

# National EMS Database

## NEMSIS Public Release Research Data Set

### v3.4.0



## 2023 User Manual

April 2024

NEMSIS Technical Assistance Center  
University of Utah School of Medicine  
295 Chipeta Way, P.O. Box 581289  
Salt Lake City, Utah 84158-1289  
[www.nemsis.org](http://www.nemsis.org)

### Acknowledgement

The Office of Emergency Medical Services, National Highway Traffic Safety Administration established the NEMSIS National EMS Database as a public service. The National EMS Database is a repository of EMS related data voluntarily reported by participating EMS agencies and states. The National Highway Traffic Safety Administration funds and administers the NEMSIS Program



## TERMS OF USE

---

Please be advised of the following Terms and Conditions of Use. In order to request the NEMSIS Public Release Research Data Set, you must agree to these terms and conditions (below) and complete the data application form.

The National Highway Traffic Safety Administration (NHTSA) established the NEMSIS National EMS Database as a public service. The National EMS Database is a repository of EMS related data voluntarily reported by participating EMS agencies and states. PLEASE NOTE THAT THE PUBLIC RELEASE RESEARCH DATASET IS NOT A POPULATION BASED DATA SET.

NHTSA funds and administers the NEMSIS Program. Therefore, use of any information from the National EMS Database or the NEMSIS Public Release Research Datasets must include a prominent credit line. That line is to read as follows:

*National Highway Traffic Safety Administration, National Emergency Medical Services Information System. The content reproduced from the NEMSIS Database remains the property of the National Highway Traffic Safety Administration. The National Highway Traffic Safety Administration is not responsible for any claims arising from works based on the original Data, Text, Tables, or Figures.*

### **Specific Terms of Agreement:**

Limited license is granted to use said Information from the NEMSIS National EMS Database from the National Highway Traffic Safety Administration, provided the Requester agrees to the following provisions:

1. Treat the information received from the NEMSIS Technical Assistance Center as non-public health data. The data may never be used by Requester as a basis for legal, administrative or other actions that can directly affect an individual whose medical or personal information is identifiable in the data.
2. Use the information received under the provisions of this Agreement only for the following not-for-profit purposes: research, advocacy, medical education, patient education, or other EMS care-related activities supported by not-for-profit organizations.
3. All Information derived from the NEMSIS National EMS Database shall remain the full property of The National Highway Traffic Safety Administration and shall be so noted in educational material, website presentations, and publications.
4. Warrant that The National Highway Traffic Safety Administration is not responsible for any claims arising from works based on the original Data, Text, Tables, or Figures.
5. Indemnify the National Highway Traffic Safety Administration and the National EMS Information System Technical Assistance Center and their employees and agents from any and all liability, loss, or damage suffered as a result of claims, demands, costs, or judgments arising out of use of NEMSIS National EMS Database information.
6. Requestor may not sublease or permit other parties to use NEMSIS data without advance written approval of NEMSIS Technical Assistance Center.

The Requester's obligations hereunder shall remain in full force and effect and survive the completion of the Requester's defined project described herein above. The terms of this Agreement shall be binding upon the Requester and the organization through which his/her project is conducted.

A copy of the final printed material must be forwarded to NEMSIS Technical Assistance Center staff <https://nemsis.org/support>.



## TABLE OF CONTENTS

ACKNOWLEDGEMENT .....	1
TERMS OF USE.....	1
HISTORY OF NEMESIS .....	3
NEMESIS CONFIDENTIALITY POLICY.....	5
CURRENT LIMITATIONS OF NATIONAL EMS DATA.....	6
Data Quality in the National EMS Database.....	6
The National EMS Database is not a Population-based Dataset. ....	6
SELECTION AND INFORMATION BIAS IN THE NATIONAL EMS DATABASE.....	7
Selection Bias .....	7
Information bias .....	7
Missing data in the National EMS Dataset.....	7
CONTACT INFORMATION.....	8
REFERENCES .....	8
GETTING STARTED WITH NATIONAL EMS DATA .....	9
FREQUENTLY ASKED QUESTIONS ABOUT USING NATIONAL EMS DATA .....	10
What are the system requirements for downloading the NEMESIS data? .....	10
Can I estimate a number of patients based on the National EMS Database? .....	10
How can I merge the data sets in the National EMS Database? .....	10
What are the patient inclusion criteria for the National EMS Database?.....	10
How can I gain access to the Additional Variables Requiring Approval?.....	10
SELECTED NEMESIS PUBLICATIONS .....	11
APPENDIX A: PUBLIC USE VARIABLE DESCRIPTION LIST .....	15
APPENDIX B: LIMITED USE VARIABLE DESCRIPTION LIST .....	19
APPENDIX C: OVERVIEW OF NATIONAL NEMESIS BUSINESS RULES BY NEMESIS ELEMENT .....	20
OTHER VALUE LIMITS: .....	20
APPENDIX D: 2023 CONTRIBUTING STATES & TERRITORIES .....	23
APPENDIX E: EXTENDED DEFINITION DOCUMENT VERSION 3.4.0.....	24
APPENDIX F: COMPUTED VARIABLE DESCRIPTION LIST* .....	25
APPENDIX G: NEMESIS 2023 PUBLIC RELEASE RESEARCH DATASET REFERENCE TABLES .....	26
APPENDIX H NEMESIS 2023 PUBLIC RELEASE RESEARCH DATASET .....	27



## HISTORY OF NEMSIS

**In 1973**, the Emergency Medical Services (EMS) Systems Act is passed. Administered by The Department of Health, Education and Welfare, the EMS Systems Act provides funding for the development of local EMS systems. The Act identifies 15 essential components of an EMS system, including the need for EMS data collection. This is the first federal legislation requiring EMS data collection and documentation of EMS services.

**In 1991**, the Utstein Style for Uniform Reporting of Data is published. This is the first major document to publish data points that specifically addressed data collection for EMS systems. The data points are specific to prehospital cardiac care and include variables on patient outcomes.

**In 1994**, the NHTSA Uniform Pre-hospital EMS Dataset (Version 1.0) is published. The EMS Community recognizes that EMS systems across the country are collecting different data elements for identical types of incidents, emergencies, EMS operations, and prehospital clinical care. There is clearly a need for standardization. In response, NHTSA works with representatives of national EMS organizations and EMS technical experts to develop the NHTSA Uniform Pre-hospital EMS Dataset, a national consensus document that defines 81 elements determined important to an EMS information system.

**In 1996**, NHTSA's EMS Agenda for the Future: A Vision for the Nation's EMS System (Agenda) is published. The agenda is a collaborative effort involving representatives from State Offices of EMS, National EMS Organizations, and Federal Partners. The agenda identifies 14 EMS Attributes for continued development and improvement of EMS systems. The Information Systems Attribute includes 5 recommendations related to uniform EMS data elements, information systems for collecting and transmitting data electronically, and integration with other public safety and healthcare data.

**In 1997**, Data Elements for Emergency Department Systems is published. The data elements, developed by the Center for Disease Control and Prevention's National Center for Injury Control and Prevention, extends the concept of information systems for emergency departments by providing standards for data collection and linkages back to EMS.

**In 1998**, NHTSA's EMS Agenda for the Future: Implementation Guide is published. The Implementation Guide, a follow-up compendium to the EMS Agenda for the Future, identifies approaches for implementing The Agenda's 89 recommendations.

**In 2001**, the National EMS Information System (NEMSIS) and the National EMS Database are developed. The development of NEMSIS is a collaborative effort by The National Association of State EMS Directors with funding from NHTSA and the Trauma and EMS Systems Program at the Health Resources and Services Administration's (HRSA) Maternal and Child Health Bureau.



**In 2003**, an EMS data collection Memorandum of Agreement (MOU) is signed by 51 U.S. States and Territories. The MOU establishes the need for standardized EMS data element definitions, standardized data collection at the state level, and a defined set of national NEMESIS data elements. By 2008, all states, the District of Columbia and the 5 U.S. Incorporated Territories have signed the MOU.

After 18 months of working with an expert consensus panel, a 400-page NEMESIS data dictionary is completed. The data dictionary includes data element labels, definitions, and standardized value codes.

**In 2004**, NEMESIS physical database schemas, element traits, and database development scripts are made available. These standardized implementation templates are provided to EMS software vendors for the development of EMS electronic patient care (ePCR) software and to states for development of state-level EMS data collection systems.

Also, during this time, Extensible Markup Language (XML) is designated as the standard to transmit EMS data from EMS agencies at the local-level to state-level EMS data collection systems, and onto the National EMS Database. XML's open format provides an easy way to transmit data for different ePCR software formats.

**In 2005**, the NEMESIS Version 2.2 Data Standard is created. The Version 2.2 Data Standard is developed using a national consensus process during a NEMESIS project pilot phase administered collaboratively by NHTSA, HRSA, and the CDC.

As a result of the pilot phase, NHTSA, HRSA, and the CDC recognize the value of the NEMESIS Project and initiate funding for a NEMESIS Technical Assistance Center (TAC). Initial development and testing of the NEMESIS standard are completed by the EMS Performance Improvement Center (EMS-PIC) at the University of North Carolina. The TAC agreement is awarded to the University of Utah School of Medicine (Utah). Utah works closely with the EMS-PIC to ensure an accurate transfer of NEMESIS knowledge and technology developed by the EMS-PIC.

**In 2009**, NEMESIS Version 3 is created. NEMESIS Version 3 expands the number of NEMESIS data elements, incorporates ICD-10-CM codes for 19 data elements, establishes software business rules to improve data quality, expands recommendations for state EMS datasets, and establishes a data export and transmission standard based on Web Services to facilitate automated and near real-time EMS data transfer.

**In 2012**, NEMESIS Version 3.2.6 Data Standard ePCR software compliance testing is initiated to ensure adherence to the NEMESIS standard. Also, during this time, NEMESIS Version 3 works with a Standards Development Organization (Health Level Seven) and meets the American National Standards Institute (ANSI) requirements to become a national healthcare data standard. A Data Standard for Trial Use (DSTU) period is initiated and continued for 18 months. Also, during this time, the number of states submitting Version 2 NEMESIS data to the National EMS Database reaches 37 states and territories.



**In 2015**, the National EMS Database reaches over 30 million NEMESIS Version 2.2.1 Data Standard records of EMS activations from 49 U.S. States and Territories. NEMESIS Version 3.4.0 is rolled out in 13 states with several additional states planning migration for early 2016.

**In 2017**, NEMESIS Version 2.2.1 has closed (Dec 31, 2016) for ePCR software compliance testing by the NEMESIS-TAC and for submission to the National EMS Database. The NEMESIS-TAC begins exclusively collecting Version 3 NEMESIS data from states and territories on January 1, 2017. For calendar year 2017, the NEMESIS-TAC collects 7,907,829 NEMESIS Version 3.3.4/3.4.0 records of EMS activations from 4,016 agencies located in 35 states and territories.

**In 2019**, the date to close NEMESIS Version 3.3.4 submissions is extended to March of 2021. NEMESIS Version 3.5.0 is completed and provided to software companies for implementation. Using NEMESIS Version 3.4.0, 10,062 EMS agencies serving 47 states and territories submit 34,203,087 EMS activations to the National EMS Repository. Over 900 scholarly reports, peer-reviewed papers, and other publications are now available online, using NEMESIS data.

**In 2020**, during the COVID-19 pandemic, more than 12,000 EMS agencies serving 50 states and territories submitted in excess of 44 million EMS activations to the NEMESIS National EMS Repository. Many scholarly reports were published during that same year highlighting the reduced EMS call volume, excess at-home deaths, decreased vehicular crashes, additional opioid overdoses and increased mental-health related EMS calls that were occurring during the pandemic. The migration to NEMESIS v3.5.0 that was to occur during 2020 was delayed by the pandemic.

## **NEMESIS CONFIDENTIALITY POLICY**

The NEMESIS National Database is maintained on a secure database with limited internal access. External users must gain permission to the dataset by completing a request form available on the web site (<https://nemsis.org/using-ems-data/request-research-data/>). Use of the National EMS Dataset is in strict compliance with the Health Insurance Portability and Accountability Act of 1996 (HIPAA).<sup>2</sup> The NEMESIS Technical Assistance Center does not distribute or report data identifying a patient, EMS agency, health care facility, or reporting state in any manner that allows for identification without the express written permission of the entity to be identified. The dataset collected by the NEMESIS TAC is considered a “limited” dataset under HIPAA, and the research dataset that the NEMESIS TAC releases is a “de-identified” dataset.



## **CURRENT LIMITATIONS OF NATIONAL EMS DATA**

### ***Data Quality in the National EMS Database***

The National EMS Database is a large representative sample— it consists solely of data submitted by participating EMS agencies within states/territories, and it is not a population-based data set. In addition, the National EMS Database inherits the individual deficiencies originating from its contributing entities. However, the NEMSIS TAC is continually cleaning and standardizing the data to improve data quality. Data files received from contributing EMS agencies and states are checked for completeness, logical consistency, and proper formatting. Any data files not passing the NEMSIS validation and data cleaning processes are rejected or flagged, based upon the type of the discovered errors. A data profile report is generated for each submitted file from a state/territory allowing the opportunity to review the quality of submitted data, correct errors and resubmit their data if needed. Any remaining data limitations, errors, or inconsistencies are allowed into the database. These errors remain for two reasons: 1) it would be extremely difficult to flag individual errors and request corrections from thousands of EMS agencies submitting millions of records and; 2) allowing states (and associated EMS agencies) to view data as submitted, will hopefully facilitate efforts to further refine data collection techniques to increase the accuracy of data collected.

The NEMSIS TAC employs edit checks to identify invalid or out of range values for the variables included in the research data set. There are currently over 450 edit checks. For further information about the edit checks please see Appendix B.

### ***The National EMS Database is not a Population-based Dataset.***

The National EMS Database is subject to the limitations of any “convenience sample”. It probably includes a disproportionate number of EMS agencies with the resources and leadership necessary to be an adopter of the NEMSIS standard. The data may not be representative of all states or EMS agencies in the nation.

In addition, users of the National EMS Database should understand that the data are “event-based” and not “patient-based”. That is, a single patient may be represented in more than one record for a variety of reasons. A patient may request EMS assistance frequently, and therefore, be represented in the dataset more than once. In addition, several agencies may respond to the same event (i.e., one patient) and each submit a patient care record to the National EMS Database. For example, a patient may be treated by first responders, who transfer care to a ground ambulance crew, who deliver the patient to a soccer field for transport to a tertiary hospital via air ambulance. In this case, three patient care reports (records) would exist in the National EMS Database for the single event. Thus, we refer to the National EMS Database as a registry of “EMS activations”.



## **Selection and Information Bias in the National EMS Database**

As a “convenience sample,” the National EMS Database is subject to various forms of bias. The NEMESIS national data are submitted voluntarily from EMS agencies and states that have demonstrated a commitment to monitoring and improving the care of patients treated and transported by EMS. These may not be representative of all EMS agencies and states. In addition, states have differing criteria for including patients in statewide EMS databases. Some states include all 9-1-1 calls, while other states limit case additions to patient contacts or patient transports.

Some of the theoretical issues resulting from the use of registries have been noted<sup>2-4</sup>. The most obvious problems are selection bias, the inconsistency with which clinical variables can be measured, and inter-agency differences in treatment and transport practices.

### ***Selection Bias***

refers to an apparent difference between two groups that is actually caused by different inclusion criteria. For example, if a state includes all “no-treatment, left on scene” patients in its registry and another state does not, the state not including this patient population may appear to have more “higher acuity” events (e.g., frequent treatment and medication events) compared to the state including patient refusals. Any difference in inclusion/exclusion criteria could produce a selection bias.

### ***Information bias***

refers to an apparent difference between two groups that is actually caused by a difference in the data available to compare them. Many fields among the national NEMESIS elements allow for null values and differences in the proportion of cases with missing (or null) data may be responsible for apparent differences among EMS agencies between or within states. If one state demonstrates incomplete data on patients when reporting treatment complications, for example, it may falsely appear to be delivering better quality care than a state that diligently requires every treatment complication to be recorded.

### ***Missing data in the National EMS Dataset***

The proportion of missing data varies across data elements in the National EMS Database, and it is important to decide how to deal with missing data when doing analyses. In most cases, NEMESIS data are not missing at random and analyses, therefore, are subject to bias if missing data are ignored. That is, the results may be misleading when excluding all observations with missing data or null values. Excluding observations with missing values is the default for most software programs when running statistical analyses.

Another available option is to provide plausible values for the missing data, either by single value or multiple value imputation. A single imputation of a value may be an educated guess at the value, substitution of the mean value, or substitution based on a regression equation using other (observed) values. For example, one might assume that a patient has suffered an injury (eSituation.02 = Yes) if the complaint reported to dispatch was “Traumatic Injury”. Most statistical software packages can do imputations without much difficulty. However, it is important to explore the impact of missing data with sensitivity analyses. That is, repeat an analysis with and without imputation and see whether there are any important differences.





## CONTACT INFORMATION

For further assistance in using the National EMS Dataset contact:

<https://nemsis.org/support/>

## REFERENCES

1. Annas GJ. Medical privacy and medical research - judging the new federal regulations. *NEngl J Med.*; 346 pp.216-220.
2. Herrmann N, Cayten CG, Senior J, Staroscik R, Walsh S, Woll M. Interobserver and intraobserver reliability in the collection of emergency medical services data. *Health ServRes.* 1980; 15 pp.127-43.
3. Mann NC, Guice K, Cassidy L, Wright D, Koury J, Anderson C. Are statewide trauma registries comparable? Reaching for a national trauma dataset. *Acad Emerg Med.* 2006;13(9) pp.946-53.
4. Izquierdo JN, Schoenbach VJ. The potential and limitations of data from population-basedstate cancer registries. *Am J Public Hlth.* 2000; 90 pp.695-98.



## GETTING STARTED WITH NATIONAL EMS DATA

The 2023 NEMESIS Public-Release Research Dataset includes 54,190,579 Version 3.4.0 EMS activations collected from 14,369 agencies located in 54 states and territories. This dataset is organized into a set of relational tables and consists of 42 data files each (including 6 reference tables and 1 computed table). These files are provided in ASCII format (pipe-separated values), SAS and STATA formats. Both types of files can be used to export the data to other formats (e.g., R, SPSS, etc.).

It is important to note that in 2023 data was received in both v3.4.0 and v3.5.0 versions of the NEMESIS data standard. The research datasets are mapped so that all the data in the research datasets are in v3.4.0. Additional information about mapping and translation between standards is available at: <https://nemsis.org/technical-resources/version-3/v3-element-mappingtranslation-documents/>

The table named “Pub PCRevents” includes all of the single-entry elements contained in the NEMESIS standard that have been approved for release. All other tables include elements for which multiple entry values are possible. The data element “PcrKey” is the unique key to match elements for each record contained in the Event Table and all other tables. This “PcrKey” (also known as “Primary Key”) is the unique ID for each record contained in each table and can be used to match elements across tables associated with the same EMS event. A Foreign key is also found in all tables, except the Pub PCRevents Table, and is used to match multiple entries (for multiple entry elements) to the same EMS event. For most multiple entry elements, the included PcrKey is the same PcrKey found in the Pub PCRevents table. MedsGivenComplications, ProceduresComplications and Vitals related elements all contain a foreign key that matches multiple instances to a primary key in the MedsGiven, Procedures and vitals tables.

Please note that the time format changed in 2020 from YYYY-MM-DD HH:MM:SS to DDMMYYYY:HH:MM:SS.

Contact us with any concerns or suggestions you might have by opening a help desk support ticket. A detailed data dictionary of each variable can be found on the NEMESIS website (<https://nemsis.org/technical-resources/version-3/version-3-data-dictionaries/>).

Additional information regarding file size:

UNCOMPRESSED	
ASCII	169 GB
SAS	144 GB
STATA	131 GB

COMPRESSED	
ASCII	19 GB
SAS	18 GB
STATA	17 GB



## FREQUENTLY ASKED QUESTIONS ABOUT USING NATIONAL EMS DATA

### ***What are the system requirements for downloading the NEMSIS data?***

#### *Relational Tables*

Minimum of 250 GB of storage for ASCII files  
Minimum of 250 GB of storage for SAS files  
Minimum of 250 GB of storage for STATA files  
Minimum of 16+ GB of RAM strongly recommended.

### ***Can I estimate a number of patients based on the National EMS Database?***

The National EMS Database is an incident database and there are no patient identifiers in the database. If a patient has more than one EMS reported incident during a year, or several agencies submit a run report for the same incident, this patient will be in the database more than once.

### ***How can I merge the data sets in the National EMS Database?***

The National EMS Database files can be merged by using the unique incident key for each incident (e.g., PcrKey).

### ***What are the patient inclusion criteria for the National EMS Database?***

States have differing criteria for including patients in statewide EMS databases. Some states include all calls, some include only 9-1-1 calls, while other states limit case additions to patient contacts or patient transports.

### ***How can I gain access to the [Additional Variables Requiring Approval](#)?***

Data variables found on page 20 are submitted by states to the NEMSIS TAC but are prohibited from release by existing State Data Use Agreements. Researchers can gain access to these variables by making a direct request to each state for which the researcher wishes access. In addition, the NEMSIS TAC can make use of the HIPAA de-identification clause to statistically “mask” these elements in a fashion that allows for the investigation of a specific hypothesis.

As an example, if a researcher is working with a hypothesis that requires access to geographic boundaries (such as the element “EMS Agency State”), the NEMSIS TAC can collapse data from several states into categories, based on the hypothesis, and provide the researcher a new “blinded” categorical element and include a primary key element for merging to the publicly accessible patient-level data. To make use of this process, contact the Technical Assistance Center by opening a help desk support ticket.



## SELECTED NEMSIS PUBLICATIONS

Additional publications can be found at: <https://nemsis.org/using-ems-data/articles-and-publications/>

Mears, G., Dawson, D., and Ornato, J. Emergency Medical Services Information Systems and a Future EMS National Database. *Prehospital Emergency Care*, 2002 Jan-Mar; 6(1) pp.123-30.

Dawson DE. National Emergency Medical Services Information System (NEMSIS). *Prehosp Emerg Care*. 2006 Jul-Sep; 10(3) pp.314-6.

Kemp M. Mapping the future: with NEMSIS, the EMS of tomorrow will be shaped by the data of today. *EMS Mag*. 2009 Feb; 38(2) pp.48-50.

Moskatel L, Slusky D. Did UberX Reduce Ambulance Volume? *Health Economics*. 2019; 28pp.817–829.

Watanabe BL, Patterson GS, Kempema JM, Magallanes O, Brown LH. Is Use of Warning Lights and Sirens Associated with Increased Risk of Ambulance Crashes? A Contemporary Analysis Using National EMS Information System (NEMSIS) Data. *Ann Emerg Med*. 2019; 74 pp.101-109.

Klassen AB, Marshall M, Dai M, Mann NC, Sztajnkrycer MD. Emergency Medical Services Response to Mass Shooting and Active Shooter Incidents, United States, 2014–2015. *Prehospital Emergency Care*. 2019; 23(2) pp.159-166.

Friedman J, Hoof M, Smith A, Tatum D, Ibraheem K, Guidry C, Schroll R, Duchesne J, McGrew P. Pediatric Firearm Incidents: It is Time to Decrease On-Scene Mortality. *J Trauma Acute Care Surg*. 2019; 86(5) pp.791-796.

Wei R, Mann NC, Dai M, Hsia RY. Injury-based Geographic Access to Trauma Centers. *Academic Emergency Medicine*. 2019; 26 pp.192–204.

Byrne JP, Mann NC, Dai M, et al. Association Between Emergency Medical Service Response Time and Motor Vehicle Crash Mortality in the United States. *JAMA Surg*. 2019;154(4) pp.286–293.

Kahn PA, Dhruva SS, Rhee TG, and Ross JS. Use of Mechanical Cardiopulmonary Resuscitation Devices for Out-of-Hospital Cardiac Arrest, 2010-2016. *JAMA Network Open*. 2019; 2(10) e1913298.

Nwanne T, Jarvis J, Barton D, Donnelly JP, and Wang HE. Advanced airway management success rates in a national cohort of emergency medical services agencies, *Resuscitation*. 2019; 146, pp. 43-49.

Miller KEM, James HJ, Holmes GM, Van Houtven CH. The effect of rural hospital closures on emergency medical service response and transport times. *Health Serv Res.* 2020;55(2).

Cui ER, Beja-Glasser A, Fernandez AR, Grover JM, Mann NC, Patel MD. Emergency Medical Services Time Intervals for Acute Chest Pain in the United States, 2015–2016. *Prehospital Emerg Care.* 2020;24(4).

Lerner EB, Newgard CD, Mann NC. Effect of the Coronavirus Disease 2019 (COVID-19) Pandemic on the U.S. Emergency Medical Services System: A Preliminary Report. *Acad Emerg Med.* 2020;27(8).

Okubo M, Chan HK, Callaway CW, Mann NC, Wang HE. Characteristics of paediatric out-of-hospital cardiac arrest in the United States. *Resuscitation.* 2020;153.

Chan HK, Okubo M, Callaway CW, Mann NC, Wang HE. Characteristics of adult out-of-hospital cardiac arrest in the National Emergency Medical Services Information System. *J Am Coll Emerg Physicians Open.* 2020;1(4).

Friedman J, Beletsky L, Schriger DL. Overdose-Related Cardiac Arrests Observed by Emergency Medical Services During the US COVID-19 Epidemic. *JAMA Psychiatry.* Published online December 3, 2020.

Jadhav S, Gaddam S. Gender and location disparities in prehospital bystander AED usage. *Resuscitation.* 2021;158.

Gaddam S, Singh S. Socioeconomic disparities in prehospital cardiac arrest outcomes: An analysis of the NEMESIS database. *Am J Emerg Med.* 2020;38(10).

Hill T, Weber T, Roberts M, et al. Retrospective cross-sectional analysis of demographic disparities in outcomes of CPR performed by EMS providers in the United States. *JRSM Cardiovasc Dis.* 2021;10.

Abbas, Amena Y., Erika C. Odom, and Isaac Nwaise. 2022. “Association Between Dispatch Complaint and Critical Prehospital Time Intervals in Suspected Stroke 911 Activations in the National Emergency Medical Services Information System, 2012–2016.” *Journal of Stroke and Cerebrovascular Diseases* 31(3): 106228.

Aung, Sidney et al. 2021. “Emergency Activations for Chest Pain and Ventricular Arrhythmias Related to Regional Covid-19 Across the US.” *Circulation* 144(Suppl\_1).

Fernandez, Antonio R. et al. 2021. “Out-of-Hospital Ketamine: Indications for Use, Patient Outcomes, and Associated Mortality.” *Annals of Emergency Medicine* 78(1): 123–31.

Friedman, Joseph et al. 2021. “Racial/Ethnic, Social, and Geographic Trends in Overdose-Associated Cardiac Arrests Observed by US Emergency Medical Services During the COVID-19 Pandemic.” *JAMA Psychiatry* 78(8): 886.

Handberry, Maya et al. 2021. “Changes in Emergency Medical Services Before and During the COVID-19 Pandemic in the United States, January 2018–December 2020.” *Clinical Infectious Diseases* 73(Supplement\_1): S84–91.

Hibdon, Julie, Cody W. Telep, and Jessica Huff. 2021. “Going Beyond the Blue: The Utility of Emergency Medical Services Data in Understanding Violent Crime.” *Criminal Justice Review* 46(2): 190–211.

Lerner, E. Brooke et al. 2021. “A Novel Use of NEMESIS to Create a PECARN-Specific EMS Patient Registry.” *Prehospital Emergency Care*: 1–8.

Lindbeck, George et al. 2022. “Evidence-Based Guidelines for Prehospital Pain Management: Recommendations.” *Prehospital Emergency Care*: 1–10.

Ordoobadi, Alexander J. et al. 2021. “Disparity in Prehospital Scene Time for Geriatric Trauma Patients.” *The American Journal of Surgery*.

Peters, Gregory A., Alexander J. Ordoobadi, Ashish R. Panchal, and Rebecca E. Cash. 2022. “Differences in Out-of-Hospital Cardiac Arrest Management and Outcomes across Urban, Suburban, and Rural Settings.” *Prehospital Emergency Care*: 1–8.

Rivard, Madison K. et al. 2021. “Public Health Surveillance of Behavioral Health Emergencies through Emergency Medical Services Data.” *Prehospital Emergency Care*: 1–9.

Rock, Peter J., Dana Quesinberry, Michael D. Singleton, and Svetla Slavova. 2021. “Emergency Medical Services and Syndromic Surveillance: A Comparison with Traditional Surveillance and Effects on Timeliness.” *Public Health Reports* 136(1\_suppl): 72S-79S.

Rock, Peter J., Dana Quesinberry, Michael D. Singleton, and Svetla Slavova. 2021. “Emergency Medical Services and Syndromic Surveillance: A Comparison with Traditional Surveillance and Effects on Timeliness.” *Public Health Reports* 136(1\_suppl): 72S-79S.

Shekhar, Aditya C., Christopher Mercer, Robert Ball, and Ira Blumen. 2021. “Persistent Racial/Ethnic Disparities in Out-of-Hospital Cardiac Arrest.” *Annals of Emergency Medicine* 78(2): 314–16.

Ward, Caleb et al. 2021. “National Characteristics of Non-Transported Children by Emergency Medical Services in the United States.” *Prehospital Emergency Care*: 1–10.

Stratman, E. G., Boutilier, J. J., & Albert, L. A. (2022) “Patient Assessment and Response Dynamics in Emergency Medical Service Systems.” *IIE Annual Conference* <https://www.proquest.com/docview/2715838528>

Shekhar, A., Coutec, R., Maderd, T., Del Riose, M., Peeler, K., Mann, N. Clay, & Madhok, M. (2022) “Demographic disparities in tracheal intubation success rates during infant out-of-hospital cardiac arrest.” *Trends in Anaesthesia and Critical Care* DOI:/10.1016/j.tacc.2022.101210

Schultz, B., Burnett, G., Tyler, S., & Mandt, M. (2022) “Pediatric Interfacility Transport Modality and Outcomes.” *Air Medical Journal* DOI:[/10.1016/j.amj.2022.10.012](https://doi.org/10.1016/j.amj.2022.10.012)

Shekhar, A., Larkin, A., Fisher, B., & Mann, N. Clay (2022) “Aspirin use in ST-elevation myocardial infarction (STEMI) patients transported by emergency medical services (EMS).” *The American Journal of Emergency Medicine* DOI:[/10.1016/j.ajem.2022.11.030](https://doi.org/10.1016/j.ajem.2022.11.030)

Hartmann, K., Lubin, J., Boehmer, S., Amin, S., & Flamm, A. (2022) “Ground Versus Air: Which Mode of Emergency Medical Service Transportation Is More Likely to Crash?” *Science Direct* DOI: [10.1016/j.amj.2022.10.014](https://doi.org/10.1016/j.amj.2022.10.014)

Ramgopal, S., Sepanski, R., & Martin-Gill, C. (2022) “Empirically Derived Age-Based Vital Signs for Children in the Out-of-Hospital Setting.” *Annals of Emergency Medicine* DOI:[10.1016/j.annemergmed.2022.09.019](https://doi.org/10.1016/j.annemergmed.2022.09.019)

Shekhar, A., Peeler, K., Marron, J., Mann, N. Clay, & Madhok, M. (2022) “Neighborhood Socioeconomic Disparities in Infant Out-of-Hospital Cardiac Arrest.” *Circulation* [https://www.ahajournals.org/doi/abs/10.1161/circ.146.suppl\\_1.1560](https://www.ahajournals.org/doi/abs/10.1161/circ.146.suppl_1.1560)  
9



## APPENDIX A: PUBLIC USE VARIABLE DESCRIPTION LIST

This section includes the data table name, variable name, and variable description as defined in the v3.4.0 Public Use NEMESIS National EMS Database. Variable definitions and value codes can be found in the NEMESIS Data Dictionary (v3.4.0) <https://nemsis.org/technical-resources/version-3/version-3-data-dictionaries/>.

Table Name	Variable Name	Variable Description
EINJURY_01REF	DiagnosisCodeDescr	ICD 10 code description
EINJURY_01REF	eInjury_01	Cause of Injury
EPROCEDURES_03REF	ProcedureCodeDescr	ICD 10 code description
EPROCEDURES_03REF	eProcedures_03	Procedure
ESITUATION_09REF	DiagnosisCodeDescr	ICD 10 code description
ESITUATION_09REF	eSituation_09	Primary Symptom
ESITUATION_10REF	DiagnosisCodeDescr	ICD 10 code description
ESITUATION_10REF	eSituation_10	Other Associated Symptom
ESITUATION_11REF	DiagnosisCodeDescr	ICD 10 code description
ESITUATION_11REF	eSituation_11	Provider's Primary Impression
ESITUATION_12REF	DiagnosisCodeDescr	ICD 10 code description
ESITUATION_12REF	eSituation_12	Provider's Secondary Impression
FACTPCRADDITIONALRESPONSEMODE	PcrKey	Primary Key for relational table
FACTPCRADDITIONALRESPONSEMODE	eResponse_24	Additional Response Mode Descriptors
FACTPCRADDITIONALSYMPTOM	PcrKey	Primary Key for relational table
FACTPCRADDITIONALSYMPTOM	eSituation_10	Other Associated Symptoms
FACTPCRADDITIONALTRANSPORTMODE	PcrKey	Primary Key for relational table
FACTPCRADDITIONALTRANSPORTMODE	eDisposition_18	Additional Transport Mode Descriptors
FACTPCRALCOHOLDRUGUSEINDICATOR	PcrKey	Primary Key for relational table
FACTPCRALCOHOLDRUGUSEINDICATOR	eHistory_17	Alcohol/Drug Use Indicators
FACTPCRARRESTCPRPROVIDED	PcrKey	Primary Key for relational table
FACTPCRARRESTCPRPROVIDED	eArrest_09	Type of CPR Provided
FACTPCRARRESTRHYTHMDESTINATION	eArrest_17	Cardiac Rhythm on Arrival at Destination
FACTPCRARRESTROSC	PcrKey	Primary Key for relational table
FACTPCRARRESTROSC	eArrest_12	Any Return of SpontaneousCirculation
FACTPCRARRESTWITNESS	PcrKey	Primary Key for relational table
FACTPCRARRESTWITNESS	eArrest_04	Arrest Witnessed By
FACTPCRBARRIERCARE	PcrKey	Primary Key for relational table
FACTPCRBARRIERCARE	eHistory_01	Barriers to Patient Care
FACTPCRCAUSEOFINJURY	PcrKey	Primary Key for relational table
FACTPCRCAUSEOFINJURY	eInjury_01	Cause of Injury
FACTPCRDESTINATIONREASON	PcrKey	Primary Key for relational table
FACTPCRDESTINATIONREASON	eDisposition_20	Reason for Choosing Destination
FACTPCRDESTINATIONTEAM	PcrKey	Primary Key for relational table
FACTPCRDESTINATIONTEAM	eDisposition_24	Destination Team Pre-Arrival Alert or Activation
FACTPCRDESTINATIONTEAM	eDisposition_25	Date/Time Destination Pre-ArrivalAlert or Activation





**PUBLIC USE VARIABLE DESCRIPTION LIST – CONTINUED**

<b>Table Name</b>	<b>Variable Name</b>	<b>Variable Description</b>
FACTPCRDISPATCHDELAY	PcrKey	Primary Key for relational table
FACTPCRDISPATCHDELAY	eResponse_08	Type of Dispatch Delay
FACTPCRINJURYRISKFACTOR	PcrKey	Primary Key for relational table
FACTPCRINJURYRISKFACTOR	eInjury_04	Vehicular, Pedestrian, or Other Injury Risk Factor
FACTPCRMEDICATION	PcrKey	Primary Key for relational table
FACTPCRMEDICATION	PcrMedicationKey	Primary Key for Medication
FACTPCRMEDICATION	eMedications_01	Date/Time Medication Administered
FACTPCRMEDICATION	eMedications_02	Medication Administered Prior to this Unit's EMS Care
FACTPCRMEDICATION	eMedications_03	Medication Given
FACTPCRMEDICATION	eMedications_05	Medication Dosage
FACTPCRMEDICATION	eMedications_06	Medication Dosage Units
FACTPCRMEDICATION	eMedications_07	Response to Medication
FACTPCRMEDICATION	eMedications_10	Role/Type of Person Administering Medication
FACTPCRMEDICATION	eMedications_03	Medication recoded name
FACTPCRPRIMARYIMPRESSION	PcrKey	Primary Key for relational table
FACTPCRPRIMARYIMPRESSION	eSituation_11	Provider's Primary Impression
FACTPCRPRIMARYSYMPTOM	PcrKey	Primary Key for relational table
FACTPCRPRIMARYSYMPTOM	eSituation_09	Primary Symptom
FACTPCRPROCEDURE	PcrKey	Primary Key for relational table
FACTPCRPROCEDURE	PcrProcedureKey	Primary Key for Procedures
FACTPCRPROCEDURE	eProcedures_01	Date/Time Procedure Performed
FACTPCRPROCEDURE	eProcedures_02	Procedure Performed Prior to this Unit's EMS Care
FACTPCRPROCEDURE	eProcedures_03	Procedure
FACTPCRPROCEDURE	eProcedures_05	Number of Procedure Attempts
FACTPCRPROCEDURE	eProcedures_06	Procedure Successful
FACTPCRPROCEDURE	eProcedures_07	Procedure complication
FACTPCRPROCEDURE	eProcedures_08	Response to Procedure
FACTPCRPROCEDURE	eProcedures_10	Role/Type of Person Performing the Procedure
FACTPCRPROTOCOL	PcrKey	Primary Key for relational table
FACTPCRPROTOCOL	eProtocol_01	Protocols Used
FACTPCRPROTOCOL	eProtocol_02	Protocol Age Category
FACTPCRRESPONSEDELAY	PcrKey	Primary Key for relational table
FACTPCRRESPONSEDELAY	eResponse_09	Type of Response Delay
FACTPCRSCENEDELAY	PcrKey	Primary Key for relational table
FACTPCRSCENEDELAY	eResponse_10	Type of Scene Delay
FACTPCRSECONDARYIMPRESSION	PcrKey	Primary Key for relational table
FACTPCRSECONDARYIMPRESSION	eSituation_12	Provider's Secondary Impressions
FACTPCRTRANSPORTDELAY	PcrKey	Primary Key for relational table
FACTPCRTRANSPORTDELAY	eResponse_11	Type of Transport Delay
FACTPCRTRAUMACRITERIA	PcrKey	Primary Key for relational table
FACTPCRTRAUMACRITERIA	eInjury_03	Trauma Center Criteria
FACTPCRTURNAROUNDDELAY	PcrKey	Primary Key for relational table



**PUBLIC USE VARIABLE DESCRIPTION LIST - CONTINUED**

<b>Table Name</b>	<b>Variable Name</b>	<b>Variable Description</b>
FACTPCRTURNAROUNDDELAY	eResponse_12	Type of Turn-Around Delay
FACTPCRVITAL	PerKey	Primary Key for relational table
FACTPCRVITAL	PerVitalKey	Primary Key for Vitals
FACTPCRVITAL	eVitals_01	Date/Time Vital Signs Taken
FACTPCRVITAL	eVitals_02	Obtained Prior to this Unit's EMSCare
FACTPCRVITAL	eVitals_04	ECG Type
FACTPCRVITAL	eVitals_06	SBP (Systolic Blood Pressure)
FACTPCRVITAL	eVitals_08	Method of Blood PressureMeasurement
FACTPCRVITAL	eVitals_10	Heart Rate
FACTPCRVITAL	eVitals_12	Pulse Oximetry
FACTPCRVITAL	eVitals_14	Respiratory Rate
FACTPCRVITAL	eVitals_16	End Tidal Carbon Dioxide (ETCO2)
FACTPCRVITAL	eVitals_18	Blood Glucose Level
FACTPCRVITAL	eVitals_19	Glasgow Coma Score-Eye
FACTPCRVITAL	eVitals_20	Glasgow Coma Score-Verbal
FACTPCRVITAL	eVitals_21	Glasgow Coma Score-Motor
FACTPCRVITAL	eVitals_26	Level of Responsiveness (AVPU)
FACTPCRVITAL	eVitals_27	Pain Scale Score
FACTPCRVITAL	eVitals_29	Stroke Scale Score
FACTPCRVITAL	eVitals_30	Stroke Scale Type
FACTPCRVITAL	eVitals_31	Reperfusion Checklist
FACTPCRWORKRELATEDEXPOSURE	PerKey	Primary Key for relational table
FACTPCRWORKRELATEDEXPOSURE	eOther_05	Suspect EMS Work RelatedExposure, Injury, or Death
PUB_PCREVENTS	PerKey	Primary Key for relational table
PUB_PCREVENTS	eArrest_01	Cardiac Arrest
PUB_PCREVENTS	eArrest_02	Cardiac Arrest Etiology
PUB_PCREVENTS	eArrest_05	CPR Care Provided Prior to EMSArrival
PUB_PCREVENTS	eArrest_07	AED Use Prior to EMS Arrival
PUB_PCREVENTS	eArrest_11	First Monitored Arrest Rhythm of thePatient
PUB_PCREVENTS	eArrest_16	Reason CPR/ResuscitationDiscontinued
PUB_PCREVENTS	eArrest_16	Reason CPR/Resuscitation DiscontinuedGo
PUB_PCREVENTS	eArrest_14	Date/Time of Cardiac Arrest
PUB_PCREVENTS	eArrest_18	End of EMS Cardiac Arrest Event
PUB_PCREVENTS	eDispatch_01	Complaint Reported by Dispatch
PUB_PCREVENTS	eDispatch_02	EMD Performed
PUB_PCREVENTS	eDisposition_12	Incident/Patient Disposition
PUB_PCREVENTS	eDisposition_16	EMS Transport Method
PUB_PCREVENTS	eDisposition_17	Transport Mode from Scene
PUB_PCREVENTS	eDisposition_19	Final Patient Acuity
PUB_PCREVENTS	eDisposition_21	Type of Destination
PUB_PCREVENTS	eDisposition_22	Hospital In-Patient Destination
PUB_PCREVENTS	eDisposition_23	Hospital Capability
PUB_PCREVENTS	eOutcome_01	Emergency Department Disposition
PUB_PCREVENTS	eOutcome_02	Hospital Disposition
PUB_PCREVENTS	ePatient_13	Gender
PUB_PCREVENTS	ePatient_15	Age



**PUBLIC USE VARIABLE DESCRIPTION LIST - CONTINUED**

<b>Table Name</b>	<b>Variable Name</b>	<b>Variable Description</b>
PUB_PCREVENTS	ePatient_16	Age Units
PUB_PCREVENTS	ePayment_01	Primary Method of Payment
PUB_PCREVENTS	ePayment_50	CMS Service Level
PUB_PCREVENTS	eResponse_05	Type of Service Requested
PUB_PCREVENTS	eResponse_07	Primary Role of the Unit
PUB_PCREVENTS	eScene_09	Incident Location Type
PUB_PCREVENTS	eSituation_01	Date/Time of Symptom Onset
PUB_PCREVENTS	eSituation_02	Possible Injury
PUB_PCREVENTS	eSituation_07	Chief Complaint Anatomic Location
PUB_PCREVENTS	eSituation_08	Chief Complaint Organ System
PUB_PCREVENTS	eSituation_13	Initial Patient Acuity
PUB_PCREVENTS	eTimes_01	PSAP Call Date/Time
PUB_PCREVENTS	eTimes_03	Unit Notified by Dispatch Date/Time
PUB_PCREVENTS	eTimes_05	Unit En Route Date/Time
PUB_PCREVENTS	eTimes_06	Unit Arrived on Scene Date/Time
PUB_PCREVENTS	eTimes_07	Arrived at Patient Date/Time
PUB_PCREVENTS	eTimes_09	Unit Left Scene Date/Time
PUB_PCREVENTS	eTimes_11	Patient Arrived at DestinationDate/Time
PUB_PCREVENTS	eTimes_12	Destination Patient Transfer of CareDate/Time
PUB_PCREVENTS	eTimes_13	Unit Back In-Service Date/Time
PCRMEDCOMPGROUP	MedicationKey	Foreign key to match to Medicationtable
PCRMEDCOMPGROUP	PcrMedCompGroupKey	Primary Key for MedicationComplication
PCRMEDCOMPGROUP	eMedications_08	Medication Complication
PCRPATIENTRACEGROUP	PcrPatientRaceGroupKey	Primary Key for Patient Race
PCRPATIENTRACEGROUP	ePatient_14	Race
PCRVITALGLASGOWQUALIFIERGROUP	VitalKey	Foreign key For FactPcrVital table
PCRVITALGLASGOWQUALIFIERGROUP	eVitals_22	Glasgow Coma Score-Qualifier
COMPUTEDELEMENTS	PcrKey	Primary Key for relational table
COMPUTEDELEMENTS	EMSDispatchCenterTimeSec	Difference in seconds between eTimes.03 and eTimes.01.
COMPUTEDELEMENTS	EMSSceneResponseTimeMin	Difference in minutes between eTimes.06 and eTimes.05
COMPUTEDELEMENTS	EMSSceneTimeMin	Difference in minutes between eTimes.06 and eTimes.09
COMPUTEDELEMENTS	EMSSceneToPatientTimeMin	Difference in minutes between eTimes.06 and eTimes.07
COMPUTEDELEMENTS	EMSSystemResponseTimeMin	Difference in minutes between eTimes.03 and eTimes.06
COMPUTEDELEMENTS	EMSTotalCallTimeMin	Difference in minutes between eTimes.13 and eTimes.03
COMPUTEDELEMENTS	EMSTransportTimeMin	Difference in minutes between eTimes.09 and eTimes.11
COMPUTEDELEMENTS	EMSchuteTimeMin	Difference in minutes between eTimes.03 and eTimes.05



**PUBLIC USE VARIABLE DESCRIPTION LIST – CONTINUED**

Table Name	Variable Name	Variable Description
COMPUTEDELEMENTS	USCensusDivision	US Census Bureau Divisions
COMPUTEDELEMENTS	USCensusRegion	US Census Bureau Regions
COMPUTEDELEMENTS	Urbanicity	Based on 2013 USDA Urban Influence Codes
COMPUTEDELEMENTS	Ageinyear	Age in years
COMPUTEDELEMENTS	NasemsoRegion	NASEMSO Regions

**APPENDIX B: LIMITED USE VARIABLE DESCRIPTION LIST**

This section includes the variable name and variable description for elements protected from public use in their native form. These variables can be made available as “de-identified data elements” (specified by the HIPAA Privacy Rule) by statistical manipulation to include masked anonymous value codes. Masked value codes can be grouped to address a specific hypothesis and made available to researchers through use of the master Primary Key (i.e., PcrKey) to link back to individual cases. Variable definitions and value codes can be found in the NEMESIS Data Dictionary (v.3.4.0) <https://nemsis.org/technical-resources/version-3/version-3-data-dictionaries/>.

Variable Name	Variable Description
eResponse_01	EMS Agency Number
eResponse_04	EMS Response Number
eResponse_14	EMS Unit Call Sign
ePatient_07	Patient's Home County
ePatient_08	Patient's Home State
ePatient_09	Patient's Home ZIP Code
eDisposition_05	Destination State
eDisposition_06	Destination County
eDisposition_07	Destination ZIP Code
eScene_18	Incident State
eScene_19	Incident ZIP Code
eScene_21	Incident County



## APPENDIX C: OVERVIEW OF NATIONAL NEMESIS BUSINESS RULES BY NEMESIS ELEMENT

Information regarding individual data element business rules can be found on the NEMESIS website Schematron documentation library.

[https://nemisis.org/technical-resources/version-3/version-3-schematron/](https://nemis.org/technical-resources/version-3/version-3-schematron/)

Additional data reduction methods applied to the data warehouse and public extracts:

For all 1-to-Many and Many-to-Many elements:

- 1) If a patient record has both null values and non-null values, exclude 1: Many records with null values.
- 2) If a patient record has multiple null values listed but does not have any non-null values, keep only the first null value listed and exclude all other 1: Many records with null values.
- 3) If a patient record has multiple non-null values listed and the same exact 1: Many values is listed multiple times, keep that specific value only for the 1<sup>st</sup> five times it is listed; exclude all other repetitions of the value.

### OTHER VALUE LIMITS:

**Usually based upon the number of possible values, excluding null and NOT values, which are contained within an element.**

eHistory.17	shall have no more than <b>six</b> values per event.
eArrest.14	time before 2023.01.01 set to null, keep 2024.01.01
eArrest.03	shall have no more than <b>three</b> values per event.
eArrest.04	shall have no more than <b>three</b> values per event.
eDisposition.20	shall have no more than <b>six</b> values per event.
eDisposition.25	time before 2023.01.01 set to null, keep 2024.01.01
eDisposition.07	all 00000 set to 'not recorded'
eSituation.11	shall have no more than <b>14</b> values per event.
eSituation.12	shall have no more than <b>14</b> values per event
eInjury.04	shall have no more than <b>six</b> values per event.
eMedication.03	shall have no more than <b>29</b> values per event.



**OTHER VALUE LIMITS – CONTINUED**

eMedication.01	time before 2023.01.01 set to null, keep 2024.01.01
eProcedure.03	shall have no more than <b>29</b> values per event.
eProcedure.01	time before 2023.01.01 set to null, keep 2024.01.01
eResponse.24	shall have no more than <b>seven</b> values per event.
eSituation.01	removed time after 2023.12.31
eScene.19	set all 00000 to not recorded
eSituation.09	shall have no more than <b>20</b> values per event.
eSituation.10	shall have no more than <b>20</b> values per event.
eTimes01	eTimes.13 time before 2023.01.01 set to null, keep 2024.01.01
eDisposition.18	shall have no more than <b>five</b> values per event.
eInjury.03	shall have no more than <b>seven</b> values per event.
eResponse.12	shall have no more than <b>nine</b> values per event.
eOther.05	shall have no more than <b>one</b> value per event.
ePatient.14	shall have no more than <b>six</b> values per event.
eProcedure.07	shall have no more than <b>nine</b> values per event.
Vital Signs	shall have no more than <b>30</b> values per event.
eVitals.05	shall have no more than <b>three</b> values per event.
eArrest.17	shall have no more than <b>seven</b> values per event
ePatient.09	set all 0000 to not recorded
eResponse.10	shall have no more than <b>nine</b> values per event



**OTHER VALUE LIMITS - CONTINUED**

**Derived elapsed times are excluded from the dataset if outside the range listed below.**

EmsDispatchCenterTimeSec	0-3599 in seconds
EmsChuteTimeMin	0-59 in minutes
EmsSystemResponseTimeMin	0-1439 in minutes
EmsSceneResponseTimeMin	0-1439 in minutes
EmsSceneTimeMin	0-1439 in minutes
EmsSceneToPatientTimeMin	0-719 in minutes
EmsTransportTimeMin	0-1439 in minutes
EmsTotalCallTimeMin	0-1439 in minutes



## APPENDIX D: 2023 CONTRIBUTING STATES & TERRITORIES

Alabama	Indiana	New Hampshire	Texas
Alaska	Iowa	New Jersey	Utah
Arizona	Kansas	New Mexico	Vermont
Arkansas	Kentucky	New York	Virginia
California	Louisiana	North Carolina	Virgin Islands
Colorado	Maine	North Dakota	Washington
Connecticut	Maryland	Northern Mariana Islands	West Virginia
Delaware	Massachusetts	Ohio	Wisconsin
District of Columbia	Michigan	Oklahoma	Wyoming
Florida	Minnesota	Oregon	
Georgia	Mississippi	Pennsylvania	
Guam	Missouri	Rhode Island	
Hawaii	Montana	South Carolina	
Idaho	Nebraska	South Dakota	
Illinois	Nevada	Tennessee	



## APPENDIX E: EXTENDED DEFINITION DOCUMENT VERSION 3.4.0

([https://nemsis.org/wp-content/uploads/2018/09/Extended-Data-Definitions\\_v3\\_Final.pdf](https://nemsis.org/wp-content/uploads/2018/09/Extended-Data-Definitions_v3_Final.pdf))

These extended definitions explain field values of a specific number of v3 variables can be found at the link above.



# EXTENDED DATA DEFINITIONS

May 2016

NEMESIS Version 3.4.0

This document represents an effort to continue the process of defining field values, which was started with NEMESIS v2.2.1. The NAEMSO Data Managers Council (DMC), with help from the NEMESIS Technical Assistance Center (TAC), built off the extended data definitions contained in the 2008 Extended Definition Document, NEMESIS 2.2, to create value definitions contained in the NEMESIS v3.4.0 dataset.

The DMC and NEMESIS TAC are confident that this document will continue to promote the development, standardization, and improvement of state and national EMS data systems.



## APPENDIX F: COMPUTED VARIABLE DESCRIPTION LIST\*

Variable Name	Short Variable Definition
AgeinYears	Age in Years, computed from Age and Age Units
EMSDispatchCenterTimeSec	Time difference in minutes between eTimes.03 and eTimes.01. Note: if > 3,599 seconds, set to null.
EMSchuteTimeMin	Time difference in minutes between eTimes.03 and eTimes.05. Note: if > 59 minutes, set to null.
EMSSystemResponseTimeMin	Time difference in minutes between eTimes.03 and eTimes.06. Note: if > 1,439 minutes, set to null.
EMSSceneResponseTimeMin	Time difference in minutes between eTimes.06 and eTimes.05. Note: if > 1,439 minutes, set to null.
EMSSceneTimeMin	Time difference in minutes between eTimes.06 and eTimes.09. Note: if > 1,439 minutes, set to null.
EMSSceneToPatientTimeMin	Time difference in minutes between eTimes.06 and eTimes.07. Note: if > 719 minutes, set to null.
EMSTransportTimeMin	Time difference in minutes between eTimes.09 and eTimes.11. Note: if > 1,439 minutes, set to null.
EMSTotalCallTimeMin	Time difference in minutes between eTimes.13 and eTimes.03. Note: if > 1,439 minutes, set to null.
USCensusRegion	Stratifies events into the five major U.S. Census regions
USCensusDivision	Stratifies events into the ten U.S. Census divisions
NasemsoRegion	Stratifies events into the four NASEMSO regions
Urbanicity	Stratifies events by four Urbanicity Codes, based upon USDA Urban Influence Codes

\* For all elapsed times, negative elapsed time values are set to null.



## APPENDIX G: NEMESIS 2023 PUBLIC RELEASE RESEARCH DATASET REFERENCE TABLES

These reference tables contain only code descriptions for ICD-10 codes for user references. These tables should not be linked to a particular PCRkey. They are used to translate ICD-10-CM numerical values to text values.

**Table Name:** EINJURY\_01REF

**Elements:**

Original Variable	Description
DiagnosisCodeDescr	
eInjury_01	Cause of the injury

**Table Name:** EPROCEDURES\_03REF

**Elements:**

Original Variable	Description
ProcedureCodeDescr	
eProcedures_03	Procedure performed on the patient

**Table Name:** ESITUATION\_09REF

**Elements:**

Original Variable	Description
DiagnosisCodeDescr	
eSituation_09	Primary symptom

**Table Name:** ESITUATION\_10REF

**Elements:**

Original Variable	Description
DiagnosisCodeDescr	
eSituation_10	Other associated symptoms

**Table Name:** ESITUATION\_11REF

**Elements:**

Original Variable	Description
DiagnosisCodeDescr	
eSituation_11	Provider's primary impression

**Table Name:** ESITUATION\_12REF

**Elements:**

Original Variable	Description
DiagnosisCodeDescr	
eSituation_12	Provider's secondary impression



## APPENDIX H NEMESIS 2023 PUBLIC RELEASE RESEARCH DATASET

The PCRkey is the unique ID for each record in each table and the primary key to link the tables. There are foreign keys that are used to match multiple instances (for multiple-entry elements) to the same EMS event. PCRMEDCOMPGROUP, PCRPROCCOMPGROUP, and Vitals tables contain foreign keys that match multiple instances to a primary key in the FACTPCRMEDICATION, FACTPCRPROCEDURE, and FACTPCRVITAL tables. PcrMedCompGroupKey, PcrPatientRaceGroupKey, and PcrProcCompGroupKey are Group Keys, which are used to link together multiple vital signs, medications, etc. *DestinationCountyNotValueKey and DestinationZipcodeNotValueKey* are NotValue keys for counties and zip codes.

**Table Name:** COMPUTEDELEMENTS

**Elements:**

Original Variable	Description
PcrKey	primary key, unique for each event
USCensusRegion	US Census Region
USCensusDivision	US Census Division
NasemsoRegion	NASEMSO Region
Urbanicity	Urbanicity
ageinyear	Age in Years, computed from Age and Age Units
EMSDispatchCenterTimeSec	Difference in seconds between Unit Notified by Dispatch Date/Time (eTimes.03) and PSAP Call Date/Time (eTimes.01).
EMSchuteTimeMin	Difference in minutes between Unit Notified by Dispatch Date/Time (eTimes.03) and Unit En Route Date/Time (eTimes.05).
EMSSystemResponseTimeMin	Difference in minutes between Unit Notified by Dispatch Date/Time (eTimes.03) and Unit Arrived on Scene Date/Time (eTimes.06).
EMSSceneResponseTimeMin	Difference in minutes between Unit Arrived on Scene Date/Time (eTimes.06) and Unit En Route Date/Time (eTimes.05).
EMSSceneTimeMin	Difference in minutes between Unit Arrived on Scene Date/Time (eTimes.06) and Unit Left Scene Date/Time (eTimes.09).
EMSSceneToPatientTimeMin	Difference in minutes between Unit Arrived on Scene Date/Time (eTimes.06) and Arrived at Patient Date/Time (eTimes.07).
EMSTransportTimeMin	Difference in minutes between Unit Left Scene Date/Time (eTimes.09) and Patient Arrived at Destination Date/Time (eTimes.11).
EMSTotalCallTimeMin	Difference in minutes between Unit Back In-Service Date/Time (eTimes.13) and Unit Notified by Dispatch Date/Time (eTimes.03).



## NEMESIS 2023 Public Release Research Dataset

**Table Name:** FACTPCRADDITIONALRESPONSEMODE

**Elements:**

Original Variable	Description
PcrKey	primary key, unique for each event/delay
eResponse_24	Additional response mode descriptors

**Table Name:** FACTPCRADDITIONALSYPMTOM

**Elements:**

Original Variable	Description
PcrKey	primary key, unique for each event/delay
eSituation_10	Other associated symptoms

**Table Name:** FACTPCRADDITIONALTRANSPORTMODE

**Elements:**

Original Variable	Description
PcrKey	primary key, unique for each event/delay
eDisposition_18	Additional transport mode descriptors

**Table Name:** FACTPCRALCOHOLDRUGUSEINDICATOR

**Elements:**

Original Variable	Description
PcrKey	primary key, unique for each event/delay
eHistory_17	Alcohol/drug use indicators

**Table Name:** FACTPCRARRESTCPRPROVIDED

**Elements:**

Original Variable	Description
PcrKey	primary key, unique for each event/delay
eArrest_09	Type of CPR provided

**Table Name:** FACTPCRARRESTRESUSCITATION

**Elements:**

Original Variable	Description
PcrKey	primary key, unique for each event/delay
eArrest_03	Resuscitation attempted by EMS

**Table Name:** FACTPCRARRESTRHYTHMDESTINATION

**Elements:**

Original Variable	Description
PcrKey	primary key, unique for each event/delay
eArrest_17	Cardiac rhythm on arrival at destination



## NEMESIS 2023 Public Release Research Dataset

**Table Name:** FACTPCRARRESTROSC

**Elements:**

Original Variable	Description
PcrKey	primary key, unique for each event/delay
eArrest_12	Any return of spontaneous circulation

**Table Name:** FACTPCRARRESTWITNESS

**Elements:**

Original Variable	Description
PcrKey	primary key, unique for each event/delay
eArrest_04	Arrest witnessed by

**Table Name:** FACTPCRBARRIERSTOCARE

**Elements:**

Original Variable	Description
PcrKey	primary key, unique for each event/delay
eHistory_01	Barriers to patient care

**Table Name:** FACTPCRCAUSEOFINJURY

**Elements:**

Original Variable	Description
PcrKey	primary key, unique for each event/delay
eInjury_01	Cause of injury

**Table Name:** FACTPCRDESTINATIONREASON

**Elements:**

Original Variable	Description
PcrKey	primary key, unique for each event/delay
eDisposition_20	Reason for choosing destination

**Table Name:** FACTPCRDESTINATIONTEAM

**Elements:**

Original Variable	Description
PcrKey	primary key, unique for each event/delay
eDisposition_24	Destination team pre-arrival alert or activation
eDisposition_25	Date/Time of destination pre-arrival alert or activation

**Table Name:** FACTPCRDISPATCHDELAY

**Elements:**

Original Variable	Description
PcrKey	primary key, unique for each event/delay
eResponse_08	Type of dispatch delay

**Table Name:** FACTPCRINJURYRISKFACTOR

**Elements:**

Original Variable	Description
PcrKey	primary key, unique for each event/delay
eInjury_04	Vehicular, pedestrian, or other injury risk factor



## NEMESIS 2023 Public Release Research Dataset

**Table Name:** FACTPCRMEDICATION

**Elements:**

Original Variable	Description
PcrKey	primary key, unique for each event/delay
PcrMedicationKey	Foreign key
eMedications_01	Date/Time medication administered
eMedications_02	Medication administered prior to this unit's EMS care
eMedications_03	Medication given
eMedications_05	Medication dosage
eMedications_06	Medication dosage units
eMedications_07	Response to medication
eMedications_10	Role/Type of person administering medication
eMedications_03Descr	

**Table Name:** FACTPCRPRIMARYIMPRESSION

**Elements:**

Original Variable	Description
PcrKey	primary key, unique for each event/delay
eSituation_11	Provider's primary impression

**Table Name:** FACTPCRPRIMARYSYMPTOM

**Elements:**

Original Variable	Description
PcrKey	primary key, unique for each event/delay
eSituation_09	Primary symptom

**Table Name:** FACTPCRPROCEDURE

**Elements:**

Original Variable	Description
PcrKey	primary key, unique for each event/delay
PcrProcedureKey	Foreign key
eProcedures_01	Date/Time procedure performed
eProcedures_02	Procedure performed prior to this unit's EMS care
eProcedures_03	Procedure
eProcedures_05	Number of procedure attempts
eProcedures_06	Procedure successful
eProcedures_07	Procedure complication
eProcedures_08	Response to procedure
eProcedures_10	Role/Type of person performing the procedure

**Table Name:** FACTPCRPROTOCOL

**Elements:**

Original Variable	Description
PcrKey	primary key, unique for each event/delay
eProtocol_01	Protocols used
eProtocol_02	Protocol age category



## NEMESIS 2023 Public Release Research Dataset

**Table Name:** FACTPCRRESPONSEDELAY

**Elements:**

Original Variable	Description
PcrKey	primary key, unique for each event/delay
eResponse_09	Type of response delay

**Table Name:** FACTPCRSCENEDELAY

**Elements:**

Original Variable	Description
PcrKey	primary key, unique for each event/delay
eResponse_10	Type of scene delay

**Table Name:** FACTPCRSECONDARYIMPRESSION

**Elements:**

Original Variable	Description
PcrKey	primary key, unique for each event/delay
eSituation_12	Provider's secondary impressions

**Table Name:** FACTPCRTRANSPORTDELAY

**Elements:**

Original Variable	Description
PcrKey	primary key, unique for each event/delay
eResponse_11	Type of transport delay

**Table Name:** FACTPCRTRAUMACRITERIA

**Elements:**

Original Variable	Description
PcrKey	primary key, unique for each event/delay
eInjury_03	Trauma center criteria

**Table Name:** FACTPCRTURNAROUNDDELAY

**Elements:**

Original Variable	Description
PcrKey	primary key, unique for each event/delay
eResponse_12	Type of turn-around delay





## NEMESIS 2023 Public Release Research Dataset

**Table Name:** FACTPCRVRTAL

**Elements:**

Original Variable	Description
PcrKey	primary key, unique for each event/delay
PcrVitalKey	foreign key
eVitals_01	Date/Time vital signs taken
eVitals_02	Obtained prior to this unit's EMS care
eVitals_04	ECG Type
eVitals_06	SBP (Systolic Blood Pressure)
eVitals_08	Method of blood pressure measurement
eVitals_10	Heart rate
eVitals_12	Pulse oximetry
eVitals_14	Respiratory rate
eVitals_16	End tidal carbon dioxide (ETCO2)
eVitals_18	Blood glucose level
eVitals_19	Glasgow Coma Score – Eye
eVitals_20	Glasgow Coma Score – Verbal
eVitals_21	Glasgow Coma Score – Motor
eVitals_26	Level of responsiveness (AVPU)
eVitals_27	Pain scale score
eVitals_29	Stroke scale score
eVitals_30	Stroke scale type
eVitals_31	Reperfusion checklist

**Table Name:** FACTPCRWORKRELATEDDEXPOSURE

**Elements:**

Original Variable	Description
PcrKey	primary key, unique for each event/delay
eOther_05	Suspected EMS work related exposure, injury, or death

**Table Name:** PCRMEDCOMPGROUP

**Elements:**

Original Variable	Description
MedicationKey	foreign key
PcrMedCompGroupKey	group key
eMedications_08	Medication complication

**Table Name:** PCRPATIENTRACEGROUP

**Elements:**

Original Variable	Description
PcrKey	primary key, unique for each event/delay
PcrPatientRaceGroupKey	group key
ePatient_14	Race



## NEMESIS 2023 Public Release Research Dataset

**Table Name:** PCRPROCCOMPGROUP

**Elements:**

Original Variable	Description
PcrProcCompGroupKey	group key
ProcedureKey	foreign key
eProcedures_07	Procedure complication

**Table Name:** PCRVITALECGGROUP

**Elements:**

Original Variable	Description
PcrVitalECGGroupKey	group key
VitalKey	foreign key
eVitals_03	Cardiac rhythm / Electrocardiography (ECG)

**Table Name:** PCRVITALECGINTERPRETATIONGROUP

**Elements:**

Original Variable	Description
PcrVitalECGInterpretationGroupKe	group key
VitalKey	foreign key
eVitals_05	Method of ECG Interpretation

**Table Name:** PCRVITALGLASGOWQUALIFIERGROUP

**Elements:**

Original Variable	Description
PcrVitalECGGroupKey	group key
VitalKey	foreign key
eVitals_22	Glasgow Coma Score – Qualifier



## NEMESIS 2023 Public Release Research Dataset

**Table Name:** PUB\_PCREVENTS

**Elements:**

Original Variable	Description
PcrKey	primary key, unique for each event/delay
eArrest_01	Cardiac arrest
eArrest_02	Cardiac arrest etiology
eArrest_05	CPR care provided prior to EMS arrival
eArrest_07	AED use prior to EMS arrival
eArrest_11	First monitored arrest rhythm of the patient
eArrest_14	Date/Time of cardiac arrest
eArrest_16	Reason CPR/resuscitation discontinued
eArrest_18	End of EMS cardiac arrest event
eDispatch_01	Complaint reported by dispatch
eDispatch_02	EMD performed
eDisposition_12	Incident/patient disposition
eDisposition_16	EMS transport method
eDisposition_17	Transport mode from scene
eDisposition_19	Final patient acuity
eDisposition_21	Type of destination
eDisposition_22	Hospital in-patient destination
eDisposition_23	Hospital capability
eOutcome_01	Emergency department disposition
eOutcome_02	Hospital disposition
ePatient_13	Gender
ePatient_15	Age
ePatient_16	Age units
ePayment_01	Primary method of payment
ePayment_50	CMS service level
eResponse_05	Type of service requested
eResponse_07	Primary role of the unit
eResponse_15	Level of care of this unit
eResponse_23	Response mode to scene
eScene_01	First EMS unit on scene
eScene_06	Number of patients at scene
eScene_07	Mass casualty incident
eScene_08	Triage classification for MCI patient
eScene_09	Incident location type
eSituation_01	Date/Time of symptom onset
eSituation_02	Possibly injury
eSituation_07	Chief complaint anatomic location
eSituation_08	Chief complaint organ system
eSituation_13	Initial patient acuity



## NEMESIS 2023 Public Release Research Dataset

**Table Name:** PUB\_PCREVENTS

**Elements:**

<b>Original Variable</b>	<b>Description</b>
eTimes_01	PSAP call date/time
eTimes_03	Unit notified by dispatch date/time
eTimes_05	Unit En Route date/time
eTimes_06	Unit arrived on scene date/time
eTimes_07	Arrived at patient date/time
eTimes_09	Unit left scene date/time
eTimes_11	Patient arrived at destination date/time
eTimes_12	Destination patient transfer of care date/time
eTimes_13	Unit back In-Service date/time