TEXAS
Health and Human Services

Texas Department of State Health Services

Texas EMS and Trauma Registry (EMS/TR) Using Linked Motor Vehicle Crash Data

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Emergency Medical Service (EMS) Patient Care Record(s)

Exploring Motor Vehicle Crash (MVC) data elements collected in the prehospital care setting

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EMS Patient Care Records (PCR) General

PCR Data Collection:

- The EMS Care Provider - emergency medical technician (EMT), advanced emergency medical technician (AEMT), paramedic, etc. – records the information.
- Agencies transmit data to the Texas Department of State Health Services (DSHS) emergency medical services and trauma registries (EMS/TR) within 90 days of the service call.
- EMS/TR elements are submitted to the national emergency medical services information system (NEMSIS) repository and can be found at:

nemsis.org/media/nemsis_v3/release-3.5.0/DataDictionary/PDFHTML/EMSDEMSTATE_National/NEMSISDataDictionary.pdf

Motor Vehicle Crash (MVC) Patient Assessment Elements

Collected Data Elements:

- eDispatch.01 – Dispatch Reason = 2301069 (traffic accident).
- eInjury.01 – Cause of Injury.
- eInjury.03-.04 – Trauma Triage Criteria:
  - Crash Death (2904007);
  - Crash Ejection (2904009);
  - Crash Intrusion (2904011);
  - Crash High Risk Injury (2904013); or
  - Motorcycle Crash (2904015).

Additional MVC Assessment PCR Elements

- **Manner of Collision (Same Direction, Rear End, Opposite Direction).**
- **EMS Unit Response Delays due to MVC:**
  - eResponse.09 (Type of response delay) = 2209025 (Vehicle crash involving Unit).
  - eResponse.10 (Type of scene delay) = 2210033 (Vehicle crash involving Unit).
  - eResponse.12 (Type of transport delay) = 2210033 (Vehicle crash involving Unit).
  - eResponse.12 (Turn-around delay) = 2212027 (Vehicle crash Involving Unit).

NOTE: Requestors should assess for duplication as an MVC occurrence involving an EMS unit may be reported in various components of the Patient Care Record.

MVC Descriptive Elements Collected through Crash Records Information System (CRIS) Data Linkage

What is a Data Linkage?

- Data Linkage is a method of bringing information from different data sources together to create a more comprehensive, informative data set.
- EMS/TR and CRIS Data Linkage allows researchers to link information between the DSHS EMS/Patient Care Report and the Texas Peace Officer's Crash Report (CR-3).
- Data is currently linked through a probabilistic linkage (i.e. patient demographic information).
- Future initiatives will allow linking to take place using an identifier and/or state wristband number.

Current DSHS Initiatives to link EMS/CRIS Reports/ Hospital Records

- Texas Wristband Project.
- Creating a Universal Unique Patient Identifier (UUID) to be used by the NEMSIS.

Methodology

Inclusion Criteria

- DSHS Trauma Data

  Motor Vehicle Traffic-related International Classification of Diseases 10 Clinical Modifications (ICD10-CM) in Cause of Injury Field: V1-V89, X81, X82, X83, Y02, Y08, Y32, Y36, Y37, Y38.

- DSHS EMS Data

  Motor Vehicle Traffic-related ICD10-CM in Cause of Injury Field: V1-V89, X81, X82, X83, Y02, Y08, Y32, Y36, Y37, Y38 TxDOT Crash Data • Chief Complaint: Traffic Transportation Incident, Automated Crash Notification.

- TxDOT CRIS Data

  Chief Complaint: Traffic Transportation Incident, Automated Crash Notification.

	Matching Variables used by EMS/TR
CRIS to Trauma	First name, last name, middle name, birth date, incident county, incident date, and age.
CRIS to EMS	First name, last name, middle name, birth date, incident county, incident date, and age.
CRIS to EMS to Trauma	Unique identifier (ID) created by linking crash_ID, unit_nbr, and prsn_nbr.

CRIS, EMS, and Trauma Linked Data

2021 Linkage Summary

Dataset	N total (in full dataset before linking)	N total (transportation related injuries subset)	N linked pairs (based on data linking algorithm)	N linked de-duplicated pairs
CRIS	1,591,148	1,408,738	-	-
EMS	4,567,864	184,025	110,191	-
Trauma	153,135	26,081	16,071	-
CRIS to EMS to Trauma	-	-	10,501	10,469

CRIS, EMS, and Trauma Linked Data by Year

Number of pairs in linking data sets by year							
Dataset	**2014**	**2015***	**2016**	**2018****	**2019**	**2020**	**2021**
CRIS to EMS	28,806	63,179	72,304	118,029	175,896	99,618	110,191
CRIS to Trauma	11,886	16,262	17,829	15,283	16,587	17,379	16,071
CRIS to EMS to Trauma	3,119	5,075	6,367	6,667	10,418	12,047	10,501

*In 2015, passengers were added to the crash data.

**In 2018, chief complaint was added to select traffic related records along with ICD codes.

CRIS, EMS, and Trauma Linked Data – CRIS Injury Severity

Injury Severity	2019	2020	2021
Incapacitated Injury	3,796	3,793	4,706
Non-incapacitating injury	2,968	2,842	2,796
Possible injury	2,278	2,207	2,083
Killed	469	497	495
Not injured	251	227	337
Unknown	39	34	52
Total	**9,801**	**9,570**	**10,469**

CRIS, EMS, and Trauma linked Data – Trauma Injury Severity

Injury Severity Score (ISS)	2019	2020	2021
Very Low (0-9)	5,296	4,902	4,200
Low (10-15)	2,077	2,107	3,686
High (16-24)	1,300	1,456	1,607
Very High (25-75)	878	991	976
Missing	250	114	0
Total	**9,801**	**9,570**	**10,469**

CRIS, EMS, and Trauma linked Response Times

Injury Severity	2019	2020	2021
Traffic Related count	9,796	8,814	10,464
Mean response time (minutes)	9.2	8.86	10.62
Median response time (minutes)	7.0	7.0	8.0

Summary of Learned Information

- Linking EMS, Trauma, and CRIS data can create a fuller picture of the impacts of Texas MVCs.
- Linking data provides more useful data to analyze. These additional data elements can be used to assess trends of crash severity, Texas communities with increased risk, and the impact of MVCs on EMS agencies and trauma facilities.
- Linkages provide opportunities for education, for example differences between injury severity reported in crash records and trauma facility assessments.
- Linked MVC data allows researchers to assess additional determinants, including the manner in which the collision occurs and the corresponding prehospital injuries.
- The EMS Unit Collision impacts can also be assessed.

TxDOT/CRIS Resources

1) nemsis.org/media/nemsis_v3/release3.5.0/DataDictionary/PDFHTML/EMSDEMSTATE_National/NEMSISDataDictionary.pdf

2) cris.dot.state.tx.us/public/Query/app/home

3) dshs.texas.gov/sites/default/files/injury/data/TxDOT-DSHS_CRIS-EMS-Trauma_Data-Linkage_Sept2022.pdf

Thank you!

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