

## Knowledge Gaps in Neuroepidemiology of Geriatric TBI:

The National EMS Information System  
and Prehospital Emergency Care

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National Academies: Approaches to Address  
Unmet Research Needs in Traumatic Brain Injury  
Among Older Adults: A Workshop

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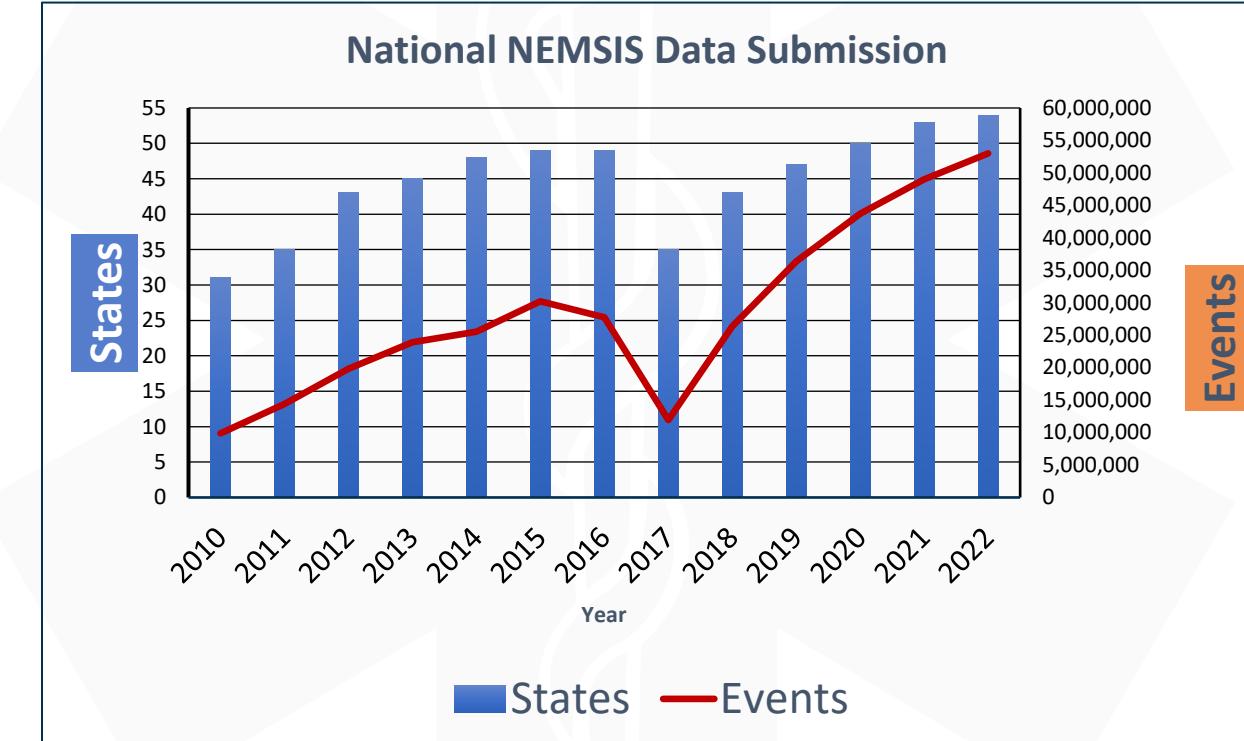
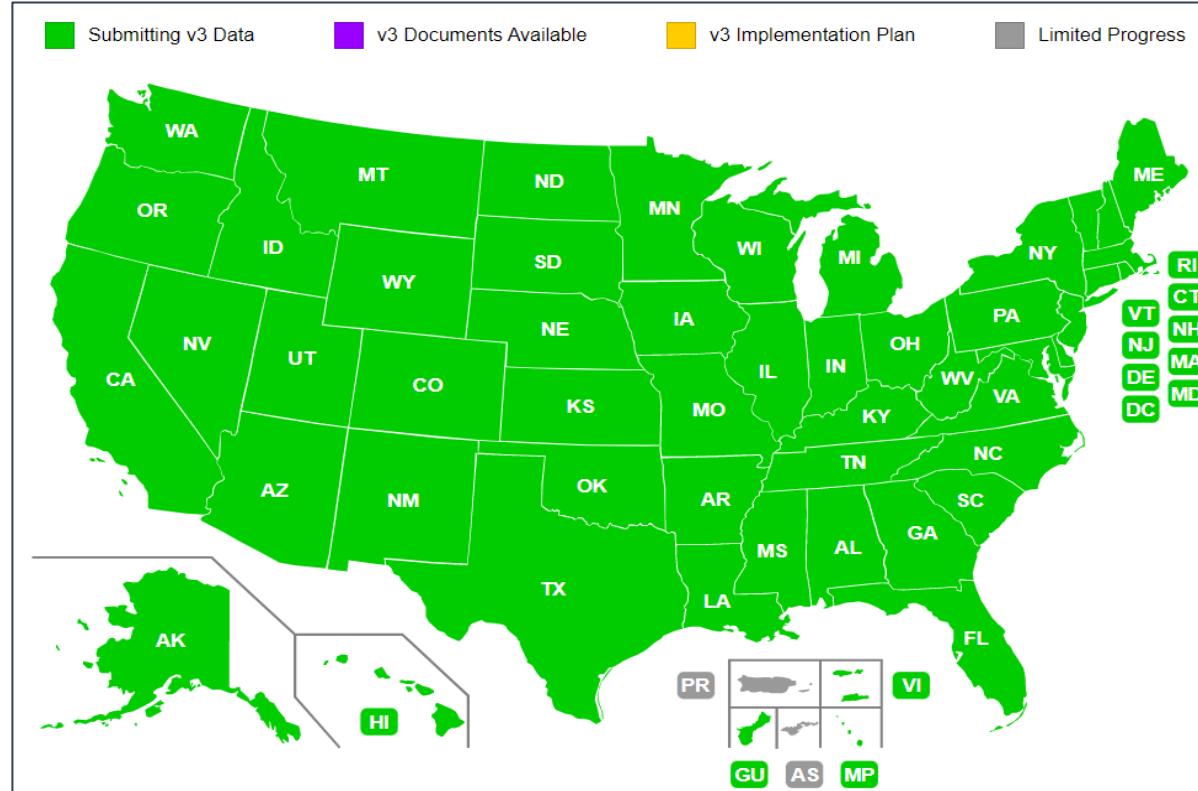
# The National EMS Information System (NEMSIS)

- **Documentation standard** for EMS response and care
- **Data definitions** for point of care data collection
- **Compliance testing** for EMS ePCR software
- **Interoperability** and exchange standards
- **National EMS Database**



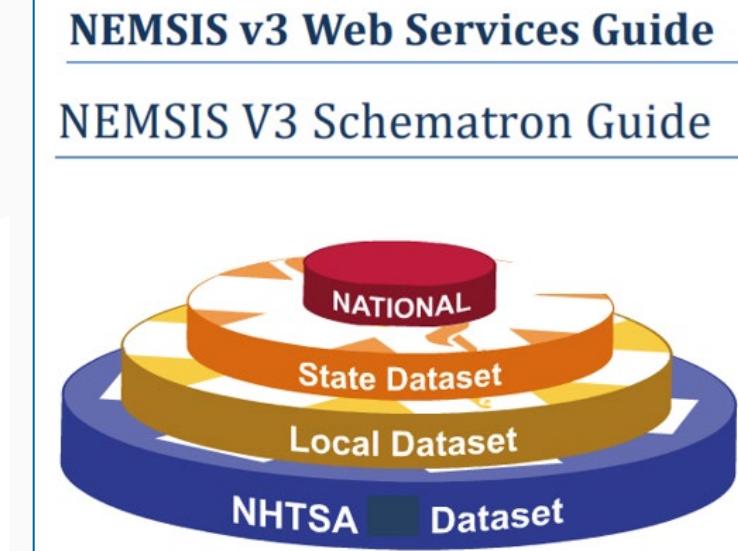
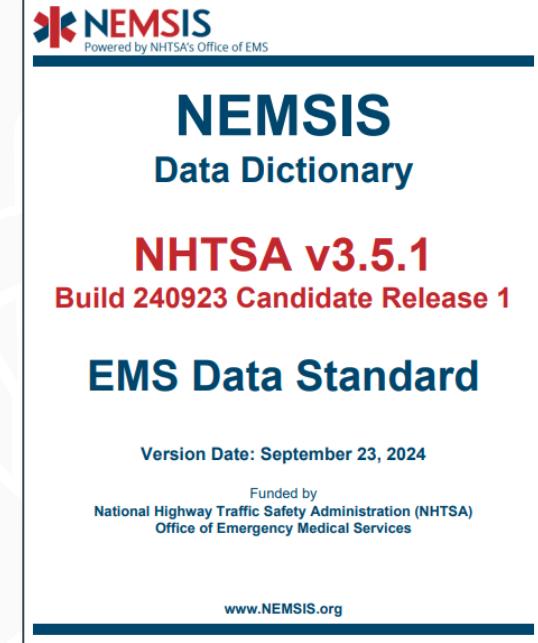
# NEMSIS State Participation and Submissions

## Submitting Version 3 NEMSIS Data



# NEMSIS Data Elements

- **652 NEMSIS Data Elements** can be collected by a local EMS Agency
- **163 NEMSIS Data Elements** are collected at the National level (National EMS Database)
- Data Elements Collected:
  - EMS Operations (e.g., response and patient transport)
  - Incident Location
  - Patient Demographics
  - Patient Assessment (e.g., clinical impression, primary symptoms, vital signs, trauma triage categories)
  - Patient Care (e.g., procedures, medications)
  - Patient Disposition



# Defining Head Injury Patients in NEMESIS

- Why “**Head Injury**” and not **Traumatic Brain Injury**?
  - EMS Clinicians (EMTs, Paramedics) make clinical impressions of patients' injuries and conditions, not diagnoses
- **3,846 unique ICD-10-CM codes** documented for **Primary Impression** for Injured **Older Adults** (65+) by EMS clinicians for 9-1-1 responses in 2023
  - Of those, **240 Impressions** had one of the following **key words**: “head” “brain” “concussion” “skull” “hematoma” or “hemorrhage”
  - **129 Impressions related to Head Injury**
    - Method: 2 EMS clinicians conducted review, +1 arbitrator for discordant categorizations

# Older Adult Head Injury Patients Encountered by EMS

- In 2023, there were **261,931** 9-1-1 Activated EMS Responses to Older Adults with a documented “Head Injury” Primary Impression
  - **Fall** was the most common dispatch reason (77%)
  - **Nursing Home** was the most common incident location type (27%)
  - The median age of patients was **80 years**, and a **majority were female** (59%)
  - While more than 90% of EMS responses encountered a patient with a GCS of 14-15, there were **15,921 with a GCS  $\leq 13$**
  - For these responses, **90%** (n=235,681) were transport by EMS

# Prehospital Knowledge Gaps & Research Needs

- Development of head injury / TBI EMS data phenotypes
- Characterization of head injury patients encountered by EMS
  - Are EMS clinicians' mis-triaging older adult TBI patients?
  - Are there innovative tools and resources that could improve prehospital assessment and triage of older adult acute TBI patients?
    - Point-of-Care blood biomarker testing
    - Portable infrared brain scanners
    - Physician consult with EMS clinicians via telemedicine
    - Access to patients' medical records via health information exchange (HIE)
    - Interoperability to increase hospital outcome information in the EMS report → CQI
  - What are the most effective interventions for treating older adult acute TBI patients in the prehospital setting?
    - EPIC TBI Project (University of Arizona): prevent and treat hypoxia, hypotension and hyperventilation
    - Transfusion of blood plasma

# NEMSIS Support



<https://www.nemsis.org>



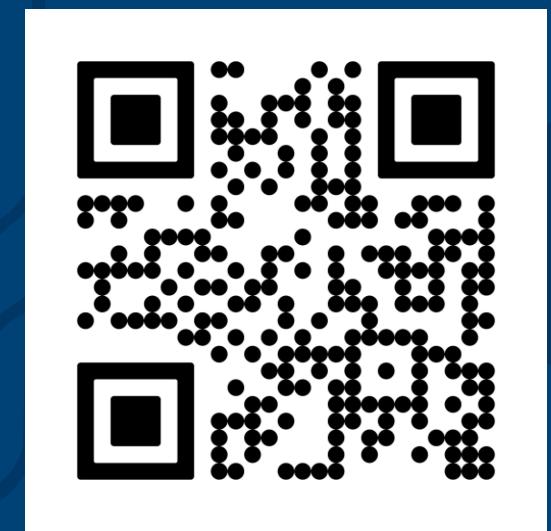
<https://nemsis.atlassian.net/servicedesk/customer/portals>

# THANK YOU!

911.gov



\*ems.gov



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