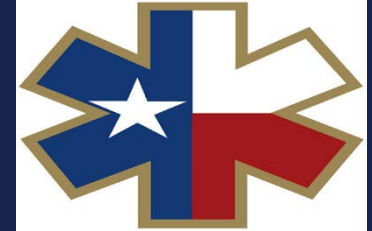




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Data Linkage between EMS and Trauma Registry Records with Crash Records in Texas

Haruna Miyakado, MS, Pierce Baumann, Dan Dao, MPH

Texas Emergency Medical Service (EMS) & Trauma Registries

Office of Injury Prevention

Background

Motor vehicle traffic crashes

- Leading cause of death and injury
- Preventing injuries
 - = National public health priority
- Preventable if we understand fully the nature of the problem



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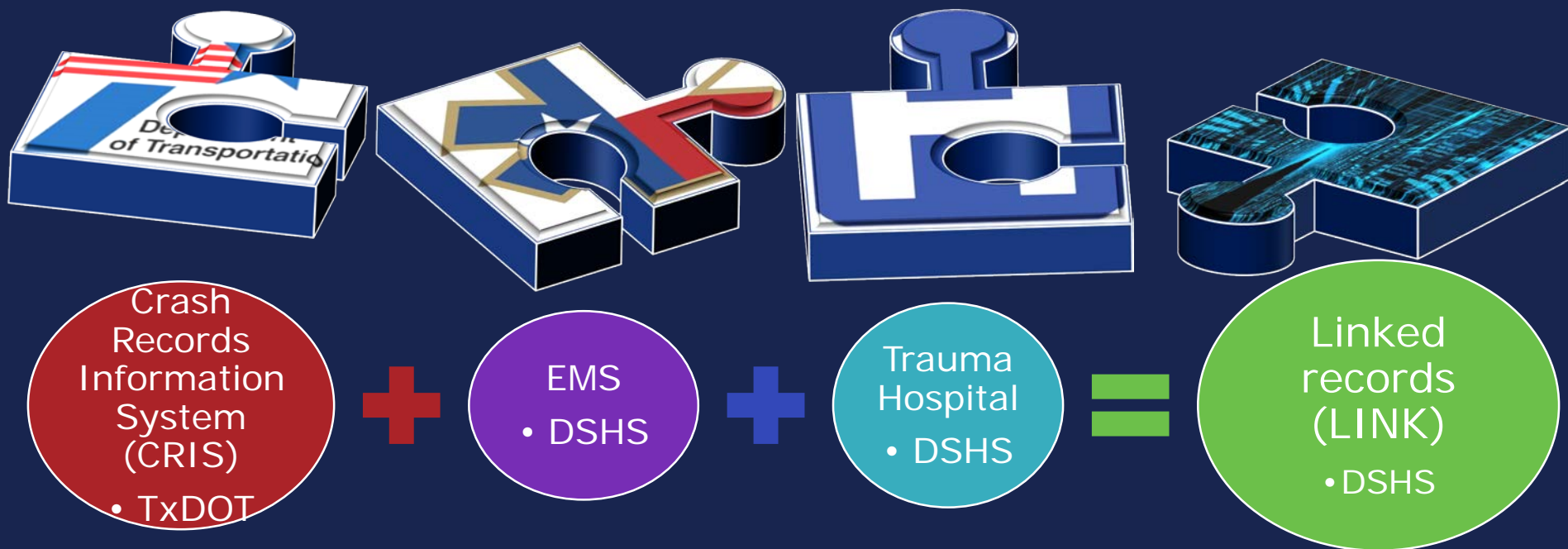




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Background – contd.



Background – contd.

Trauma Registry Dataset



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- Patients sustaining traumatic injuries with ICD 10-CM code
- AND one of the following:
 - Hospital admission resulting from the traumatic injury
 - Patient transfer via EMS transports resulting from the traumatic injury
 - Death resulting from the traumatic injury
- Data elements:
 - Demographics
 - Payment type
 - Injury severity and procedures, etc.



Top 5 Specific Causes of Injury in Trauma Data



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	ICD10CM Codes	# Trauma Records	Percent
Fall on same level from slipping, tripping and stumbling without subsequent striking against object	W01.0XXA	24,994	18.88
Unspecified fall	W19.XXXA	6,058	4.58
Other fall on same level	W18.39XA	3,776	2.85
Fall on same level, unspecified	W18.30XA	3,666	2.77
Car driver injured in collision with other type car in traffic accident	V43.52XA	3,627	2.74

Background

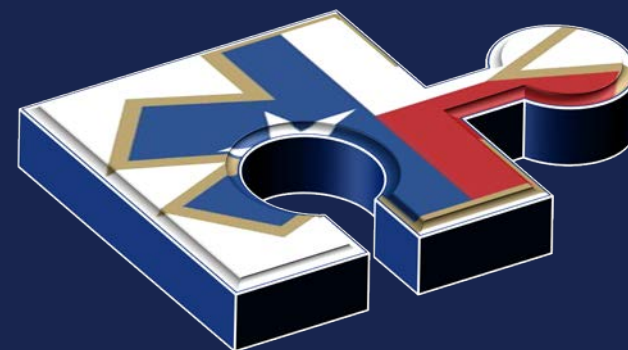
– EMS Registry Dataset



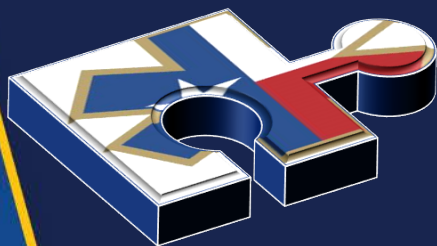
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- Intersect between the crash location and the health record.
- Lack comprehensive clinical assessment
- Underestimate injuries prevalence
- Follow National EMS Information System standard (NEMSIS):
 - 700+ EMS Agencies report data
 - Data elements:
 - Demographics
 - Procedures
 - Vital signs
 - Run time
 - Transport conditions, etc.

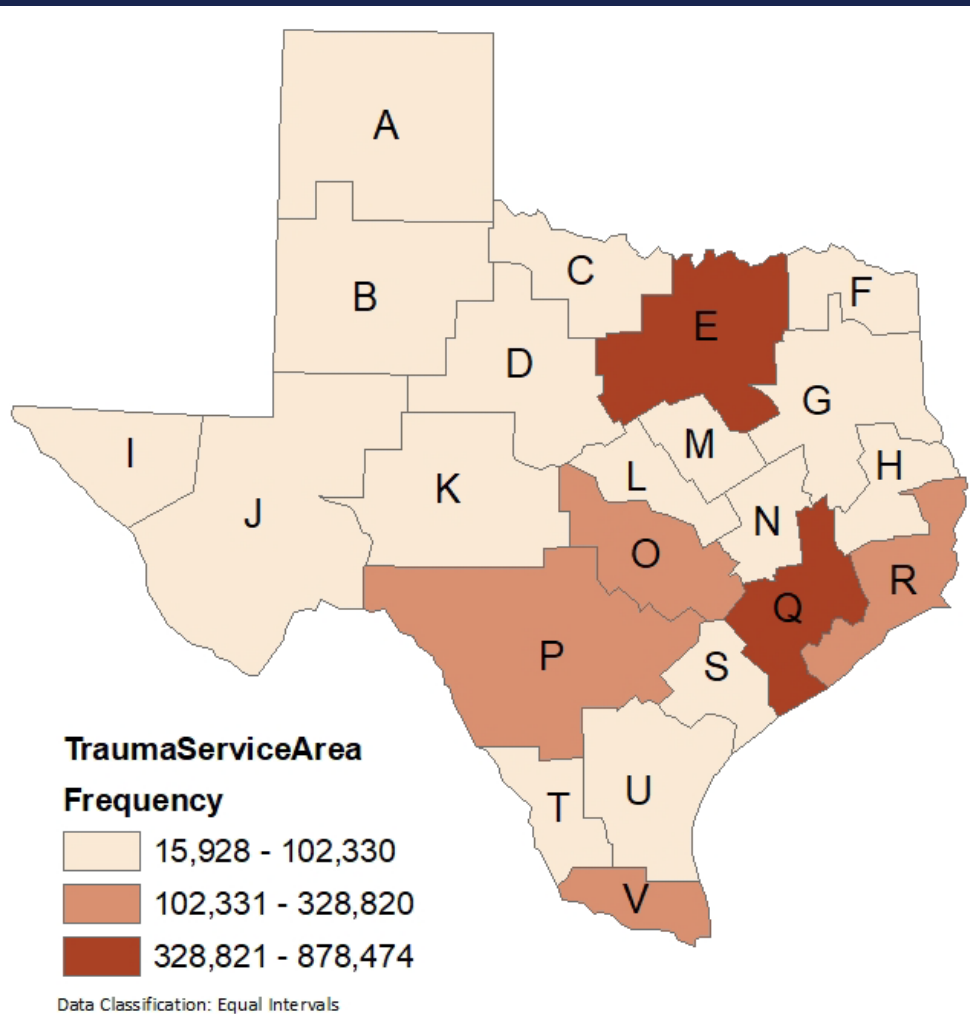


EMS Runs by Trauma Service Area (TSA)

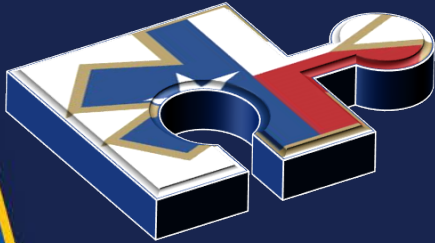


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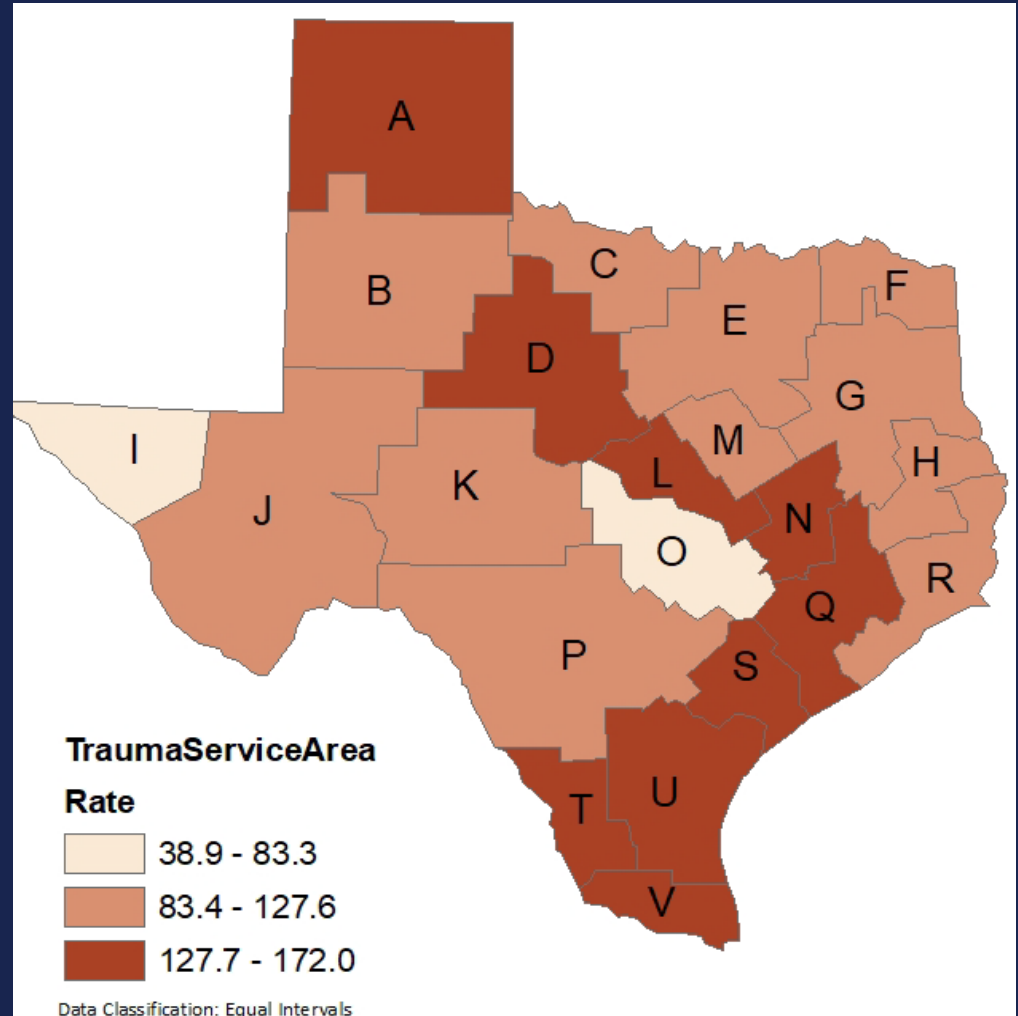


EMS Reporting Rate (All Runs) Per 1,000 Pop By Trauma Service Area



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Top 10 Complaint Reported by Dispatch



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	# EMS Runs	Percent
Transfer/Interfacility/Palliative Care	484,165	14.6
Sick Person No Other Appropriate Choice	463,746	14.0
No Other Appropriate Choice	432,163	13.0
Traffic Transportation Incident	308,884	9.3
Breathing Problems	240,054	7.2
Falls	206,833	6.2
Chest Pain Non Traumatic	129,708	3.9
Unconscious Fainting Near Fainting	125,560	3.8
Convulsions Seizures	92,710	2.8
Unknown Problem Person Down	81,669	2.5
Missing	4,660	0.1

Type Service Requested

	# EMS Runs	Percent
911 Response	2,479,733	74.6
Interfacility Transport	493,927	14.9
Medical Transport	285,042	8.6
Public Assistance	40,659	1.2
Intercept	12,049	0.4
Standby	8,676	0.3
Mutual Aid	2,594	0.1
Missing	2,951	0.1
Total	3,325,631	100.0



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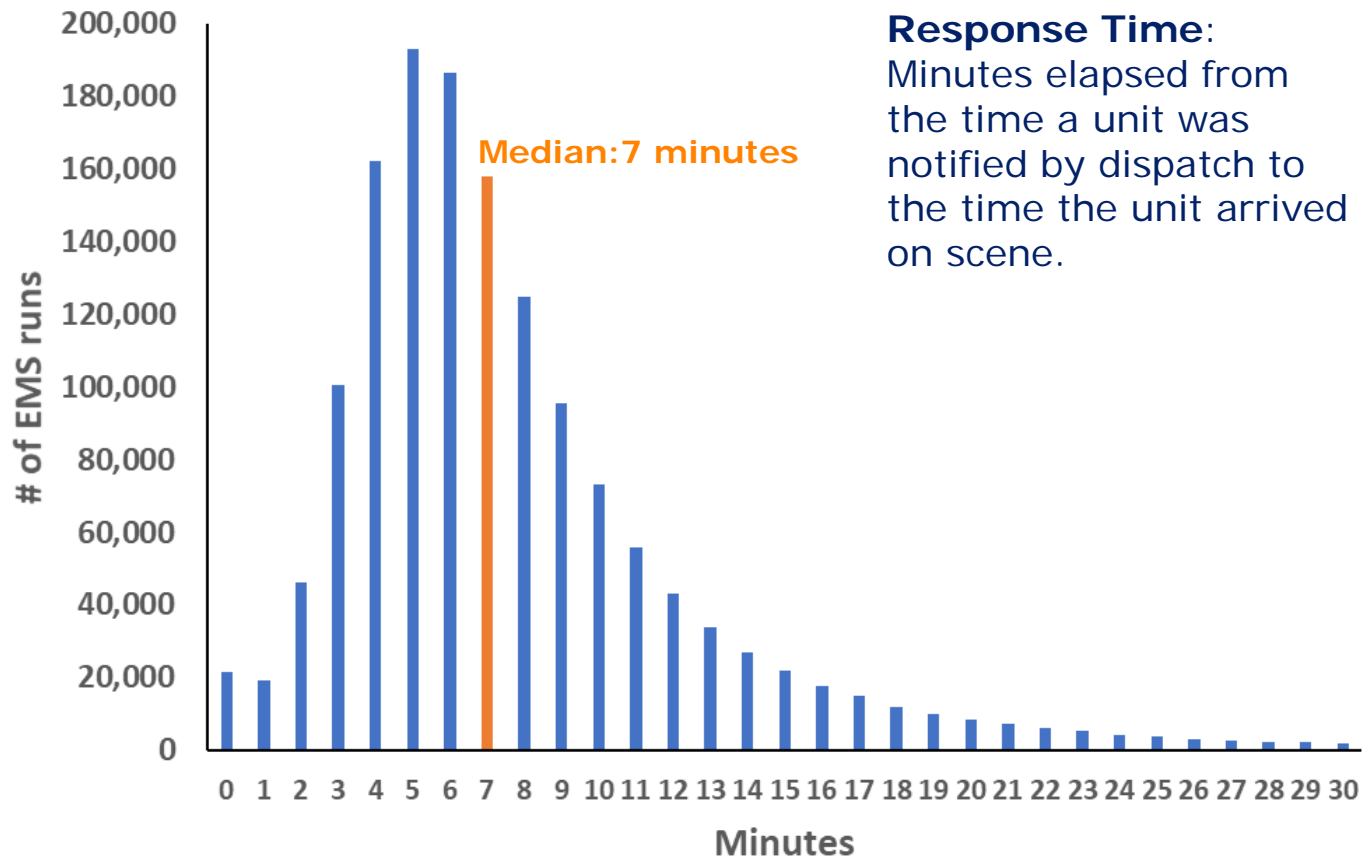
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Response Time



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EMS Runs: 911 response with ground ambulance

Background – Police Crash Data



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- Only includes incidents occurring on public roadways.
- Based on eye-witness.
- Underlying risk and protective factors of the crash or injury.
- About 50% of the MVCs in the country are not reported to the police.
- Biased toward more-serious crashes.



Circling Back



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- We get a more complete picture.
- In order to be in the linked data, a crash record has to go through EMS and end up in hospital as a traumatic injury.

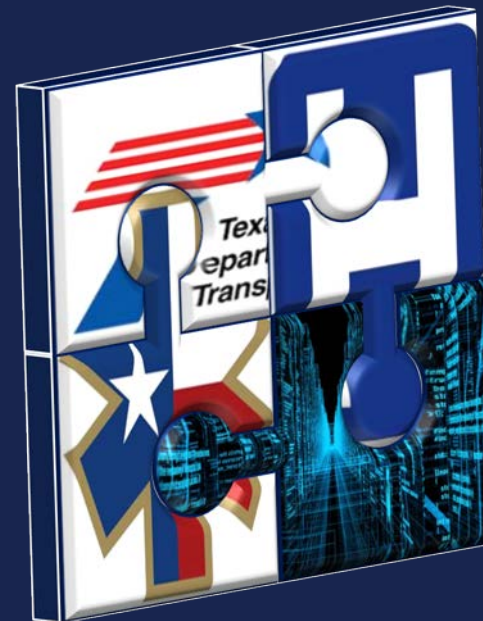
Objectives

1. Link crash data with statutorily reportable injury and event data
2. Explore the linked dataset
3. Understand how linked data can be used



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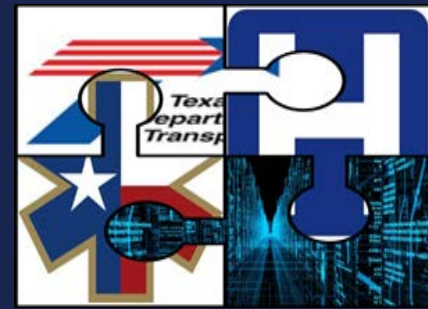


Demographics of the Linked Data

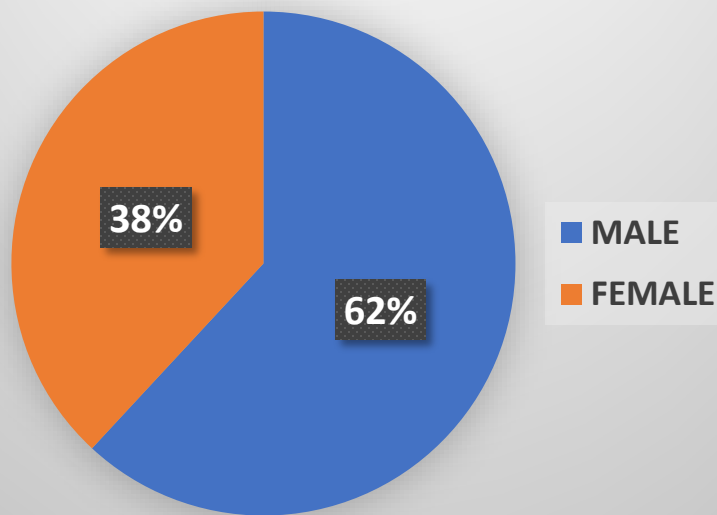


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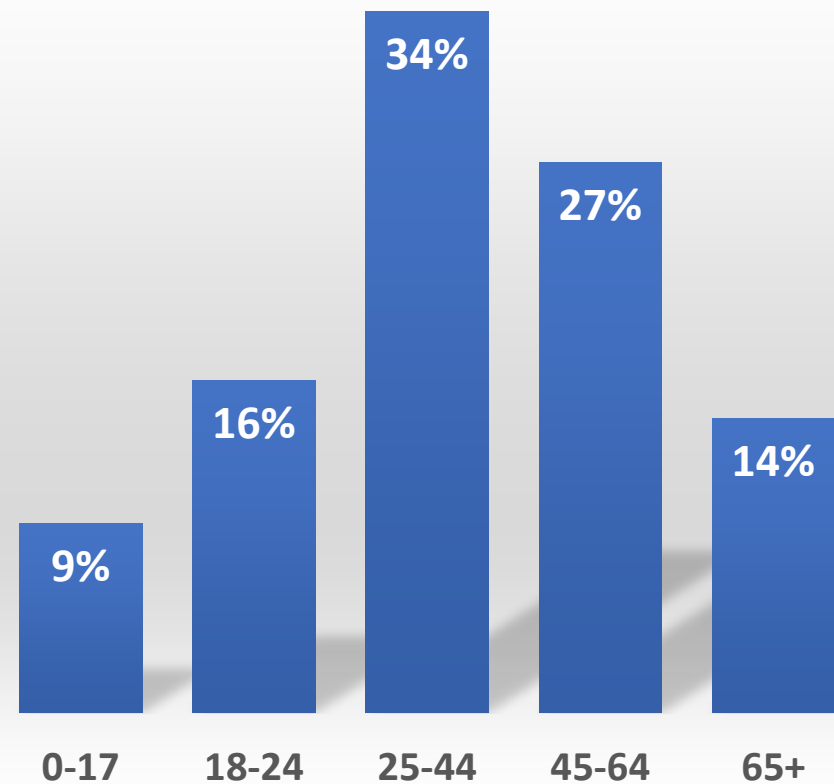
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Gender



Age Group



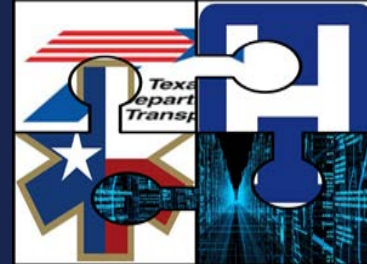


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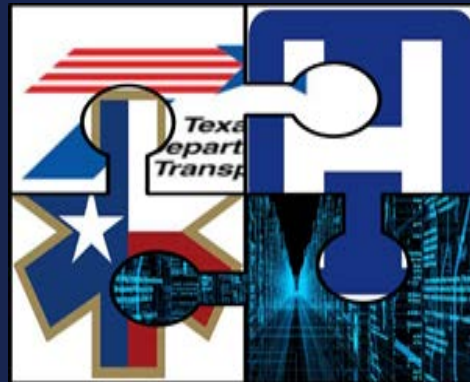
Person Type ID of the Linked Data



Person Type ID	Count	Percent
DRIVER	3,157	55.4
PASSENGER/OCCUPANT	1,080	18.9
PEDALCYCLIST	124	2.2
PEDESTRIAN	504	8.8
DRIVER OF MOTORCYCLE TYPE VEHICLE	787	13.8
PASSENGER/OCCUPANT ON MOTORCYCLE TYPE VEHICLE	38	0.7
OTHER (EXPLAIN IN NARRATIVE)	9	0.2
UNKNOWN	3	0.1
Total	5,702	100.0

Application of Linked data

- Compare distributions between
 - Crash-assigned
 - CR-3 reported injury severity ID
 - TxDOT crash data
 - Hospital-assigned
 - Injury Severity Scores (ISS)
 - DSHS Trauma hospital data

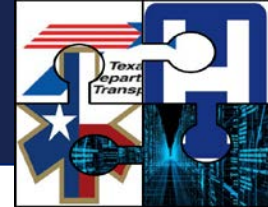


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Crash-assigned Injury Severity ID

Linked Data (LINK)



Crash-assigned Injury Severity ID	Linked Data (LINK)
NOT INJURED	2.2%
POSSIBLE INJURY	23.6%
NON-INCAPACITATING INJURY	31.2%
SUSPECTED SERIOUS INJURY	37.8%
KILLED	4.9%
UNKNOWN	0.3%
TOTAL	100.0%



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Hospital-assigned Injury Severity Score (ISS)



- Decided by the Association for the Advancement of Automotive Medicine
- Ranges from 0 to 75:
 - i. Low 0-9
 - ii. Moderate 10-15
 - iii. High 16-24
 - iv. Very High 25-75
- A series of anatomically-defined injury descriptions that were mapped according to:
 - i. Energy dissipation
 - ii. Threat to life
 - iii. Permanent impairment
 - iv. Treatment period
 - v. Incidence



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Hospital-assigned ISS by Crash-assigned Injury Severity



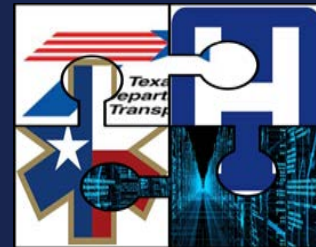
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Hospital-assigned ISS				
Crash-assigned Injury Severity	Low	Moderate	High	Very High
Not Injured	84%	9%	3%	4%
Possible Injury	72%	17%	8%	3%
Non-incapacitating Injury	69%	18%	10%	3%
Suspected Serious Injury	41%	26%	20%	13%
Killed	11%	12%	23%	54%



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Limitations: Injury Severity Score Metrics

Crash-assigned Score

- Subjective determination by non-medical personnel
- Likelihood of classifying severe internal injuries is low

Hospital-assigned ISS

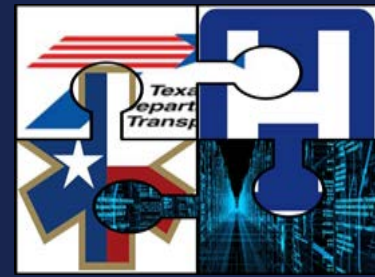
- Unweighted summary measure of single or multiple injuries
- Multiple dimensions of injury considered:
 - Likelihood of death;
 - Use of hospital resources;
 - Cost of resources/treatments;
 - Length of recovery;
 - Likelihood and extent of disability;
 - Impact on quality of life, etc.



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Implications



Linked data enables:

- Increase specificity of injuries
- New dimensions for assessing outcome data
- Impact of EMS response and patient field care
- New public health strategies with policy implication



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Acknowledgements:

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Austin Public Health

Nadia Bekka, MEd., CPH

EMS and Trauma Registries

Office of Injury Prevention

Texas Department of State Health Services

Questions:



Useful Links

- <https://www.dshs.texas.gov/injury/registry/EMS.doc>
- <https://www.dshs.texas.gov/injury/registry/Hospital.doc>
- <https://www.txdot.gov/government/enforcement/data-access.html>
- <https://www.dshs.texas.gov/injury/data/Data-Requests.doc>

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