (1-8 cat); 90 (9-15 cat); 26 (16-24); 2 (25-44); 1 (No ISS)
Average Distance from Scene to Facility	38.8 Miles	GCS Motor	2 (1 cat); 1 (4 cat); 7 (5 cat); 165 (6 cat); 43 (unknown)
Transport Type	160 Ambulance; 9 Helicopter, 43 Private Vehicle/Walk-In; 6 Unknown	RTS—Systolic	4 (2-4)
Trauma Type	197 Blunt; 19 Penetrating; 1 Burn; 10 Other; 1 Unknown	RTS—GCS Scale	3.9 (3-4)
Cause of Injury	111 Fall; 53 MVC; 16 Struck; 3 Fire-arm; 12 Transport; 6 Cut/Pierce; 2 Machinery; 6 Bicyclist; 1 Burn; 1 Bite/Sting; 7 Unknown	RTS—Resp. Scale	3 (3-4)
Signs of Life	195 Yes; 13 No; 10 Unknown	RTS	7.5 (3—7.8)
Age	55.6 Years (0.4-104 Years)	B Value	3.99 (0-5.7)
Gender	102 Female; 116 Male	Ps	0.97 (0.46—1)
Interfacility Transfer	173 Yes; 45 No	Resp. Assistance	6 Yes; 29 No; 183 Unknown
Region	27 North; 122 Central; 37 South; 32 Unknown	ED LOS	18.5 (12-37.5)
		ED Disposition	1 AMA; 117 Floor; 1 Home w/ Services; 7 Home w/o Services; 19 ICU; 2 NA; 8 Observation; 12 OR; 40 Telemetry; 11 Transferred

-Region was created from injury zip code. Missing = no injury zip or injury zip from out of state.

-Numbers represent counts per category or mean with minimum and maximum in parentheses.

-No signs of life is defined as having none of the following: organized EKG activity, papillary responses, spontaneous respiratory attempts or movement, and unassisted blood pressure. This usually implies the patient was brought to the ED with CPR in progress (2015 Trauma Registry Data Dictionary, page 185).

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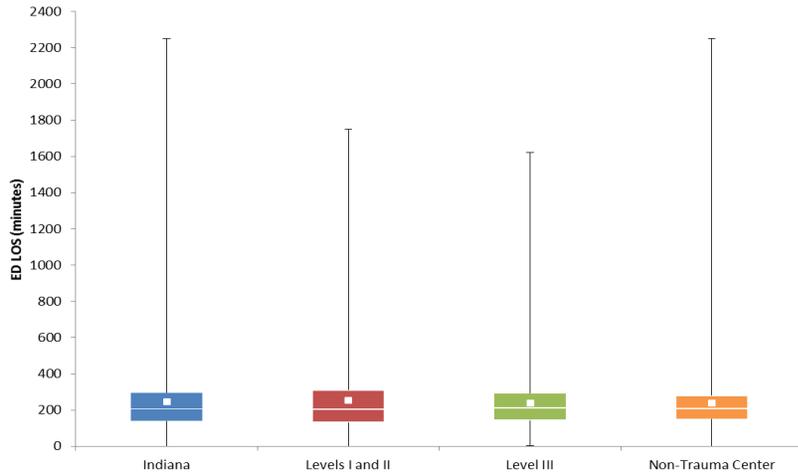
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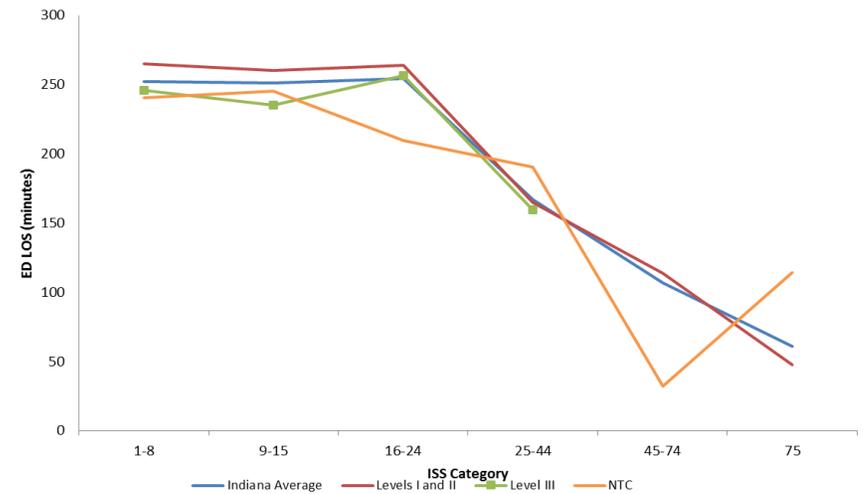
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ED LOS (Minutes) - All Patients



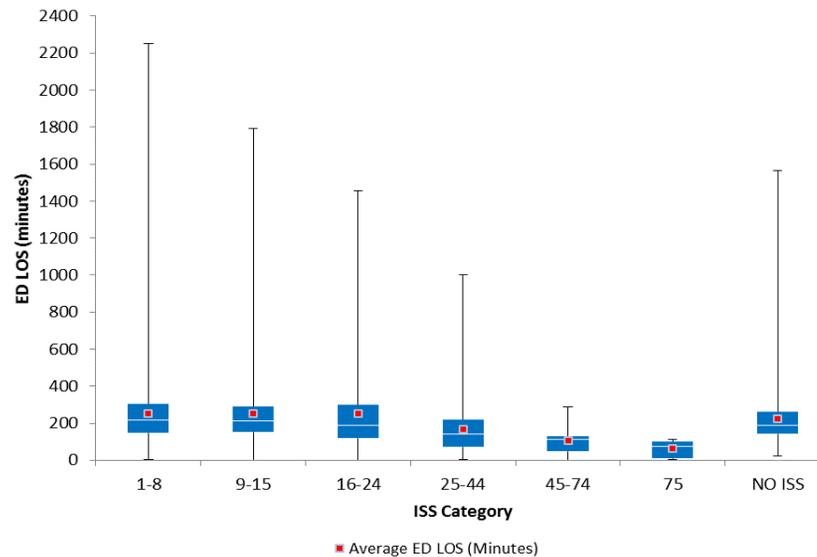
ED LOS (Minutes) by ISS



A table with all the values for ED LOS is found on page 49.

ED LOS (Minutes) by ISS

Note for EDLOS by ISS, there were 5 cases with ISS of 75; one was at non-trauma centers.



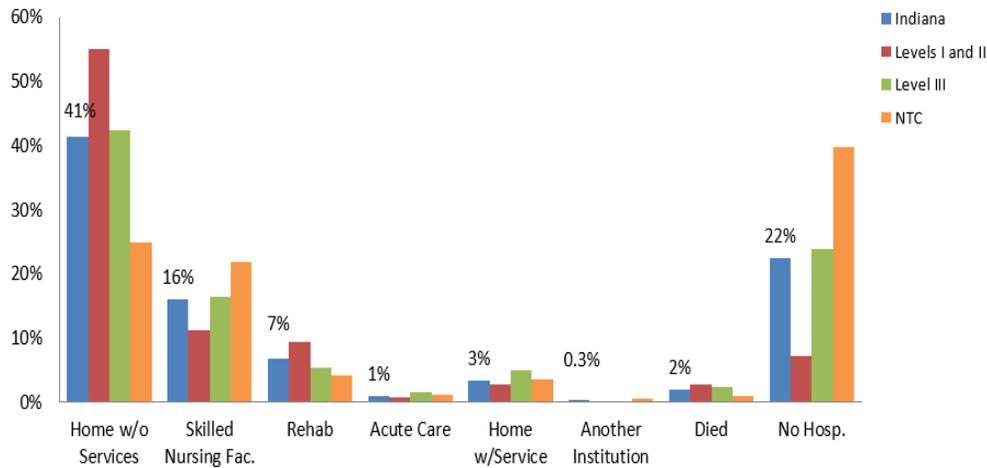
A table with values for ED LOS by ISS may be found on page 50.

Indiana Trauma Registry

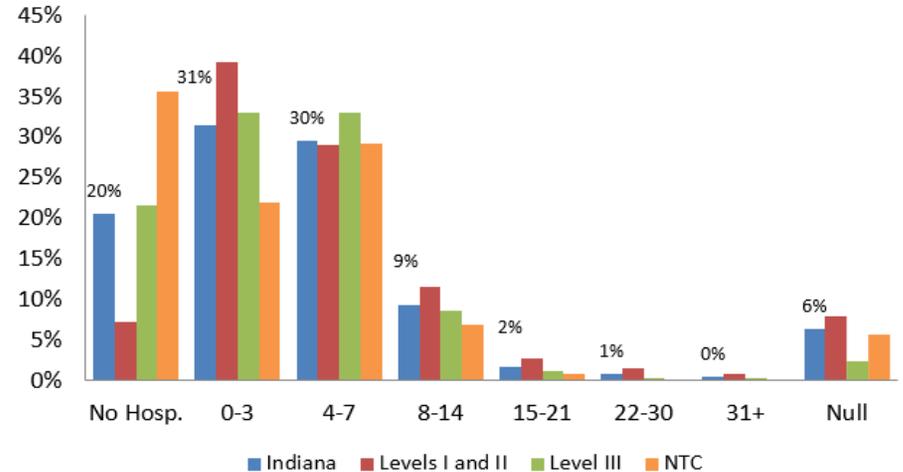
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Hospital Disposition



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, AMA, hospice and intermediate care.

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Statewide Quarter 3 Data Report

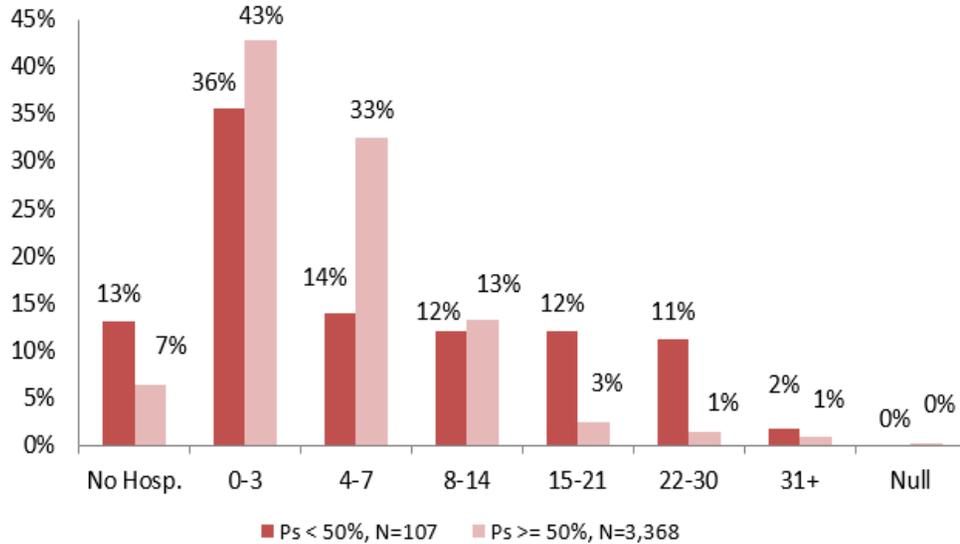
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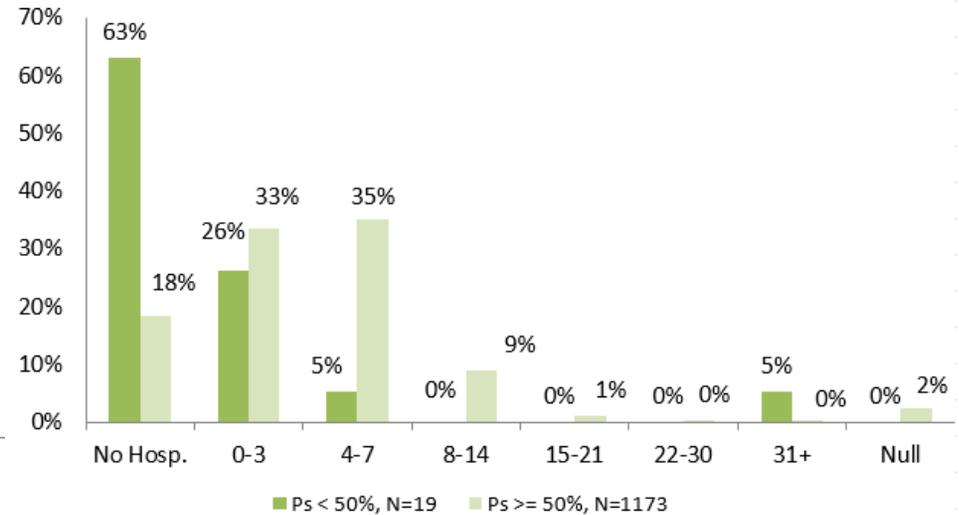
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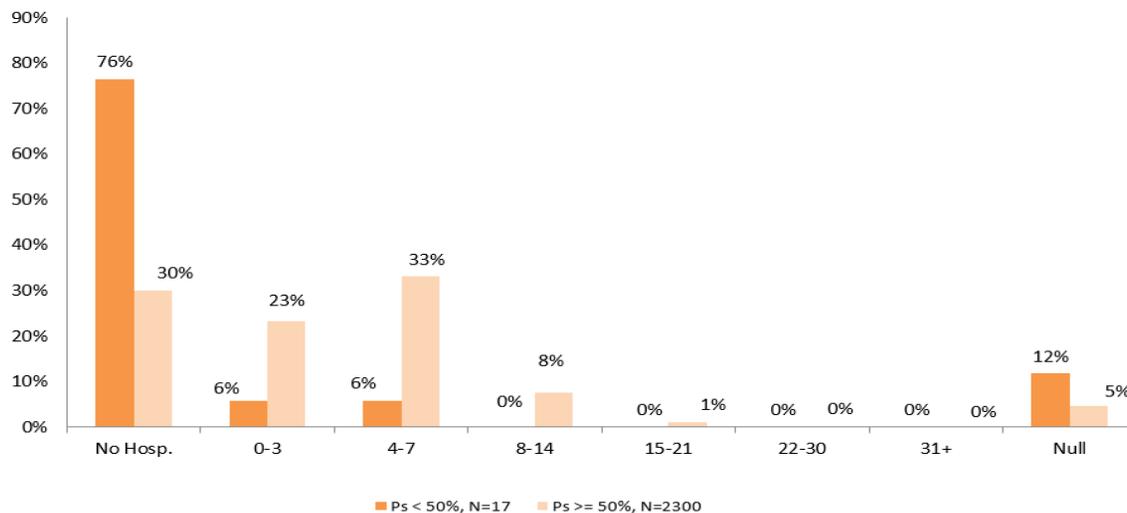
Hospital LOS (days) by Ps Levels I and II



Hospital LOS (days) by Ps Level III



Hospital LOS (days) by Ps Non-Trauma Centers



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ED Disposition = Expired for Ps \geq 50%, N=7

Facilities	1 Non-Trauma Centers 6 Trauma Centers	ISS	4 (1-8 cat.); 1 (9-15 cat.); 2 (25-44)
Average Distance from Scene to Facility*	11.7 Miles	GCS Motor	4 (1 cat); 1 (5 cat); 1 (6 cat); 1 Unknown
Transport Type	6 Ambulance; 1 Helicopter	RTS—Systolic	3.7 (2-4)
Trauma Type	6 Blunt; 1 Penetrating	RTS—GCS Scale	2 (0-4)
Cause of Injury	2 Fall; 3 MVC; 1 Firearm; 1 Transport	RTS—Resp. Scale	2.4 (0-4)
Signs of Life	3 Yes; 4 No	RTS	4.5 (2.3-7.8)
Age	35.4 Years (10—73 Years)	B Value	2 (1-3.8)
Gender	2 Female; 5 Male	Ps	0.9 (0.7—0.98)
Interfacility Transfer	1 Yes; 6 No	Resp. Assistance	1 Yes; 1 No; 5 Unknown
Region	4 North; 1 Central; 1 Unknown	ED LOS	1.41 hours (0.2-2.2 hours)

-Region was created from injury zip code. Missing = no injury zip or injury zip from out of state.

-Numbers represent counts per category or mean with minimum and maximum in parentheses.

-No signs of life is defined as having none of the following: organized EKG activity, papillary responses, spontaneous respiratory attempts or movement, and unassisted blood pressure. This usually implies the patient was brought to the ED with CPR in progress (2015 Trauma Registry Data Dictionary, page 185).

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ED Dispo ≠ Expired, Hospital Dispo = Expired for Ps ≥ 50%, N=78, Trauma Centers

Interfacility Transfer	29 Yes	Interfacility Transfer	49 No
Average Distance from Scene to Facility	41.5 Miles	Average Distance from Scene to Facility	16 Miles
Transport Type	17 Ambulance; 10 Helicopter; 2 Unknown	Transport Type	36 Ambulance; 7 Helicopter; 5 Private; 1 Unknown
Trauma Type	29 Blunt	Trauma Type	45 Blunt; 4 Penetrating
Cause of Injury	19 Fall; 7 MVC; 2 Struck; 1 Transport	Cause of Injury	29 Fall; 12 MVC; 2 Struck; 3 Firearm; 2 Transport; 1 Cut/Pierce
Signs of Life	23 Yes; 2 No; 2 Unknown	Signs of Life	32 Yes; 2 No; 2 Unknown
Age	62.4 Years (2-89 Years)	Age	68.3 Years (15-98 Years)
Gender	10 Female; 19 Male	Gender	15 Female; 34 Male
Region	3 North; 11 Central; 7 South; 8 NK	Region	17 North; 20 Central; 8 South; 4 NK
ISS	5 (1-8); 4 (9-15); 56(16-24); 14 (25-44)	ISS	5 (1-8); 21 (9-15); 7 (16-24); 16 (25-44)
GCS Motor	7 (1 cat); 1 (2 cat); 2 (4 cat); 1 (5 cat); 17 (6 cat); 1 (unknown)	GCS Motor	7 (1 cat); 1 (3 cat); 2 (4 cat); 4 (5 cat); 34 (6 cat); 1 (unknown)
RTS—Systolic	3.9 (2-4)	RTS—Systolic	3.9 (2-4)
RTS—GCS Scale	2.6 (0-4)	RTS—GCS Scale	3.3 (0-4)
RTS—Resp. Scale	2.8 (0-3)	RTS—Resp. Scale	2.9 (0-4)
RTS	6.1 (2.9-7.6)	RTS	6.8 (2.9-7.6)
Ps	0.8 (0.5–.995)	Ps	0.9 (0.5–.995)
Resp. Assistance	29 Unknown	Resp. Assistance	1 Yes; 6 No; 42 Unknown
ED LOS	2.8 Hours (0.2—6.6 Hours)	ED LOS	4.2 Hours (0.3—19 Hours)

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ED Dispo ≠ Expired, Hospital Dispo = Expired for Ps ≥ 50%, N=21, Non-trauma Centers

Interfacility Transfer	2 Yes	Interfacility Transfer	19 No
Average Distance from Scene to Facility	9.7 Miles	Average Distance from Scene to Facility	9.2 Miles
Transport Type	23 Ambulance; 20 Helicopter	Transport Type	15 Ambulance; 3 Private; 1 Unknown
Trauma Type	2 Blunt	Trauma Type	19 Blunt
Cause of Injury	2 Fall	Cause of Injury	18 Fall; 1 Struck
Signs of Life	1 Yes; 1 No	Signs of Life	17 Yes; 2 No
Age	75 Years	Age	83 (67-93 Years)
Gender		Gender	13 Female; 6 Male
Region		Region	4 North; 12 Central; 3 South
ISS	1 (1-8); 1 (9-15)	ISS	6 (1-8); 9 (9-15); 3 (25-44); 1 Unknown
GCS Motor	1 (1 cat); 1 (5 cat)	GCS Motor	1 (3 cat); 1 (5 cat); 17 (6 cat)
RTS—Systolic	4 (4)	RTS—Systolic	3.8 (2-4)
RTS—GCS Scale	1.5 (0-3)	RTS—GCS Scale	3.9 (3-4)
RTS—Resp. Scale	3 (3)	RTS—Resp. Scale	3 (3)
RTS	5.2 (3.8-6.6)	RTS	7.3 (6-7.6)
Ps	0.7 (0.5–.9)	Ps	0.94 (0.85 –0.98)
Resp. Assistance	1 Yes; 1 Unknown	Resp. Assistance	2 Yes; 6 No; 11 Unknown
ED LOS	2 Unknown	ED LOS	4.3 (1.6-7.3)

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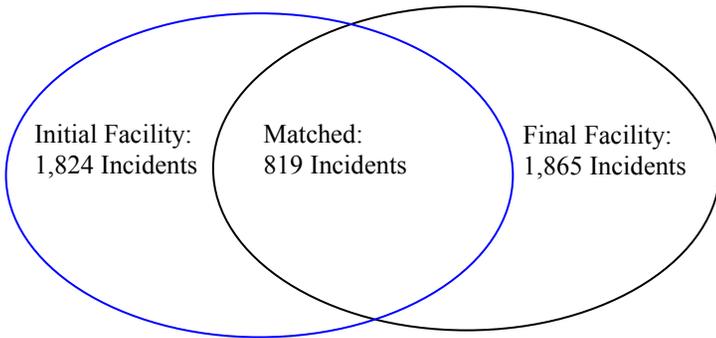
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For Quarter 3, 2015, of the 9,555 incidents reported to the Indiana Trauma Registry, 1,824 cases that had an ED Disposition of “Transferred to another acute care facility” at the initial facility or that had the Inter-Facility Transfer equal to “Yes” at the Trauma Center. Of those transferred, 819 cases were probabilistically matched. The linked cases make up 22% of the Q3 2015 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, 2015.

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

Rural Hospitals

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

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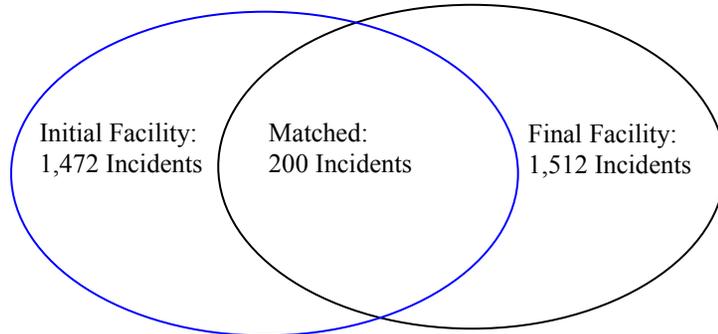
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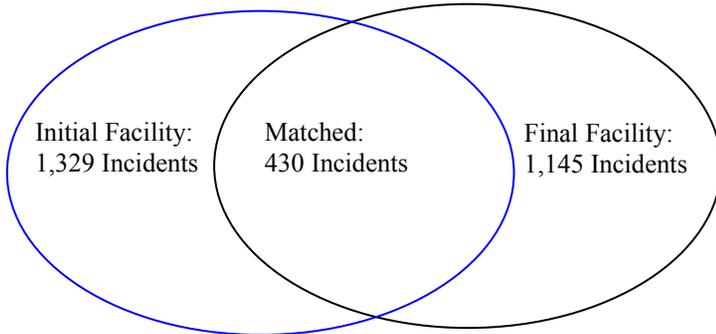
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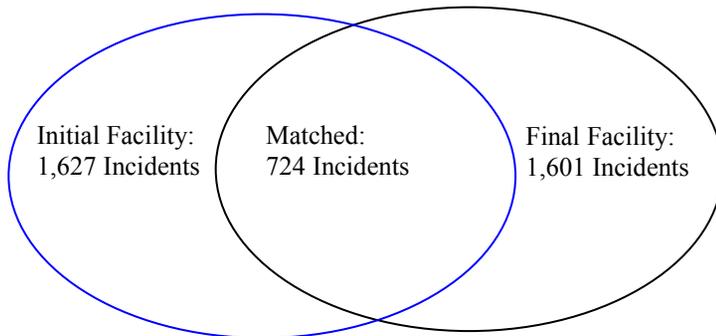
Historical Links



For Quarter 4, 2014, of the 8,052 incidents reported to the Indiana Trauma Registry, 1472 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, 200 cases were probabilistically matched. The linked cases make up 6.7% of the Q4 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.



For Quarter 1, 2015, of the 7,050 incidents reported to the Indiana Trauma Registry, 1,329 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, 430 cases were probabilistically matched. The linked cases make up 17% of the Q1 2015 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.



For Quarter 2, 2015, of the 8,605 incidents reported to the Indiana Trauma Registry, 1,627 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, 724 cases were probabilistically matched. The linked cases make up 22% of the Q2 2015 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.

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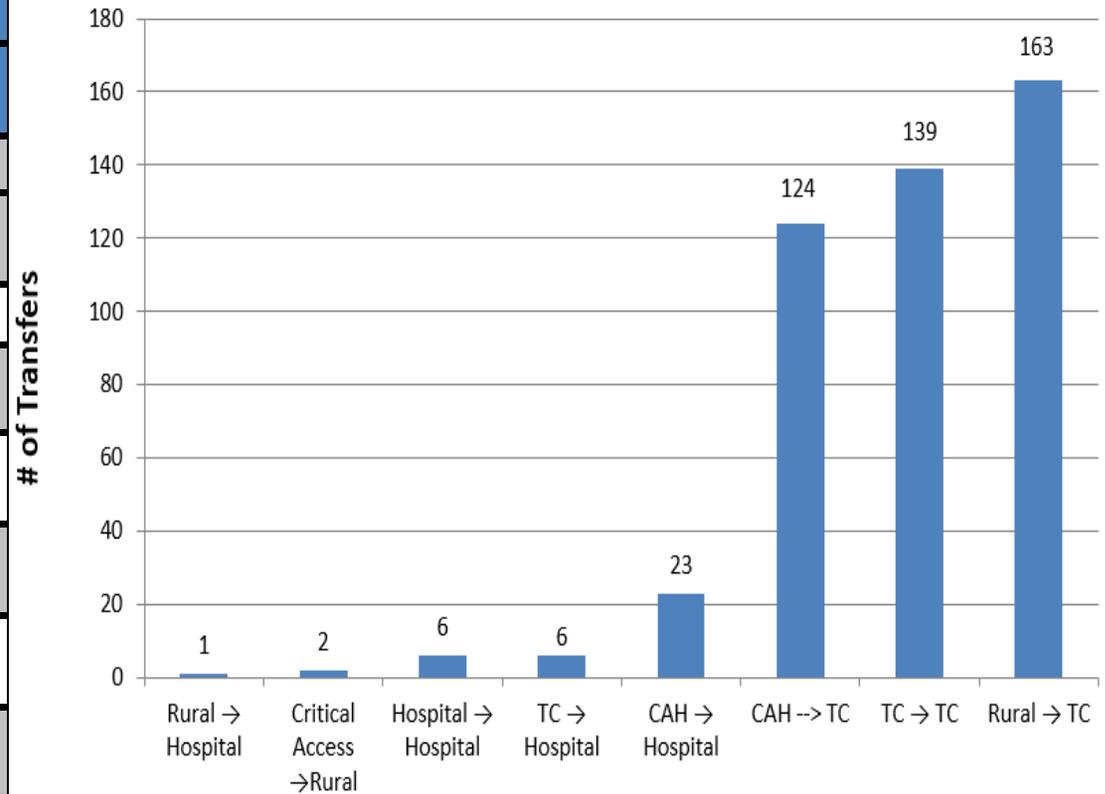
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Facility to Facility Transfers

For Transfer Patients:		
Initial Hospital Type	Final Hospital Type	Incident Counts
Rural	Hospital	1
Critical Access Hospital	Rural Hospital	2
Hospital	Hospital	6
Trauma Center	Hospital	6
Critical Access Hospital	Hospital	23
Critical Access Hospital	Trauma Center	124
Trauma Center	Trauma Center	139
Rural Hospital	Trauma Center	163
Hospital	Trauma Center	355

Facility Transfer Type



Rural = Rural Hospital; TC = ACS Verified or In Process Trauma Center;

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For Linked Transfer Patients:

For Transfer Patients:					
	All Transfer Patients	Critical*	Physiological Critical**	ISS Critical***	<u>Ps <0.5****</u>
Number of Patients	819	446	411	65	4
EMS Notified to Scene	12.2 minutes	9.5 minutes	9.4 minutes	9.1 minutes	5.5 minutes
EMS Scene Arrival to Departure	19.4 minutes	16.1 minutes	16.3 minutes	13.7 minutes	17.5 minutes
EMS Scene Departure to Initial Hospital ED Arrival	18.2 minutes	17.7 minutes	17.6 minutes	16.6 minutes	10 minutes
Initial Hospital ED Arrival to Departure	3 hours 5.1 minutes	3 hours 2.6 minutes	3 hours 6 minutes	2 hours 25.6 minutes	41.7 minutes
Initial Hospital ED Departure to Final Hospital ED Arrival	58.5 minutes	1 hour 1.6 minutes	1 hour 2.9 minutes	57.9 minutes	49.3 minutes
TOTAL TIME	4 hours 53.4 minutes	4 hours 47.5 minutes	4 hours 52.2 minutes	4 hours 2.9 minutes	2 hours 4 minutes

*Critical patient is defined as having a GCS \leq 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 \leq 12 at the initial hospital.

***ISS Critical Transfer patient is defined as having an ISS $>$ 15. at the initial hospital

****Patients with a probability of survival \leq 0.5 at the initial hospital.

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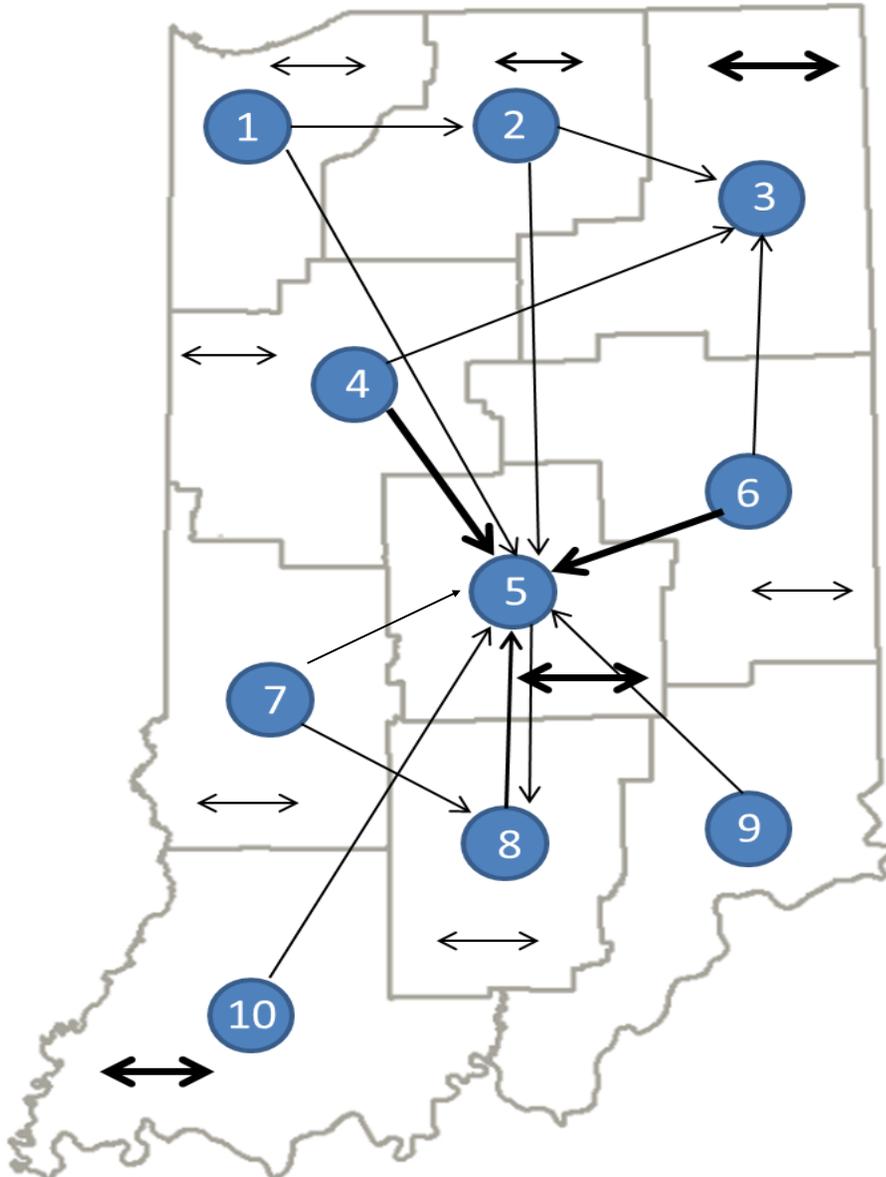
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For Transfer Patients:		
Public Health Preparedness District Initial Hospital	Public Health Preparedness District Final Hospital	Incident Counts
1	1	7
1	2	7
1	5	11
2	2	22
2	3	12
2	5	7
3	3	124
3	5	3
4	3	8
4	4	12
4	5	76
5	5	148
6	3	9
6	5	108
6	6	15
7	5	54
7	7	14
7	8	2
8	5	56
8	8	8
9	5	8
9	9	1
10	5	15
10	10	92

*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 PHPD, not of a specific hospital or county.

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For Linked Transfer Patients:

For Transfer Patients:					
	All Transfer Patients	<i>Critical*</i>	<i>Physiological Critical**</i>	<i>ISS Critical***</i>	<u><i>Ps <0.5****</i></u>
Number of Patients	819	446	411	65	4
Total Time	4 hours 53.4 minutes	4 hours 47.5 minutes	4 hours 52.2 minutes	4 hours 2.9 minutes	2 hours 4 minutes
Total Mileage	54.4	57.3	57.8	57.9	76.4
Injury Scene to Initial Hospital Mileage***	7.3	6.9	6.9	7.2	7.4
Initial Facility to Final Facility Mileage	47.1	50.5	50.9	50.7	74
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	7.3	47.1	54.4	676	125
North Region	4.2	34.0	38.2	172	12
Central Region	7.8	53.3	61.1	423	101
South Region	10.7	37.7	48.5	80	12

*Critical patient is defined as having a GCS \leq 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 \leq 12 at the initial hospital.

*** ISS Critical Transfer patient is defined as ISS $>$ 15 at the initial hospital.

****Probability of Survival $<$ 0.5

[†]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

Indiana Trauma Registry

Statewide Quarter 3 Data Report

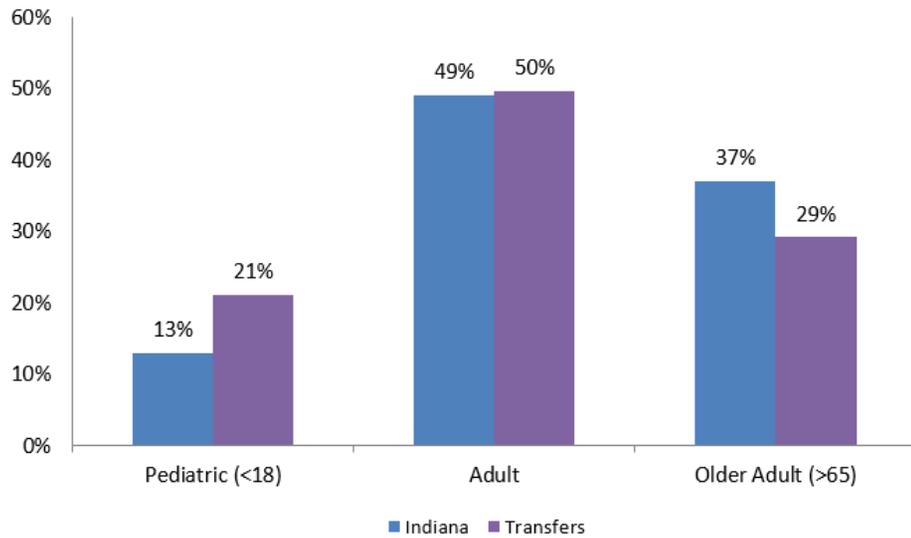
July 1, 2015—September 30, 2015

9,555 Incidents—819 Transfers

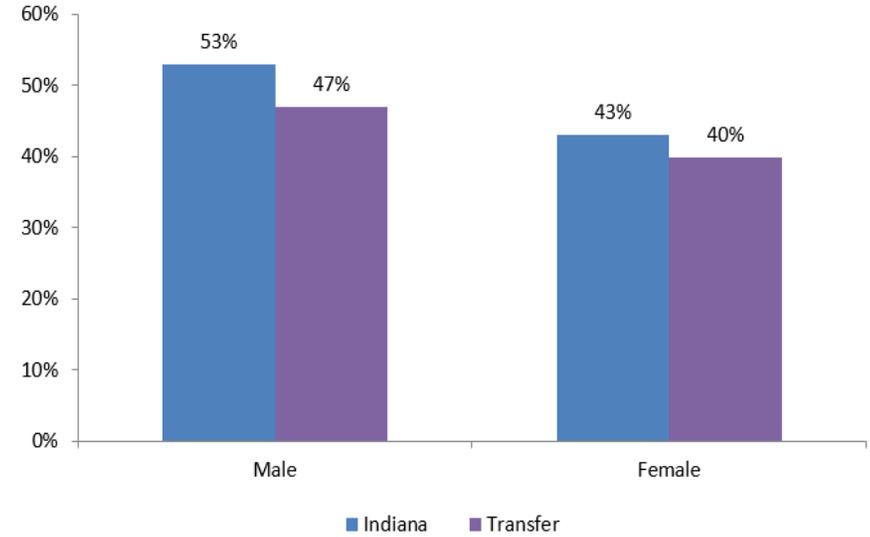
99 Total Hospitals Reporting

Level I and II:	9 facilities	48.4% of data
Level III:	7 facilities	9.9% of data
(Non-Trauma) Hospitals:	83 facilities	41.6% of data

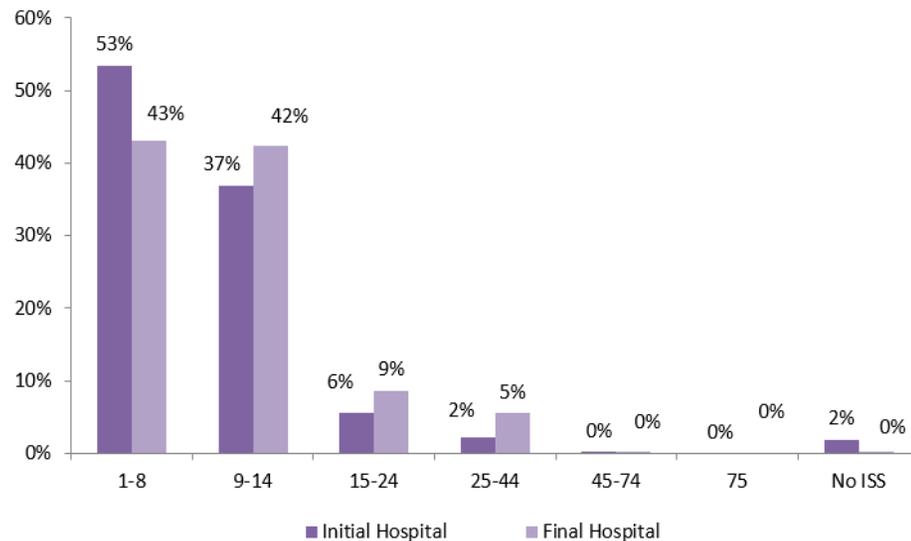
Patient Age Groupings



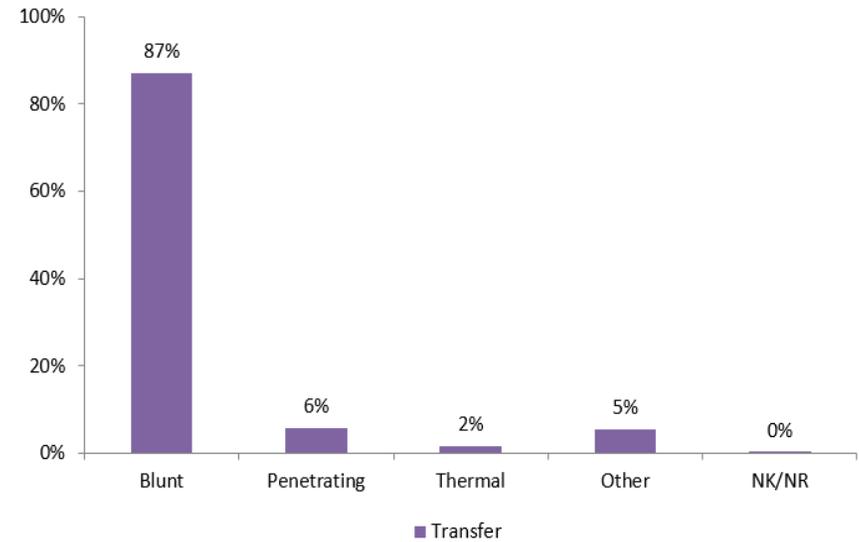
Patient Gender



Injury Severity Score (ISS)



Trauma Type- Final Hospital



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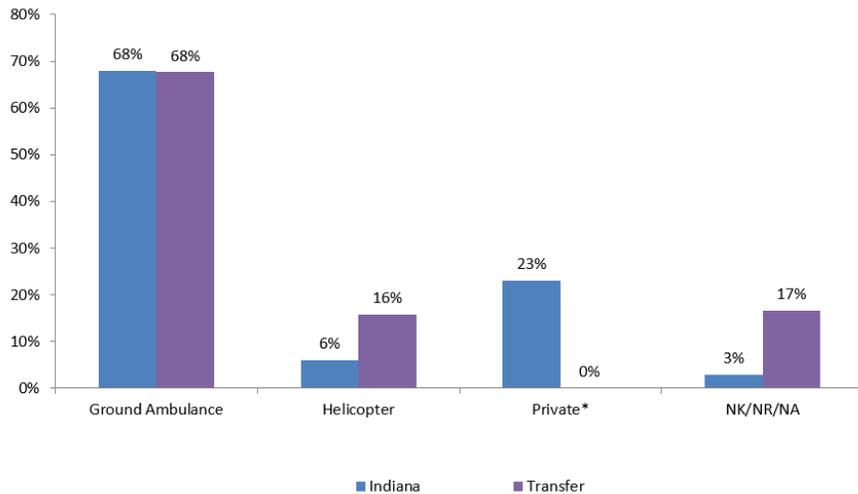
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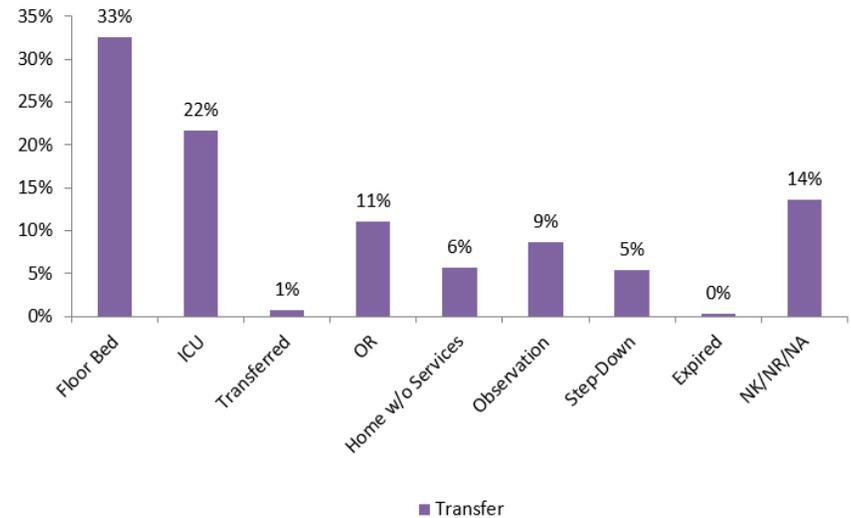
Level I and II:	9 facilities	48.4% of data
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Transport Mode— Final Hospital

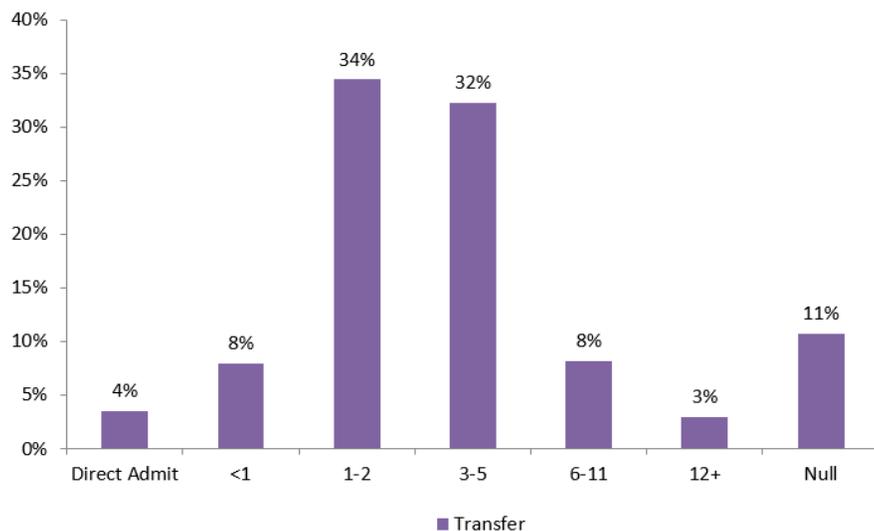


<1% Transport Mode: Police, Other * Indicates Private/ Public Vehicle, Walk-in

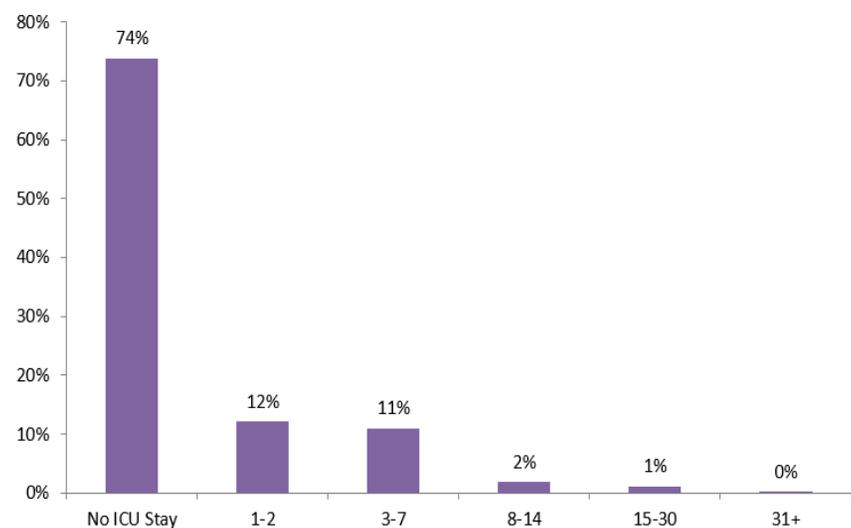
ED Disposition by Percentage- Final Hospital



ED Length of Stay (hours)- Final Hospital



ICU Length of Stay (days)- Final Hospital



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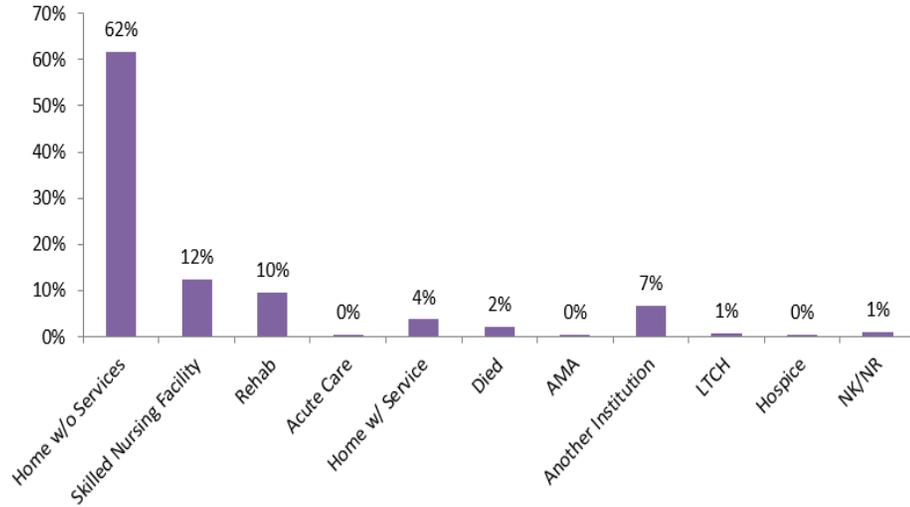
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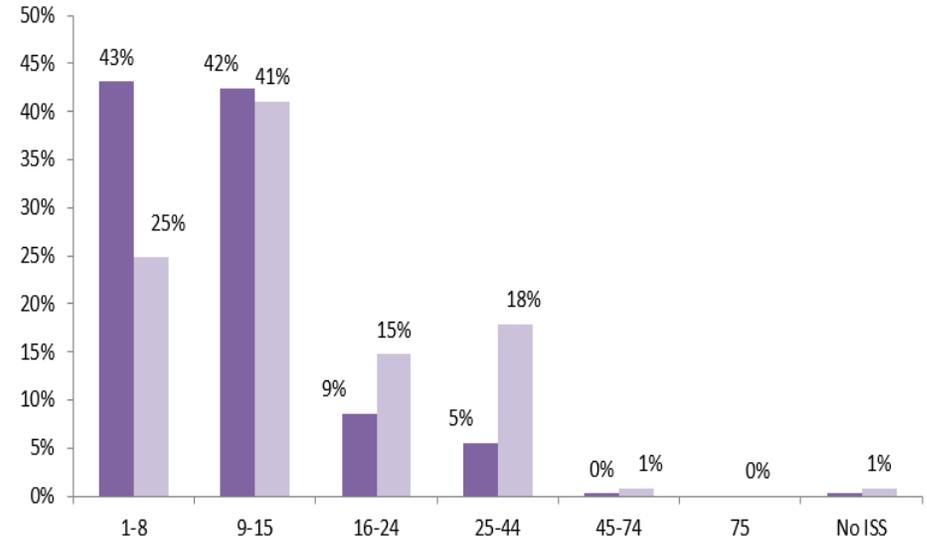
Level III: 7 facilities 9.9% of data

(Non-Trauma) Hospitals: 83 facilities 41.6% of data

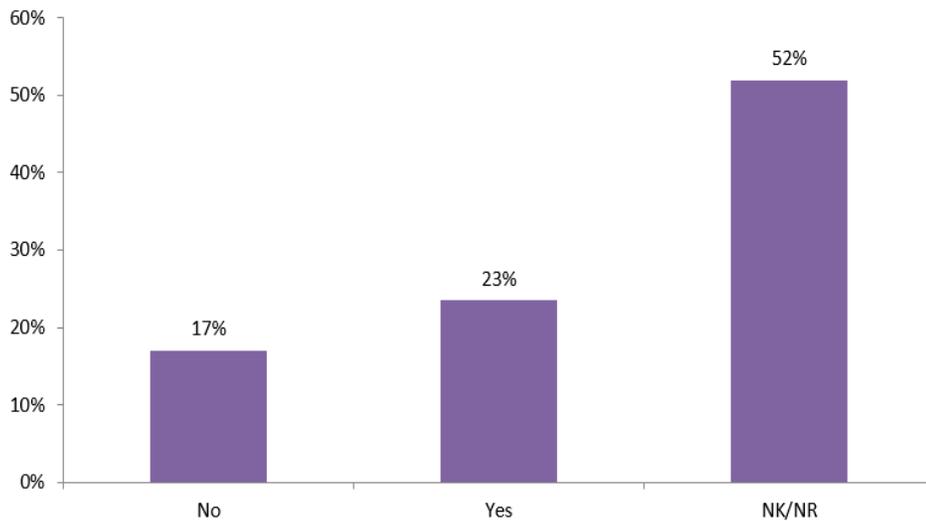
Discharge Disposition— Final Hospital



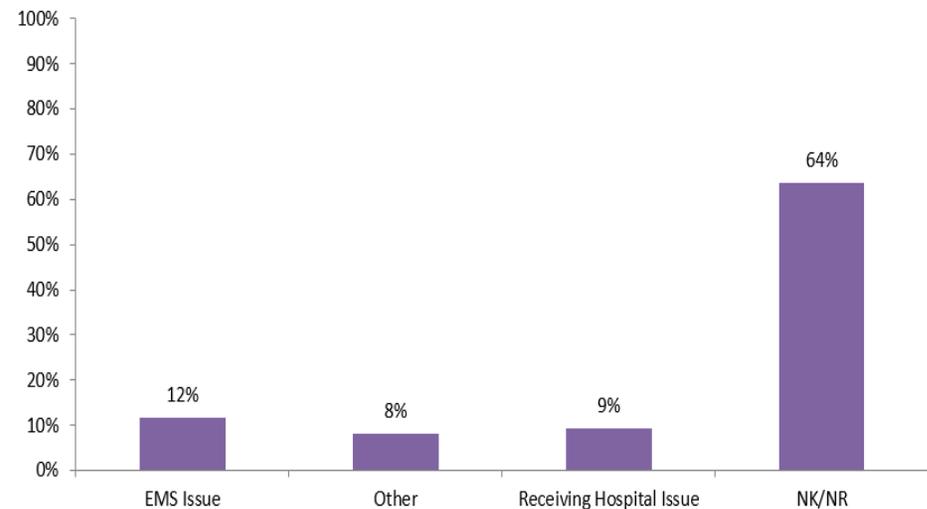
Helicopter Transfers by ISS— Final Hospital



Transfer Delay Indicated- Initial Hospital



Initial Facility Transfer Delay Reason



Indiana Trauma Registry

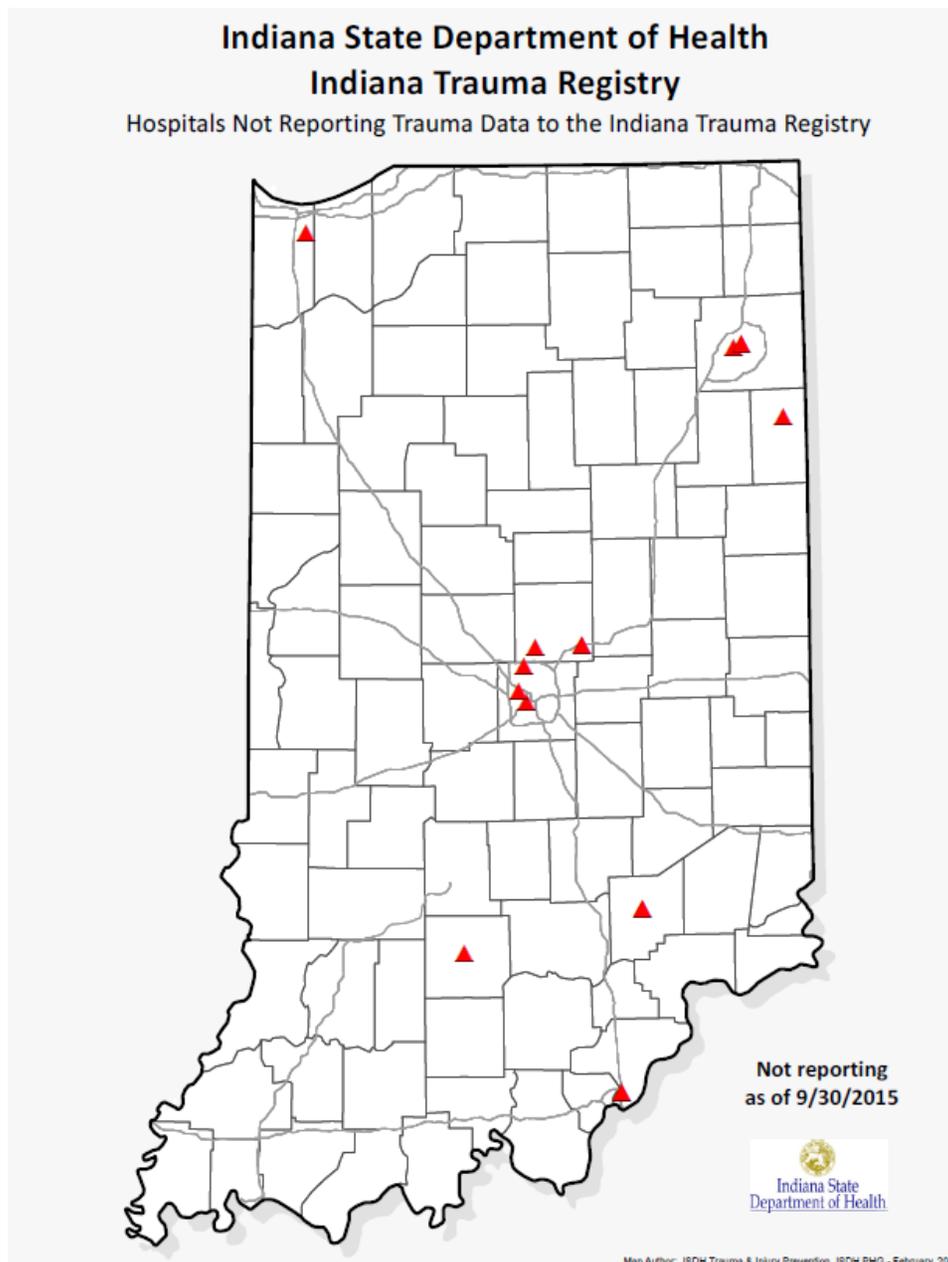
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Map Author: ISDH Trauma & Injury Prevention, ISDH PHG - February, 2016

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Requests and Changes to the Report from Trauma Care Committee members at the August 2015 ISTCC Meeting:

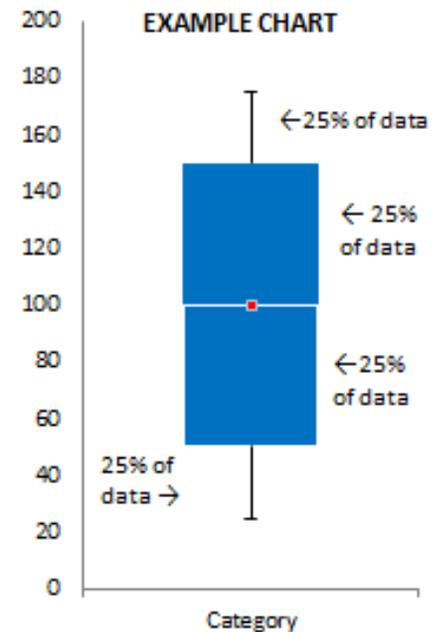
General Report:

- The hospital categories are now: Level I or II trauma centers, Level III trauma centers, and non-trauma hospitals. The trauma center categories include both verified and in process trauma centers. This is the second report that uses this categorization.
- The first half of the report (pages 1-21) focuses on data and timely topics for the past quarter. The second half of the report (Supplemental Report, pages 22-53) contain demographic information, data that stays nearly constant from quarter to quarter, and reference tables and maps.
- We are continuing to track the number of cases that fell into the ED LOS >12 hours category, which is on page 3.
- A map of all reporting hospitals is found on page 52.
- A map of all hospital not reporting is found on page 20.
- Average ED LOS by district may be found on pages 24. ED LOS is split out into transfers and critical transfers.
- There were seven cases with Ps \geq 50% and ED Disposition of expired.
- A fifth column for transferred patients with Ps < 0.50 was added on pages 14 and 16.
- Page 36 has a caterpillar plot with the ED LOS for all non-trauma centers.
- Page 44 has a caterpillar plot with the ED LOS for all patients who had an ED disposition = transferred for non-trauma centers.
- Signs of Life: The two field values for this variable are: 1) Arrived with no signs of life, 2) Arrived with signs of life. A patient with no signs of life is defined as having none of the following: organized EKG activity, pupillary responses, spontaneous respiratory attempts or movement, and unassisted blood pressure. This usually implies the patient was brought to the ED with CPR in progress.

Example Bar and Whisker Plot:

-Bar and whisker plots were requested at the November 2013 ISTCC meeting in order to show more than just an average ED LOS and ED LOS by ISS. The bar and whisker plots represent the four quartiles of data, as illustrated on the example graph to the right. The blue boxes each contain 25% of the values and the error bars each represent where 25% of the values fell. The median is represented in the middle of the two blue boxes with the white line. The red dot in the center indicates the average for that category. The cap on the error bars indicates the minimum and maximum of each category and all the values fall within the two caps.

-For the ED LOS bar and whisker plots to the right, the average is represented by the white dot and the color boxes reflect the hospital type. The ED LOS by ISS plots on the next page follow the same layout and the red dots indicate the average for each of the ISS categories.



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Supplemental Report

-The Supplemental Report (pages 22-53) contain demographic information, data that stays nearly constant from quarter to quarter, and reference tables and maps.

Definitions:

Direct Admit: Patient is admitted directly to the hospital and does not spend time in Emergency Department. The ED Length of Stay should reflect a direct admittance.

External Cause of Injury: ICD-9-CM codes that are used to describe the mechanism or external factor that caused the injury event.

Trauma Type: The classification of the force applied to the body. Trauma type categories include blunt, penetrating, thermal, and other trauma.

Injury Severity Score: An anatomical scoring system defined as the sum of the three highest squared maximum Abbreviated Injury Scale (AIS) values to account for multiple injuries in the six body regions.

Signs of Life: The two field values for this variable are: 1) Arrived with no signs of life, 2) Arrived with signs of life. A patient with no signs of life is defined as having none of the following: organized EKG activity, pupillary responses, spontaneous respiratory attempts or movement, and unassisted blood pressure. This usually implies the patient was brought to the ED with CPR in progress.

Acronyms:

E-code: External Cause of Injury	MVC: Motor Vehicle Collision
ED: Emergency Department	OR: Operating Room
ICU: Intensive Care Unit	Ps: Probability of Survival
ISS: Injury Severity Score	CAHs: Critical Access Hospital
LOS: Length of Stay	

Calculations:

$Ps = 1/(1+e^{-b})$ where $b=b_0+b1(RTS) + b2(ISS) + b3(Age\ Index)$

Total GCS = Verbal GCS + Motor GCS + Eye GCS

$RTS = 0.94*GCS+0.73*SBP+0.29*RR$

$ISS = (AIS)^2 + (AIS)^2 + (AIS)^2$



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7 facilities

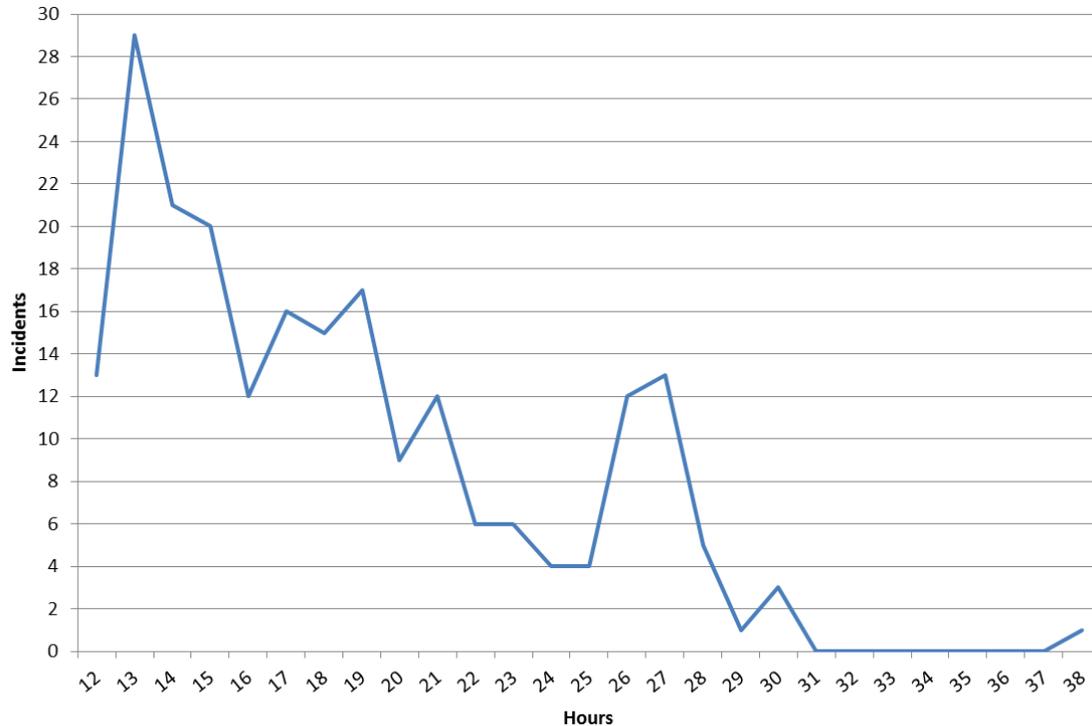
9.9% of data

(Non-Trauma) Hospitals:

83 facilities

41.6% of data

ED LOS \geq 12 Hours



N=219

ED Length of Stay \geq 12 Hours

Hour	Count	Hour	Count
12th	13	26th	12
13th	29	27th	13
14th	21	28th	5
15th	20	29th	1
16th	12	30th	3
17th	16	31st	0
18th	15	32nd	0
19th	17	33rd	0
20th	9	34th	0
21st	12	34th	0
22nd	6	35th	0
23rd	6	36th	0
24th	4	37th	0
25th	4	38th	1

Indiana Trauma Registry

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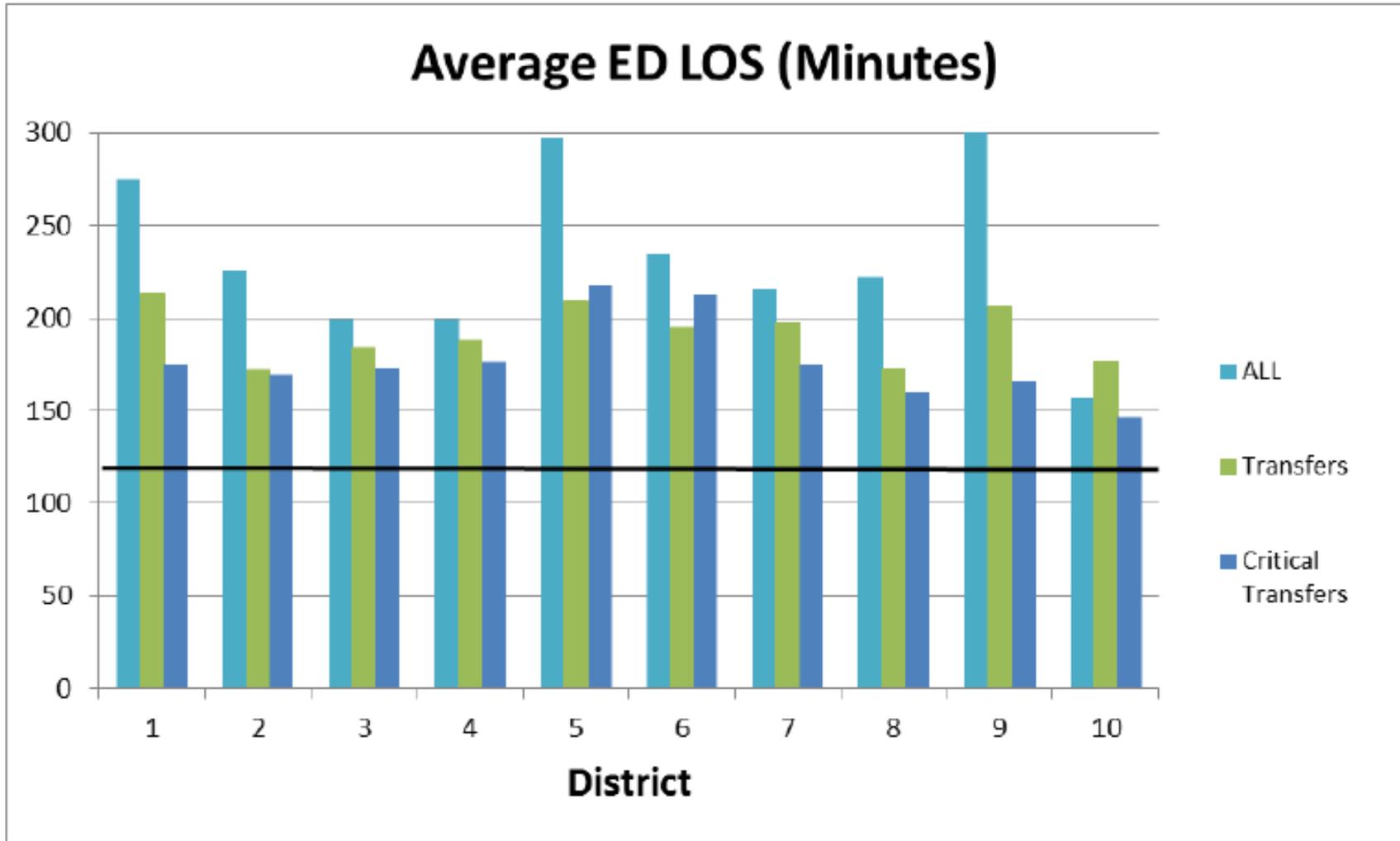
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The average bar is represents 120 minutes.

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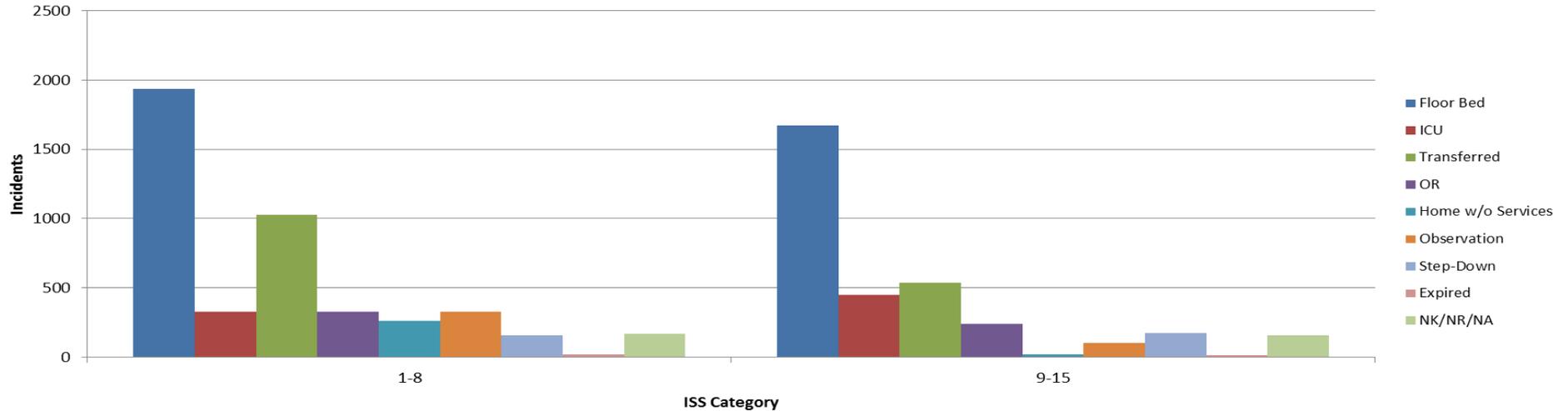
9.9% of data

(Non-Trauma) Hospitals:

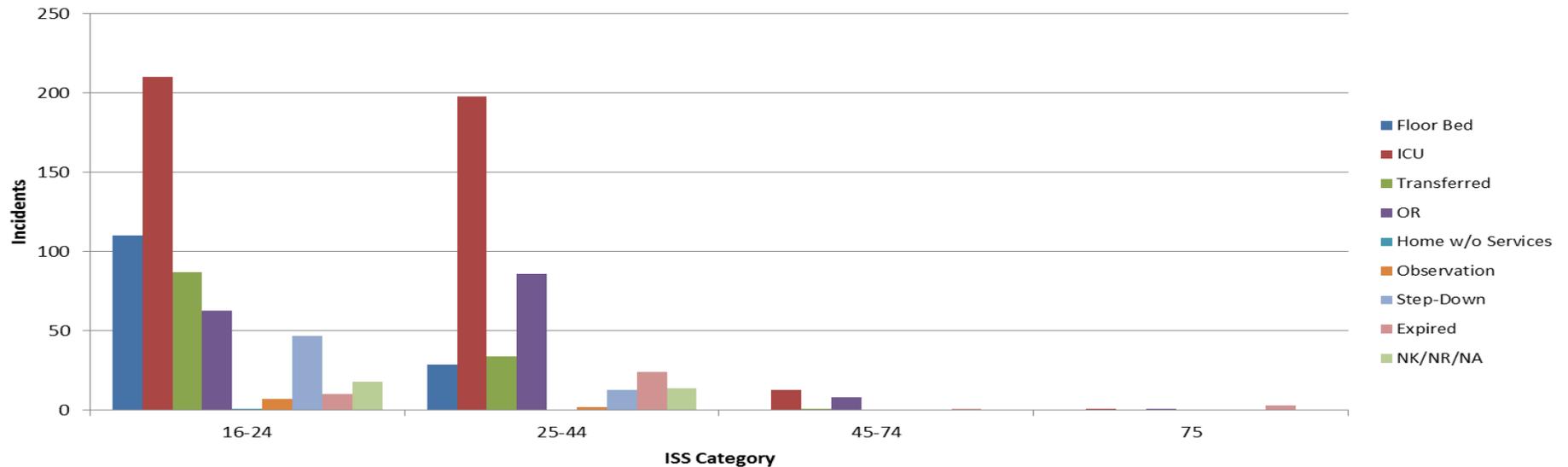
83 facilities

41.6% of data

ED Disposition by ISS 1-14



ED Disposition by ISS 15-75



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.

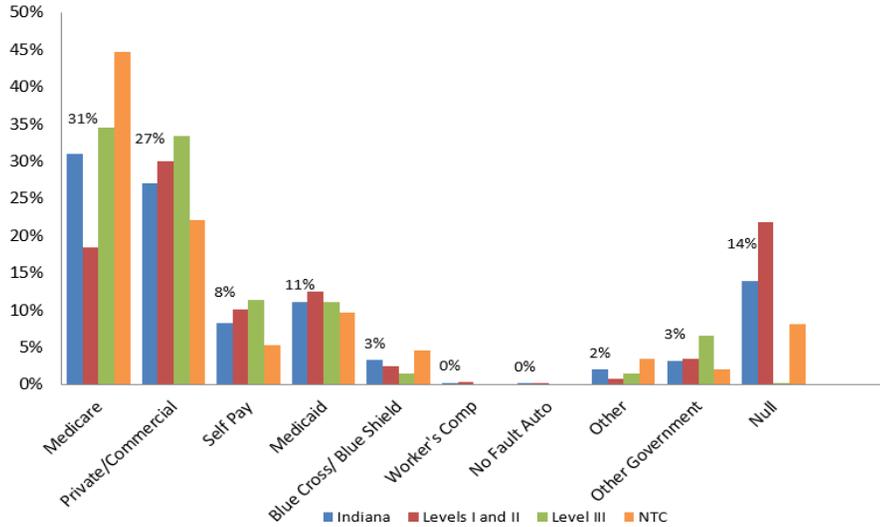
*A table with values for ED Disposition by ISS is found on page 51.

Indiana Trauma Registry

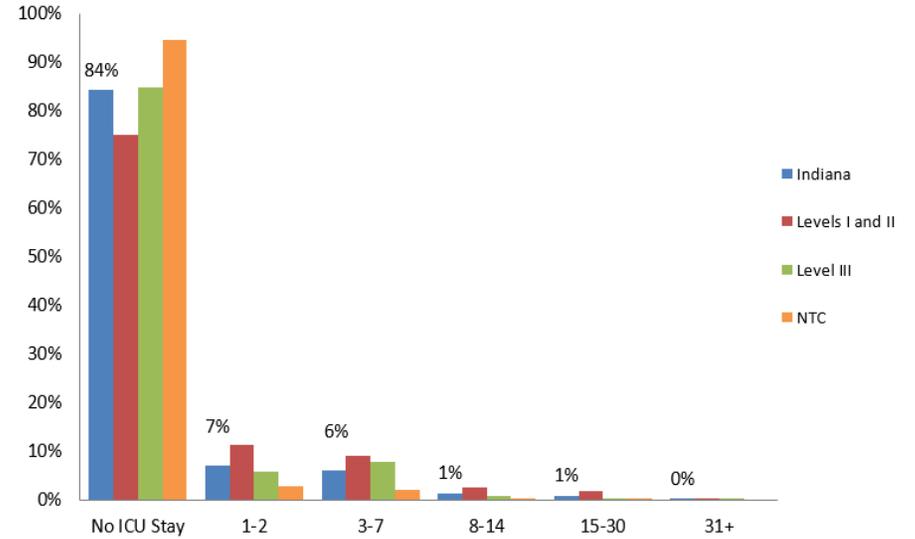
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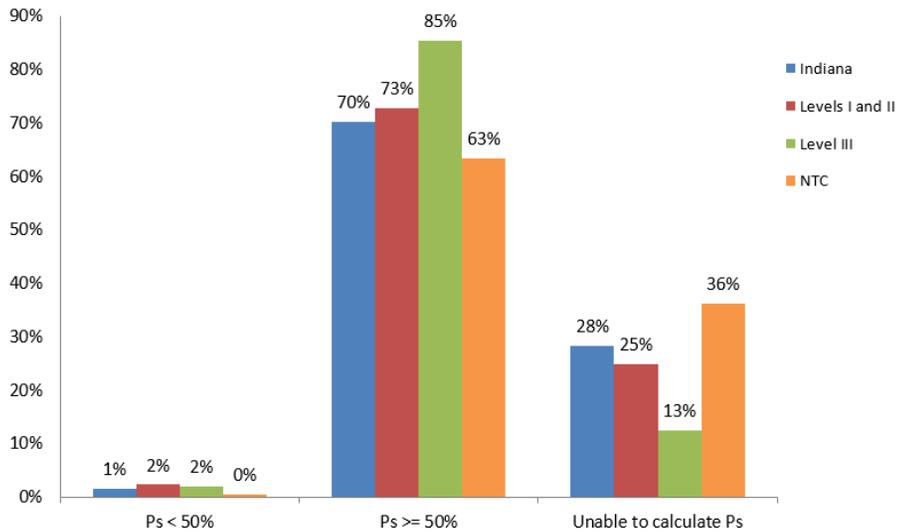
Primary Payer Mix



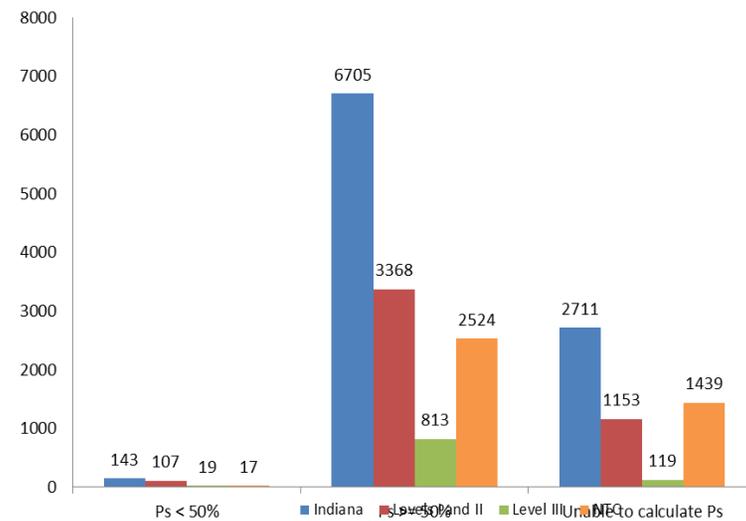
ICU Length of Stay (Days)



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 6,848 incidents with calculated Ps.

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Probability of Survival Components—All Patients									
		Count Missing				Percent Missing			
Components		Indiana	Levels I and II	Level III	Non-Trauma Center	Indiana	Levels I and II	Level III	Non-Trauma Centers
RTS	GCS	2427	1022	81	1324	25.39%	22.08%	8.52%	33.27%
	SBP	864	527	36	301	9.04%	11.39%	3.79%	7.56%
	Respiratory Rate	806	549	24	233	8.43%	11.86%	2.52%	5.85%
ISS		7	0	0	7	0.07%	0.00%	0.00%	0.18%
Age		6	0	0	6	0.06%	0.00%	0.00%	0.15%

$$RTS = 0.9368 * GCS + 0.7326 * SBP + 0.2908 * \text{Respiratory Rate}$$

Indiana Trauma Registry

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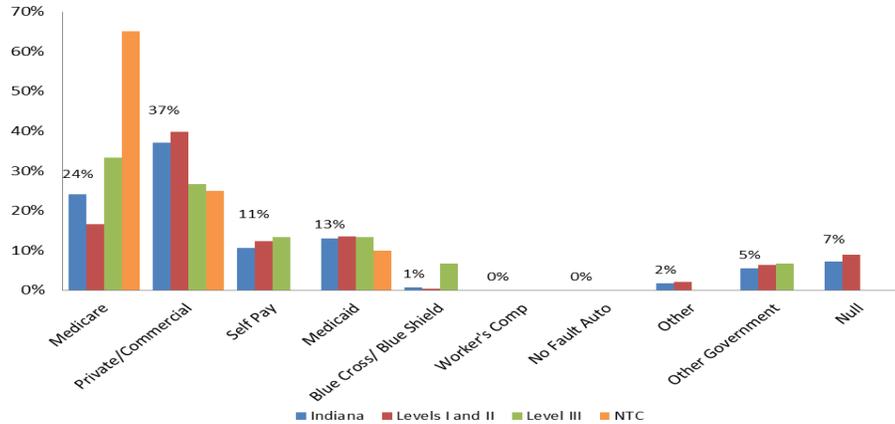
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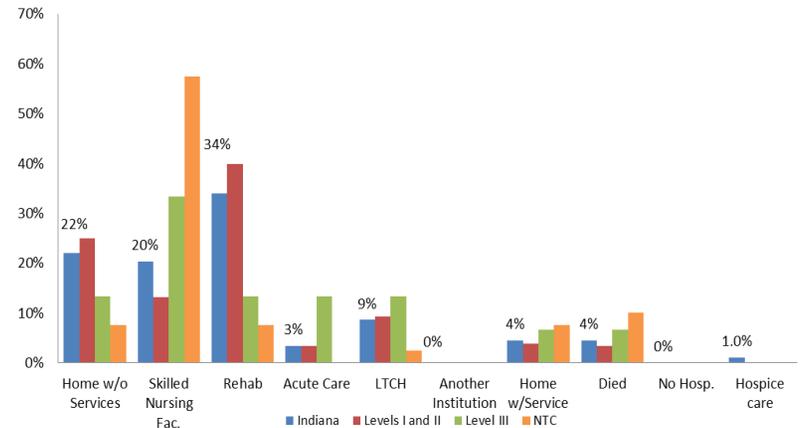
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Hospital Length of Stay > 15 days, N=278

Primary Payer Mix

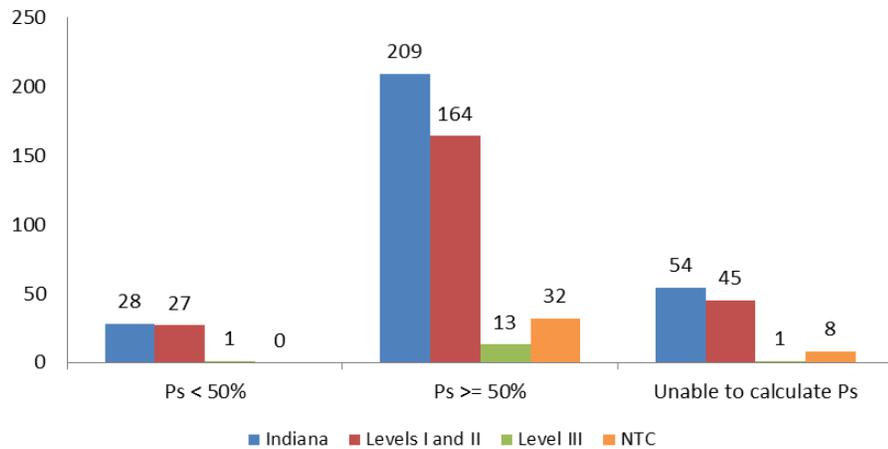


Hospital Disposition

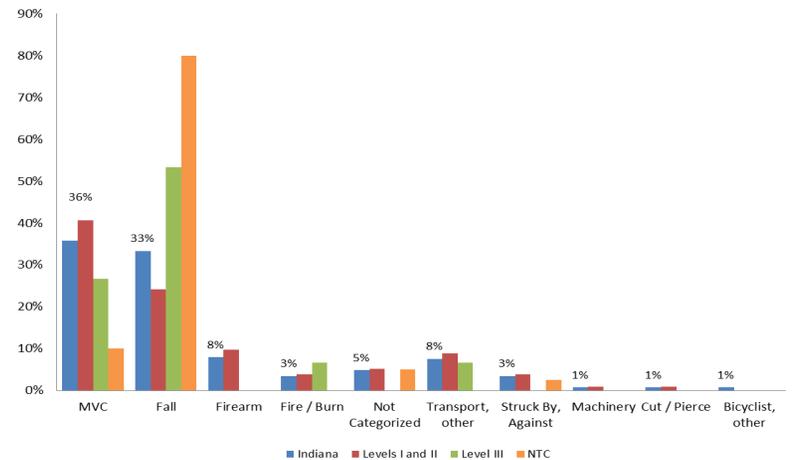


Another Institution includes any other medical facility not defined in the other categories.

Probability of Survival



Cause of Injury



Hospital Length of Stay > 15 Days: Total N=291;
Level III N=15;

Levels I and II N= 236;
NTC N=40

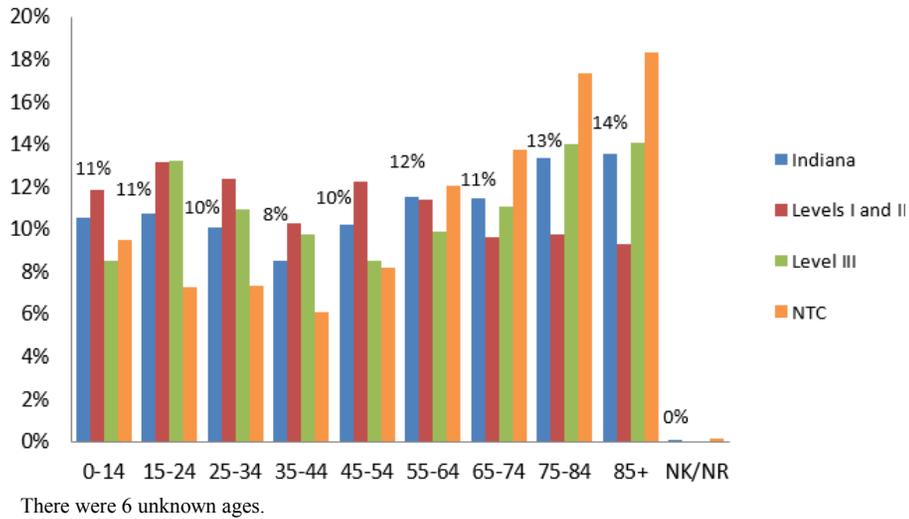
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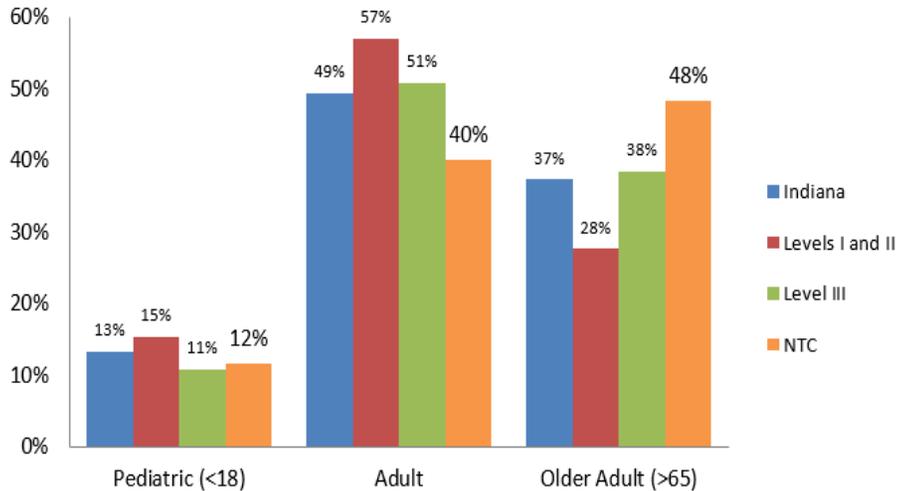
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Patient Age (Years)



Age Group	Indiana	I and II	III	NTC
0-14	1009	550	81	378
15-24	1025	610	126	289
25-34	967	572	104	291
35-44	812	476	93	243
45-54	974	568	81	325
55-64	1100	526	94	480
65-74	1097	445	105	547
75-84	1275	451	133	691
85+	1294	430	134	730
NK/NR	6	0	0	6
Total	9559	4628	951	3980

Patient Age Groupings



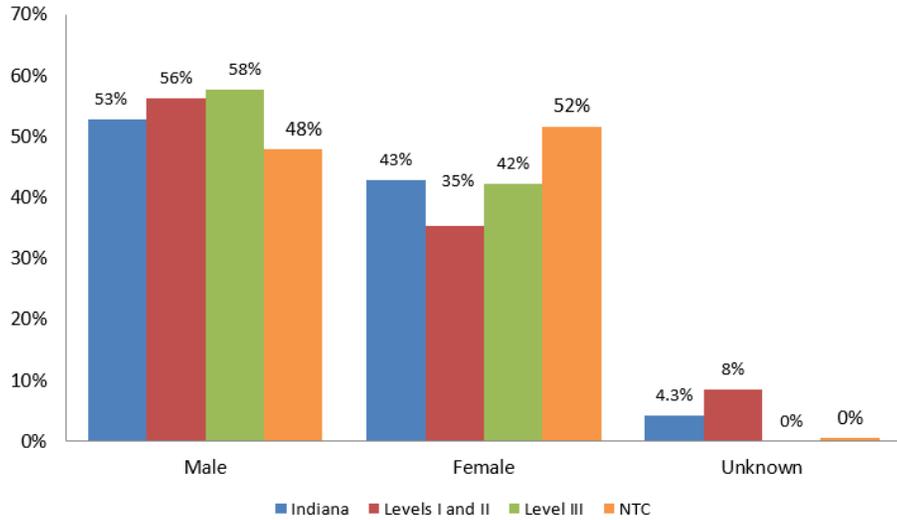
Age Group	Indiana	I and II	III	NTC
Pediatric	1274	711	102	461
Adult	4713	2638	483	1592
Older Adult	3566	1279	366	1921
Total	9553	4628	951	3974

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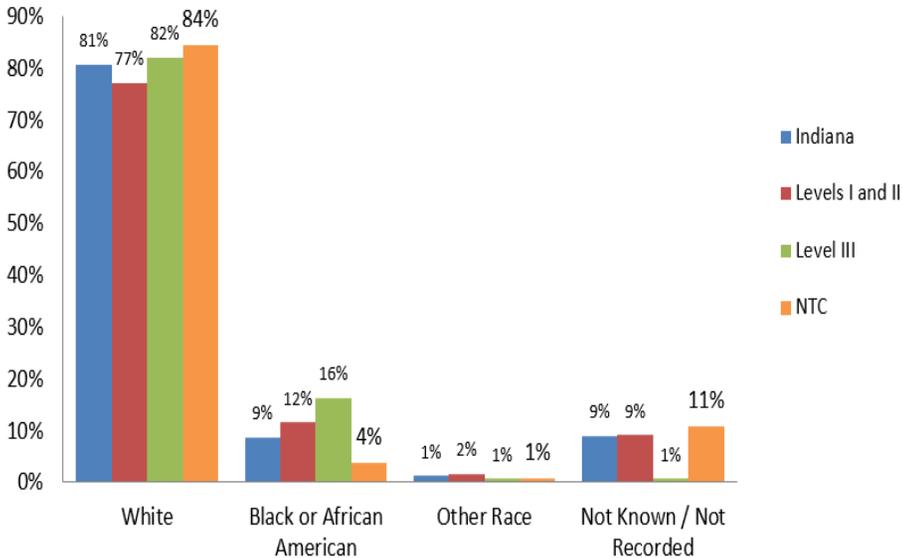
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Patient Gender



Gender	Indiana	I and II	III	NTC
Male	5056	2603	549	1904
Female	4091	1632	402	2057
Unknown	412	393	0	19
Total	9559	4628	951	3980

Patient Race



Race	Indiana	I and II	III	NTC
White	7705	3570	779	3356
Black or African American	835	536	155	144
Other	113	73	6	34
Not Known/Not Recorded	861	423	7	431
American Indian or Alaska Native	6	4	0	2
Asian	35	20	4	11
Native Hawaiian or Pacific Islander	4	2	0	2
Total	9559	4628	951	3980

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

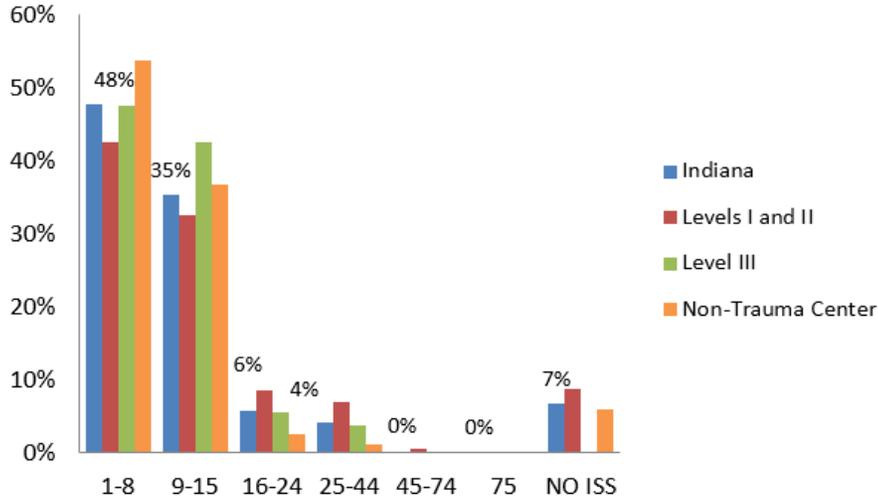
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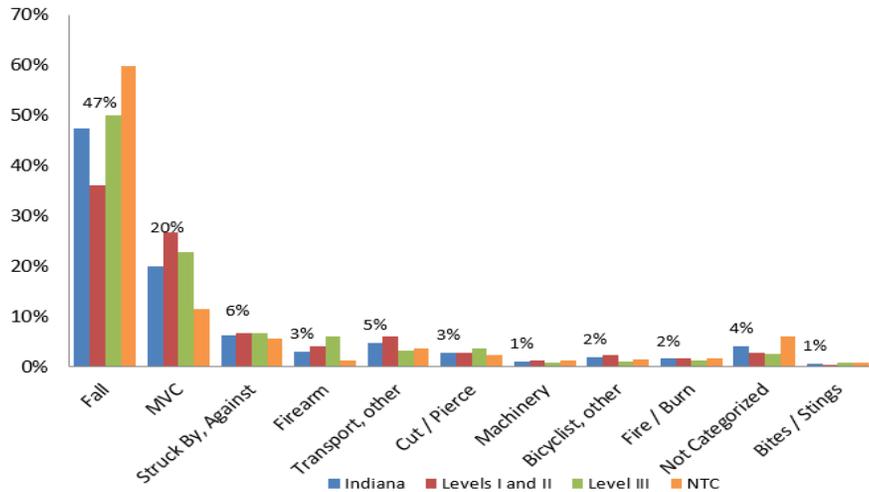
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Injury Severity Score (ISS)



There were 23 and 5 cases in the 45-74 and 75+ categories, respectively

Cause of Injury



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

ISS Category	Indiana	I and II	III	NTC
1-8	4562	1971	453	2138
9-15	3374	1509	405	1460
16-24	553	398	53	102
25-44	402	320	35	47
45-74	23	21	2	0
75	5	4	1	0
No ISS	640	405	2	233
Total	9559	4628	951	3980

Cause of Injury	Indiana	I and II	III	NTC
Fall	4529	1673	477	2379
MVC	1915	1241	217	457
Struck By, Against	603	314	63	226
Firearm	289	186	57	46
Transport	459	283	30	146
Cut / Pierce	260	130	34	96
Machinery	107	53	7	47
Bicyclist	176	105	10	61
Fire/Burn	154	77	12	65
Not Categorized	391	129	25	237
Bites/Stings	57	15	7	35

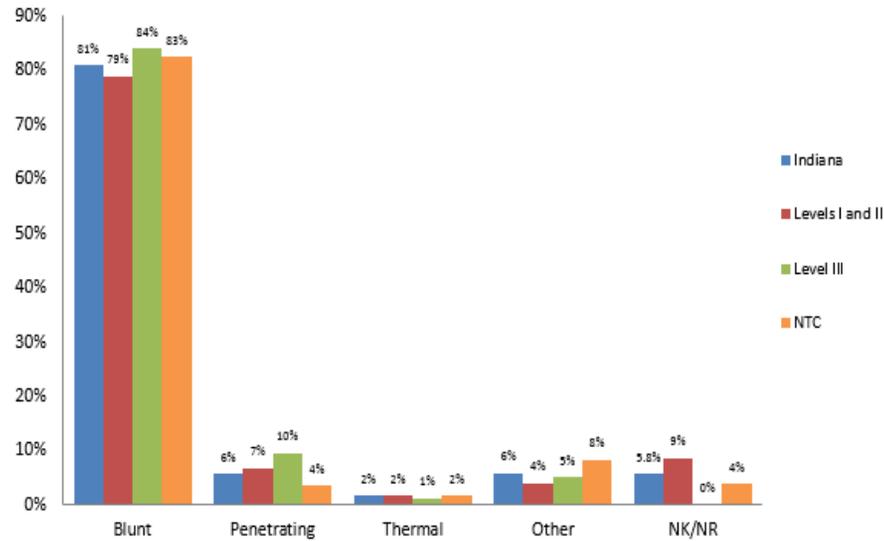
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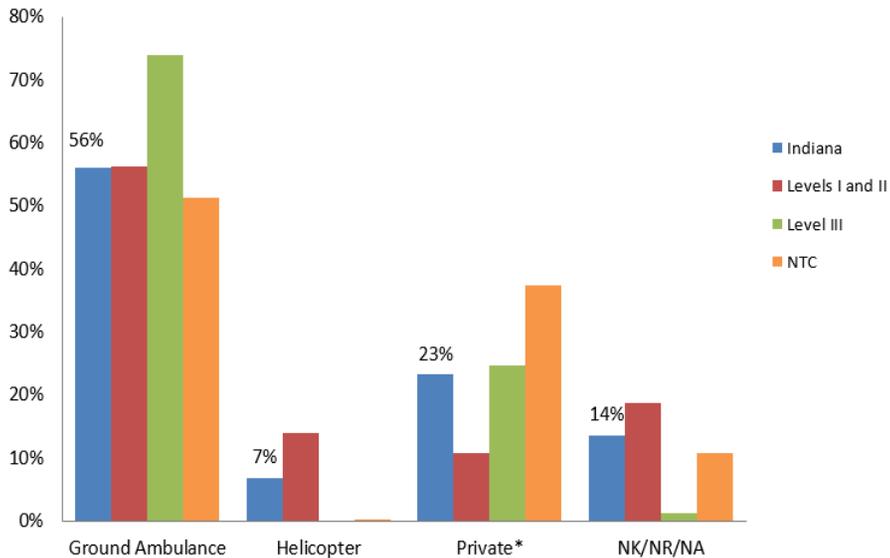
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Trauma Type



Trauma Type	Indiana	I and II	III	NTC
Blunt	7736	3651	800	3285
Penetrating	549	316	91	142
Thermal	154	77	12	65
Other	564	185	48	331
NK/NR	556	399	0	157
Total	9559	4628	951	3980

Transport Mode



Transport Mode	Indiana	I and II	III	NTC
Ground Ambulance	4730	2034	703	1993
Helicopter	323	295	27	1
Private	1698	376	288	1034
NK/NR/NA	282	11	110	161
Police	16	5	2	9
Other	1	0	0	1
Total	7050	2721	1130	3199

<1% Transport Mode: Police, Other

* Indicates Private/ Public Vehicle, Walk-in

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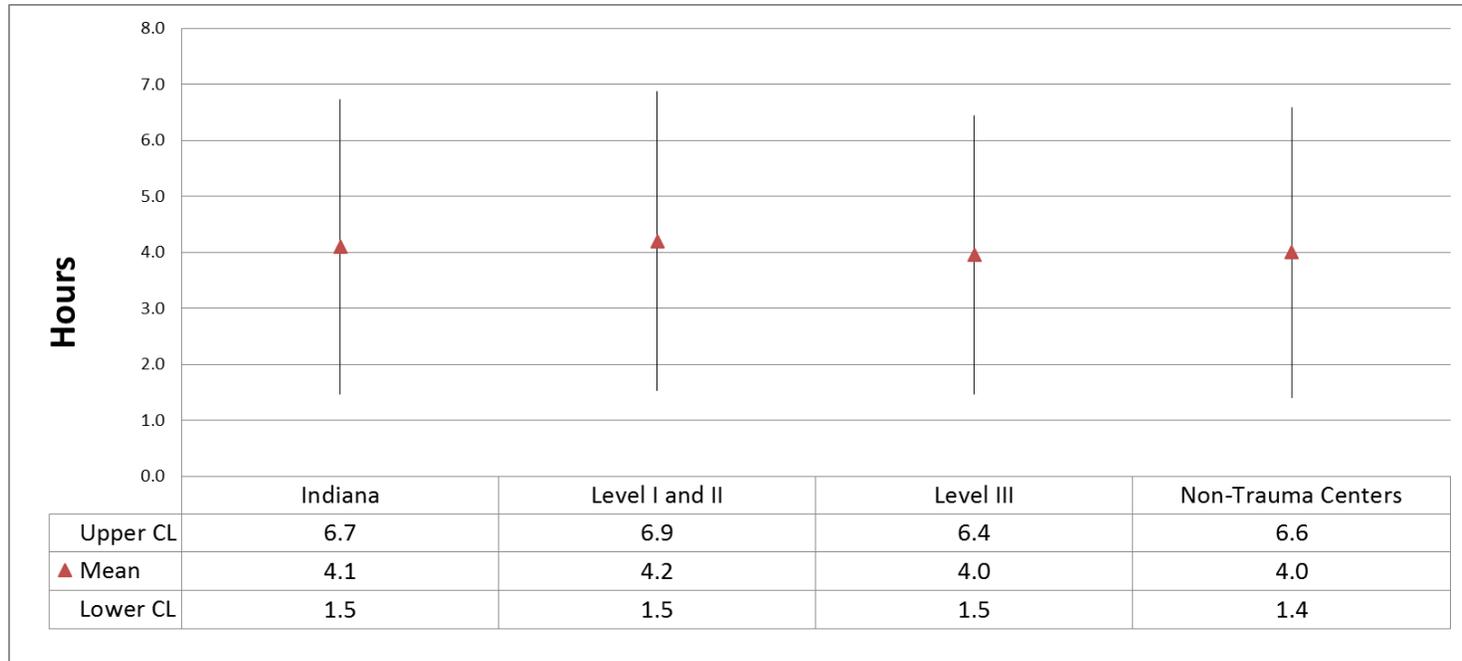
9.9% of data

(Non-Trauma) Hospitals:

83 facilities

41.6% of data

All Patients Average ED LOS (Hours)



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.

The ED LOS for these graphs was modeled using time-to-event analysis. The purposes of using this analysis were to account for censoring (death) and to see how variables influence ED LOS. The outcome variable was ED LOS and the independent variables were total GCS and age. If total GCS was missing but manual total GCS was recorded, then the manual total GCS was used. These two variables were used because they were the most similar to variables used in the published, peer-reviewed literature on ED LOS. Both were significant in the model. Increasing total GCS and age led to a slightly shorter ED LOS. Hospitals that did not have enough incidents with total GCS or age could not be modeled.

In the chart on the left, note the trauma center average is above the mean and the non-trauma center is below the mean. The mean, 95% confidence limit and lower confidence limit are listed for each group.

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

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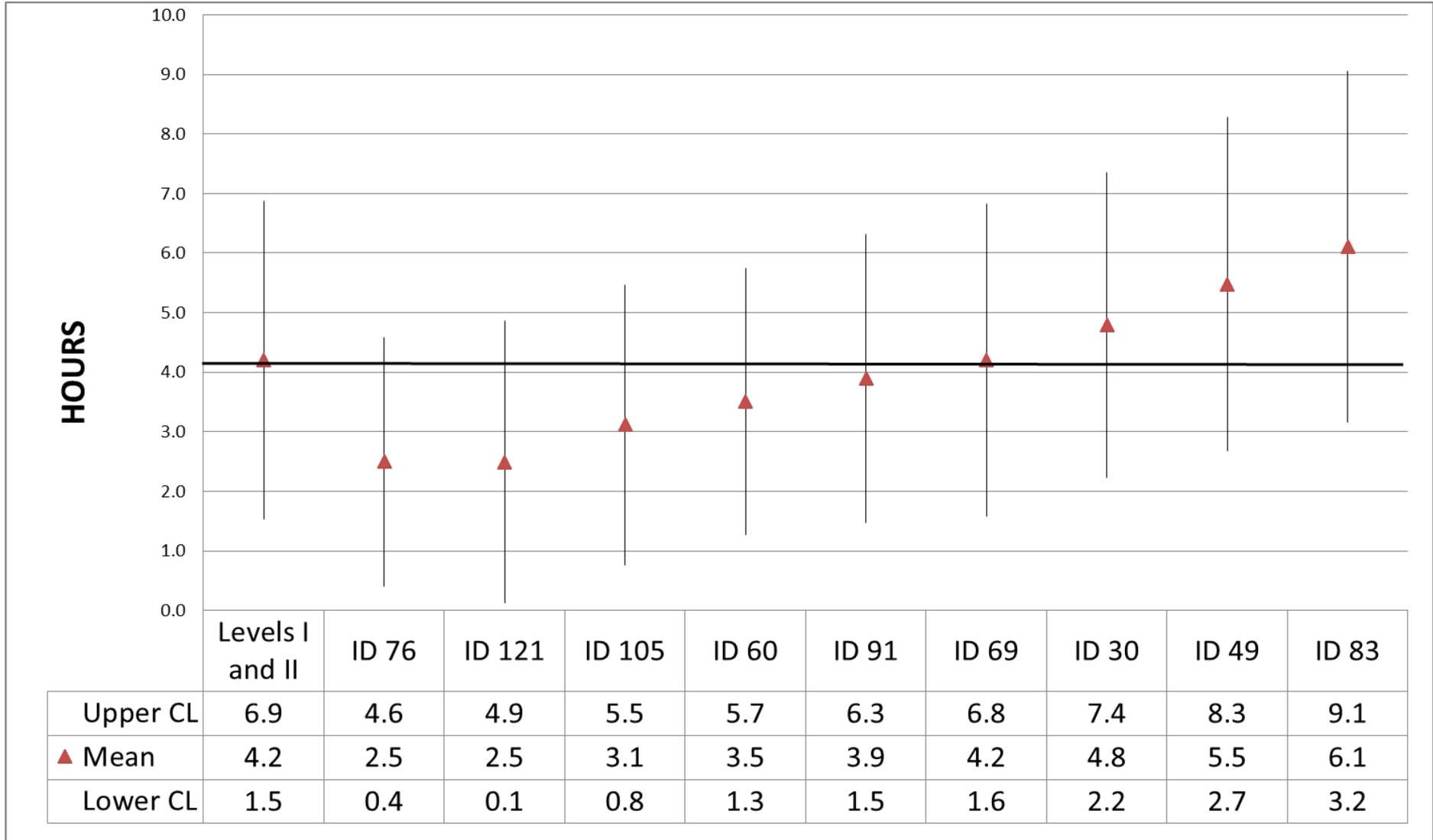
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All Patients

Level I and II Trauma Centers ED LOS (Hours)



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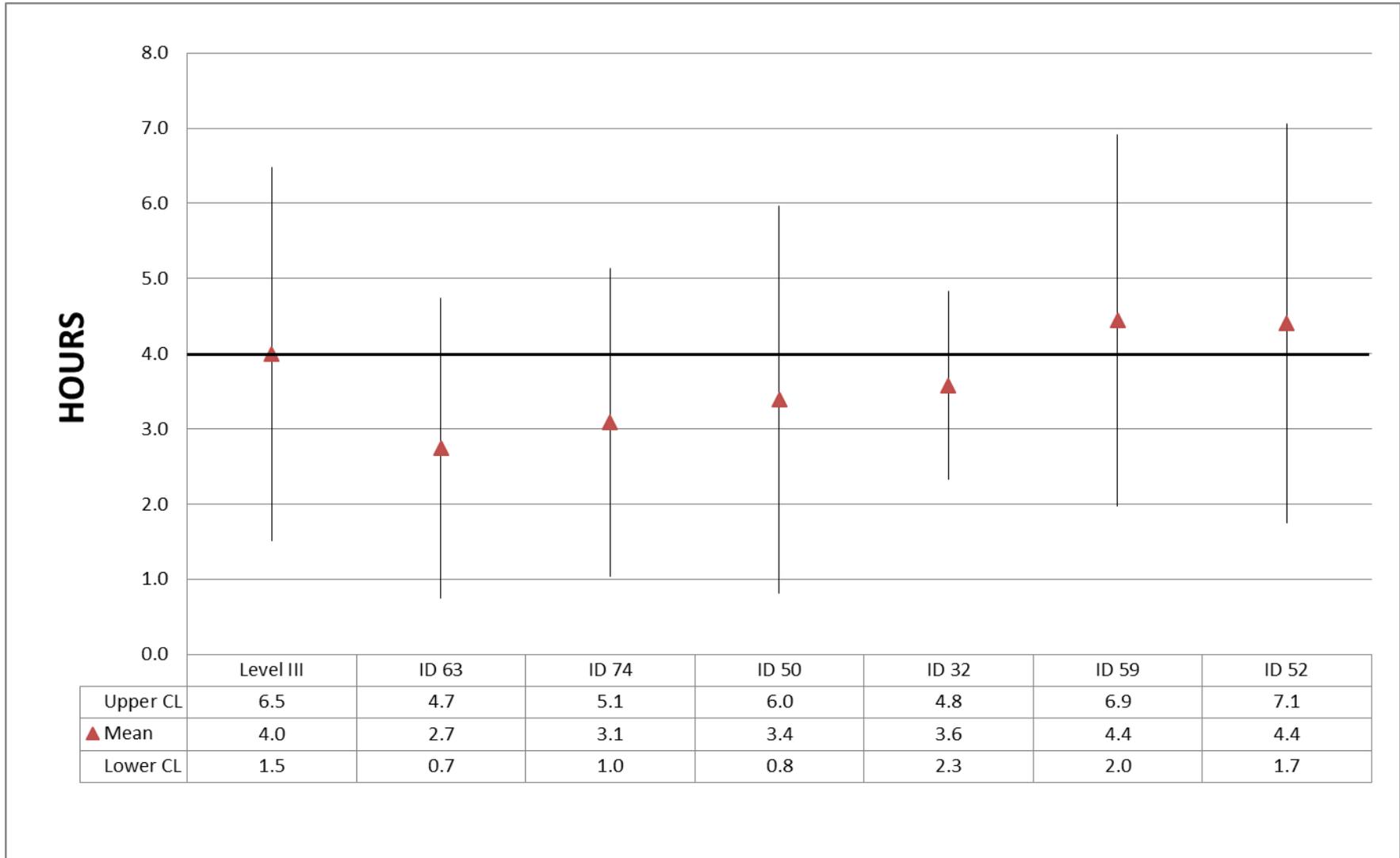
(Non-Trauma) Hospitals:

83 facilities

41.6% of data

All Patients

Level III Trauma Centers ED LOS (Hours)



Indiana Trauma Registry

Statewide Quarter 3 Data Report

July 1, 2015—September 30, 2015

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99 Total Hospitals Reporting

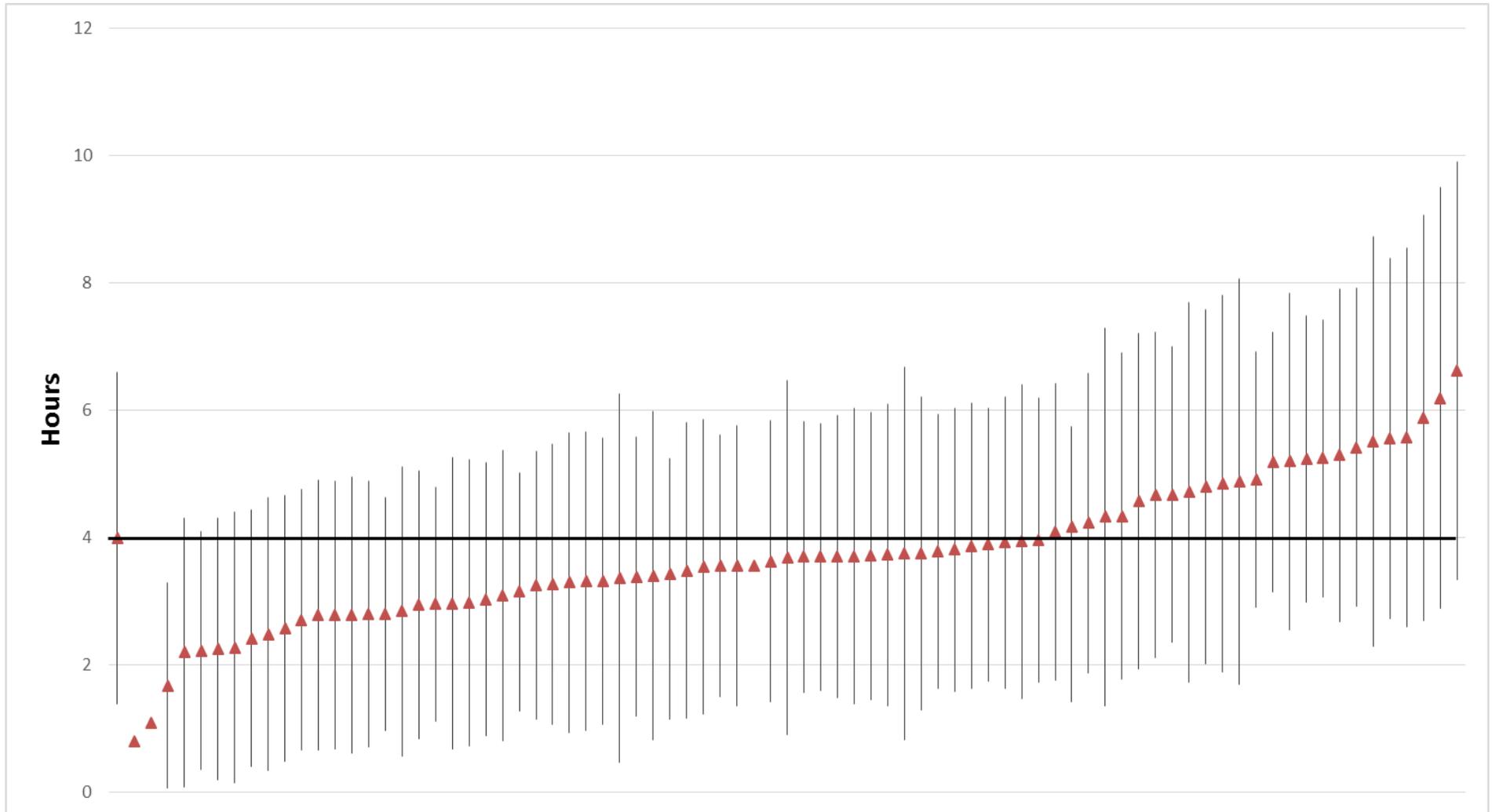
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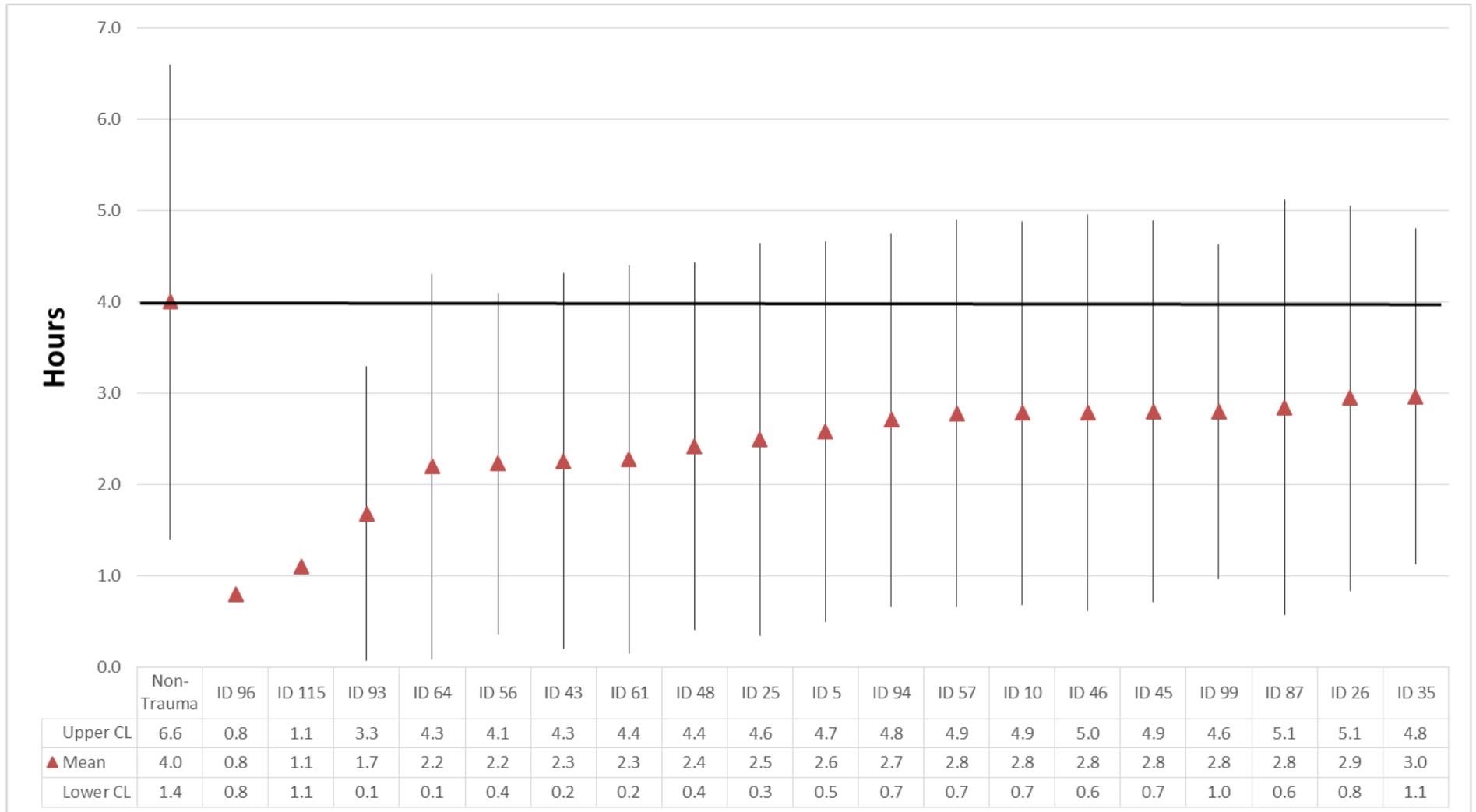
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All Patients Non-Trauma Centers- Average ED LOS (Hours)



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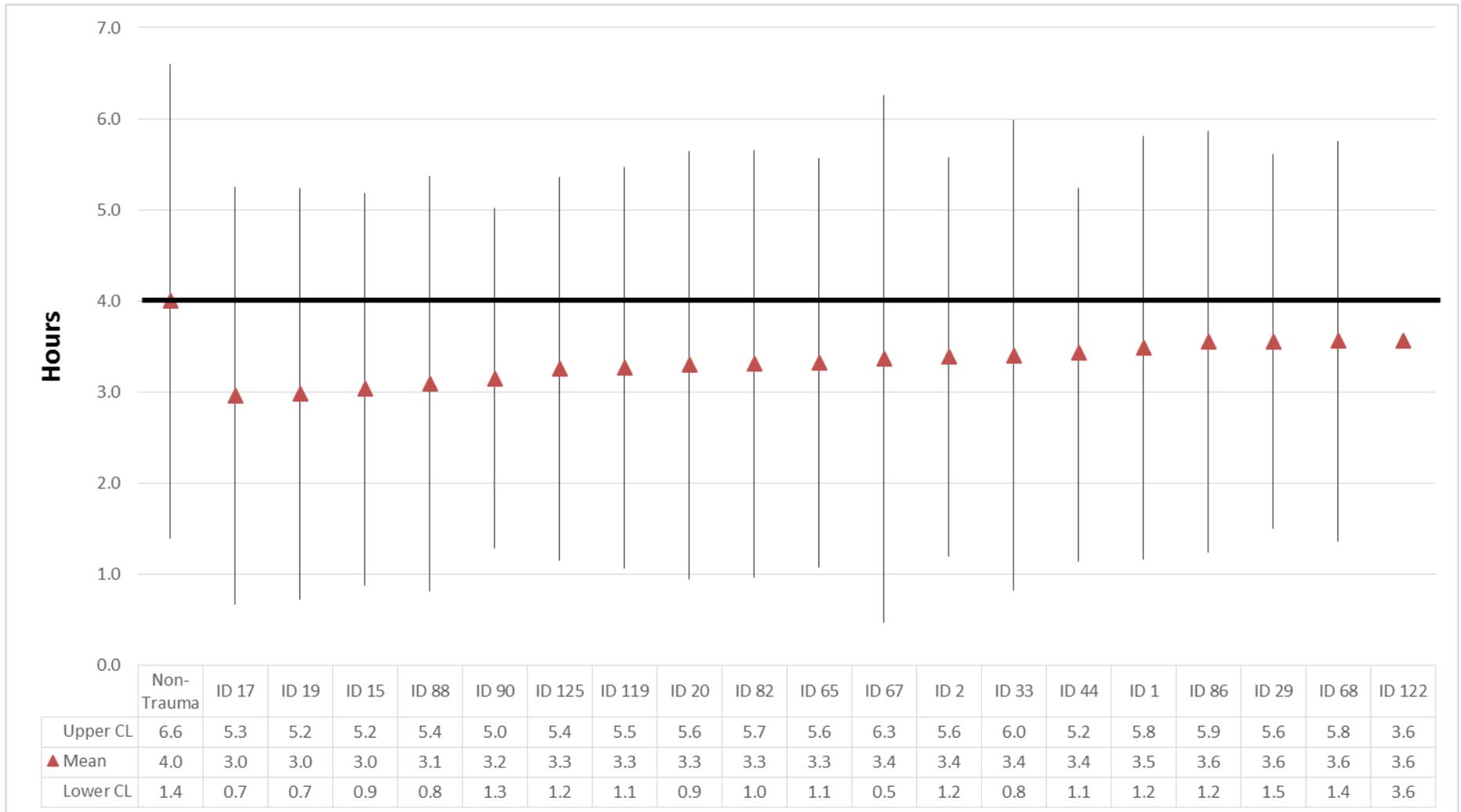
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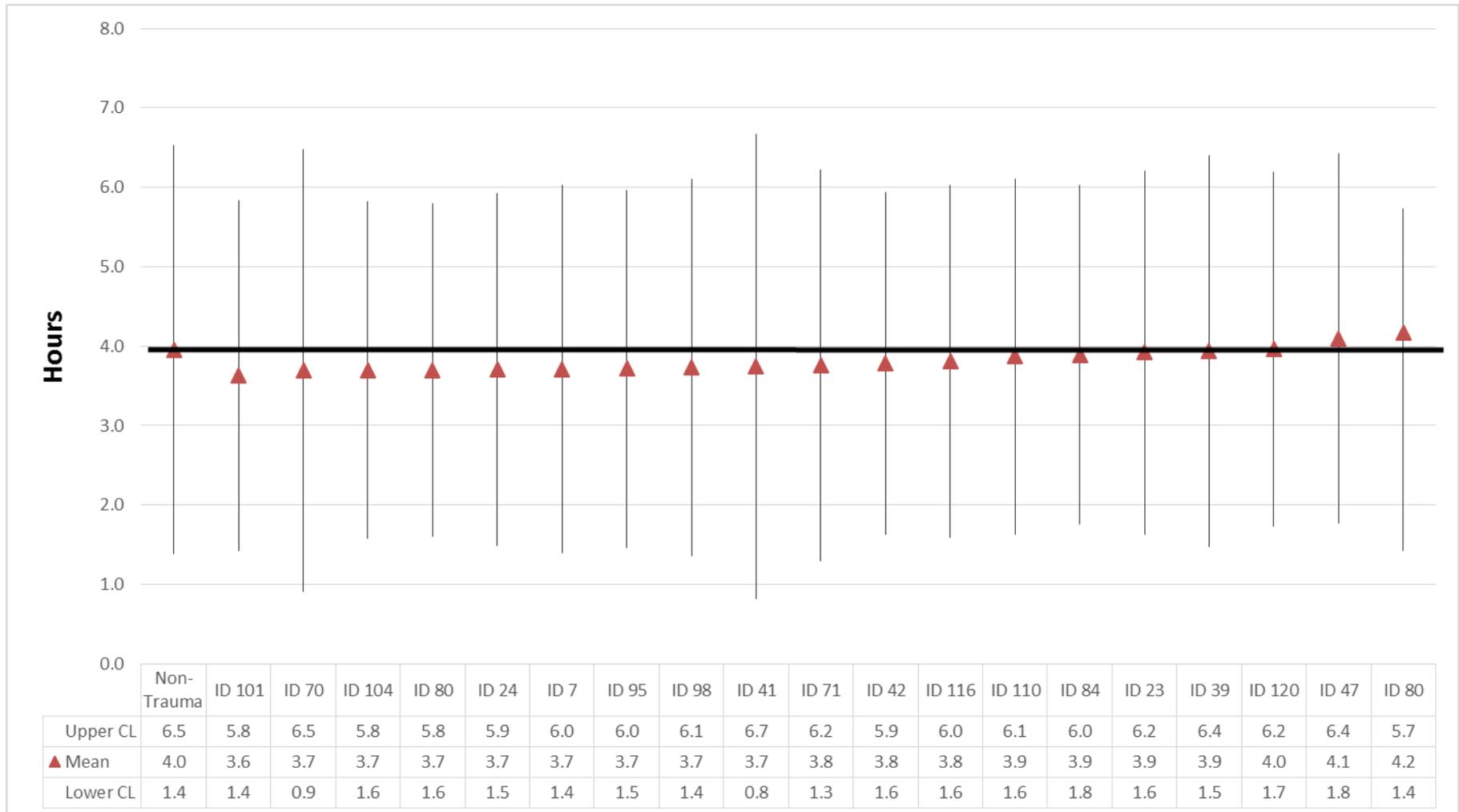
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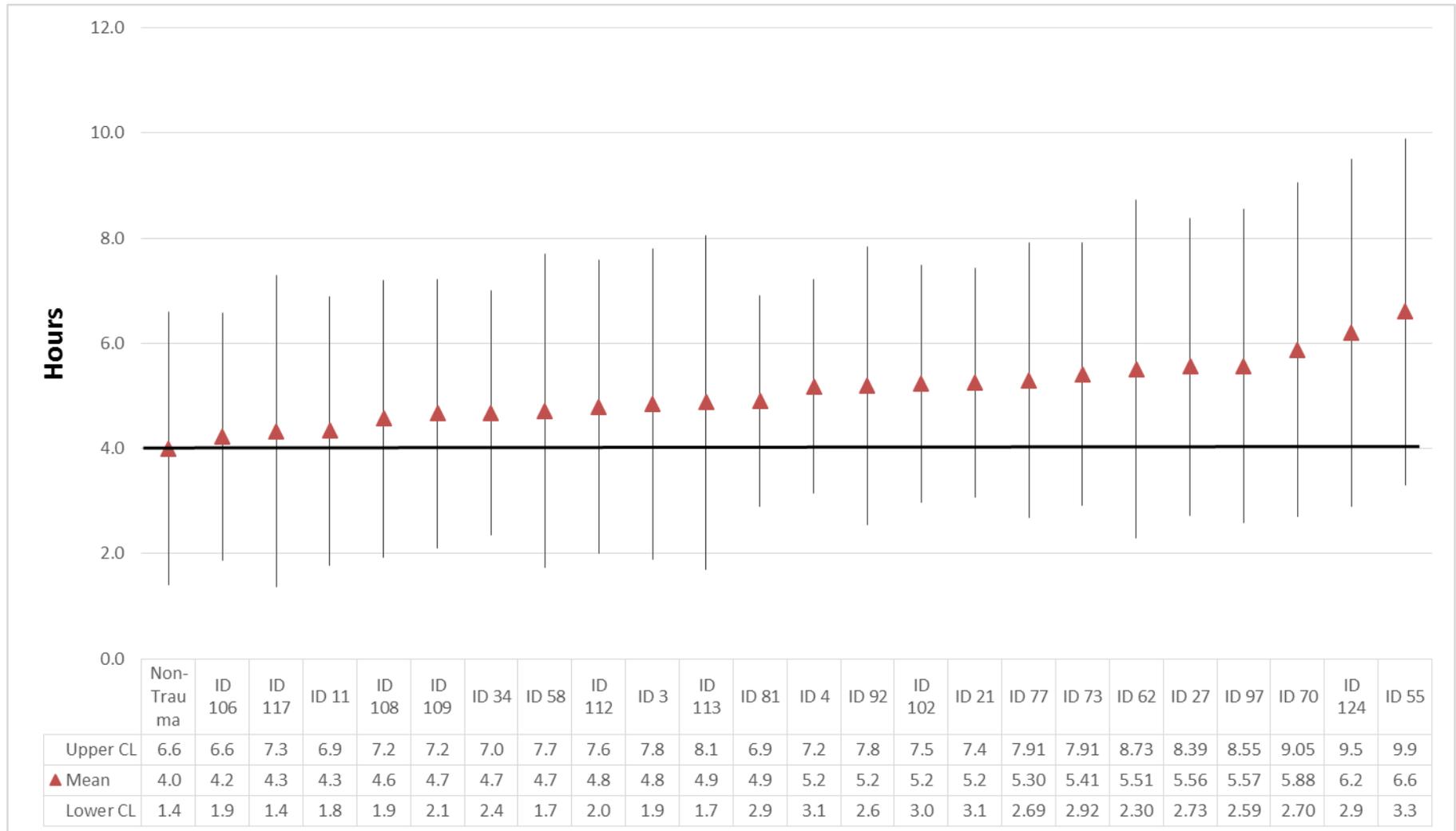
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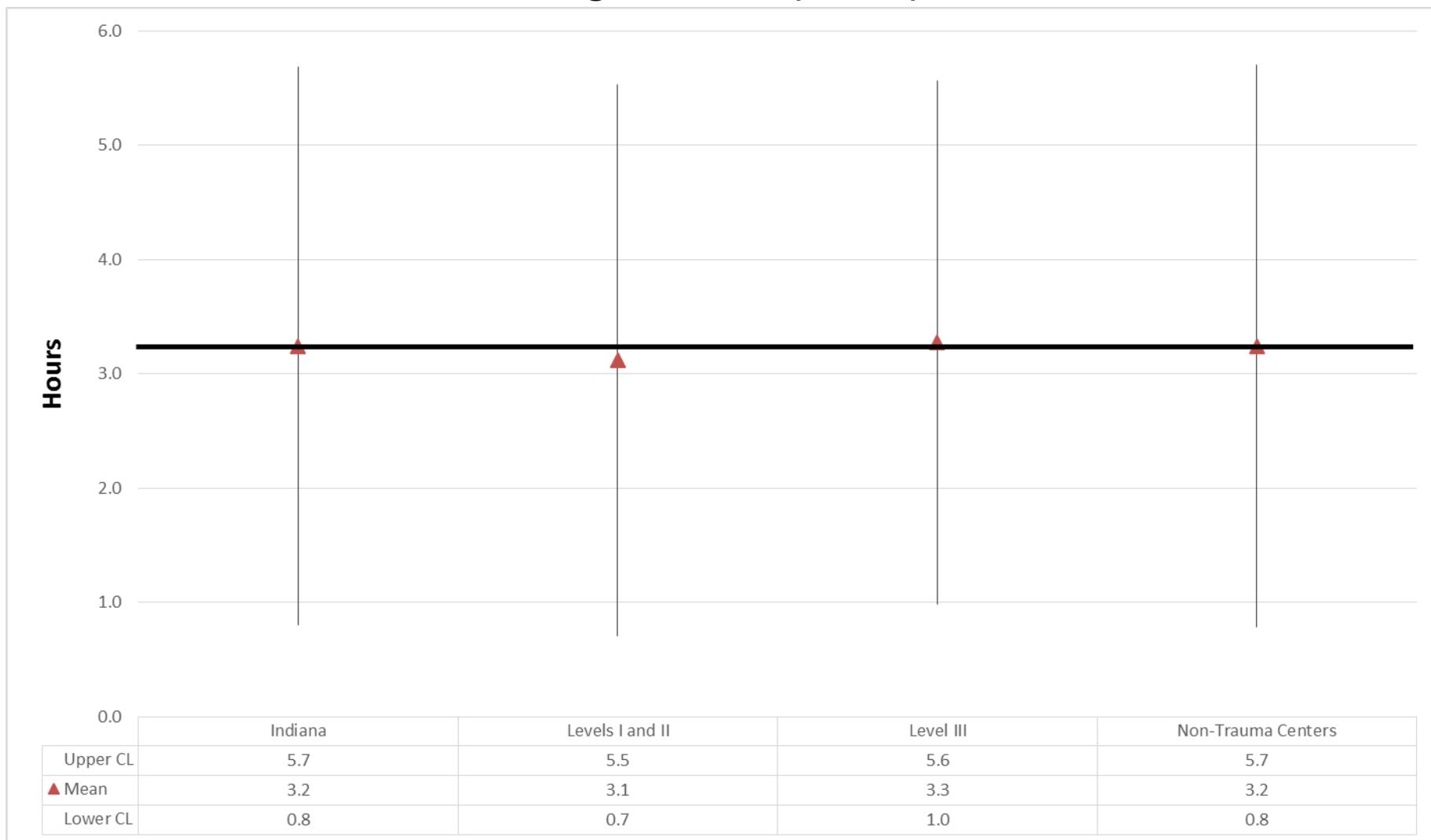
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ED Disposition = Transferred

Average ED LOS (Hours)



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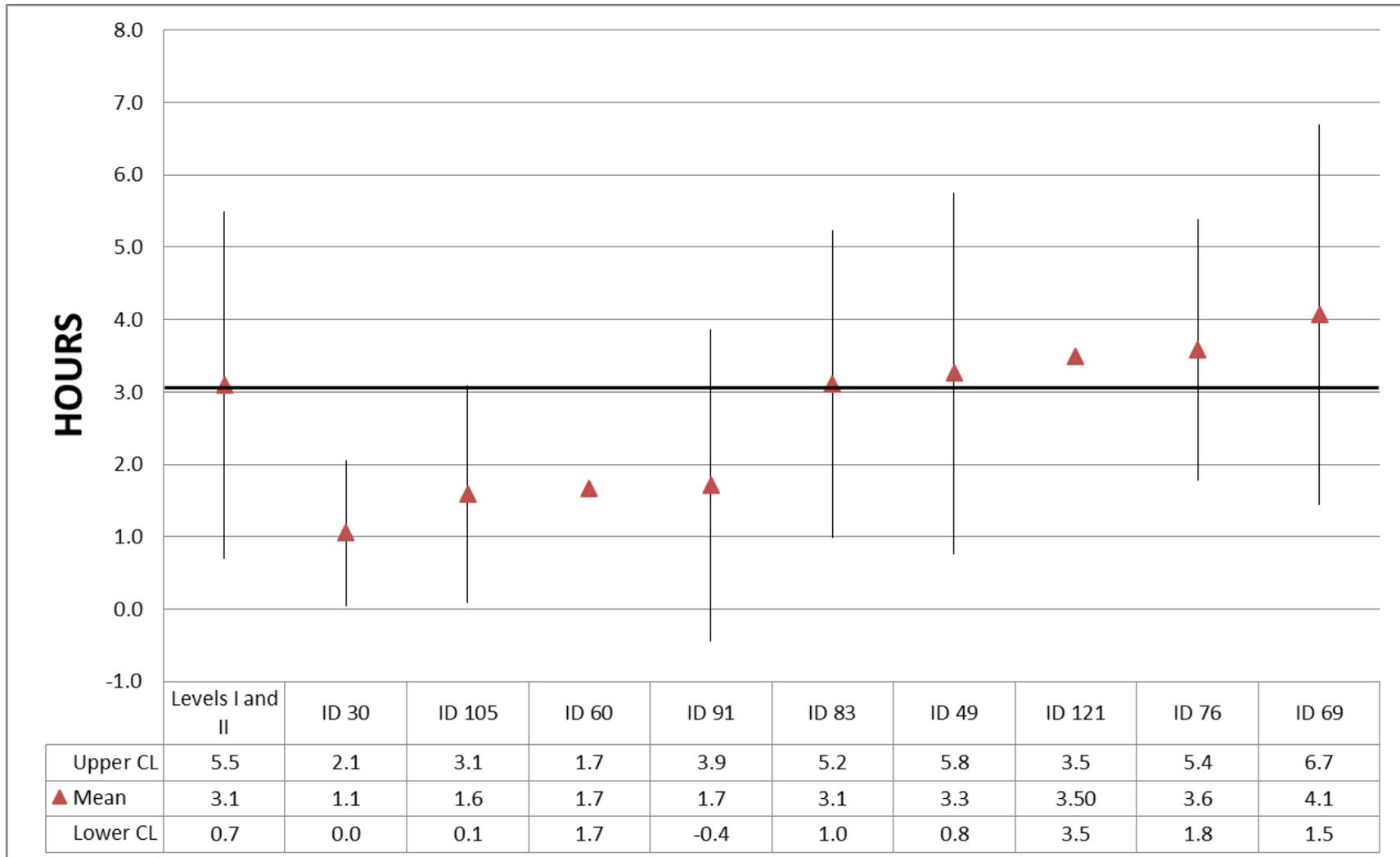
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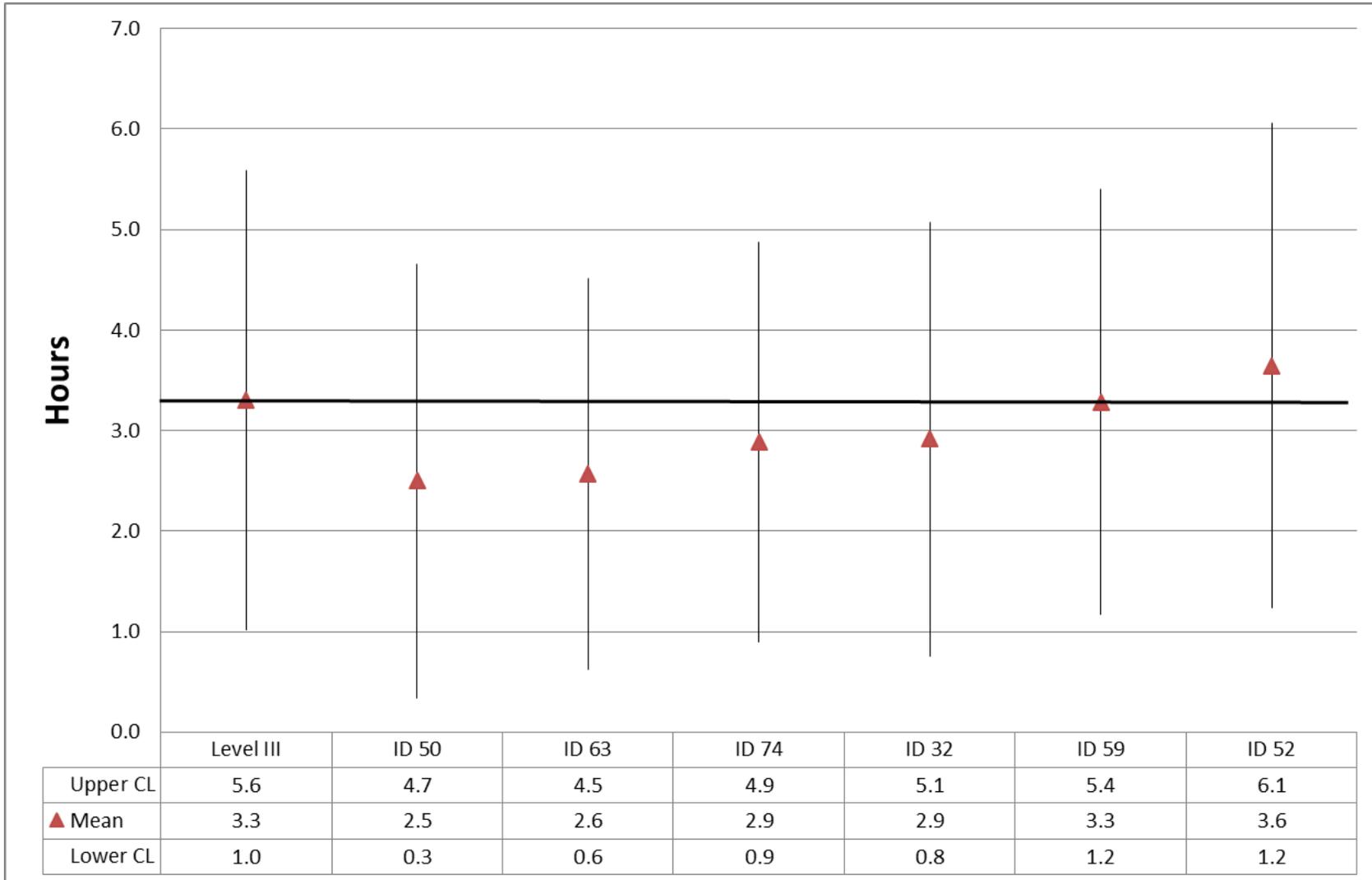
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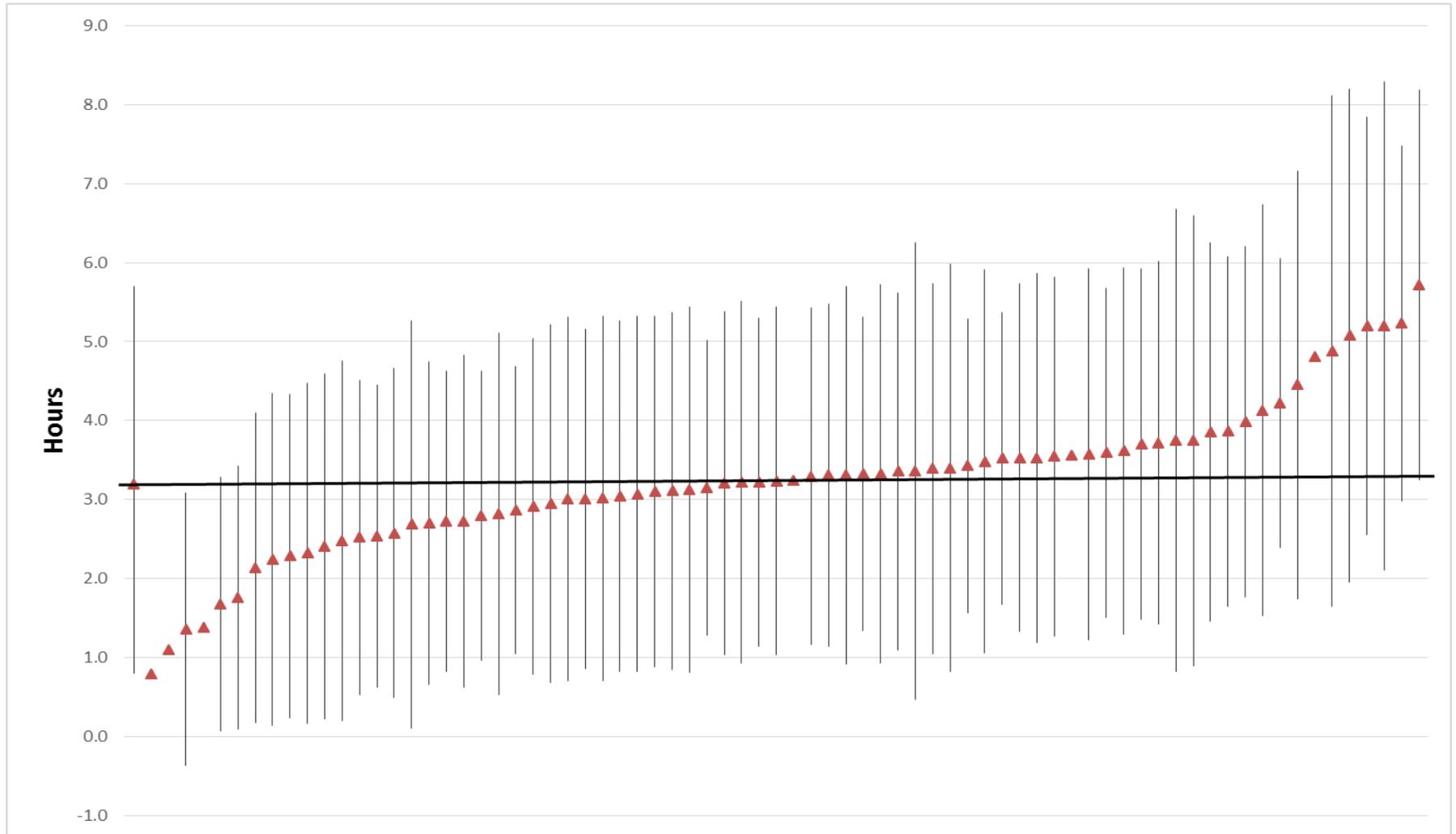
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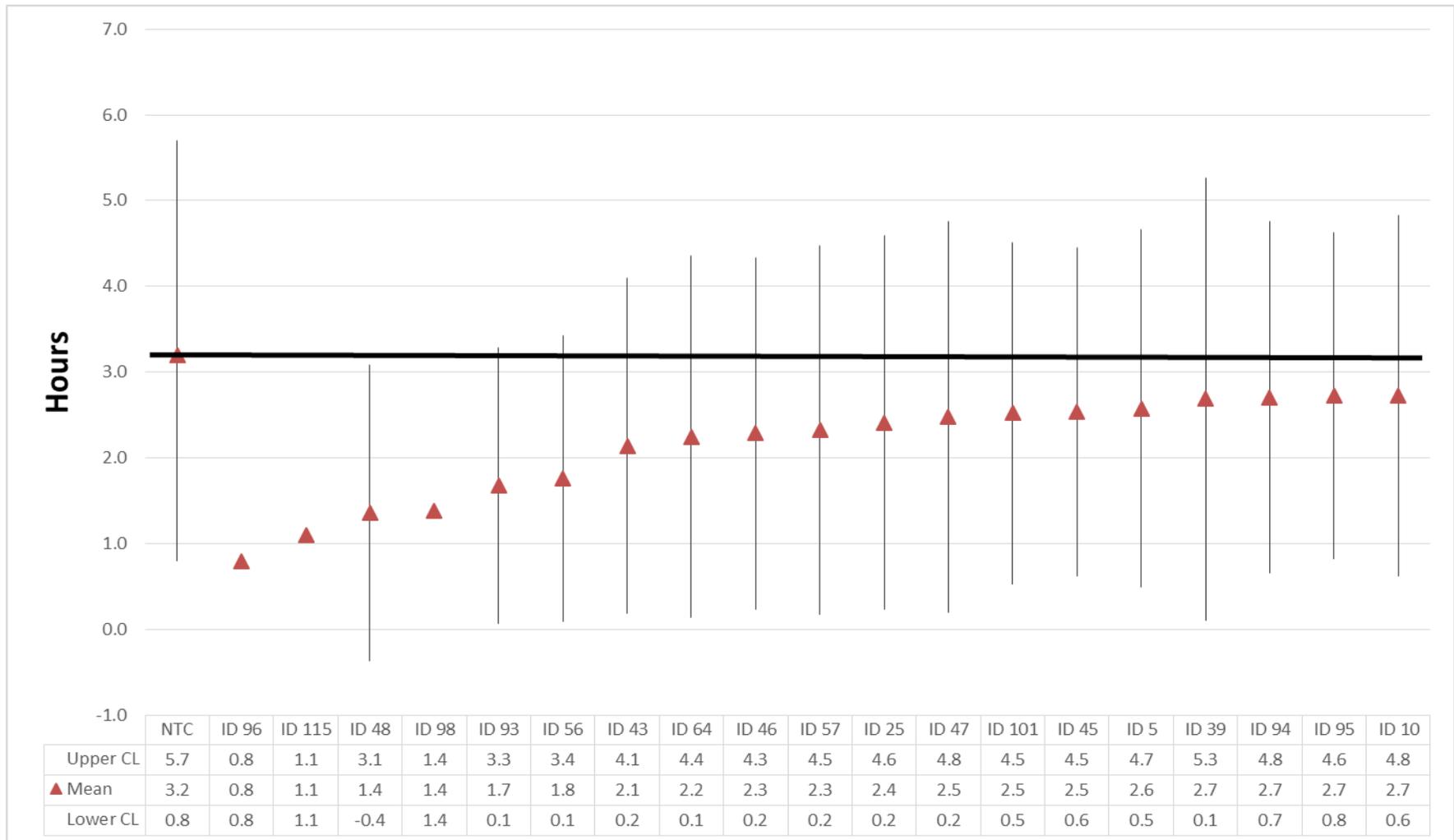
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Average ED LOS (Hours)**



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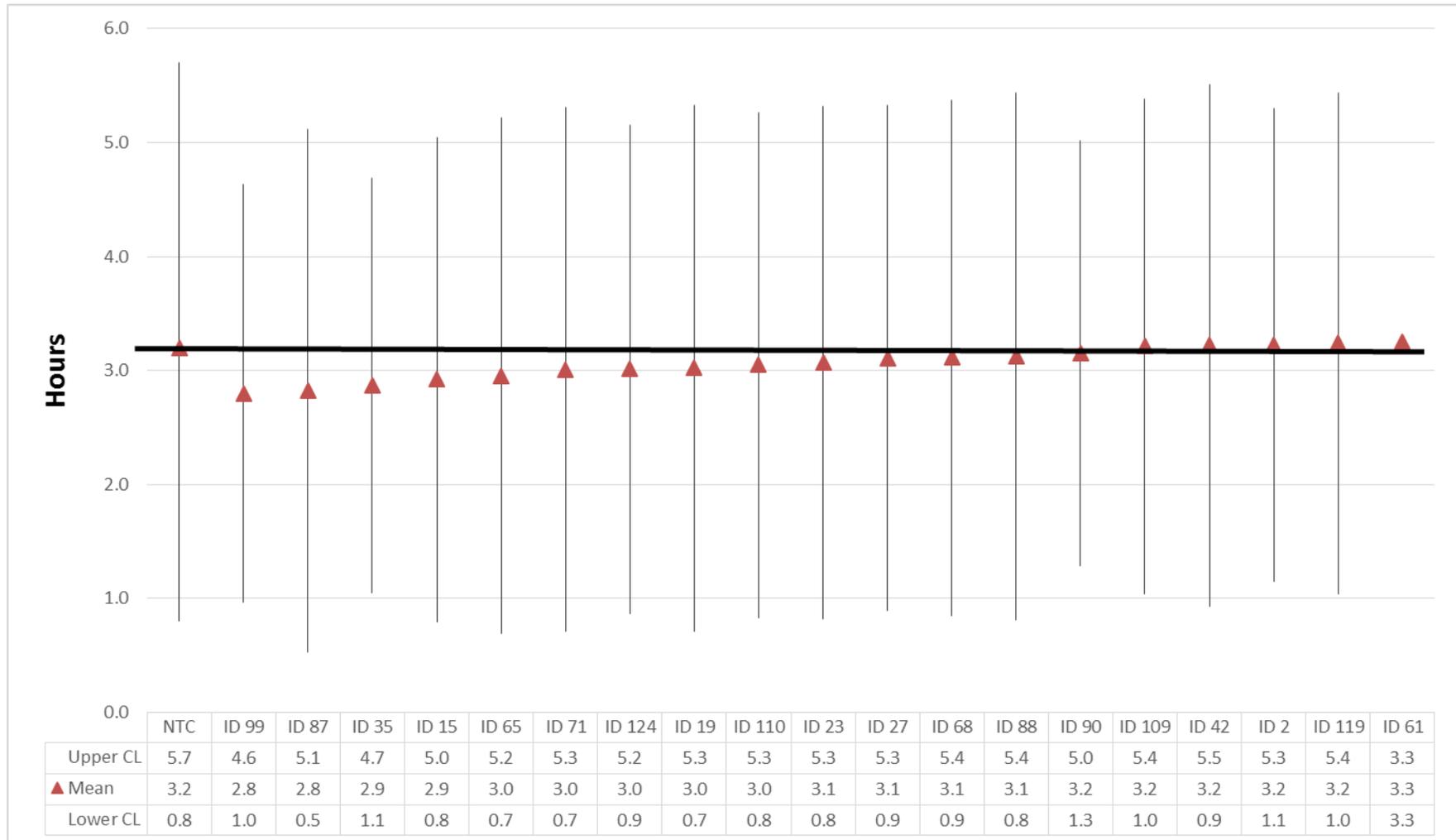
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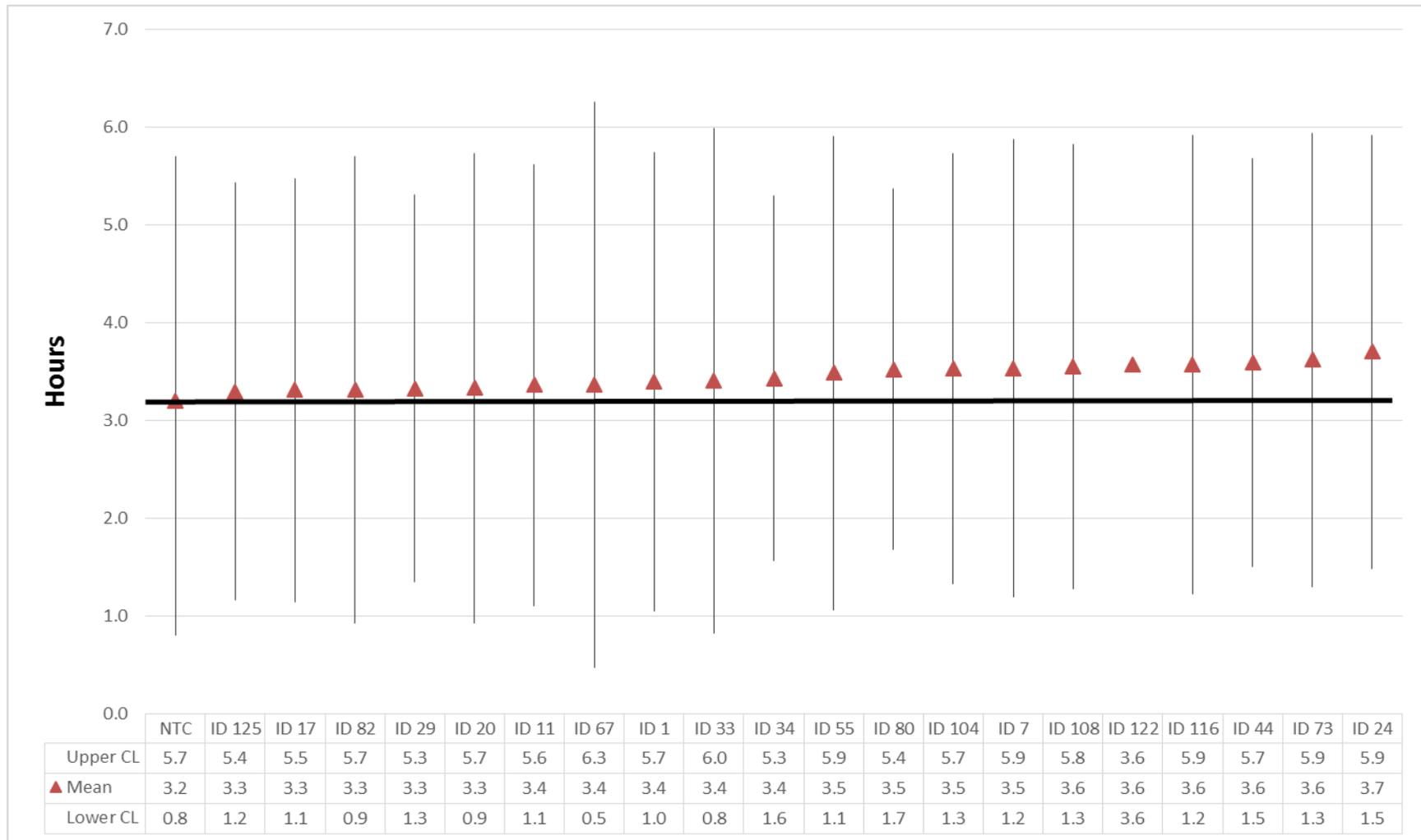
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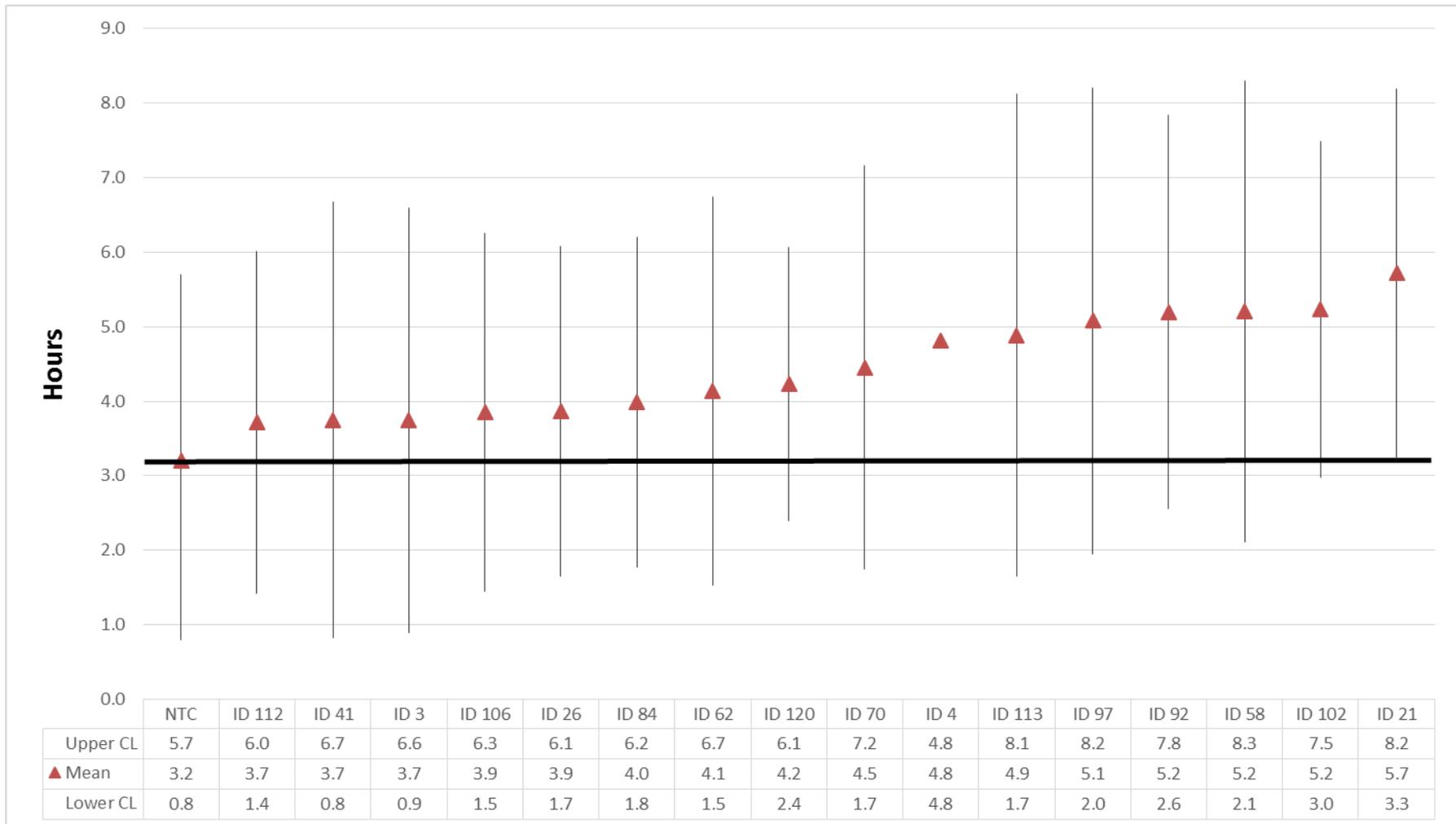
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ED Length of Stay

ED Length of Stay (minutes)				
	Indiana Average	Levels I and II	Level III	NTC
N=	8177	4040	805	3332
Average	246.8	254.3	237.6	239.8
Std. Deviation	194.1	207.2	155.3	185.6
Minimum	0	1	2	0
Quartile 1	140	131	144	148
Median	208	206	210	209
Quartile 3	295	311	294	281
Maximum	2250	1751	1621	2250

ED Disposition

ED Disposition (count)				
	Indiana	Levels I and II	Level III	NTC
Floor Bed	3865	1761	420	1684
ICU	1206	973	92	141
Transferred	1750	51	211	1488
OR	728	492	89	147
Home w/o Services	281	207	1	73
Observation	438	277	44	115
Step-Down	396	220	41	135
Expired	72	30	14	28
AMA	6	4	1	1
Home W/ Services	2	0	0	2
Other	17	11	0	6
NK/NR/NA	800	602	38	160

*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 5.

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ED Length of Stay by ISS

ED Length of Stay (minutes)								
ISS Category	Indiana Average	Indiana Average	Levels I and II	Levels I and II	Level III	Level III	Non-Trauma Centers	Non-Trauma Centers
	Counts	Minutes	Counts	Minutes	Counts	Minutes	Counts	Minutes
1-8	4105	252	1879	264.7	666	245.9	387	240.3
9-15	3039	251	1432	260.1	499	235	329	245
16-24	523	254.2	386	264	57	256.5	51	209.3
25-44	385	167.1	308	164.7	28	159.2	34	159.2
45-74	23	106.6	21	113.7	0	-	2	32
75	5	60.8	4	47.5	0	-	1	114
No ISS	93	222.2	10	252.7	22	121	1	220

*A Box and Whisker plot of ED Length of Stay by ISS is found on page 5.

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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	1938	326	1030	329	326	167	156	260	17	10	2	1	4562
9-15	1674	449	536	238	101	159	175	18	16	3	4	1	3374
16-24	110	210	87	63	7	18	47	1	10	0	0	0	553
25-44	29	198	34	86	2	14	13	0	24	2	0	0	402
45-74	0	13	1	8	0	0	0	0	1	0	0	0	23
75	0	1	0	1	0	0	0	0	3	0	0	0	5
NO ISS	114	9	62	3	0	442	5	2	1	2	0	0	640
Total	3865	1019	1750	728	436	800	396	281	72	17	6	2	9559

*Bar graph of ED Disposition by ISS is found on page 25.

Indiana State Department of Health Indiana Trauma Registry

Hospitals Reporting Trauma Data

Quarter 3, 2015

July 1, 2015 - September 30, 2015

I II Level I and II Trauma Centers

Deaconess Hospital

Eskenazi Health

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 & Health Services

III Level III Trauma Centers

Community Hospital of Anderson & Madison Co.

Franciscan St Elizabeth Health - Lafayette East

Good Samaritan Hospital

IU Health - Arnett Hospital

IU Health - Ball Memorial Hospital

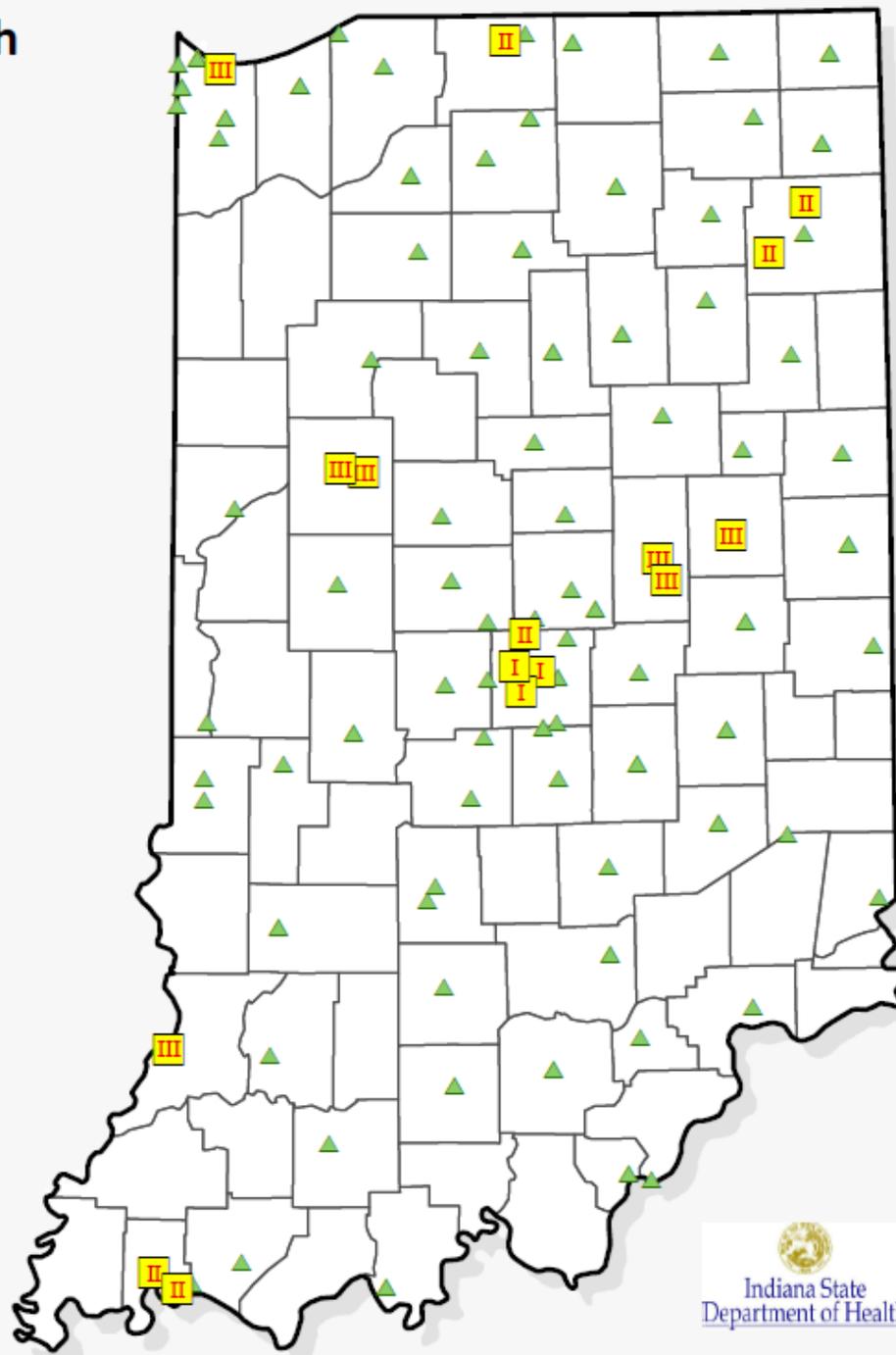
Methodist Hospitals - Northlake Campus

St Vincent Anderson Regional Hospital

▲ Non-Trauma Hospitals

84 Non-Trauma Hospitals

Hospital categories include Verified and "In the Process" Trauma Centers



Indiana Trauma Registry

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General Report:

- The caterpillar plots with the anonymous ID's for all patients per hospital may be found on pages 33-40.
- The caterpillar plots with the anonymous ID's for transferred patients per hospital may be found on pages 41-48.
- Reference tables now accompany the graphs for demographic data on pages 29-32.