

This document is provided by NHTSA to help state and national EMS partners better understand the characteristics of EMS response to motor vehicle crash-related injuries.

It will be updated periodically to provide current information regarding temporal variations in the type and characteristics of motor vehicle crash EMS activations occurring in the U.S.

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The NHTSA Office of EMS supports the improvement of patient care in the out-ofhospital setting on a national level.

It is accomplished primarily in three ways:

- 1) Bringing together available data and industry experts to identify the most critical issues facing the profession,
- 2) Tackling those issues through collaboration with partners, including other federal agencies and leading associations, and
- 3) Providing awareness and education about best practices and evidence-based guidelines.

The backbone to making EMS successful are the hundreds of thousands field clinicians. Prehospital care doesn't happen without them.



Directly from NRSS PPT: NRSS overview – elements of NRSS

On January 27, 2022 Secretary Buttigieg released the National Roadway Safety Strategy. At the core of this strategy is a Department-wide adoption of the Safe System Approach, which focuses on five key objectives: safer people, safer roads, safer vehicles, safer speeds, and post-crash care.

- Safer People: Encourage safe, responsible behavior by people who use our roads and create conditions that prioritize their ability to reach their destination unharmed.
- Safer Roads: Design roadway environments to mitigate human mistakes and account for injury tolerances, to encourage safer behaviors, and to facilitate safe travel by the most vulnerable users.
- Safer Vehicles: Expand the availability of vehicle systems and features that help to prevent crashes and minimize the impact of crashes on both occupants and nonoccupants.
- Safer Speeds: Promote safer speeds in all roadway environments through a combination of thoughtful, context-appropriate roadway design, targeted

education and outreach campaigns, and enforcement.

• Post-Crash Care: Enhance the survivability of crashes through expedient access to emergency medical care, while creating a safe working environment for vital first responders and preventing secondary crashes through robust traffic incident management practices.



Directly from NRSS PPT: https://www.transportation.gov/NRSS

The Safe System Approach of the National Roadway Safety Strategy emphasizes preventing fatalities and serious injuries over preventing crashes. This approach, combined with a focus on redundancy, means that our responsibility does not end when a crash occurs. Caring for people injured in a crash to prevent their injuries from becoming fatal is just as critical. In the safe systems approach, post-crash care is our last best chance to prevent serious injury or death.

EMS is one of the major elements of post-crash care, which is why NHTSA has supported EMS system improvement since EMS services first came to be in the 1960s.

SSA Principles:

• **Death and Serious Injuries are Unacceptable:** While no crashes are desirable, the Safe System Approach prioritizes the elimination of crashes that result in death and serious injuries since no one should experience either when using the transportation system.

- Humans Make Mistakes: People will inevitably make mistakes and decisions that can lead or contribute to crashes, but the transportation system can be designed and operated to accommodate certain types and levels of human mistakes, and avoid death and serious injuries when a crash occurs.
- Humans Are Vulnerable: People have physical limits for tolerating crash forces before death or serious injury occurs; therefore, it is critical to design and operate a transportation system that is human-centric and accommodates physical human vulnerabilities.
- **Responsibility is Shared:** All stakeholders including government at all levels, industry, nonprofit/advocacy, researchers, and the public are vital to preventing fatalities and serious injuries on our roadways.
- **Safety is Proactive:** Proactive tools should be used to identify and address safety issues in the transportation system, rather than waiting for crashes to occur and reacting afterwards.
- **Redundancy is Crucial:** Reducing risks requires that all parts of the transportation system be strengthened, so that if one part fails, the other parts still protect people.





"2 out of 5" quote refers to those that died, not all MVC patients.

The National EMS Information System (NEMSIS)



- 1. Develop and implement an outreach plan for EMS personnel for on-scene safety and traffic incident training.
- 2. Advance Traffic Incident Management training and technologies targeted at improved responder and motorist safety.
- 3. Expand the use of and support for NEMSIS by funding applied research and data quality improvements.
- 4. Improve the delivery of EMS throughout the nation in collaboration with FICEMS and NEMSAC by focusing on shortening ambulance on-scene response times.

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NEMSIS Data	aset	Counts			
EMS data are voluntarily Repository. Not all state	v submitte s collect r	ed by states/territor nor submit all EMS a	ies wishing to part activations that occ	icipate in the cur in their st	e National EMS Data tate/territory.
	Year	Total Annual Count of 911 Records Reported to NEMSI S	Total Annual Count of MVC- Related Records	Reporting States/ Territories	
	2016	19,021,555	1,041,314	49	
	2017	8,021,832	441,623	35	
	2018	16,953,577	896,693	43)atc
	2019	22,945,698	1,202,904	47	
	2020	28,547,098	1,313,017	50	ina
	2021	31,405,223	1,497,179	52	li
	2022	18,753,981*	821,362*	53	Pre
*V	Vill increas	e each month.			
Fo	r additional ir re: <u>https://ne</u>	ntormation regarding which s emsis.org/using-ems-data/re	tates/territories submitted quest-research-data/resea	data each year, se rch-data-resources	e the Research User Guide
BETTER DATA. BETTE	IS R CARE.				
See Appendix F: Historical Data Submi	ission for more	edetails.			10

Inclusion: January 4, 2016 to July 31, 2022



Motor vehicle crash rates are calculated by MVC-related injuries out of all 911 EMS responses with patient contact.

2016 and 2017 data are not included in the following graphs. Please contact nemsis@hsc.Utah.edu if you need these years.

The "drop" at the end of the years is an artifact of calculating the weekly calendar: When reporting numbers by week, the first week and last week usually do not align with year perfectly. We add extra days from another year to make every week whole week.

This is the only slide that uses ALL activations as the denominator and MVC as the numerator.

This is different from the EMS by Numbers report which is calculated by an MVC complaint reported to dispatch.



Race, age, and gender are calculated for MVC-related activations with patient contact.

Race/ethnicity is not well documented due to some states and agencies not allowing collection of the element.

The age groups for 95-100+ are a very low percentage of activations. That is why the rate shows 0.00%.

Dashboard: https://nemsis.org/view-reports/public-reports/version-3-public-dashboards/v3-public-motor-vehicle-crash-dashboard/

of injury. Severe injury ma Need for Time- Sensitive Care	y be identified in EMS data Need for Critical Trauma Care	n different ways. Probability of Patient Survival*
Provider assessment of Final Patient Acuity = "Critical" or "Emergent"	Pre-arrival alert or activation to the receiving facility for trauma	Revised Trauma Score (RTS) translated to probability of survival (POS)
Data element: eDisposition.19-Final Patient Acuity	Data element: eDisposition.24-Destination Team Pre-Arrival Alert or Activation	Based on patient vital signs

"Severely injured" is assessed using a measure called the revised trauma score (or RTS) to calculate an approximate probability of survival. Patients who present with a probability of survival of 36.1% or less are considered severely injured and require care at a Level I or Level II Trauma Center.

Verified Trauma Center Process: https://www.facs.org/search/trauma-centers eDisposition.19-Final Patient Acuity is defined in the NEMSIS Data Dictionary: https://nemsis.org/technical-resources/version-3/version-3-data-dictionaries/



Injury for this report is defined by ICD-10 codes consistent with motor-vehicle crashes.

For a complete list of codes, please contact nemsis@hsc.utah.edu.



Pedestrian is defined by the identifying ICD-10 code that indicates an injury to "pedestrian".



In the NEMSIS MVC Crash Dashboard, users can filter to a specific 5 year age range: <u>https://nemsis.org/view-reports/public-reports/version-3-public-dashboards/v3-public-motor-vehicle-crash-dashboard/</u>

Inclusion Criteria:

Adults >= 65 who sustained an MVC-related injury over MVC injuries of all ages.



Inclusion criteria: eInjury.04 is 2904009--Crash Ejection from automobile. "Crash ejection from automobile" does not distinguish between partial and full ejection.



These are EMS activations with a patient encounter in which they were ejected from a vehicle during an MVC. There is no distinction in NEMSIS data between full and partial ejection.

Crashes can have multiple patients, each one with their own unique ePCR. Patients may have more than one ePCR depending on how many agencies cared for or transported the patient.

Counts are by activation, not by crash.



Trauma Center criteria is based on vital signs and anatomical injury. These patients should be transported to a Level 1 or 2 Trauma Center based on their instability. For example, the arrow points to Q1 of 2020. 24 patients out of 1,000 qualified for transport to a Level 1 or 2 Trauma Center based on a Glasgow Coma Score of under 14.

Inclusion:

The denominator for the rate is all crashes. Each column represents a single quarter in a year. Unit notified by dispatch date is used to segment the records by quarter and year. The color bands segment the records by injury risk factor (elnjury.04). Each colored band within a column could therefore be described as the *Rate (per 1000 motor vehicle crashes) of each injury risk factor (elnjury.04) for a single calendar quarter in a single year identified using unit notified by dispatch (eTimes.03)*

1:M – clinicians may select as many options as needed to accurately describe the event.

This DOES NOT represent actual transport to a Trauma Center – just that the patient qualified for Trauma Center Care.

MVC-related injuries only

Public Dashboard: https://nemsis.org/v3-nhtsa-motor-vehicle-crash-severitydashboard-pubilc/ Federal Dashboard: https://nemsis.org/view-reports/federal-reports/version-3federal-dashboards/v3-ems-performance/

The National EMS Information System (NEMSIS)



Injury Risk Factors (which include cause of injury and special circumstances) help to determine if the patient should go to a trauma center but does not indicate it must be a Level I or Level II Trauma Center.

These risk factors do not appear to be as sensitive to the pandemic except for Motorcycle Crashes above 20 MPH where the rate rose in 2021.

Orange Box: Motorcycle crash >20 mph as Injury Risk Factor for Trauma Center Criteria

Public Dashboard: https://nemsis.org/v3-nhtsa-motor-vehicle-crash-severitydashboard-pubilc/ Federal Dashboard: https://nemsis.org/view-reports/federal-reports/version-3federal-dashboards/v3-ems-performance/



The next three graphs compare Fatality Analysis Reporting System (FARS) data and NEMSIS data.

FARS is a nationwide census providing NHTSA, Congress and the American public yearly data regarding fatal injuries suffered in motor vehicle traffic crashes: https://www.nhtsa.gov/research-data/fatality-analysis-reporting-system-fars FARS data represent fatalities and NEMSIS data include injury and severe injury rates. FARS data for 2020 and 2021 are not yet available.

Pedestrian is defined by FARS "as any person who is on a traffic way or on a sidewalk or path contiguous with a traffic way, and who is not in or on a nonmotorist conveyance."

Pedestrian is indicated in NEMSIS data by ICD-10 injury codes.



FARS: Motorcycle fatalities are quantified the same way as a vehicle occupant or a nonmotorist.



FARS data refers to this group as "pedalcyclists".



Please contact the NEMSIS Technical Assistance Center for updates to this document or for additional information. nemsis@hsc.utah.edu

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Appendix A: Parameters of Data (continued)

Timeliness: 75% of EMS data submitted to the National EMS Data Repository are generally available within 8 days of the EMS encounter.

Completeness: Approximately 92% of all 911 EMS activations across the country are represented.

Duplicates: Resubmission of an electronic patient care report (ePCR) supersedes and replaces the previous ePCR submission. This helps to reduce duplicate records in the database.

Preliminary Data: For research data that is reproducible, use the Public-Release Research Dataset provided annually.

Use of Report: Please refrain from removing single slides or graphs from this report without additional pages or clear reference to the parameters and source of the data. Taken out of context, the individual slides or graphs may not be represented accurately. Please contact the NEMSIS TAC for specific and updated slides or graphs when needed. nemsis@hsc.Utah.edu











FARS Definitions: (NHTSA Field Crash Investigation 2019 Coding and Editing Manual) https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/813042

Pedestrian

Is defined as any person who is on a traffic way or on a sidewalk or path contiguous with a traffic way, and who is not in or on a nonmotorist conveyance. This includes persons who are in contact with the ground, roadway, etc., but who are holding onto a vehicle. A nonmotorist conveyance is defined as any human-powered device by which a nonmotorist may move, or by which a pedestrian or nonmotorist may move another nonmotorist, other than by pedaling. A nonmotorist conveyance includes the following: baby carriage, coaster wagon, ice skates, roller skates, push cart, scooter, skate board, skis, sled, wheelchair, rickshaw, etc. This includes those persons in a nonmotorist conveyance who hold onto a motor vehicle in motion. Excluded are pedalcyclists.

Cyclist or cycle

Refers to any occupant of a pedalcycle, the cycle, or both. This includes those cyclists who hold onto a motor vehicle in motion.

Motored cycle

Refers to Body Type, Motorcycle, Moped (motorized bicycle), Three-wheel motorcycle or moped, Other motored cycle (minibike, motor scooter) and Unknown

motored cycle type.



NRSS Post-Crash Care Goals

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- Expand the use of and support for the National Emergency Medical Services
 Information System the national database that is used to store EMS data from the
 U.S. States and Territories by funding applied research and data quality
 improvements.
- 4. Improve the delivery of EMS throughout the nation in collaboration with the Federal Interagency Committee on Emergency Medical Services and the National Emergency Medical Services Advisory Council by focusing on shortening ambulance on-scene response times.

National Roadway Safety Strategy

