



**Flex
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Team**

University of Minnesota

University of North Carolina at Chapel Hill

University of Southern Maine

EMS Data to Support Rural EMS Improvement

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**National Rural Health Resource Center
Webinar for Flex Grantees
January 12, 2022**

A Performance Monitoring Resource for Critical Access Hospitals, States, and Communities



Agenda

- Accessing and using EMS data for EMS improvement.
- Sources of EMS data
 - State EMS agency licensure information
 - Personnel information
 - Run data
 - National EMS Information System (NEMIS)
- Accessing data – Challenges and Opportunities
- Review of EMS performance measures





EMS Flex Program EMS Activities

- EMS remains a challenging area of activity for states
 - Heavy focus on training, meetings, committee participation
 - Reliance on process/output rather than outcome measures
 - Unclear theories of change
 - Data availability





State Data Sources

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Data Collected by State Bureaus of EMS

- EMS service licensure
- Personnel licensure/certification
- Patient care/run data
- State EMS bureaus are increasingly turning to EMS data portals to collect EMS data
- Work with your state's EMS bureau to explore what data is available and how to access it





EMS Service Licensure

- Captures service-level demographic information
- Basic data elements:
 - Contact information
 - Ownership
 - Medical director information
 - Levels of services provided
 - Lists of vehicles and aircraft
 - Ownership
 - Dispatch information
 - Communication capabilities





EMS Service Licensure (cont'd)

- Captures service-level demographic information
- Additional elements (varies by state):
 - ePCR use
 - Billing capacity
 - Service area definitions
 - Staffing rosters by type/employment status
 - Estimated run volume
 - Charges for ambulance transports





EMS Personnel Licensure

- Captures personnel licensure and certification data:
 - Individual-level demographic information for EMS personnel categories
 - Emergency Medical Responder
 - Emergency Medical Technician (EMT)
 - Advanced EMT
 - Paramedic
 - Contact information
 - Certification
 - Current status
 - Work history





Patient Care Records (PCR)/Run Reports

- Records pre-hospital patient care and inter-facility patient transport care, involving the following:
 - Patient demographics
 - Response (services provided, crew members involved, response times, and travel distances)
 - Initial impressions (illness, mechanism of injury, and patient status)
 - Assessment of the scene and the patient
 - Vital signs, symptoms, and history
 - Physical examination (type and location of trauma, injury, and/or pain)



Patient Care Records (PCR)/Run Reports (cont'd)

- Records pre-hospital patient care and inter-facility patient transport care, involving the following:
 - Traumatic injury and crash data (cause of injury, crash information, safety equipment in use by the patient at the time of injury)
 - Interventions, treatment, and transport decisions and the supporting rationale





Patient Care Records (PCR)/Run Reports (final)

- EMS PCRs/run reports provide
 - Information about patients and their pre-hospital treatment to emergency department and hospital providers
 - Information to support patient billing
 - A legal record of the ambulance call's context and circumstances
 - Data to support EMS quality and performance improvement
 - Data for research and tracking purposes





What are State EMS Agencies Measuring

- Among the most common elements measures
 - Total response time
 - Scene time
 - Collection rate
 - STEMI recognition
 - Cardiac arrest return of spontaneous circulation (ROSC)
 - Intubation success rate
 - Other commonly examined statistics include overtime hours and costs, turn-out (or “chute”) time, stroke recognition and injury rates from lifting and moving patients





Operational Data Tracked by States

- Based on a national survey of state EMS leaders
 - Total response time 80.43%
 - Scene time (STEMI, CVA, Trauma) 76.09%
 - Chute/turn-out time 68.36%
 - Call processing time 60.39%
 - Total dispatch time 59.66%
 - At-hospital time 57.00%
 - Transport time 54.11%
 - Travel time 51.45%

Source: Fitch and Associates. [*The Cornerstone Series: The State of Data Use in EMS*](#)





Operational Measures (cont'd)

- Based on a national survey of state EMS leaders
 - Total task time 46.62%
 - Unit hour utilization (UHU) 45.65%
 - At-patient-side time 45.65%
 - Dispatch assignment accuracy 41.55%
 - Other 3.86%

Source: Fitch and Associates. [*The Cornerstone Series: The State of Data Use in EMS*](#)





Clinical Data Tracked by States

- Based on a national survey of state EMS leaders
 - STEMI recognition 76.27%
 - Cardiac arrest: ROSC 75.30%
 - Intubation success rate 73.12%
 - Stroke recognition 69.01%
 - IV success rate 63.44%
 - Time to 12 lead 54.00%
 - Medication errors 54.00%
 - STEMI door-to-balloon time 52.54%

Source: Fitch and Associates. [*The Cornerstone Series: The State of Data Use in EMS*](#)





Clinical Measures (cont'd)

- Based on a national survey of state EMS leaders
 - Cardiac arrest: survival-to-discharge 46.73%
 - Pain management 43.10%
 - Patient restraint (physical or chemical) 22.76%
 - Sepsis recognition 18.16%
 - Heart failure recognition 13.08%
 - Other 8.23%

Source: Fitch and Associates. [*The Cornerstone Series: The State of Data Use in EMS*](#)





Financial Data Tracked by States

- Based on a national survey of state EMS leaders
 - Collection rate 87.02%
 - Revenue per transport 72.38%
 - Cost per transport 66.02%
 - Other 5.52%

Source: Fitch and Associates. [*The Cornerstone Series: The State of Data Use in EMS*](#)

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Workforce Data Tracked by States

- Based on a national survey of state EMS leaders
 - Overtime hours/costs 81.99%
 - Turnover rate 53.74%
 - Employee satisfaction 50.14%
 - Employee wellness 5.52%
 - Meal breaks 11.08%
 - Other 4.43%

Source: Fitch and Associates. [*The Cornerstone Series: The State of Data Use in EMS*](#)





Safety Data Tracked by States

- Based on a national survey of state EMS leaders
 - Injury rates (lifting and moving patients) 77.84%
 - Injury rates (everything else) 72.02%
 - Vehicle collision rates 68.98%
 - Patient safety 59.56%
 - Cost of time lost due to injuries 38.23%
 - Crew fatigue/workload 31.30%
 - Violence against workforce 30.75%
 - Sleep time (24-hour or longer shifts) 19.67%
 - Other 1.66%

Source: Fitch and Associates. [*The Cornerstone Series: The State of Data Use in EMS*](#)





National EMS Information System (NEMESIS)

<https://nemsis.org/>

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National EMS Information System (NEMESIS) (cont'd)

- Goal - improve pre-hospital care through the standardization, aggregation, and utilization of point of care EMS data at local, state, and national levels
- Currently on Version 3.5
 - Adoption of an electronic EMS documentation system to collect and use local EMS data
 - Development of a State EMS information system in every state, which can receive/use local EMS data
 - Development of a national EMS database with reporting capabilities, allowing Federal, State, and local EMS stakeholders access to performance and benchmarking metrics





How NEMSIS Works

- NEMSIS is the national database that is used to store EMS data from states and territories
- Provides a universal standard to collect patient care information resulting from an emergency 911 call
 - Uses a common computer language (XML) to move data
 - Local agencies select elements according to their needs—keeping the national elements AND state elements as part of their selected elements
 - States select elements according to their needs—keeping the national elements as part of their selection
 - National elements are transmitted to the NEMSIS Technical Assistance Center (TAC) to populate the National EMS Dataset





How to Access NEMESIS Data

- Work with your state EMS bureau
- Each state is allowed three active directory accounts for the EMS State Data Manager, State EMS Medical Director and State EMS Director
 - Visit your state's Emergency Medical Services website and review the procedures for acquiring access to state level data
 - Contact your state's EMS office, explain the purpose for needing the data and make your request directly to the State EMS Manager
 - Contact information for State EMS Data Managers can be found on the NEMESIS website <https://nemsis.org/>





NEMESIS Data Dictionaries

- EMS/Demographic/State data dictionary
 - https://nemsis.org/media/nemsis_v3/release-3.5.0/DataDictionary/PDFHTML/EMSDEMSTATE/NEMESISDataDictionary.pdf
- National elements only data dictionary
 - https://nemsis.org/media/nemsis_v3/release-3.5.0/DataDictionary/PDFHTML/EMSDEMSTATE_National/NEMESISDataDictionary.pdf
- Extended data definitions
 - https://nemsis.org/media/nemsis_v3/release-3.5.0/DataDictionary/PDFHTML/EMSDEMSTATE/Extended%20Data%20Definitions.pdf





Monitoring the Impact of State Flex Program EMS Activities

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Monitoring the Impact of State Flex Program EMS Activities (cont'd)

- Focus on improving EMS engagement with CAHs
- System of care orientation
- Assess local EMS capacity and system issues
- Concentrate on TCDs – STEMI, stroke, trauma
- Focused on following three domains:
 - Capability, capacity, and access
 - Recognition and diagnosis
 - Integration and coordination of care
- Goal – document system performance improvement





Assessment and Planning

Capability, Capacity, Access (NQF Domain 1)

- System Assessment
 - Assess EMS capacity and performance using standardized tools/protocols
 - Develop interventions addressing priority needs
 - Begin implementation of interventions
 - Focus leadership programs on EMS capacity building

Source: Gale J, Coburn A, Pearson K, Croll Z, Shaler G. Table 1. Developing Program Performance Measures for Rural Emergency Medical Services. *Prehosp Emerg Care*. Mar-Apr 2017;21(2):157-165.





Performance Improvement and System Building

Capability, Capacity, Access (NQF Domain 1)

- EMS Agency Data and Reporting Capacity
 - Agencies collect and use data to manage and improve performance and engage in collaborative discussions to improve performance across the system
- EMS Agency and Protocol Use (TCDs/systems of care)
 - Agencies use nationally recognized protocols for TCDs and emergency dispatch for patients of all ages





Performance Improvement and System Building (cont'd)

- **Recognition and Diagnosis (NQF Domain 2)**
 - Train staff to use evidence-based protocols for TCDs to identify specific episodes of care
- **Coordination of Care (NQF Domain 5)**
 - Agencies are working with other participants in local systems of care to plan for and develop integrated services systems





System Assessment Measures

- % of state Flex Programs conducting assessments
- % of state Flex Program EMS initiatives that address priority needs identified in the assessment
- % of state Flex Programs that track and evaluate progress towards addressing priority needs
- % of local rural health systems with local system assessment and planning processes involving community providers and stakeholders





EMS Data and Reporting Capacity Measures

- % of EMS agencies able to bill third party payers and patients for services rendered
- % of EMS agencies able to access patient billing and agency financial data for PI
- % of agencies with formal quality improvement protocols/continuous quality improvement (CQI) processes
- % of agencies that use quality data for PI
- % of local/regional systems of care in which participants meet regularly to review data on quality and system performance





EMS Protocol Use Measures for TCDs/systems of care

- % using the Center for Disease Control and Prevention CDC's [Guidelines for the Field Triage of Injured Patients](#) (trauma) of all ages
- % using the [American Heart Association's Mission \(AHA\): Lifeline](#) Guidelines (STEMI)
- % using protocols that meet current [American Stroke Association/AHA guidelines](#) for stroke care
- % of units with emergency dispatch protocols





Recognition and Diagnoses Measures

- Recognition and Diagnosis of TCD episodes of care
 - % of EMS staff trained on: STEMI recognition, stroke recognition, and trauma/field triage-all ages
 - EMS protocol use
 - % using AHA Mission: Lifeline Guidelines (STEM)
 - % using protocols meeting ASA/AHA stroke care guidelines
 - % using CDC guidelines for field triage of injured patients
- Staff training
 - % of EMS staff trained on STEMI and stroke recognition
 - % of staff with training trauma/field triage protocols for all ages





Coordination of Care Measures

- Governance, shared accountability, handoffs and transitions, and communication
 - % of EMS agencies with local system planning committees involving relevant local CAHs and other hospitals, health care providers, fire/law enforcement officials, and community stakeholders
 - % of EMS agencies with local system planning committees that have developed plans to address emergency system resource, work force, and training needs



Long Term Improvement Measures

- % of systems functioning as integrated systems of emergency care
- % of EMS agencies with improved performance on key TCD measures (e.g., D2B of ≤ 90 minutes)
- % of EMS agencies with improved financial and quality performance





Long Term Improvement Measures (cont'd)

- % of systems functioning as integrated systems of emergency care
- % of EMS agencies with improved performance on key TCD measures (e.g., D2B of ≤ 90 minutes)
- % of EMS agencies with improved financial and quality performance





EMS Compass Measures

- Funded by the National Highway Traffic Safety Administration Office of EMS and led by the National Association of State EMS Officials
- EMS [Compass](#) initiative engaged a wide range of EMS stakeholders to develop performance measures that are relevant to EMS agencies, regulators, and patients
- Measures are based on the latest version of NEMSIS
- Allows local and state EMS systems to use their own data meaningfully
- Transitioned to National EMS Quality Alliance





Categories of Compass Measures

- Hypoglycemia
- Medication Error
- Pediatric Respiratory
- Seizure
- Stroke
- Trauma
- Trauma Pain
- Vehicle Operations Safety





Categories of Compass Measures (cont'd)

- Hypoglycemia
- Medication Error
- Pediatric Respiratory
- Seizure
- Stroke
- Trauma
- Trauma Pain
- Vehicle Operations Safety
- Link to measures set:
 - <https://nasemso.org/nasemso-document/10252016-website-ems-compass-measure-v10-3-protected-xlsx/>





Flex EMS Supplement Funding – Measure Development

- Florida’s Feasible, Actionable, Impactful, Relevant (F.A.I.R.) EMS Measurement Project
 - Develop rural-relevant quality measures to be used in the Emergency Medical Services (EMS) Community that can be implemented in Florida and other states
- North Dakota’s Measures Development Project
 - Develop rural-relevant quality measures using a North Dakota Quality Improvement Program Steering Committee and external subject matter experts





Recommendations

- Contact your state EMS bureau and its EMS data manager to:
 - Understand what data is collected and available through agency licensure, personnel licensure, and run reports
 - Engage them in exploring measures to track proposed Flex Program activities based on a clear theory of change
 - Determine the process to obtain access to needed data
 - Work with them to access NEMSIS data for benchmarking purposes



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This project is supported by the Federal Office of Rural Health Policy (FORHP), Health Resources and Services Administration (HRSA), U.S. Department of Health and Human Services (HHS) under cooperative agreement #U27RH0180. The information, conclusions and opinions expressed in this presentation are those of the authors and no endorsement by FORHP, HRSA, or HHS is intended or should be inferred.