
APR-DRG and the Trauma Registry

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Conflict of Interests Disclosures

- Jodi Hackworth and her co-authors have documented that they have no relevant financial relationships to disclose or conflict of interests to resolve



Background

- Hospitals and hospital based programs need data that is:
 - Readily available
 - Measures outcomes and evaluates programs
 - Can help plan for resource utilization
- Hospital administration uses administrative data for human and capital investment allocation
- Significant differences between administrative databases and clinical registry data exist.



Background- Data Set Differences

Administrative Data	Trauma Registry Data
Readily available	Must be abstracted within 60 days of discharge per ACS
Standardized across hospitals	Only NTDB data point standardized nationally
Low cost for data entry	High cost for data entry/abstraction
Collected on all patients	Detailed clinical data
ICD-9/10 CMS coding rules and sources	Trauma Registry Coding Guidelines



Objective

To compare the identification of trauma patients using All Patient Refined Diagnosis Related Groups (APR-DRG) to the Trauma Registry and estimate differences on utilization and diagnosis.



Methods

- Retrospective Descriptive Analysis Study
- Data abstraction
 - Admitted trauma registry patients from January 2012-December 2013 (N= 1942)
 - Encounters from Administrative database identified by trauma-related APR-DRGs (N= 1004)
 - Other encounters for trauma registry patients from administrative database that did not have a trauma-related APR-DRG
- Patients and encounters were linked manually via MRN/FIN



Methods

- Compared the following variables to see the level of agreement between the two datasets:
 - Overall Agreement
 - Severity of Illness
 - Utilization
 - ICU and Surgical
 - Diagnostic categories
 - Head Trauma, Simple Fractures, Abdominal Trauma
- IRB Approved



Methods

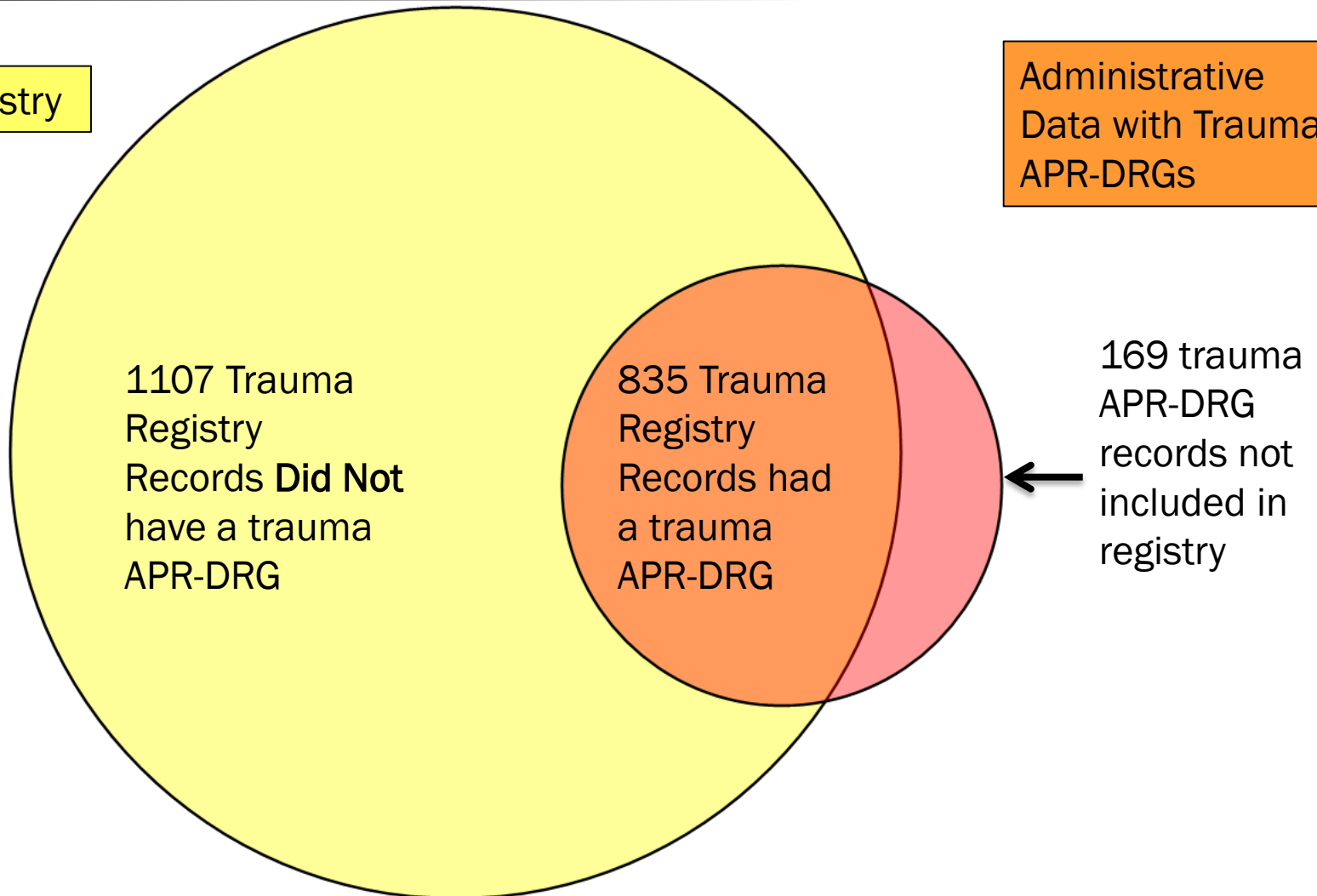
- Definitions for comparisons purposes

Variables	APR-DRG Definition	Registry Definition
Injury Category	APR-DRG SOI (Severity of Illness)	ISS (Injury Severity Score)
Hospital LOS	Hospital Full Days	Hospital Full Days
ICU Stay	Billing Flag- Days where ICU stay occurred	Full Days- Manually Calculated
Mortality	Discharge Disposition	Discharge Status in Registry- Alive or Dead
Surgery	Primary Procedure	OR Procedure(s)
Head Injury	APR-DRG Category 20, 55, 56, 57, 910	AAAM AIS coding definition of Head Injury
Craniotomy	APR-DRG Category 20 or 910	Surgical Procedure List
Simple Extremity Fractures	APR-DRG 308	Across all Diagnosis Codes
Abdominal Trauma	APR-DRG 911	Across all Diagnosis Codes

Results- Overall Agreement

Trauma Registry

Administrative Data with Trauma APR-DRGs



Results- Overall Severity

Injury Category	Matched Trauma APR-DRG N=835	Total Trauma Registry N=1942
Minor	57.6% (481/835)	78.8% (1530/1942)
Moderate	24.6% (205/835)	12.3% (239/1942)
Serious	13.1% (109/835)	5.4% (104/1942)
Critical	4.8% (40/835)	3.6% (69/1942)



Results- ICU Utilization

Injury Category	Matched Trauma APR-DRG N=203	Total Trauma Registry N=295
Minor	22.2% (45/203)	32.2% (95/295)
Moderate	24.1% (49/203)	25.1% (74/295)
Serious	34.0% (69/203)	20.7% (61/295)
Critical	19.7% (40/203)	22.0% (65/295)
Median Hospital LOS	3 days	5 days
Intubated Proportion	36.5% (74/203)	44.4% (131/295)
Mortality	6.9% (14/203)	6.1% (18/295)



Results- Surgical Utilization

Injury Category	Matched Trauma APR-DRG N=177	Total Trauma Registry N=864
Minor	23.7% (42/177)	80.0% (691/864)
Moderate	32.8% (58/177)	10.9% (94/864)
Serious	31.6% (56/177)	3.6% (31/864)
Critical	11.9% (21/177)	5.6% (48/864)



Results- Head Injury

APR/DRG Severity/ISS	Matched Trauma APR-DRG N=515	Total Trauma Registry N=705
Minor	71.1% (366/515)	69.3% (489/705)
Moderate	16.9% (87/515)	15.2% (107/705)
Serious	8.5% (44/515)	7.8% (55/705)
Critical	3.5% (18/515)	7.7% (54/705)
Craniotomies	6.8% (35/515)	7.5% (53/705)
Median Hospital LOS	1 day	1 day
Proportion of Patients in ICU	23.9% (123/515)	22.6% (169/705)
Mortality	2.1% (11/515)	2.5% (18/705)

Results- Simple Fractures

Description	Matched Trauma APR-DRG N=97	Total Trauma Registry N=672
Number of Lower Extremity Fractures (based off of diagnosis and includes one acetabulum fracture)	95	268
Number of Upper Extremity Fractures (based off of diagnosis)	2	391
Number of Both Upper and Lower Extremity Fractures	n/a	13
Number of Operative Procedures	96	570

Results- Abdominal Trauma

Injury	Matched Trauma APR-DRG N=3	Total Trauma Registry N=153
Abdominal Trauma	3*	153
Spleen Injuries- Using Diagnosis	14	65
Liver Injuries- Using Diagnosis	9	53
Pancreas Injuries- Using Diagnosis	0	12
Kidney Injuries- Using Diagnosis	4	23
Number of Spleen Surgical Procedures	1	1
Number of Liver Surgical Procedures	0	1
Number of Pancreas Surgical Procedures	0	4
Number of Kidney Surgical Procedures	2	2

Limitations

- Descriptive study
 - No true statistical comparisons
- APR-DRG severity includes comorbidities and complications versus ISS score which is only anatomic based.
- Classification of severely injured patients with trachs or primary diagnosis of physical child abuse not classified under trauma related APR-DRG



Conclusions

- Trauma APR-DRGs only capture a fraction of the trauma population included in the registry
 - Best with head injury
- Trauma APR-DRGs tend to be the more severely ill patients
 - Difficult for administrators to accurately look at utilization for human resource and capital needs
- APR-DRG administrative data should not be used as the only data source for evaluating the needs of a trauma program



Thank You.
Questions????



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