

# EMS by the Numbers

Impact of COVID-19  
October 31, 2023

N. Clay Mann PhD, MS, MBA  
NEMSIS Technical Assistance Center



This document is provided by NHTSA in an effort to help State EMS Officials track particular EMS activations occurring during the COVID-19 pandemic. This document will be updated periodically to provide current information regarding temporal variations in the type and characteristics of EMS activations occurring in the U.S. during the COVID-19 outbreak.

## Identification of ILI

- EMS Primary and Secondary Impression
- B97 codes: *SARS and other coronavirus*
- J09 codes: *Influenza*
- J15 codes: *Pneumonia*
- Patient Primary and Associated Symptoms
- R05 codes: *Cough*
- R06 codes: *Shortness of Breath*
- R50 codes: *Fever*
- J02 codes: *Pharyngitis*

The definition of Influenza-Like Illness (ILI) is based on the record inclusion criteria provided in the User Guide for the National NEMSIS ILI Surveillance Dashboard. The ILI Surveillance Dashboard User Guide can be found at:  
<https://wiki.utahdcc.org/confluence/x/BAKXAg>.

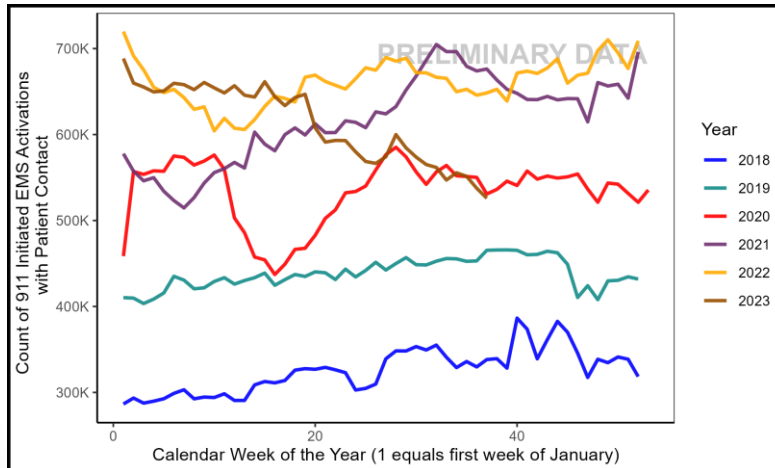
Provided in this slide are examples of the two types of ICD-10-CM codes included in the ILI criteria.

## Research Sample

- Time Period 1 (1<sup>st</sup> week to the 52<sup>nd</sup> week of 2018): 16,919,498
- Time Period 2 (1<sup>st</sup> week to the 52<sup>nd</sup> week of 2019): 22,800,494
- Time Period 3 (1<sup>st</sup> week to the 53<sup>rd</sup> week of 2020): 28,291,393
- Time Period 4 (1<sup>st</sup> week to the 52<sup>nd</sup> week of 2021): 32,111,934
- Time Period 5 (1<sup>st</sup> week to the 52<sup>nd</sup> week of 2022): 34,382,545
- Time Period 6 (1<sup>st</sup> week to the 52<sup>nd</sup> week of 2023): 22,689,239

Four date/time samples of EMS activations are included in this assessment of the COVID-19 pandemic. Three date/time periods (from the 1st week [beginning of January] to the 52nd week [end of December] of the year) are included to provide reference comparison to the fourth time period of interest (the 1st week through the 52nd week of 2021). The total sample includes 157,195,103 9-1-1 initiated EMS activations resulting in patient contact.

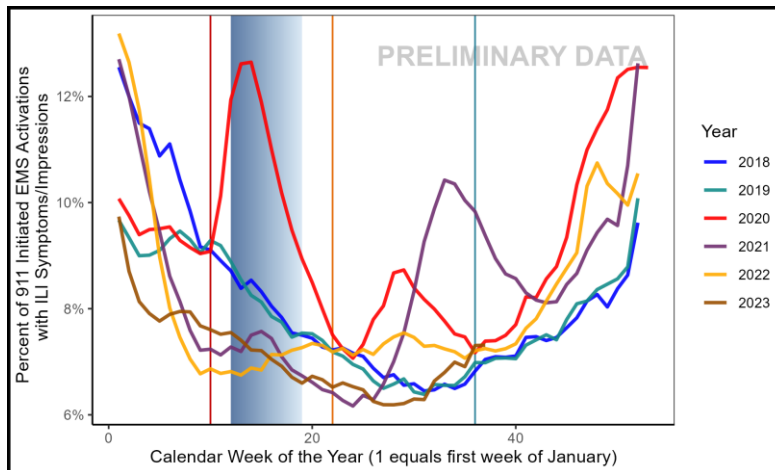
## Count of EMS Activations



The number of States submitting to the National EMS Repository increased over the study period (2017 – 32 States, 2018 – 40 States, 2019 – 44 States, 2020 – 51 States, 2021 to 2022 – 53 States and Territories). The District of Columbia submitted PCRs in each time period. States enrolling in the National EMS Repository commonly begin submitting PCRs at the beginning of the calendar year. No state has stopped submitting PCRs once enrolled.

The number of EMS activations decreased by approximately 34% between Week 10 (March 2nd to March 8th) and Week 17 (April 20th through April 26th 2020). The number of EMS activations began a second downward trend in Week 28.

## Rate of ILI Activations



Using the count of 9-1-1 initiated EMS activations with patient contact as the denominator, the rate of ILI activations is presented. This rate will increase with the introduction of the change to the ILI inclusion criteria discussed earlier. The rate of ILI-related EMS activations demonstrates the expected increase during the traditional "flu season", but higher than expected rates beginning in Week 10 and beginning to drop-off dramatically in Week 14. To provide some context to the timing of these rate fluctuations, "headline events" are listed for Week 10 and Week 12 of 2020.

### **2020:**

#### **Week 9-10:**

Feb. 26: CDC reports community spread; Vice President Pence to lead task force

#### **March 3: U.S. surpasses 100 cases**

#### **Week 12:**

March 13: President Trump declares national public health emergency

March 16: 15 days to slow the spread

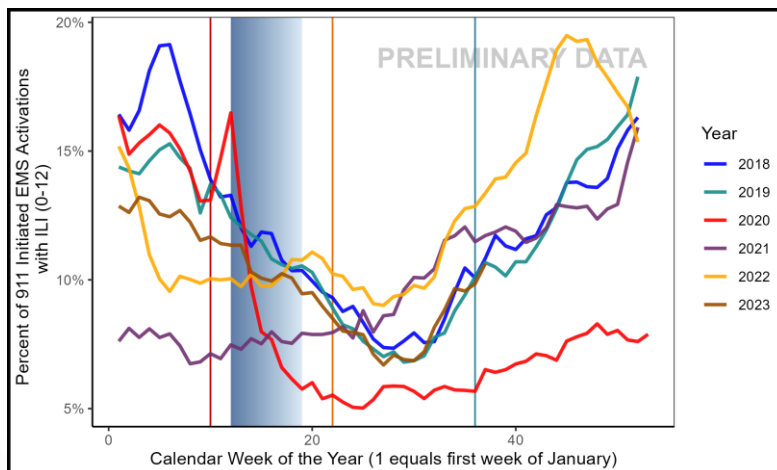
Trump issued guidelines that called for Americans to avoid social gatherings of more than 10 people for the next 15 days and to limit discretionary travel, among other guidelines.

**Many States initiate Stay-at-Home orders with orders beginning to phase-out in Week 19.**

**Week 22** May 25: Memorial Day

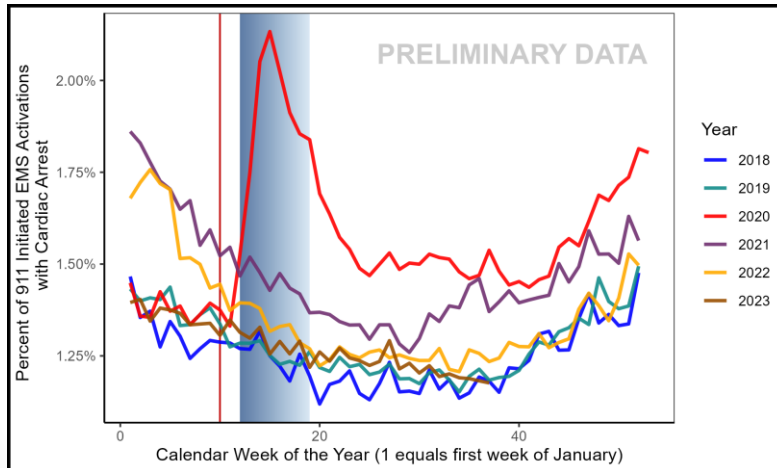
**Week 36:** Start of Labor Day weekend

## Rate of Pediatric ILI Activations



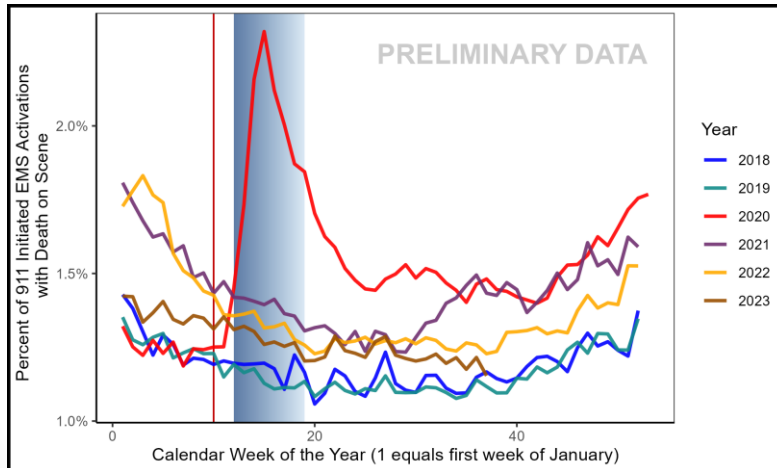
ILI inclusion criteria for patients age 0 – 12 years.

## Rate of Cardiac Arrest Activations



The rate of EMS attended cardiac arrest traditionally increases slightly during the winter months, probably due to additional witnessed arrests. Similar date stamps are superimposed across the dramatic shifts in rate of EMS attended cardiac arrests.

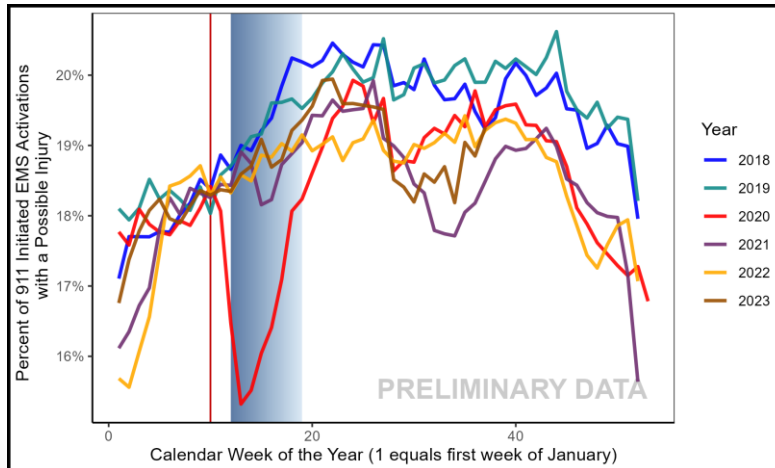
## Rate of Scene Death Activations



Similar date stamps are superimposed across the dramatic shifts in rate of EMS attended scene deaths.

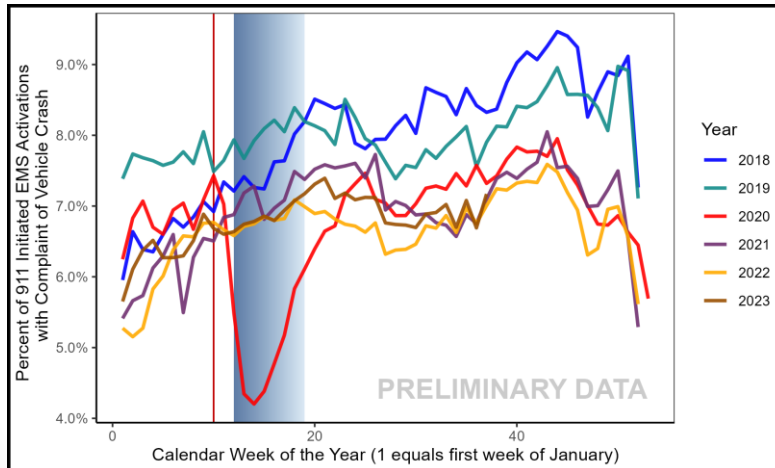


## Rate of Injury-Related Activations



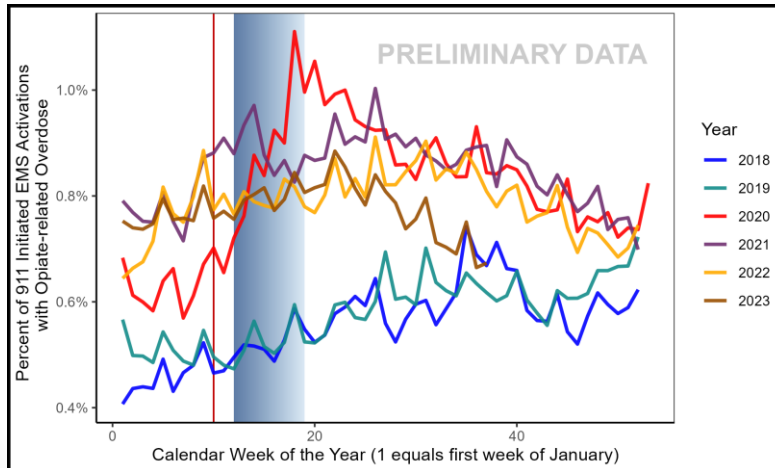
The rate of possible injury-related EMS activations demonstrates the expected increase during warmer months, but lower than expected rates beginning in Week 10 and beginning to increase in Week 13. Similar date stamps are superimposed across the dramatic shifts in rate of EMS activations reporting a possible injury.

## Rate of Vehicle Crash Activations



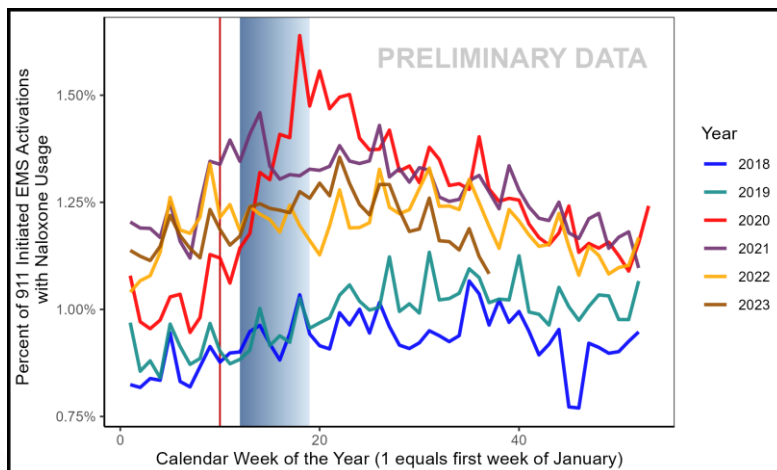
Similar date stamps are superimposed across the dramatic shifts in rate of EMS activations associated with a Traffic/Transportation Incident.

## Rate of Opioid-Related Activations



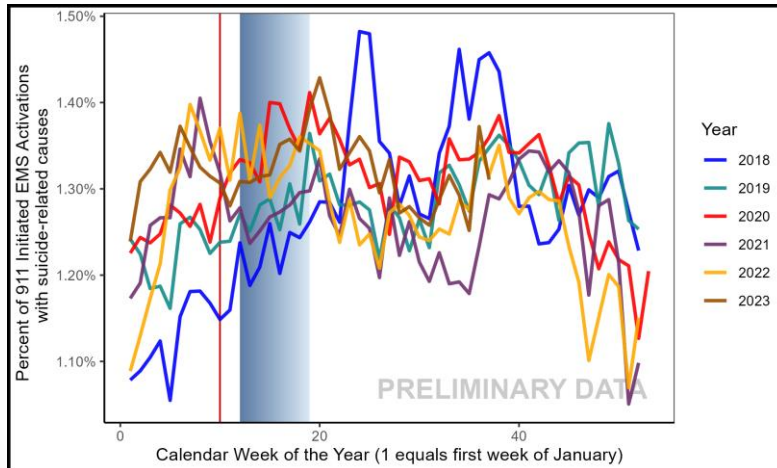
Similar date stamps are superimposed across shifts in the rate of EMS activations documenting opioid-related issues.

## Rate of Activations with Naloxone



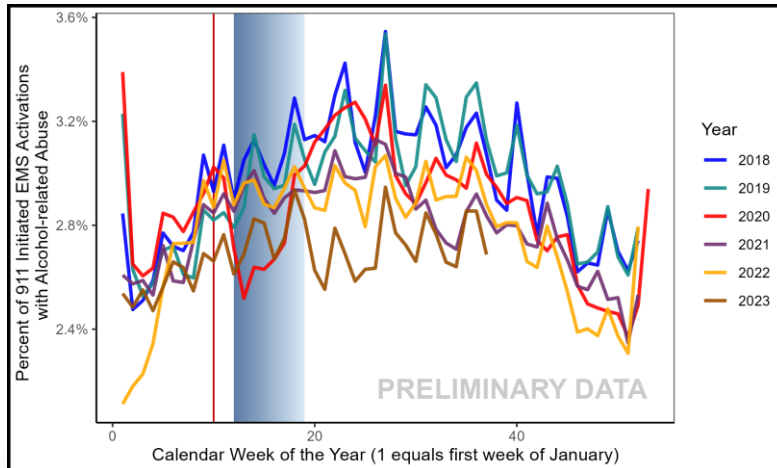
Similar date stamps are superimposed across shifts in the rate of EMS activations with documented Naloxone use.

## Rate of Suicide-Related Activations



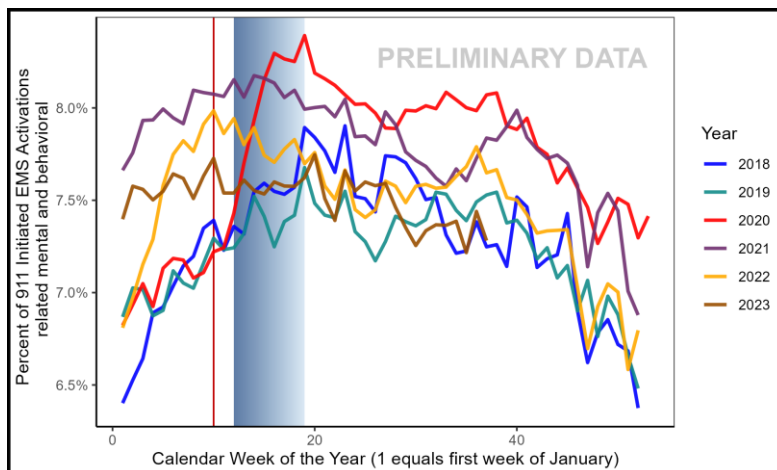
Similar date stamps are superimposed across shifts in the rate of EMS activations documenting suicide/self harm issues.

## Rate of Alcohol-Related Activations



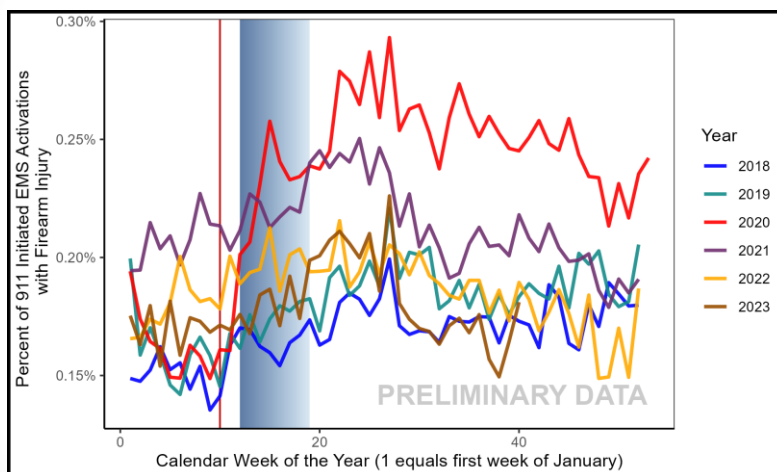
Similar date stamps are superimposed across shifts in the rate of EMS activations documenting alcohol-related issues as an impression or symptom.

## Rate of Mental/Behavioral Activations



Similar date stamps are superimposed across shifts in the rate of EMS activations associated with mental/behavioral health issues.

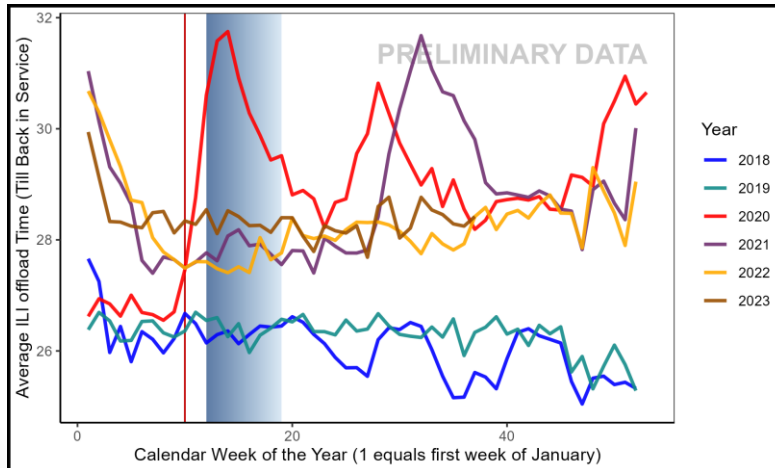
## Rate of Firearm Injury Activations



Similar date stamps are superimposed across shifts in the rate of EMS activations associated with firearm injuries.



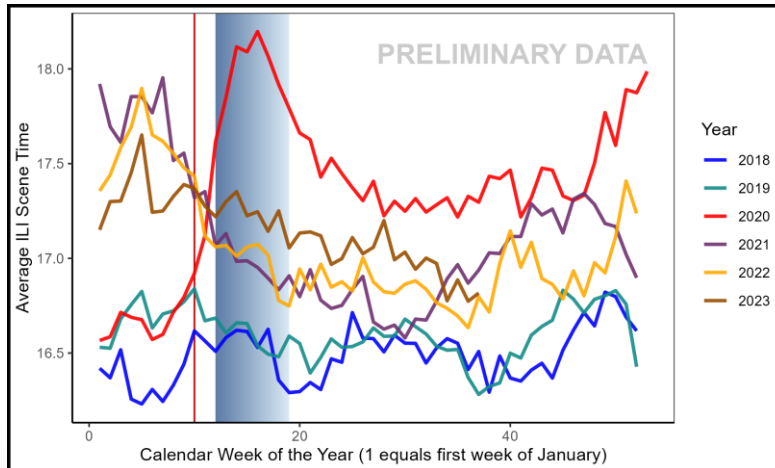
## Average ILI Offload Time



A measure of stress in the emergency care system may be calculated as the elapsed time from the arrival of an ambulance, with a patient, to the Emergency Department of a hospital until the ambulance unit is back in service. This measure is calculated, using NEMSIS elements, as:  $eTimes.13 \text{ (Unit Back in Service Date/Time)} - eTimes.11 \text{ (Patient Arrived at Destination Date/Time)}$ . During the COVID-19 pandemic, this elapsed time will include two important components of stress to the emergency care system:

- The elapsed time from ambulance arrival at the hospital until the time the hospital has the available personnel and resources to take responsibility for the care of the patient.
- The elapsed time from when the hospital accepts the patient until the ambulance is cleaned, decontaminated, and ready to return to service.

## Average ILI Scene Time



Another potential measure of stress in the emergency care system may be the additional time needed at the scene, when caring for a patient, to ensure proper precautions are taken to protect the patient, bystanders, and EMS clinicians during the COVID-19 pandemic. This measure is calculated, using NEMSIS elements, as:  $\text{eTimes.09 (Unit Left Scene Date/Time)} - \text{eTimes.06 (Unit Arrived on Scene Date/Time)}$ .

## Questions?



<https://nemsis.org>

Please contact the NEMSIS Technical Assistance Center for updates to this document.  
Contact N. Clay Mann at [clay.mann@hsc.utah.edu](mailto:clay.mann@hsc.utah.edu).