

**IMAGETREND<sup>®</sup>**

# 2020-2022 DATA

Annual ImageTrend Collaborate<sup>™</sup> Report



Author:  
Morgan K. Anderson  
Clinical & Research Services  
ImageTrend, LLC.

VOLUME 3 • PUBLISHED JULY 2023

# TABLE OF CONTENTS

## Introduction

- 01** • ABOUT COLLABORATE
    - REPORT OVERVIEW
  - 02** • METHODOLOGY
    - ASSUMPTIONS & LIMITATIONS
  - 03** • IMAGETREND'S CLINICAL & RESEARCH SERVICES TEAM
- 

- 04** • DATA OVERVIEW
- 10** • RESPIRATORY ILLNESSES
- 15** • BEHAVIORAL HEALTH
- 20** • ALCOHOL & SUSPECTED SUBSTANCE USE
- 25** • INJURIES
- 30** • TRAFFIC-RELATED
- 36** • SUMMARY/KEY FINDINGS
- 37** • APPENDIX A: REFERENCE GUIDE

## About Collaborate

The healthcare industry, specifically Emergency Medical Services (EMS), has a vast number of data sources including electronic patient care records (ePCR). These underutilized data sources provide insights to make informed data-driven decisions. ImageTrend Collaborate™ is a research and analysis program dedicated to providing vital insights into clinical, operational, licensing/credentialing, systems of care registries and public health data for the enhancement of EMS and the healthcare industry. As of 2022, the Collaborate database houses 55 million prehospital incidents spanning back to 2017. Collaborate brings together de-identified data to reach higher levels of awareness, including:



### **PUBLIC HEALTH ISSUES & EPIDEMICS**

Examples:  
Opioid Crisis, Influenza,  
COVID-19, At-risk  
Populations and Vaping  
Related Illness/Injury



### **HEALTHCARE SYSTEM TRENDS**

Examples:  
Call Volume, Dispatch  
Reasons, Personal  
Protective Equipment  
(PPE) Usage,  
Incident Dispositions and  
Patient Outcomes

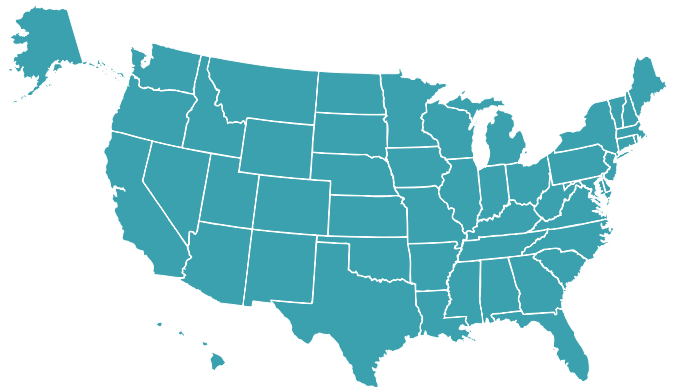


### **ESTABLISHED BENCHMARKS**

Examples:  
Ambulance Patient  
Offload Times (APOT), American  
Heart Association Mission Lifeline,  
National EMS Quality Alliance  
(NEMSQA),  
Quality Measures and  
Core Measures

## Report Overview

The purpose of this report is to contribute knowledge and insights to not only local, state, and federal agencies, but the healthcare industry as a whole. This is the third annual report of Collaborate and we expect to build off these findings as well as add additional topics of clinical importance and interest for many years to come. This report uses data from Collaborate, representing data from across the nation with over 29 million EMS incidents between January 1, 2020 – December 31, 2022.



# Methodology

## DATA COLLECTION METHOD:

All data is collected and stored within ImageTrend Collaborate. Each organization has given permission to opt-in to utilize their data for research purposes. Data reported within this report is based on the National Emergency Medical Services Information System (NEMSIS) data elements. Organizations that utilize ImageTrend Elite™ have more value options than the standard NEMSIS values for a particular element. These values are called "IT Codes" and upon creation have a mapping or fallback code that corresponds to an appropriate NEMSIS value.



## DATA DE-IDENTIFICATION:

ImageTrend Collaborate follows federally established HIPAA Safe Harbor Regulations to ensure data anonymity and protection of patient records.

## DATA ANALYSIS:

Data was aggregated and analyzed within Microsoft PowerBI Version 2.88.1385.0. In order to efficiently analyze the data, several NEMSIS data elements were grouped into similar categories (ex. eDisposition.12 "False Alarm" and "Canceled Call" were grouped into one "Cancellations" variable).

# Assumptions & Limitations

Data included within this report is retrospective and includes all submissions to ImageTrend Collaborate between 1/1/2020 and 12/31/2022. If corrections/edits or changes to the ePCR documentation are made after 12/31/2022, these changes will not be reflected within this report, but will be automatically updated within Collaborate for future reporting. Data reported and collected into the dataset has varying documentation standards based on agency or state policies.

As more agencies continue to enroll in Collaborate, data results from prior reports may not reflect the same results seen in future reports. In 2022, an additional 10 million records were added into the database.

Financial support for this report was provided by ImageTrend, Inc.

### Suggested Citation:

Anderson, MK. • ImageTrend Clinical & Research Services  
Annual ImageTrend Collaborate Report • Volume 3 • Lakeville, Minnesota, 2023.

### Correspondence:

Morgan K. Anderson, MPH • manderson@imagetrend.com • Clinical & Research Services  
ImageTrend, LLC. • 20855 Kensington Blvd., Lakeville, MN 55044

## ImageTrend's Clinical & Research Services Team

ImageTrend enhanced its data analysis solutions by establishing a Clinical and Research Services Team to better serve customers in emergency response, public health and public safety industries. Not only does this team provide insight into ImageTrend's solutions, but also bridges the gap between data collection and a need for industry-wide research.



**MORGAN K. ANDERSON** joined the ImageTrend team in 2017 and is the Research Manager. She graduated from the Medical College of Wisconsin in 2011 with a Master's degree in Public Health with an emphasis in epidemiology. Prior to coming to ImageTrend, Morgan spent five (5) years with the Army Public Health Center as an Injury Prevention Epidemiologist. Morgan has been published in The Journal of Emergency Medical Services, The American Journal of Preventative Medicine, The American Journal of Sports Medicine, Public Health, Military Medicine, and others.



**DOUGLAS G. BUTLER JR.** joined the ImageTrend team in 2018 and is the Director of Strategic Development. Prior to coming to ImageTrend, he began his EMS career in 2003 gaining experience in roles such as EMT, Paramedic, FTO/Paramedic Preceptor, EMD/EFD Certified 911 Dispatcher, EMS Educator, Regional Faculty (AHA) and Clinical Manager. As a Clinical Manager for AMR, Doug discovered his passion for data and quality improvement, which led to his position as Data Systems Manager for a multi-county EMS regulatory entity.



### *To Our Contributors*

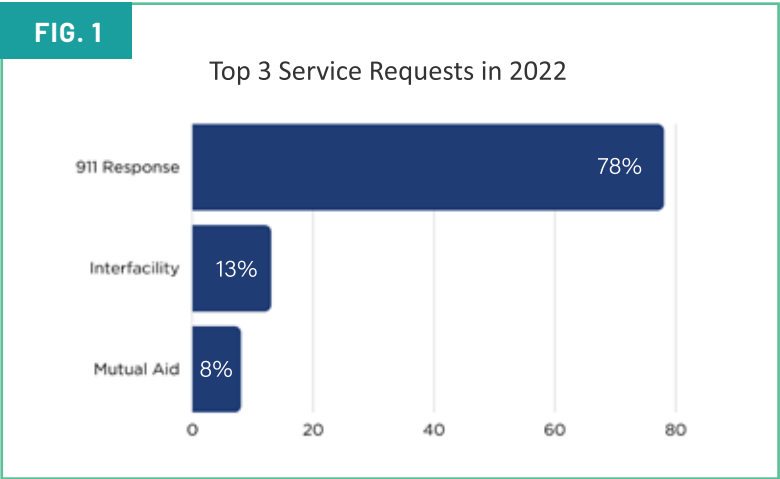
We want to thank our clients who have opted to provide their data to better the industry. Without you, our efforts to advance prehospital research to improve patient care, agency efficiencies, and industry knowledge would be limited.

### *Thank You*

# Data Overview

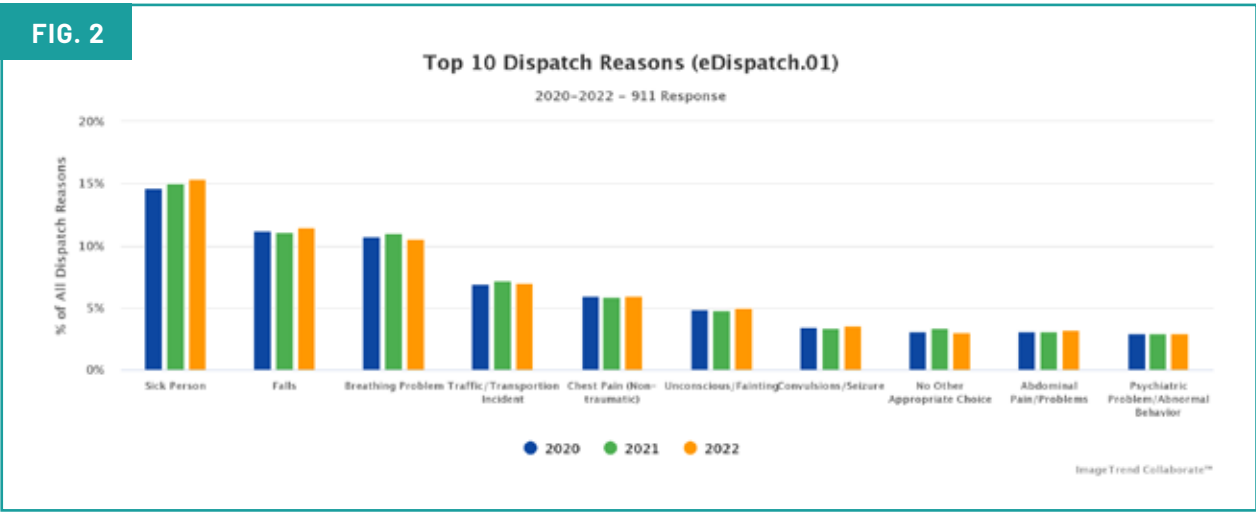
This Collaborate report contains almost 29 million EMS incidents occurring between 2020-2022. This section provides an overview of the data represented within this report along with specific insights such as dispatch reasons (eDispatch.01), patient disposition (eDisposition.12), patient demographics, and more. With almost 80% of EMS incidents requesting 911 response, most of this report focuses on these types of incidents (Fig. 1).

ALMOST  
**29**  
**MILLION**  
TOTAL EMS INCIDENTS  
2020-2022

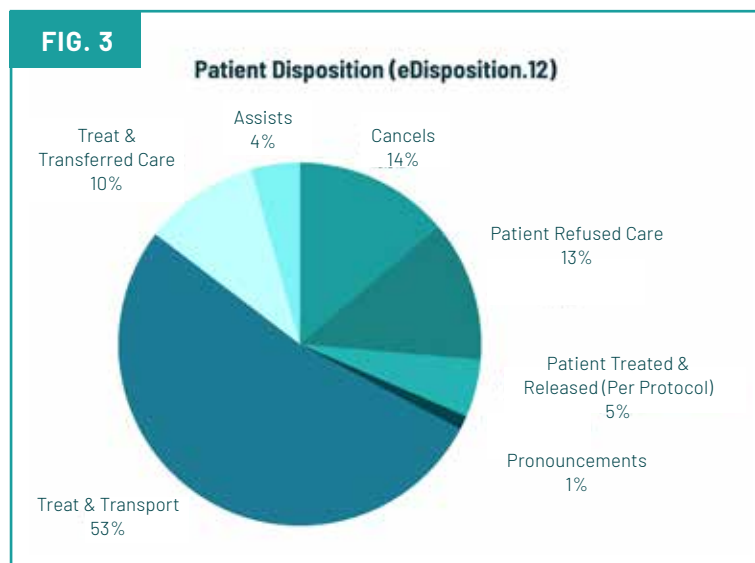


The top dispatch reasons (eDispatch.01) for 911 response incidents have changed minimally over the last three years. They included sick person (15%), falls (11%), and breathing problems (11%). Sick persons increased by 5% and falls increased by 3% from 2020 to 2022. Of note, psychiatric problems accounted for 3% and overdose/poisoning/ingestion accounted for 2% of incidents over the last three years. (Fig. 2)

**SICK PERSON  
ACCOUNTED  
FOR 15% OF  
911 RESPONSE  
DISPATCH  
REASONS**



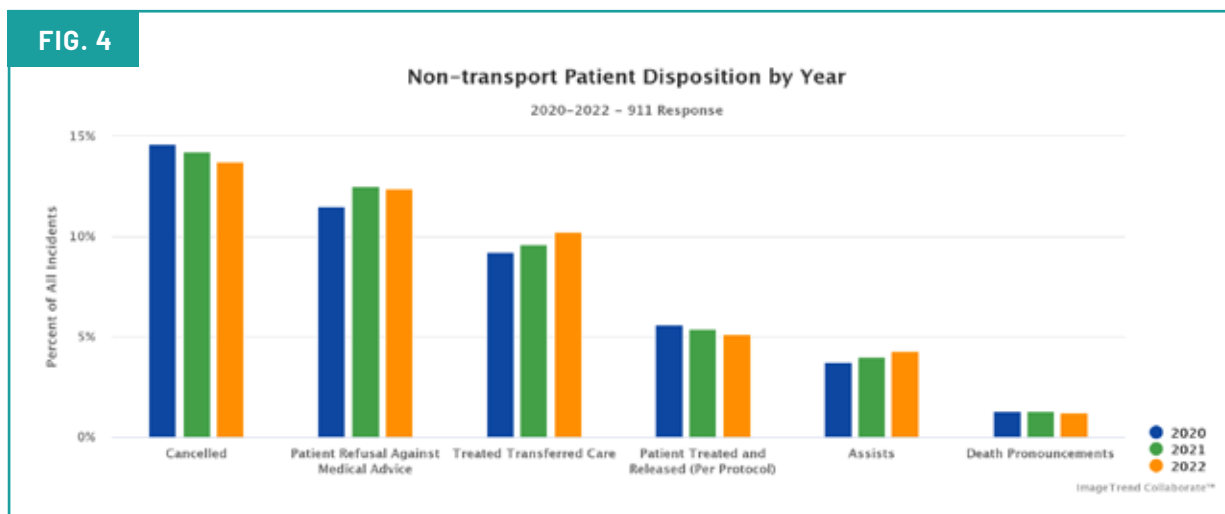
In 2022, a majority of emergent (911 response) patient dispositions (eDisposition.12) were treat and transport (52%), followed by cancels (14%) and patients refusing care against medical advice (12%) (Fig. 3). Cancellations have decreased since 2020 by 6%, patients refusing care against medical advice have increased by 8%, and assists have increased by 16% (Table 1 & Fig 4).



**Table 1. 911 Response Patient Dispositions\* by Year**

	2020	2021	2022
<b>Treat and Transportation</b>	53.0%	52.0%	52.1%
<b>Cancellations</b>	14.6%	14.2%	13.7%
<b>Patient Refusals (AMA)</b>	11.5%	12.5%	12.4%
<b>Treat, Transferred Care</b>	9.2%	9.6%	10.2%
<b>Patient Treated and Released (Per Protocol)</b>	5.6%	5.5%	5.1%
<b>Assists</b>	3.7%	4.0%	4.3%
<b>Pronouncements</b>	1.3%	1.3%	1.2%

\*NEMSIS v3.4.0 element eDisposition.12 (See Appendix A).





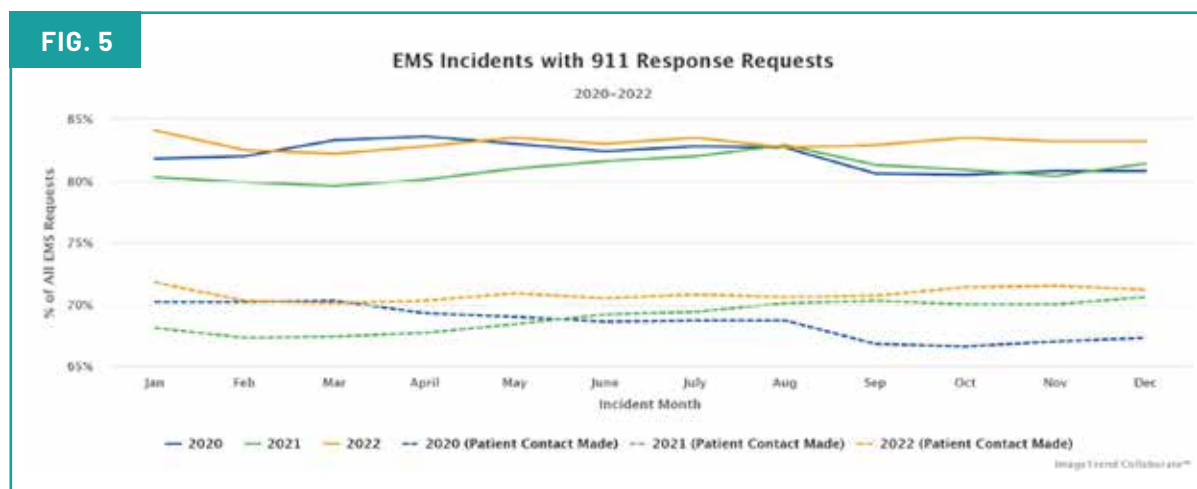
The percentage of EMS 911 requests for service fluctuated between 79% and 84% over the last three years (Fig. 5). Of all EMS requests for services, those that were 911 requests resulting in patient contact fluctuated between 67% and 70% (Fig. 5).

The lowest volume of incidents was seen in the fall of 2020 through the spring of 2021. This coincided with high rates of COVID-19 where individuals may not have been needing EMS services due to changes in lifestyle during this time (ex. less driving, recreational activities, etc.) and social perceptions (ex. fear of infection).<sup>1</sup>

**52% OF INCIDENTS  
WHERE 911 RESPONSE  
IS REQUESTED  
RESULTS IN PATIENT  
BEING TREATED AND  
TRANSPORTED**

2020-2022

**FIG. 5**

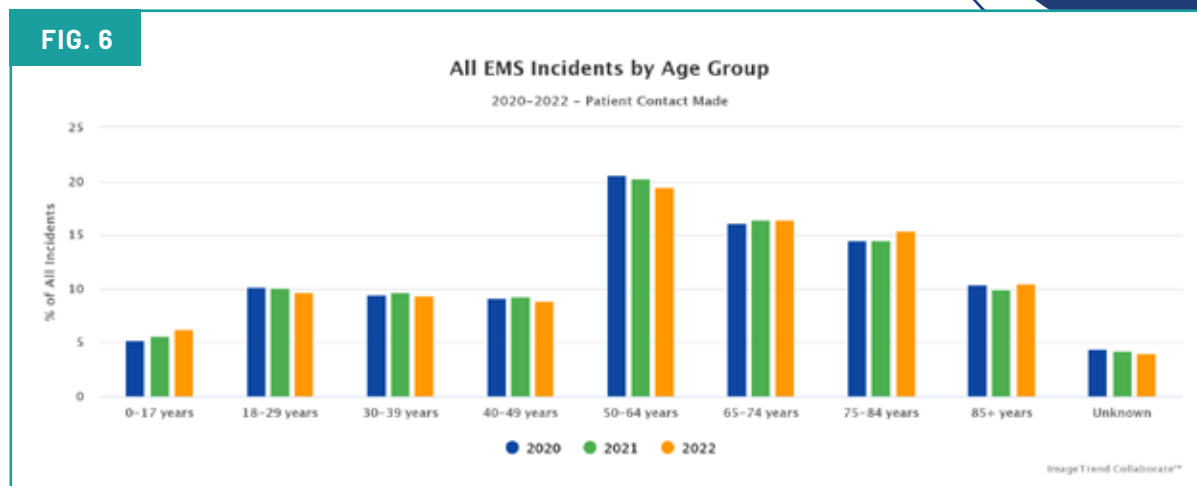


Over 60% of EMS incidents are comprised of older adults: 20% in 50-64 year olds, 30% in 65-84 year olds, and 10% in 85+ year olds. The pediatric age group (17 years and younger) accounted for almost 6% of all incidents. The breakdown by age groups has stayed fairly consistent over the last three years with a slight increase in the elderly and pediatric age groups utilizing EMS in 2022 (Fig. 6).

**1/4**

**OF EMS INCIDENTS  
INVOLVE PATIENTS  
75 YEARS OR OLDER**

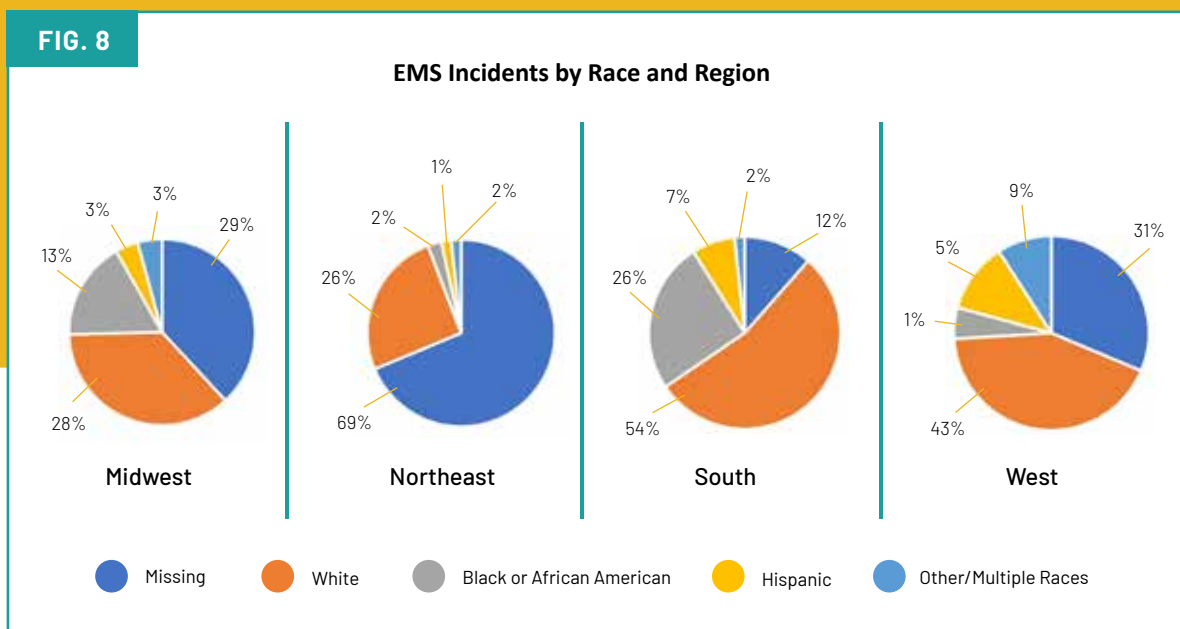
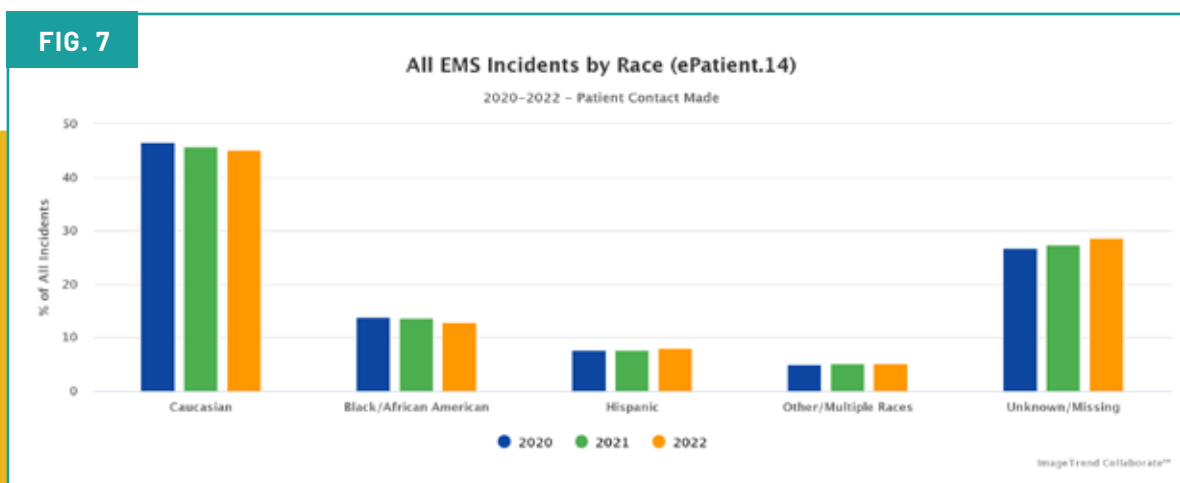
**FIG. 6**





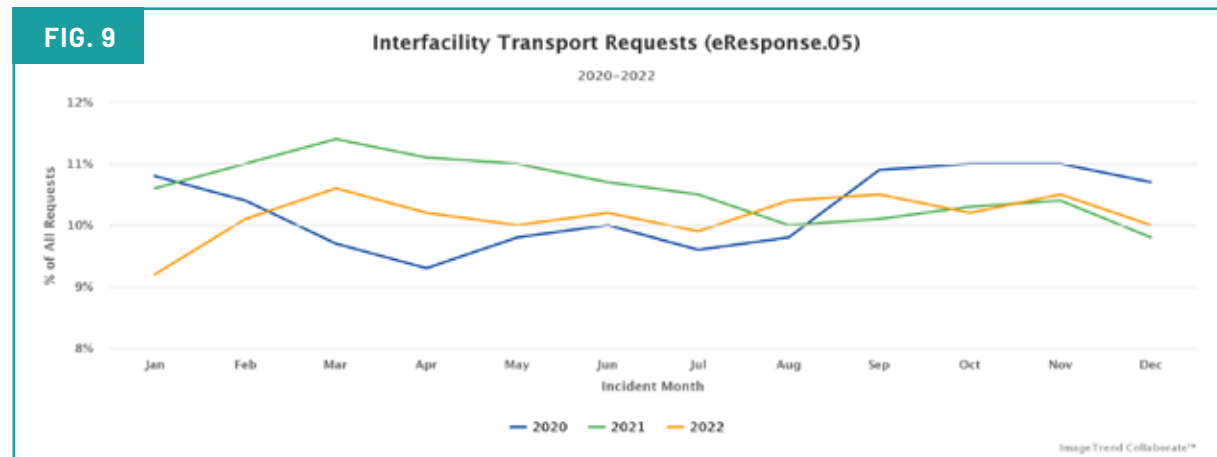
It is important to note that over 25% of prehospital incidents within this dataset did not document patient race. Focusing on a public health approach, race documentation can help identify health disparities amongst certain populations utilizing prehospital services. Evidence has shown racial and ethnic disparities exist within the healthcare system.<sup>2</sup> Within this data sample, the Northeast region had the highest portion of incidents missing race documentation (69%) and the South had the least amount of missing race documented (11%) (Fig. 7 & 8).

Examining race that was documented by EMS, over 40% of emergent incidents involved White patients, followed by Black or African American patients at just over 10%. This varied across U.S. regions (Fig. 7 & 8).



**18% OF  
INTERFACILITY  
REQUESTS INVOLVED  
A FATIGUE-RELATED  
PROVIDER PRIMARY  
IMPRESSION  
(2020-2022)**

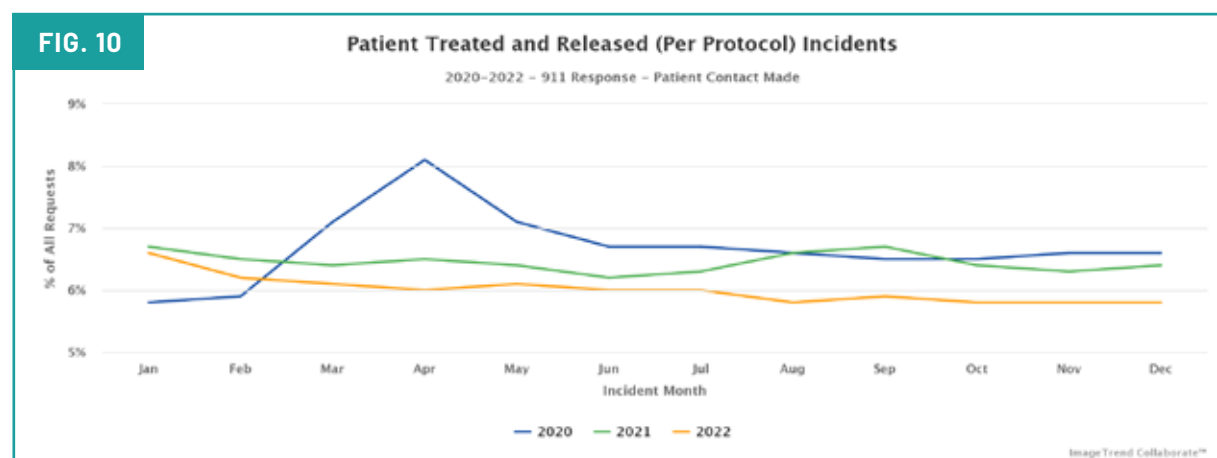
Interfacility Transport Requests (eResponse.05) account for 13% of prehospital service requests in 2022 (Fig. 1). This type of request increased at the beginning of September 2020 and remained high until July 2021. There was a slight decrease in these requests in 2022 compared to the two years prior (Fig. 9).

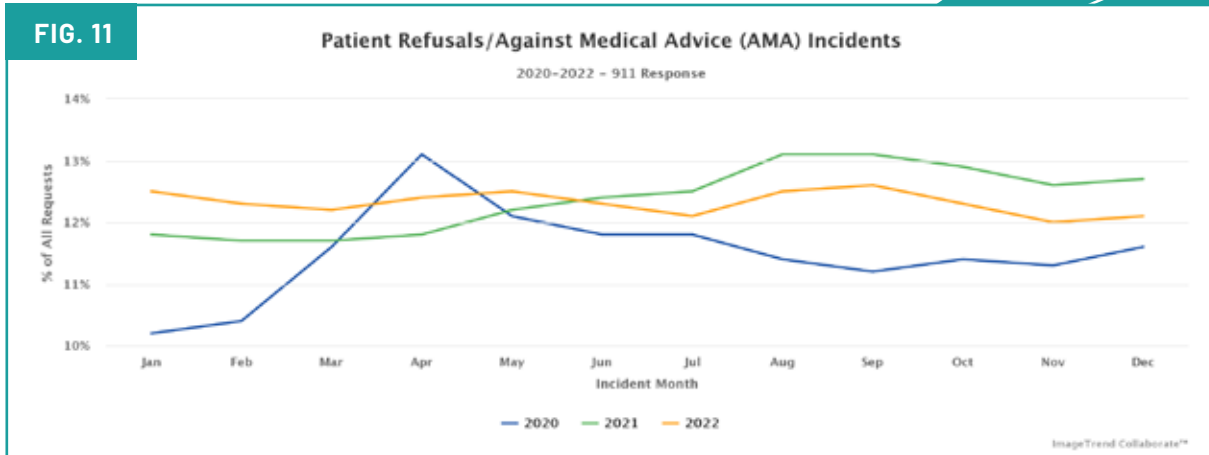


Patient treated and released per protocol (eDisposition.12) incidents accounted for 5% of all 911 response incidents (Table 1). These types of incidents increased at the onset of the COVID-19 pandemic but were the lowest overall in 2022 compared to the two prior years (Fig. 10).

From 2020 to 2022, approximately 12% of incidents resulted in medical care and/or transport being refused by a patient. There was a 30% increase in these types of incidents in April 2020, at the onset of the COVID-19 pandemic, compared to February 2020. Rates have remained significantly higher compared to 2019 (Fig. 11).<sup>3</sup>

**10% OF TREATED  
AND RELEASED  
PATIENTS HAVE A  
PRIMARY IMPRESSION  
INDICATING AN  
INJURY  
(2020-2022)**

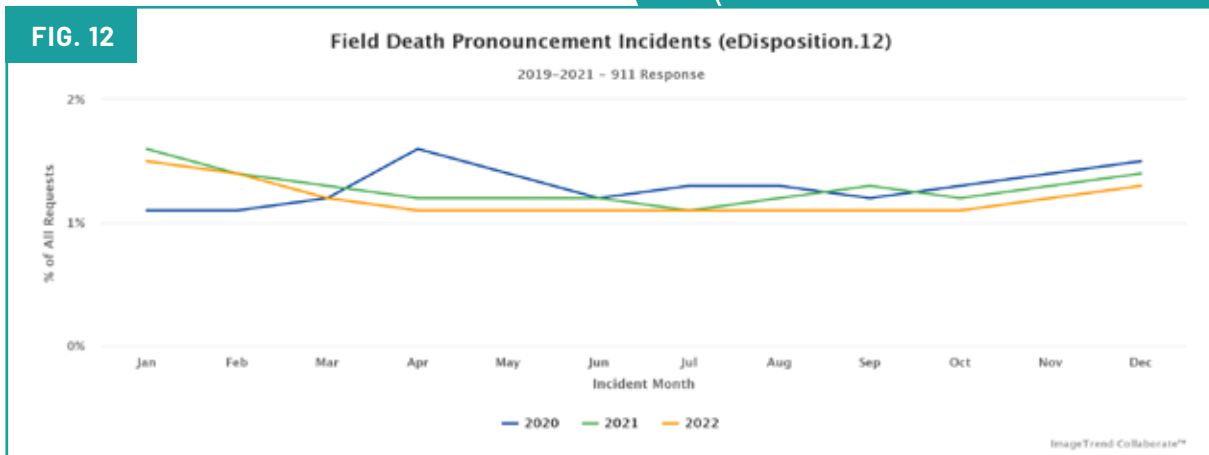


**FIG. 11**

Field death pronouncement (eDisposition.12) incidents accounted for a little over 1% of 911 response incidents (Fig. 12). In April 2020 there was a 33% increase in these types of incidents compared to the month prior, but rates remained similar for the remainder of 2020 and through 2022.

**49% OF FIELD PRONOUNCEMENTS WERE IN THE 65+ AGE GROUP**

(2020-2022)

**FIG. 12**

#### References:

1. Lerner, E. B., Newgard, C. D., & Mann, N. C. (2020). Effect of the Coronavirus Disease 2019 (COVID-19) Pandemic on the US Emergency Medical Services System: A Preliminary Report. *Academic Emergency Medicine*, 27(8), 693-699
2. Soares WE 3rd, Knowles KJ 2nd, Friedmann PD. A Thousand Cuts: Racial and Ethnic Disparities in Emergency Medicine. *Med Care*. 2019 Dec;57(12):921-923.
3. Anderson, MK & Butler, DG, Jr. ImageTrend Clinical & Research Services. Annual ImageTrend Collaborate Report. Volume 2. Lakeville, Minnesota, 2022.

## Respiratory Illnesses

As the COVID-19 pandemic began to wind down and lessen its impact on communities in 2022, we thought it would be important to analyze not only COVID-19, but also other severe respiratory illness such as influenza or respiratory syncytial virus infection (RSV) within the prehospital setting.

While specific respiratory diagnoses are not easily tested for in the prehospital setting, we utilized the CDC's criteria established for respiratory illnesses<sup>4</sup> and found this accounted for less than 1% of prehospital incidents. We broadened the criteria to include respiratory-related illnesses and found it to be a better fit for this setting (See Appendix A for inclusion criteria).

(2020-2022)

### TOP PROVIDER PRIMARY IMPRESSIONS FOR RESPIRATORY ILLNESS-RELATED INCIDENTS

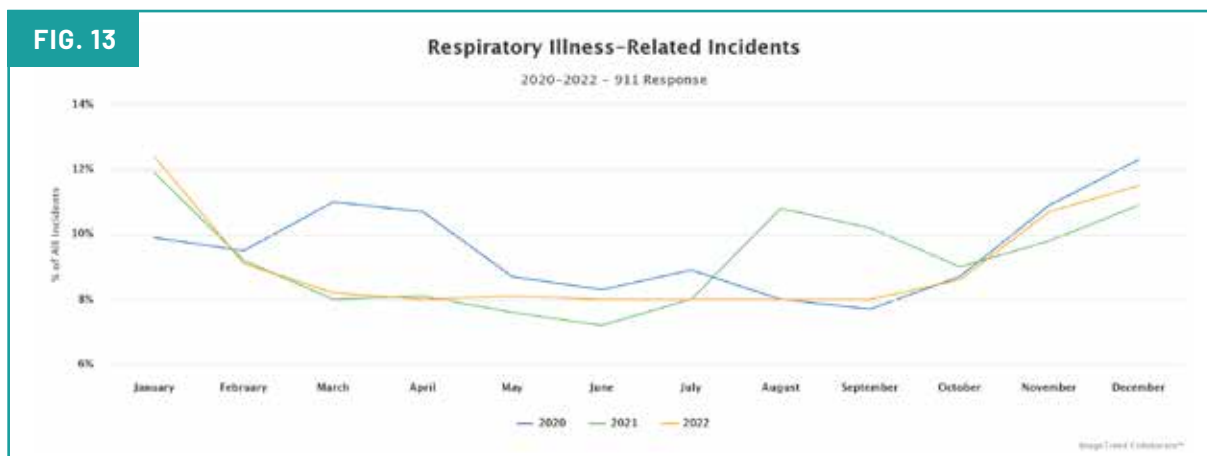
1. Acute Respiratory Distress Syndrome 29%
2. Shortness of Breath 16%
3. Respiratory Disorder, Unspecified 15%



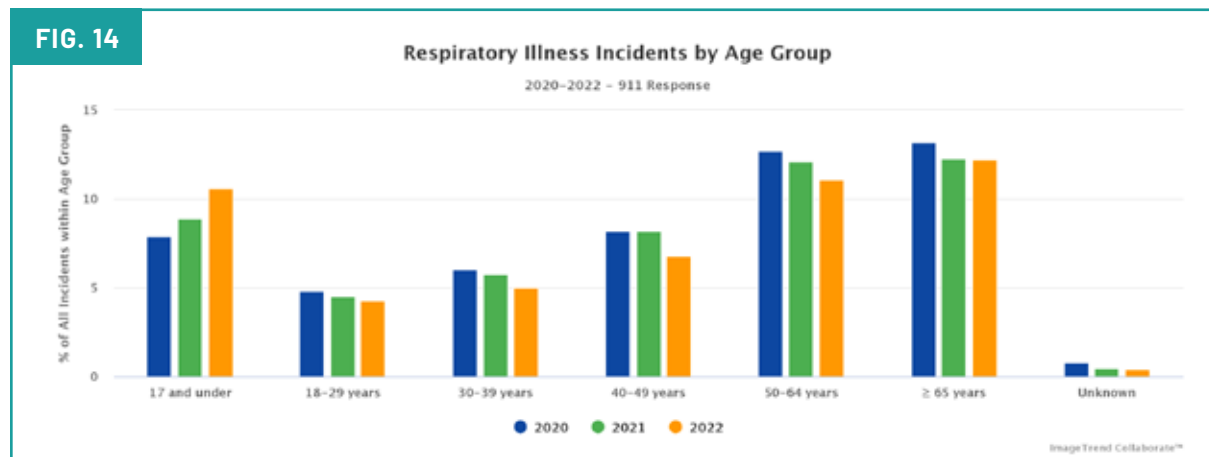
It is important to remember that those utilizing EMS for COVID-19, influenza, and RSV are most likely experiencing severe symptoms and those with mild to moderate symptoms are less likely to utilize these services and will not be captured within this dataset.

The Collaborate data shows an overall uptick in respiratory illness in spring of 2020, which was most likely due to the onset of the COVID-19 pandemic (Fig. 13).<sup>5</sup> Another uptick was seen in the fall of 2021, which was most likely due to children returning to daycare and schools after they had been home the previous year due to stay home orders (Fig. 13).<sup>5</sup> Another, more consistent increase was seen across all three years over the early winter months (Fig. 13). All of these increases in respiratory illnesses were also reported by the CDC's hospitalization data.<sup>6</sup>

FIG. 13



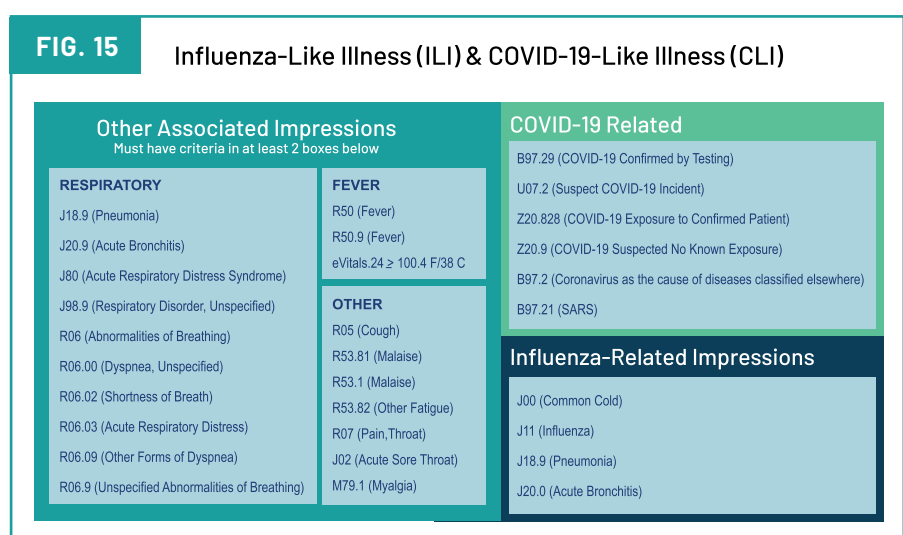
When looking at respiratory illnesses by age, patients over 50 years of age had higher proportions of respiratory illness incidents than patients under 50 years of age. While there was a decrease in proportion of respiratory incidents for patients over 50 years of age, there was an increase for the pediatric population, increasing from 8% in 2020 to 11% in 2022 (Fig. 14).



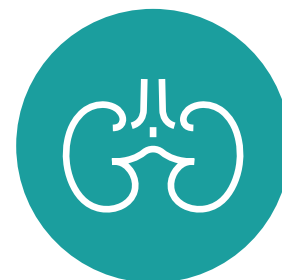
Along with changes in types of calls, the EMS industry has faced many challenges related to COVID-19, including staffing and resource shortages, as well as changes in protocols, policies, and increased mental health challenges. Continuing to monitor COVID-19 trends along with influenza is crucial to understand the short-term and long-term resources needed for future disease outbreaks. It is still critically important to monitor both influenza-like-illness (ILI) and COVID-19-like-illness (CLI).

The CDC defines ILI as fever of at least 100°F with a cough/or sore throat symptoms with a know cause other than influenza and defines CLI as a fever of at least 100°F with a cough or shortness of breath or difficulty or the presence of coronavirus diagnosis codes.<sup>5,7</sup> Upon evaluation of the ILI criteria utilized by the CDC, it was quickly identified that their criteria heavily relied on the collection and documentation of temperatures. Previous data has found EMS documented temperatures in less than 15% of all 911 response incidents.<sup>8</sup> This challenge brought together industry leaders and resulted in the development of criteria for identification of prehospital ILI and CLI incidents.

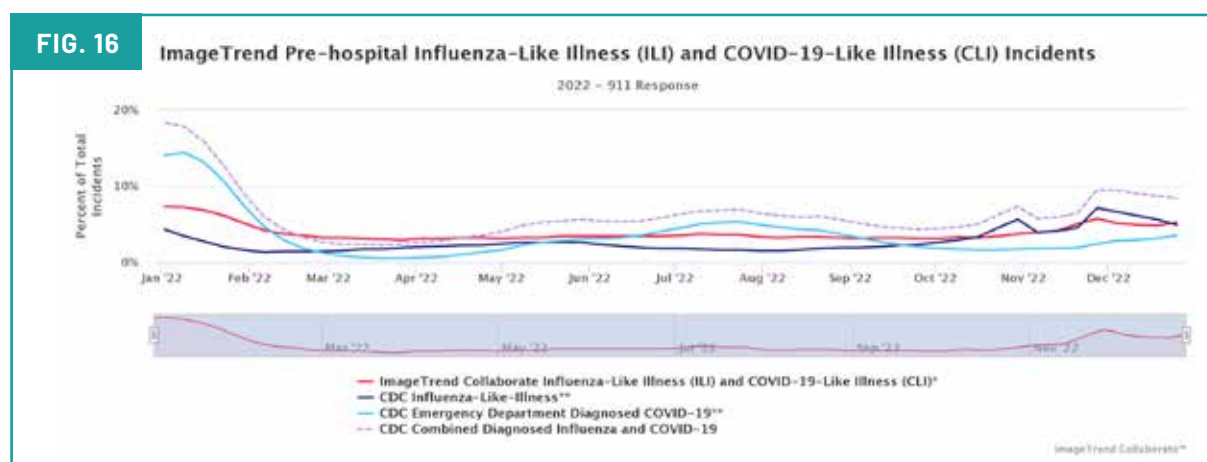
ImageTrend's ILI and CLI inclusion criteria come from provider impressions, patient symptoms, and vitals. These include acute bronchitis, common cold, COVID-19, coronavirus, SARS, influenza, pneumonia, or at least two associated impressions/symptoms involving fever, respiratory symptoms, or other cold symptoms (Fig. 15).



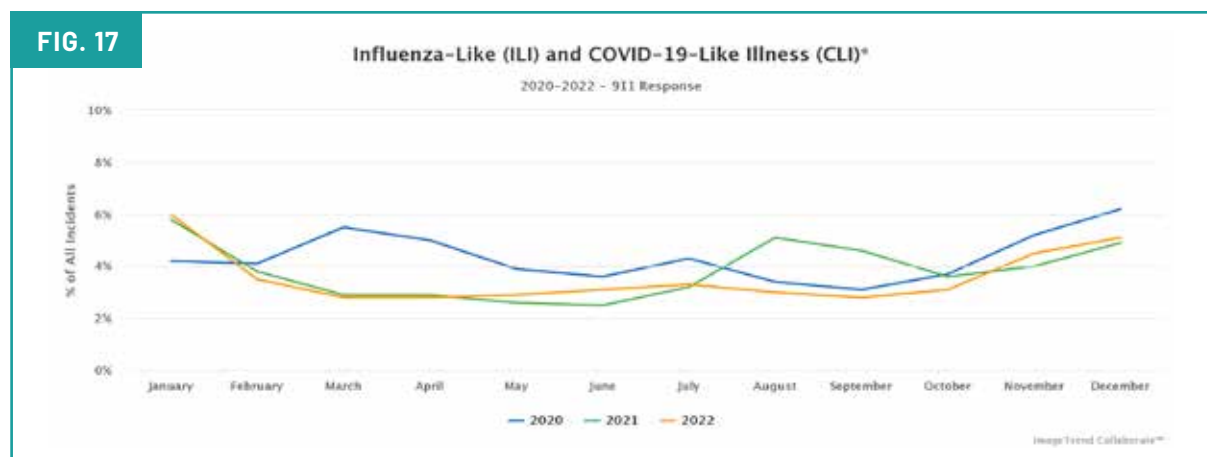
We utilized ImageTrend Collaborate data to make a comparative chart with the CDC's ILI and CLI data to monitor trends (Fig. 16). The comparative CDC data is based on emergency department visits captured from the National Syndromic Surveillance Program (NSSP).<sup>4</sup> It is important to note that both ILI and CLI are combined in the prehospital setting as their symptoms are very similar and diagnosing tools for influenza are not readily available.



Weekly incidents for 2022 were analyzed for this report. While proportions across the different health systems (prehospital, emergency department, and hospitals) may not be the same, similar trends verify an increase in overall incidents across populations.



Utilizing the same ILI and CLI criteria as mentioned above, we analyzed incidents over the last three years (Fig. 17). The peaks in ILI and CLI incidents were similar to the overall respiratory illness incidents mentioned above (Fig. 13 & Fig. 17). ILI and CLI incidents in 2022 are overall slightly lower (4%) compared to 2020 (5%) (Fig. 17).



During peak times of COVID-19 hospitalizations, many strained systems had to divert or move patients to other hospitals.<sup>9-10</sup> Interfacility transports by EMS for ILI and CLI followed similar trends as 911 requests during peak COVID-19 outbreaks (Fig. 16). Overall, interfacility transports for ILI and CLI were higher for most of 2020 and the last half of 2021. ILI and CLI rates reached 10% for all interfacility transports in December 2020, which was almost 60% higher than the average rate for 2020.

RSV can be a serious respiratory virus for young children, causing bronchiolitis and pneumonia.<sup>11</sup> As with other respiratory viruses, RSV cannot be diagnosed by EMS, but rather symptoms can be used to make inferences that it may be RSV-related. An overall analysis was done to look at respiratory illnesses in young children (under 5 years). Of the 1.4 million 911 response incidents in children under the age of 5, respiratory illness incidents accounted for 15% in 2020 and 21% in 2022 (Fig. 18). Incidents were lowest after the COVID-19 pandemic began and stayed low through the first half of 2021. The RSV season in 2021 began earlier (August) than prior seasons and was also seen in this dataset.<sup>12</sup>

**SpO2 vital recorded for young (< 5 years) pediatric respiratory illness incidents:**

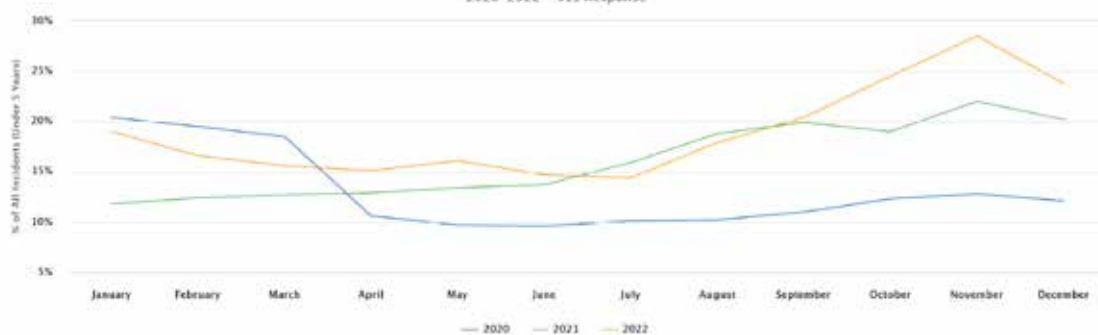
**67% of the time (2020)  
74% of the time (2022)**



**FIG. 18**

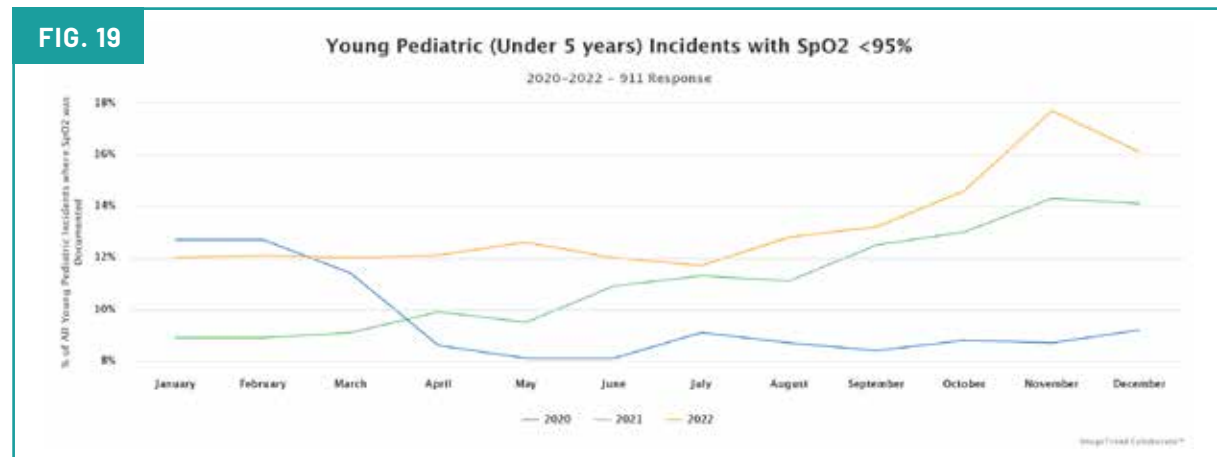
**Respiratory Illness-Related Incidents in Young Children (Under 5 years)**

2020-2022 - 911 Response





One of the primary emergent symptoms of RSV is low oxygen levels and with the illness mostly impacting young children, we evaluated oxygen levels less than 95. Of the incidents involving children under the age of 5 where a pulse oximetry vital (SpO2) (eVitals.12) was documented, there was a 37% increase in abnormal (95%) pulse oximetry vitals obtained in 2022 (13.5%) compared to 2020 (9.8%) (Fig. 19). The abnormal SpO2 level incidents followed the same trend as overall emergent respiratory illness in this age group (Fig. 18 & 19).



#### References:

- <https://www.cdc.gov/ncird/surveillance/respiratory-illnesses/index.html#companion-guide>
- Centers for Disease Control and Prevention (2023). David J. Sencer CDC Museum: In Association with the Smithsonian Institution: CDC Museum COVID-19 Timeline. Accessed 21 April, 2023. <https://www.cdc.gov/museum/timeline/covid19.html>
- Centers for Disease Control and Prevention (2023). Respiratory Virus Hospitalization Surveillance Network (RESP-NET): Weekly Rates of Respiratory Virus-Associated Hospitalizations by Season. Accessed 21 April, 2023. <https://www.cdc.gov/surveillance/resp-net/dashboard.html> A Weekly Surveillance Summary of U.S.
- Centers for Disease Control and Prevention (2023). Influenza (Flu): FluVIEW A Weekly Surveillance Summary of U.S. COVID-19 Activity. <https://www.cdc.gov/flu/weekly/overview.htm>
- Anderson, MK & Butler, DG, Jr. ImageTrend Clinical & Research Services. ImageTrend Collaborate Report: EMS Incidents During a Modern Day Pandemic. Lakeville, Minnesota, 2020.
- National Public Radio. The Associated Press. (2021). Many Hospitals With No Beds Left Are Forced To Send COVID Patients To Cities Far Away. <https://www.npr.org/2021/08/19/1029378744/hospital-beds-shortage-covid-coronavirus-states>
- French G, Hulse M, Nguyen D, et al. Impact of Hospital Strain on Excess Deaths During the COVID-19 Pandemic – United States, July 2020–July 2021. MMWR Morb Mortal Wkly Rep 2021;70:1613–1616. DOI: <http://dx.doi.org/10.15585/mmwr.mm7046a5>
- Centers for Disease Control and Prevention (2022). Respiratory Syncytial Virus Infection (RSV). Accessed 1 May, 2023 <https://www.cdc.gov/rsv/index.html>
- Hamid S, Winn A, Parikh R, et al. Seasonality of Respiratory Syncytial Virus – United States, 2017–2023. MMWR Morb Mortal Wkly Rep 2023;72:355–361. DOI: <http://dx.doi.org/10.15585/mmwr.mm7214a1>.

## Behavioral Health

In recent years, almost 20% of American adults experienced a mental illness and less than half of them reported receiving treatment for them.<sup>13</sup> A poll in 2022 found half of adults report either themselves or a family member had a severe mental health crisis.<sup>14</sup> Behavioral health incidents are not only complex and unique to each individual, but can also carry a social stigma that can lead patients to wait or even refuse seeking help.<sup>15</sup> For those who want to seek treatment, costs, waiting lists, and other obstacles can ultimately deter individuals from the help they need.<sup>16</sup> Delaying mental health care, similar to physical health, can lead to additional health crises where EMS resources are required.

For this report, we changed the inclusion criteria for behavioral incidents to cast a wider net of incidents in the prehospital setting. This year, we included all F01-F99 ICD-10 codes (including alcohol and substance use) and ICD-10 code R45 (which involves emotional state). In 2022, behavioral health incidents accounted for 11% of all 911 response incidents, which was similar to 2021 and 2020. Rates of emergent behavioral health incidents are consistently lowest in December and January of each year. (Fig. 20). In 2022, the 18 to 29 and 30 to 39 year old age groups had the highest rates (19-20%) of behavioral health incidents (Fig. 21).

### BEHAVIORAL HEALTH INCIDENTS OCCURRED:

57% PRIVATE RESIDENCE

11% RETAIL,  
COMMERCIAL OR  
PUBLIC SPACE

12% ROAD, STREET,  
OR HIGHWAY

2020-2022

(2020-2022)

67% ARE TREATED AND TRANSPORTED  
12% REFUSED CARE AND/OR TRANSPORT  
AGAINST MEDICAL ADVICE



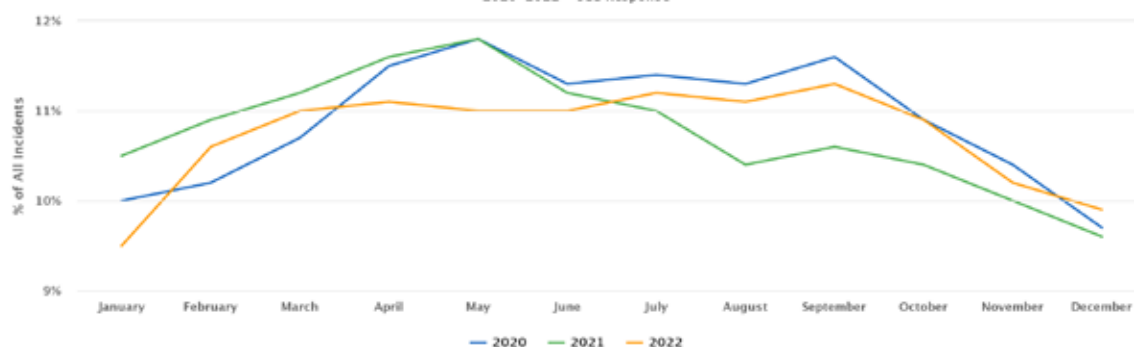
2% (2020) VS 3% (2022)

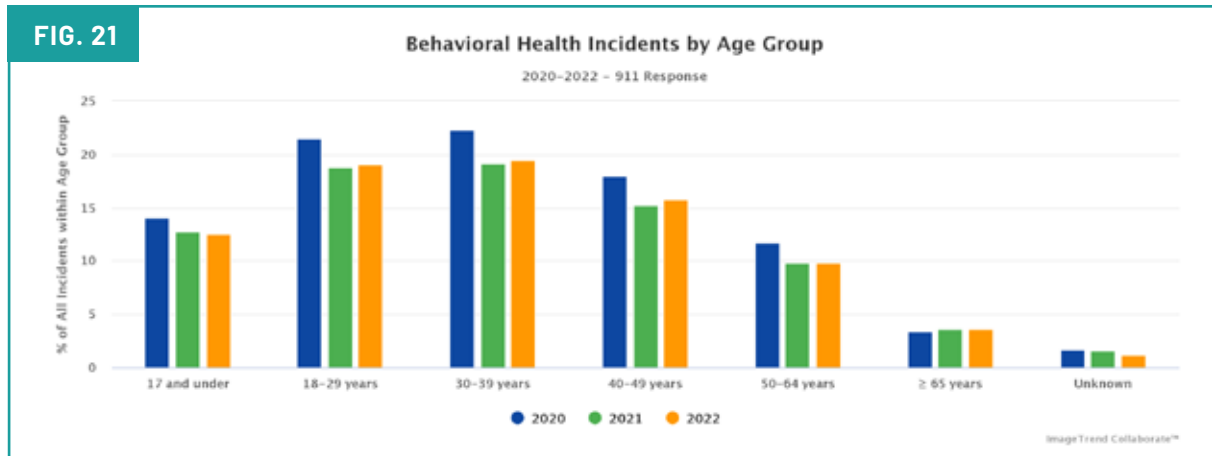
PHYSICAL RESTRAINTS FOR BEHAVIORAL  
HEALTH INCIDENTS INCREASED BY 63%

FIG. 20

### Behavioral Health Incidents

2020-2022 - 911 Response



**FIG. 21**


There were many similarities, but also some differences across age groups for emergent behavioral health provider primary impressions (Table 2). Most notably, unspecified mental disorders and alcohol-related incidents accounted for over 50% of behavioral health incidents. Anxiety accounted for almost 20% in all age groups, but was the highest (26%) in the 65+ year old group. Suicidal or homicidal ideation was highest (13%) in the pediatric age group (<18 years).

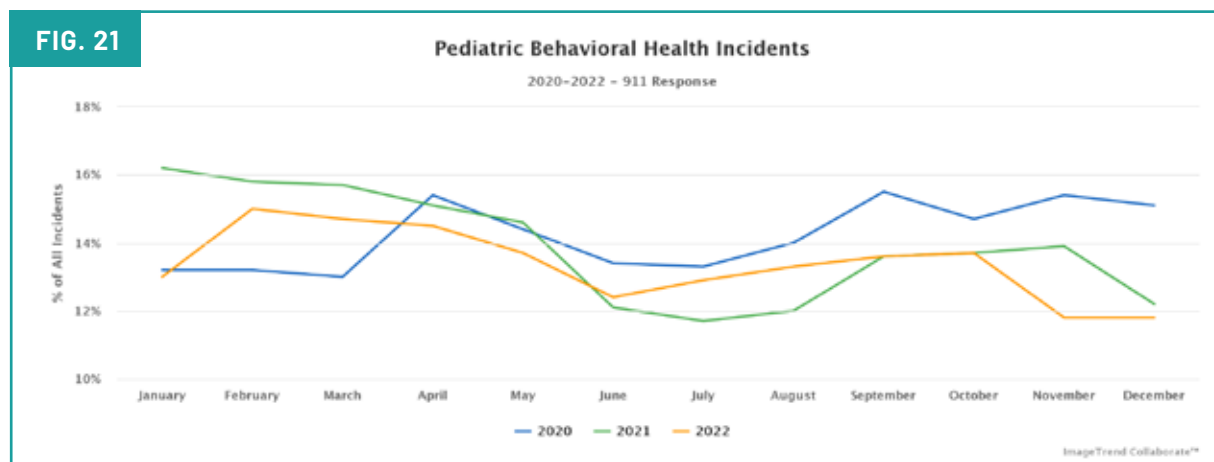
**Table 2. Top 5 Provider Primary Impression Groupings by Age Group**

RANK	<18 YEARS	18-29 YEARS	30-64 YEARS	65+ YEARS	ALL
1	Unspecified Mental Disorders 37%	Unspecified Mental Disorders 28%	Alcohol-related 30%	Unspecified Mental Disorders 29%	Unspecified Mental Disorders 27%
2	Anxiety 15%	Alcohol-related 19%	Unspecified Mental Disorders 25%	Anxiety 26%	Alcohol-related 25%
3	Suicidal or Homicidal ideation 13%	Anxiety 19%	Anxiety 17%	Alcohol-related 20%	Anxiety 18%
4	Drug/Substance Use-related 11%	Drug/Substance Use-related 16%	Drug/Substance Use-related 13%	Drug/Substance Use-related 6%	Drug/Substance Use-related 7%
5	Other symptoms and signs involving emotional state 10%	Suicidal or Homicidal ideation 7%	Suicidal or Homicidal ideation 7%	Suicidal or Homicidal ideation 3%	Other symptoms and signs involving emotional state 7%

## Pediatric Behavioral Health Incidents

Several studies have reported an increase in the proportion of pediatric mental health-related emergency department visits during the COVID-19 pandemic.<sup>18-20</sup> This increase in pediatric behavioral health emergencies is not only a public health concern but puts additional strains on EMS organizations. It is also important to recognize the need for additional training and alternative behavioral health destinations for pediatric patients.

This dataset found emergent behavioral health incidents in pediatric patients accounted for 13% of all emergent pediatric incidents in 2022, which is down slightly from 14% in 2020 (Fig. 22). The highest rates (16%) were seen during the winter of 2020/2021 (November-March). Pediatric patients between the ages of 14-17 had the highest rates of behavioral health incidents (24%) from 2020-2022. In 2022, 67% of all emergent pediatric behavioral health incidents occurred in the 14-17 year age group, followed by the 11-13 year old group (22%) (Table 3).



**IN 2022  
57% OF PEDIATRIC  
BEHAVIORAL HEALTH  
INCIDENTS OCCURRED AT  
PRIVATE RESIDENCE AND  
9% IN SCHOOLS**

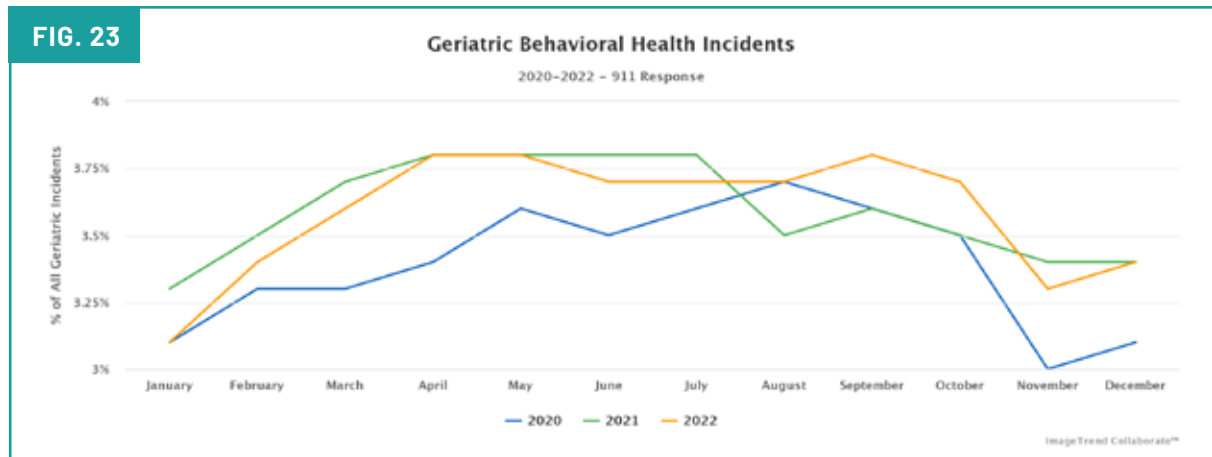
**Table 3. Prehospital Pediatric Behavioral Health Rates\***

	2020	2021	2022	Total
5-10 years	5.4%	5.5%	5.3%	5.4%
11-13 years	19.4%	20.2%	19.7%	19.8%
14-17 years	25.1%	23.8%	24.2%	24.3%

\*911 Response

## Geriatric Behavioral Health

A survey from 2020 found a quarter of older ( $\geq 65$  years) adults reported anxiety or depression during the COVID-19 pandemic. Anxiety and depression was even higher for those with fair or poor health (48%), low income (37%), and living alone (27%).<sup>17</sup> From 2020 to 2022, emergent behavioral health incidents made up less than 4% of emergent incidents in the geriatric population ( $\geq 65$  years) (Fig. 23). There was also a slight increase in these types of incidents from 2020 to 2022 (3.4% vs 3.6%).



## Behavioral Health & Alcohol or Substance Use

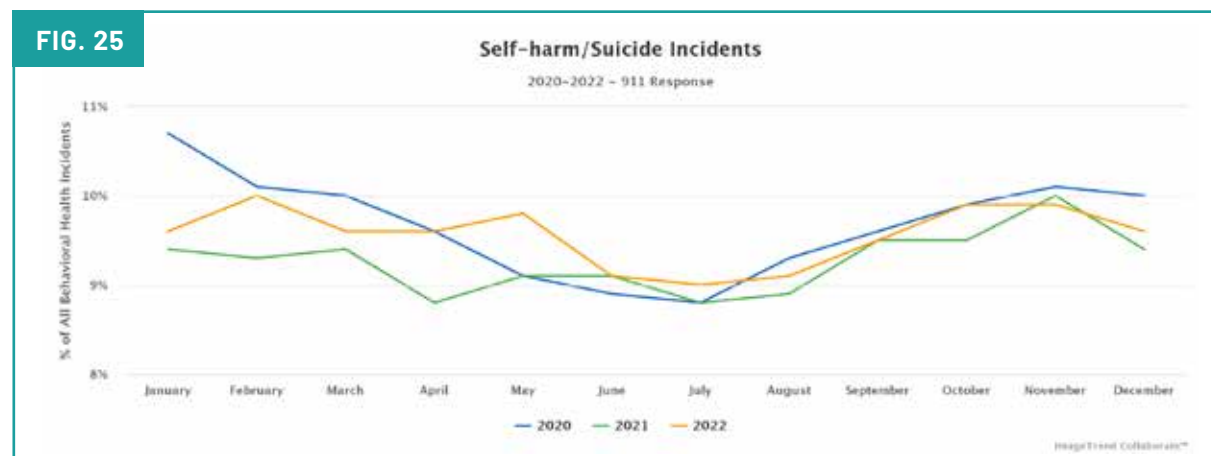
Within this dataset, 33-36% of emergent behavioral health incidents from 2020-2022 are attributed to alcohol or substance use. Further analysis on alcohol and substance use is in the section to follow. Figure 24 illustrates emergent behavioral health incidents that do not include alcohol or substance use. There is a slight increase in the proportion of incidents from 2020 to 2022 compared to all 911 incidents.



## Self-harm & Suicide



In 2022, 4.6% or over 11.4 million adults reported serious suicidal thoughts.<sup>13</sup> Unfortunately, suicide is in the 10 leading causes of death for most age groups in 2020, and is the second leading cause of death for ages 10-14 and 25-34 years old.<sup>18</sup> Self-harm/suicides account for 10% of all emergent behavioral health incidents for this dataset (Fig. 25). Emergent self-harm/suicide incidents from 2020 to 2022 have stayed consistent (9-10%). Of these incidents, 21% resulted in an injury.



**55% OF SUICIDE/SELF-HARM INCIDENTS RESULTING IN AN INJURY WERE MALE**



**83% OF SUICIDE/SELF-HARM INCIDENTS WERE TREATED AND TRANSPORTED BY EMS**

### References:

13. Reinert, M, Fritze, D. & Nguyen, T. (October 2021). "The State of Mental Health in America 2022" Mental Health America, Alexandria VA.
14. Lopes, L., Kirzinger, A., Sparks, G. & Brodie, M. (October 2022). KFF/CNN Mental Health In America Survey. <https://www.kff.org/other/report/kff-cnn-mental-health-in-america-survey/>
15. American Psychiatric Association. (2020). Stigma, Prejudice and Discrimination Against People with Mental Illness. <https://www.psychiatry.org/patients-families/stigma-and-discrimination>
16. National Alliance on Mental Illness. (2017). The Doctor Is Out. <https://www.nami.org/Support-Education/Publications-Reports/Public-Policy-Reports/The-Doctor-is-Out/DoctorIsOut>
17. Koma, W., True, S., Biniek, JF., Cubanski, J., Orgera, K., & Garfield, R. (October 2022). KFF One in Four Older Adults Report Anxiety or Depression Amid the COVID-19 Pandemic. <https://www.kff.org/medicare/issue-brief/one-in-four-older-adults-report-anxiety-or-depression-amid-the-covid-19-pandemic/>
18. Centers for Disease Control and Prevention, National Center for Injury Prevention and Control. Web-based Injury Statistics Query and Reporting System (WISQARS)[online]. (2023). Available from URL: [www.cdc.gov/injury/wisqars](http://www.cdc.gov/injury/wisqars)

## Alcohol & Suspected Substance Use

It is estimated that over 15% or 39 million adult Americans struggle with substance use annually.<sup>19</sup> Substance use can include alcohol, illicit drugs, and other substances. Within the prehospital setting, there is no doubt that alcohol consumption or illicit drug use can exacerbate the need for emergency medical services. Incidents can include poisonings or overdoses, impairment-related traffic accidents, violence, and other injuries. This section will focus on the burden of alcohol and other substance use-related incidents on EMS over the last three (3) years.

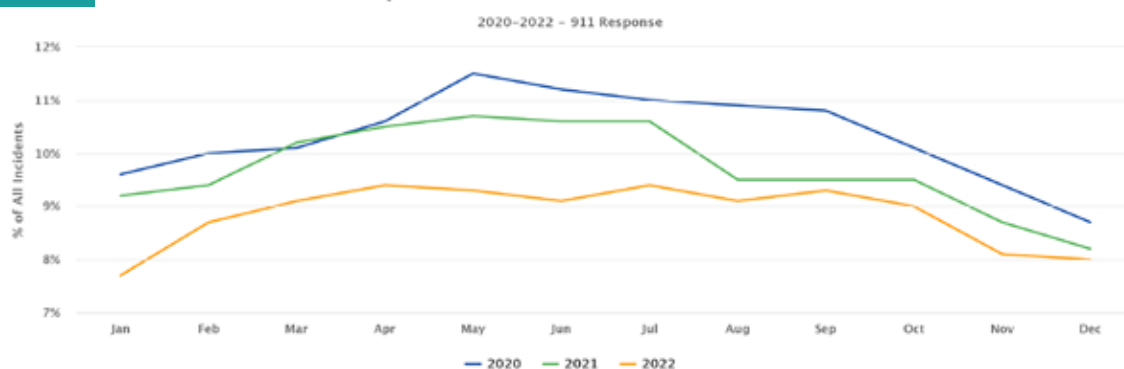
Rates of suspected substance use in the prehospital setting have accounted for approximately 10% of all 911 response incidents. In 2020, rates peaked over 11% in May and have slowly declined since. Comparing 2022 to 2020, rates fell 18% (Fig. 26).

**1 IN 10  
911 RESPONSE  
INCIDENTS ARE  
RELATED TO  
SUBSTANCE USE  
(2020-2022)**



**FIG. 26**

**Suspected Substance Use-Related Incidents**



## Alcohol-Related Incidents

Alcohol is the most commonly abused substance, with over 10% of American's struggling with alcohol use disorder and 1 in 6 adults report binge drinking.<sup>20-21</sup> A recent study estimated 1 in 8 deaths among adults between 20 and 64 years were due to alcohol.<sup>22</sup>



Overall, within this report's findings, prehospital alcohol-related incidents accounted for 7% of all emergent incidents from 2020-2022, with the western region seeing the highest rate in 2020 (8%) (Table 4). There was a 17% decline nationwide in prehospital alcohol-related incidents in 2022 compared to 2020. Summer months (May-July) see the highest amount of alcohol-related incidents compared to winter (November-February). There has been an almost 20% decrease of emergent alcohol-related incidents seen by EMS in 2022 compared to 2020 (Fig. 27).

The proportion of alcohol-related incidents was highest amongst the 30-49 year age group (12%) (Fig. 28). All age groups saw a decline in alcohol related incidents over the last three years. At the time of this report publication, there is insufficient published data to corroborate similar trends in alcohol use. This topic will continue to be monitored.

**Table 4. Alcohol-related Incidents by U.S. Regions**

Regions	2020	2021	2022
Midwest	6.5%	6.1%	5.9%
Northeast	7.4%	7.2%	6.8%
South	6.7%	5.9%	4.6%
West	7.7%	7.2%	6.8%
U.S.	7.1%	6.6%	5.9%

Inclusion Criteria: 911 Response  
Patient contact was made, and primary impression was documented

## 11% OF 911 ALCOHOL-RELATED INCIDENTS HAD A PATIENT REFUSE CARE AND/OR TRANSPORT AGAINST MEDICAL ADVICE

2020-2022



**UNDERAGE DRINKING (<21) SAW A 26% DECREASE IN 2022 COMPARED TO 2020**



**50% OF ALL 911 ALCOHOL-RELATED INCIDENTS ARE LOCATED AT PRIVATE RESIDENCES (2020-2022)**

FIG. 27

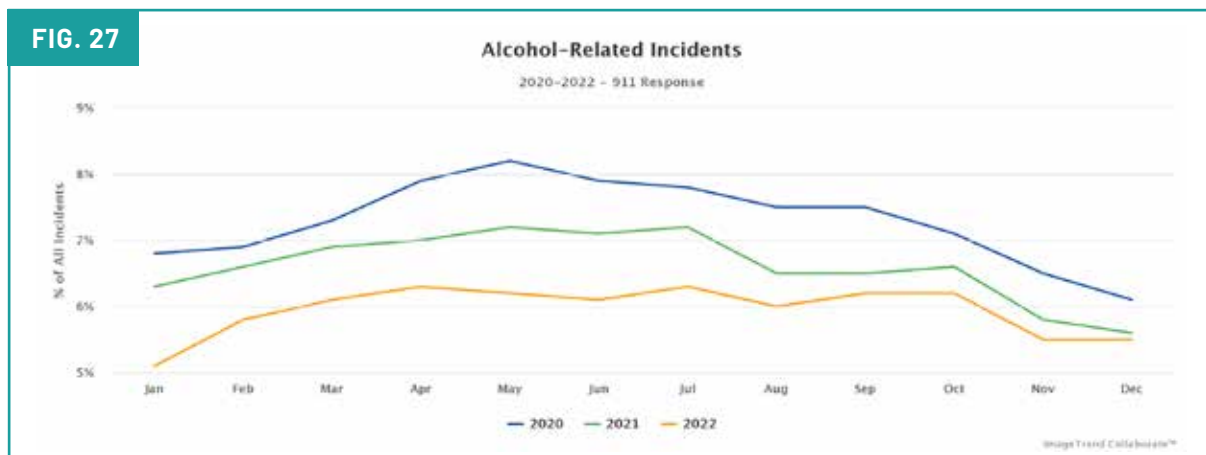
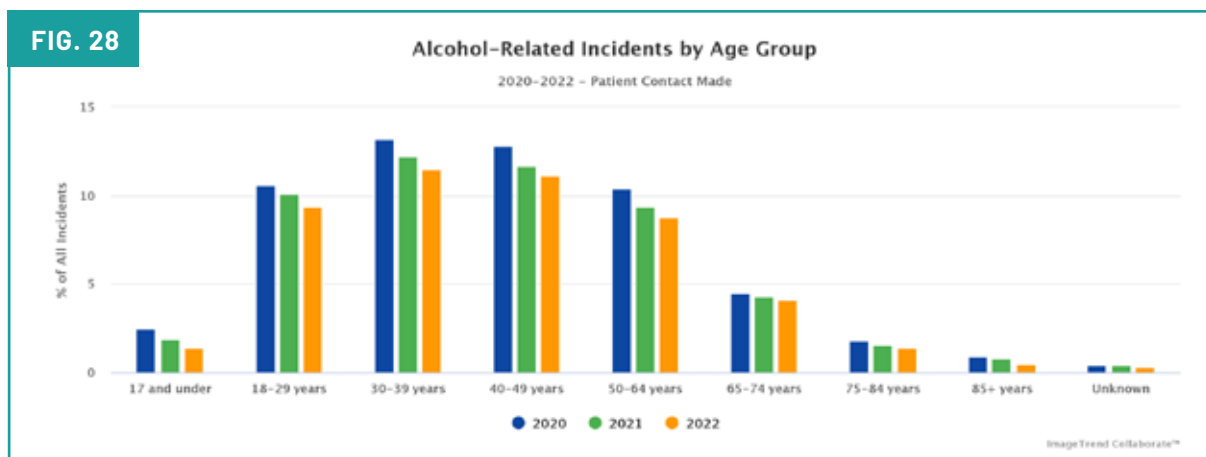


FIG. 28



## Suspected Drug & Other Substance Use

In 2021, over 61 million (22%) Americans 12 years of age or older used illicit drugs. The U.S. reported drug overdose deaths over 100,000 in all of 2021 and the first half of 2022 spanning over the prior 12 month period. While these numbers are still at record levels, evidence showed there was a decline in overdose deaths in 2022.<sup>23-24</sup>

In this dataset, drug and other substance use incidents account for almost 4% of all emergent prehospital incidents. Overall, there was a 22% decline in these type of incidents in 2022 compared to 2020 (Fig. 29). When looking at age groups, most of these incidents occur in the 18-39 year old age group (55%) (Fig. 30). Suspected substance use in 2022 by region showed the highest rate was in the western region followed by the southern region, which was a change from 2020 (Table 5).

**Pediatric patients  
≤17 years had a 25%  
decrease in 911  
response incidents  
related to drug or  
other substance use**

2020 vs 2022

FIG. 29

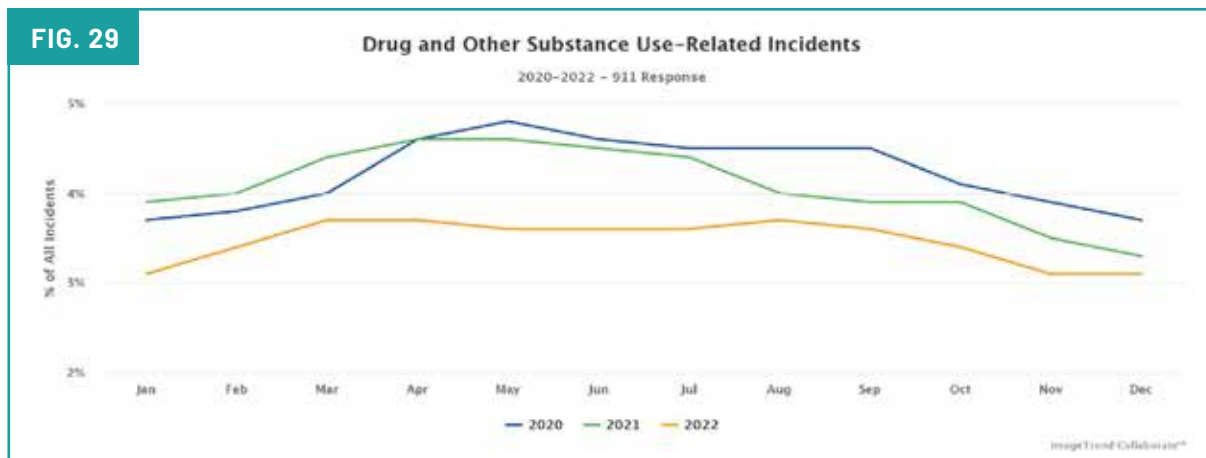
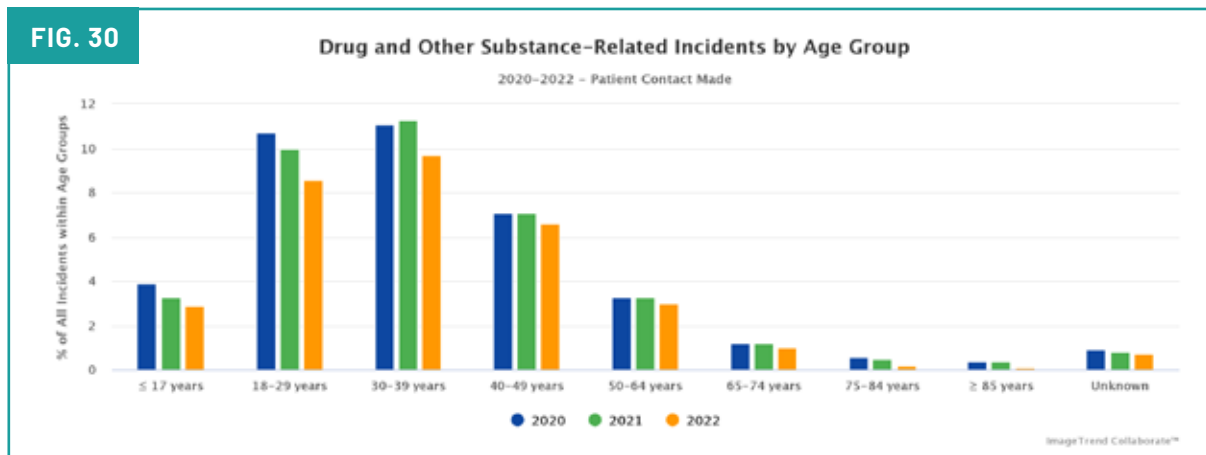


FIG. 30



**Table 5. Drug and Other Substance Use - Related Incidents by U.S. Regions**

Regions	2020	2021	2022
Midwest	2.9%	2.8%	2.5%
Northeast	3.2%	3.5%	3.4%
South	4.8%	4.5%	3.3%
West	4.5%	4.4%	4.1%
U.S.	4.5%	3.8%	3.5%

Inclusion Criteria: 911 Response  
Patient contact was made, and primary impression was documented

**(2020-2022)**

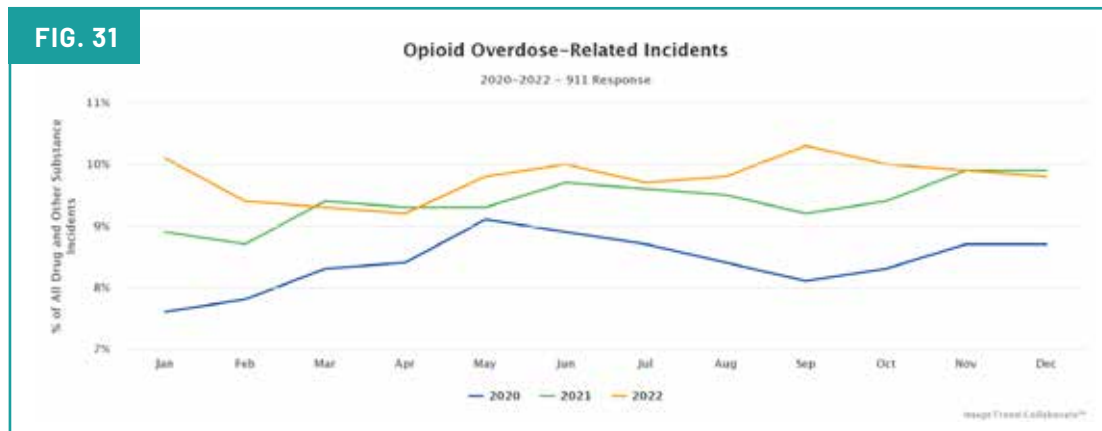
**80% OF 911 INCIDENTS INVOLVING SUSPECTED SUBSTANCE USE WERE TREATED & TRANSPORTED**

**OVER 50% OF SUSPECTED DRUG USE OCCURS IN 18-39 YEAR OLDS**

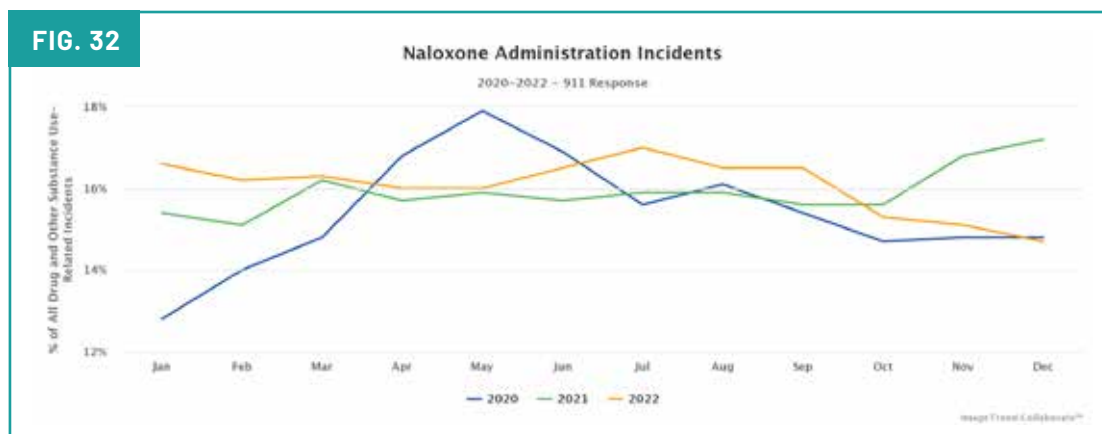
**5 OUT OF EVERY 10 NALOXONE ADMINISTRATIONS HAD AN IMPROVED RESPONSE**

Of all drug and other substance use incidents, those related to opioid overdose accounted for 10% of these incidents, increased by 15% from 2020 (Fig. 31). Prehospital naloxone administration was given in about 16% of all drug and other substance-related incidents and 39% of all opioid-related incidents (Fig. 32). Trends for naloxone administration remained similar in 2022 compared to 2020, peaking in May 2020 and December 2021.

**FIG. 31**



**FIG. 32**



#### References:

19. SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2019 and Quarters 1 and 4, 2020. <https://www.samhsa.gov/data/release/2019-national-survey-drug-use-and-health-nsduh-releases>
20. National Center for Drug Abuse Statistics. Alcohol Abuse Statistics. <https://drugabusestatistics.org/alcohol-abuse-statistics/>
21. Bohm MK, Liu Y, Esser MB, Mesnick JB, Lu H, Pan Y, Greenlund KJ. Binge drinking among adults by select characteristics and state – United States, 2018. MMWR 2021;70:41.
22. Esser MB, Leung G, Sher K, et al. Estimated Deaths Attributable to Excessive Alcohol Use Among US Adults Aged 20 to 64 Years, 2015 to 2019. JAMA Netw Open. 2022;5(11):e2239485.
23. Ahmad FB, Cisewski JA, Rossen LM, Sutton P. Provisional drug overdose death counts. National Center for Health Statistics. 2023. Designed by LM Rossen, A Lipphardt, FB Ahmad, JM Keralis, and Y Chong: National Center for Health Statistics.
24. Baumgartner JC and Radley DC, (2023). Overdose Deaths Declined but Remained Near Record Levels During the First Nine Months of 2022 as States Cope with Synthetic Opioids, To the Point (blog), Commonwealth Fund. <https://doi.org/10.26099/b912-4124>

#### 2020-2022

#### TOP 5 PRIMARY SYMPTOMS WHEN NALOXONE WAS ADMINISTERED (ANY AGE & 911 RESPONSE)

1. **ALTERED MENTAL STATUS, UNSPECIFIED 38%**
2. **UNSPECIFIED COMA 10%**
3. **CARDIAC ARREST, CAUSE UNSPECIFIED 5%**
4. **RESPIRATORY ARREST 5%**
5. **APNEA, NOT ELSEWHERE CLASSIFIED 4%**

# Injuries

There are approximately 35 million injury-related visits to emergency departments across the U.S. each year, with almost half of those requiring hospital admission.<sup>25</sup> Unintentional injuries are the leading cause of death for individuals between the ages of 1 and 44 years.<sup>26</sup>

Within the Collaborate dataset, injuries, poisoning, and certain other consequences of external causes (ICD-10-CM Codes S00-T88) with 911 response accounted for 4,639,671 incidents (23%) of incidents between 2020 and 2022. These incidents were identified through primary and secondary provider impressions (eSituation.11 & 12), cause of injury (eInjury.01), and possible injury (eInjury.02) (Fig. 1). When the possible injury (eInjury.02) field of “yes” was utilized alone, 3,516,512 incidents were identified, a 25% decrease. We decided to utilize the more expansive definition for the purpose of this report. This may be an opportunity for further analyses in data reporting quality and how EMS providers define injuries.

Emergent injury rates were highest (> 30%) in the younger age groups (0-29 years) (Fig. 2). The proportion of injuries amongst males and females was both 50% of all emergent incidents. Hispanic individuals had the highest rate of injuries (28%), followed by White individuals (25%), and Black/African American individuals (20%) (Fig. 35).

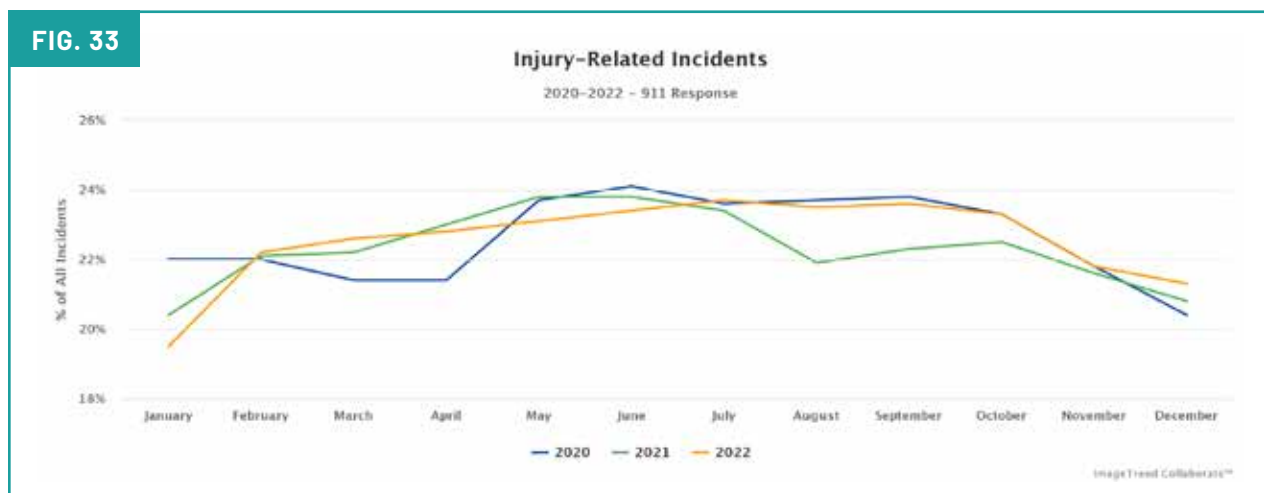
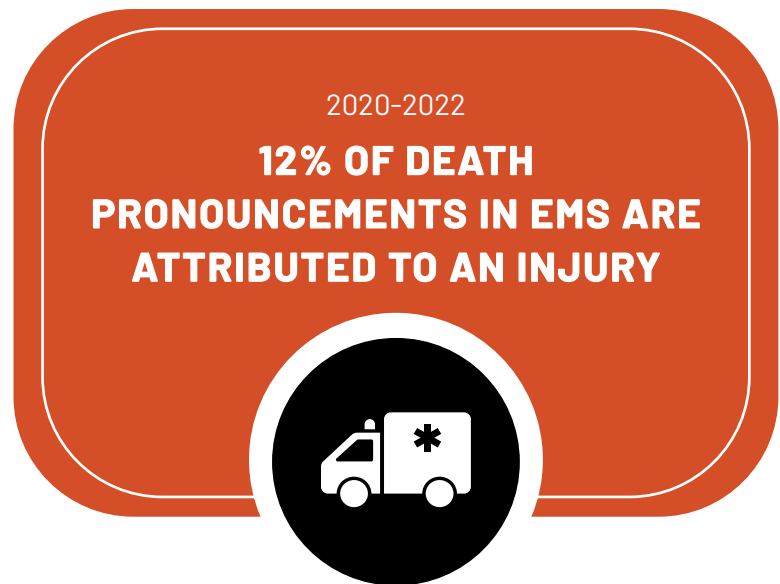


FIG. 34

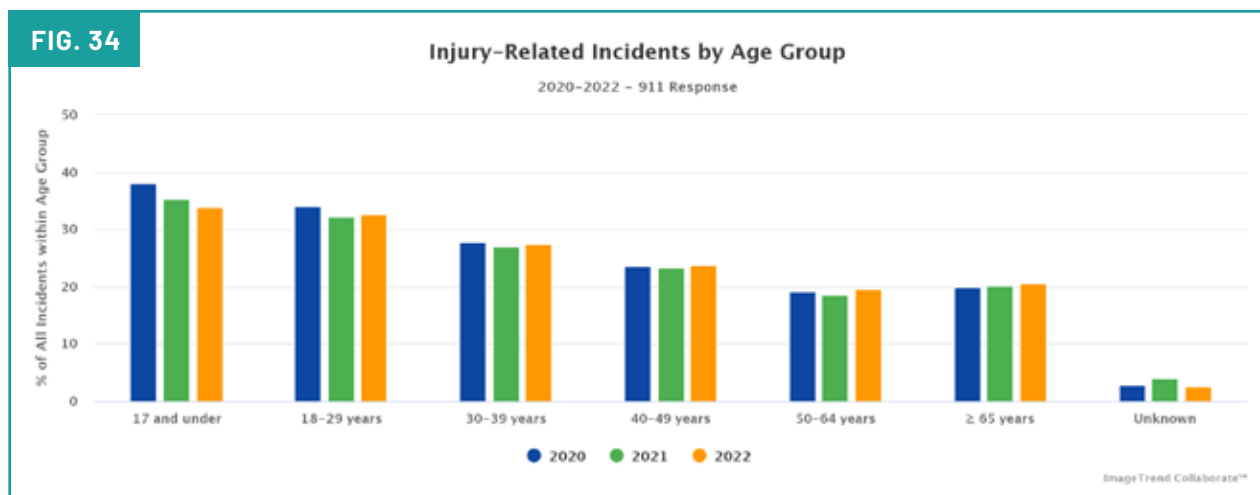
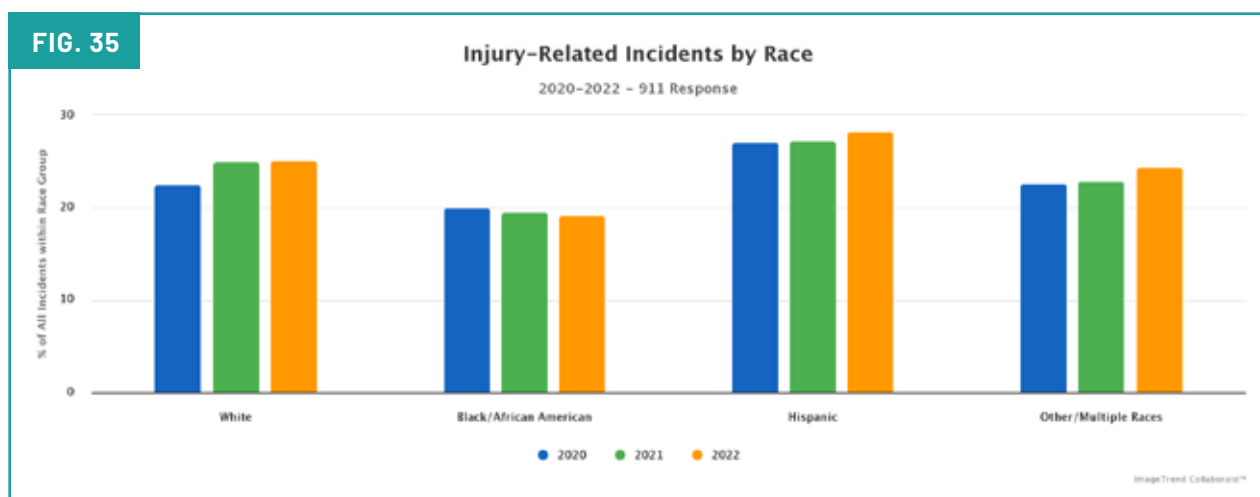


FIG. 35



The top three injury causes (Table 6) included: slips, trips, and falls (49%), motor vehicle traffic crashes (19%), and assaults (9%). Falls have been the top cause of injury for emergency department visits and motor vehicle has been the fourth cause of injury. Injury, unspecified (T14.90) was the leading provider primary impression for all injuries (21%) (Table. 7)

**POISONING IS CONSIDERED AN INJURY AND ACCOUNTS FOR OVER 3% OF 911 RESPONSE INJURIES**





## 27% OF TREAT AND TRANSPORT INCIDENTS WHERE PROVIDER IMPRESSIONS INDICATED AN INJURY DID NOT HAVE A DOCUMENTED CAUSE

**Table 6. Top 3 Causes (eInjury.01) of Emergent Injuries Attended by EMS<sup>a</sup>**

Causes (ICD-10-CM Codes)	2020	2021	2022	Total
Slips, Trips, and Falls (W00-W19)	48.5%	48.1%	50.0%	48.9%
Motor Vehicle Traffic Crash <sup>b</sup>	18.7%	19.8%	17.8%	18.7%
Assaults (X92-Y09)	9.2%	8.4%	8.1%	8.6%

<sup>a</sup> Denominator is 911 response, patient contact was made, and cause of injury was documented.

<sup>b</sup> See Motor Vehicle Crash report section or Appendix for ICD-10-Code inclusion criteria.

**Table 7. Top 3 Provider Primary Impressions (eSituation.11) of Emergent Injuries Attended by EMS<sup>a</sup>**

Provider Primary Impression (ICD-10-CM Codes)	2020	2021	2022	Total
Injury, Unspecified (T14.90)	21.6%	20.9%	21.7%	21.4%
Unspecified Injury of Head (S09.90)	5.9%	5.8%	5.9%	5.9%
Acute pain, not elsewhere classified (G89.1)	5.2%	5.1%	5.0%	5.1%

<sup>a</sup> Denominator is 911 response, patient contact was made, and cause of injury was documented.



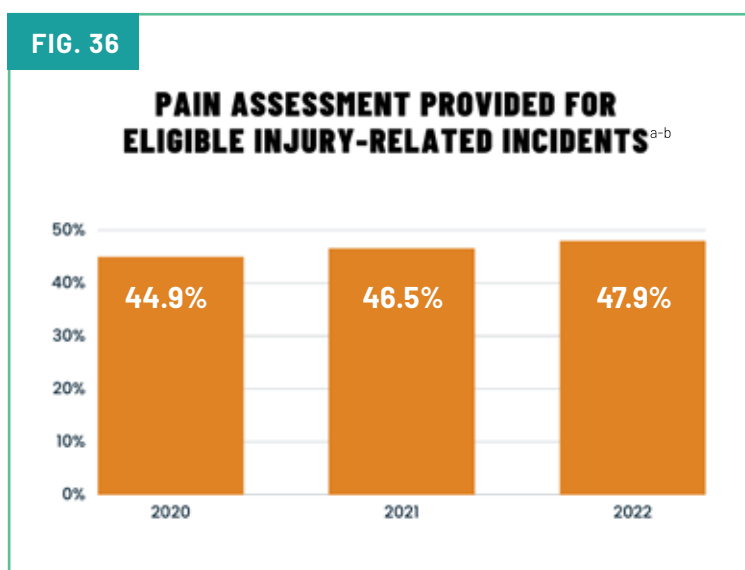
## Pain Assessment & Control

The assessment and treatment of pain for injuries is an important component during EMS care and pain relief is highly valued by patients.<sup>27</sup> Of the performance measures that the National EMS Quality Alliance (NEMSQA) has established, the assessment of pain is one of them.<sup>28</sup> Utilizing NEMSQA's criteria for pain assessment, with the exception of expanding the inclusion criteria for injuries, our dataset showed pain was only assessed in 45% of eligible incidents for all age groups in 2020, but increased to 48% in 2022 (Fig. 36).

## Pain Control

Approximately 11% of injury-related incidents that were treated and transported received pain medication (acetaminophen, ibuprofen, ketorolac, fentanyl, morphine, hydrocodone, hydromorphone, ketamine, nitrous oxide, oxycodone) in 2020 and increased by 12% in 2022. It is important to note that not all patients may have met the eligibility criteria to receive pain medication or there may have been additional reasons as to why they did not receive pain medication.

FIG. 36



<sup>a</sup> Denominator incidents were 911 response, patient contact made, transported by EMS, and injury-related (see appendix for injury inclusion criteria).

<sup>b</sup> Eligible injury-related incidents all 911 response EMS transports for patients with injury and a Glasgow Coma Score (GCS) of 15 or an Alert Verbal Painful Unresponsiveness (AVPU) of Alert.<sup>1</sup>

## Injury Severity

Approximately 60% of 911 response injury-related incidents had an initial patient acuity (eSituation.13) documented. Of those that had a documented acuity, a majority were lower acuity (68%) (Fig. 37). Approximately 90% of Glasgow Coma Scale (GCS) scores were documented for injury-related incidents (eVitals.23). Of those that had a documented GCS score, 94% were Mild (13-15) (Fig. 38).



## 80% OF PAIN MEDICATION ADMINISTERED WAS FENTANYL 10% WAS MORPHINE

2020-2022

FIG. 37

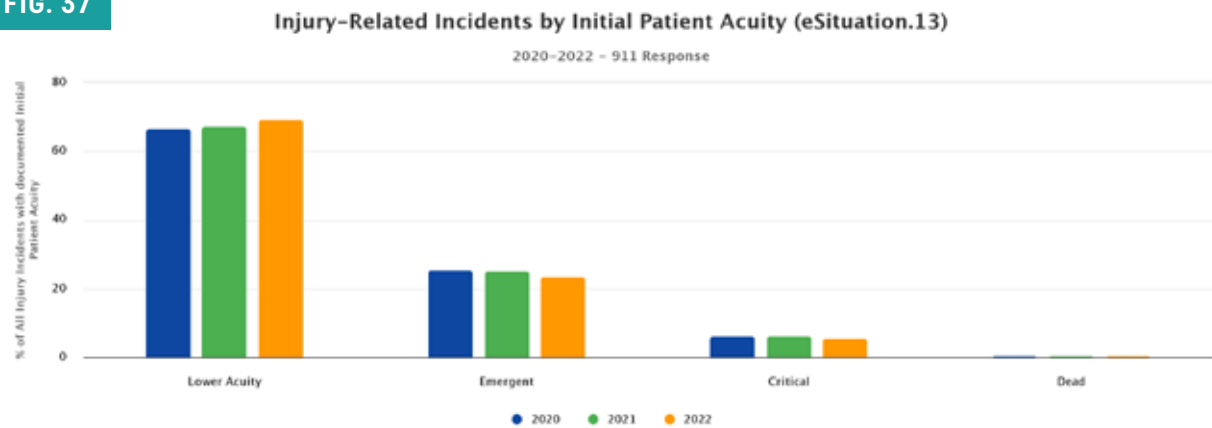
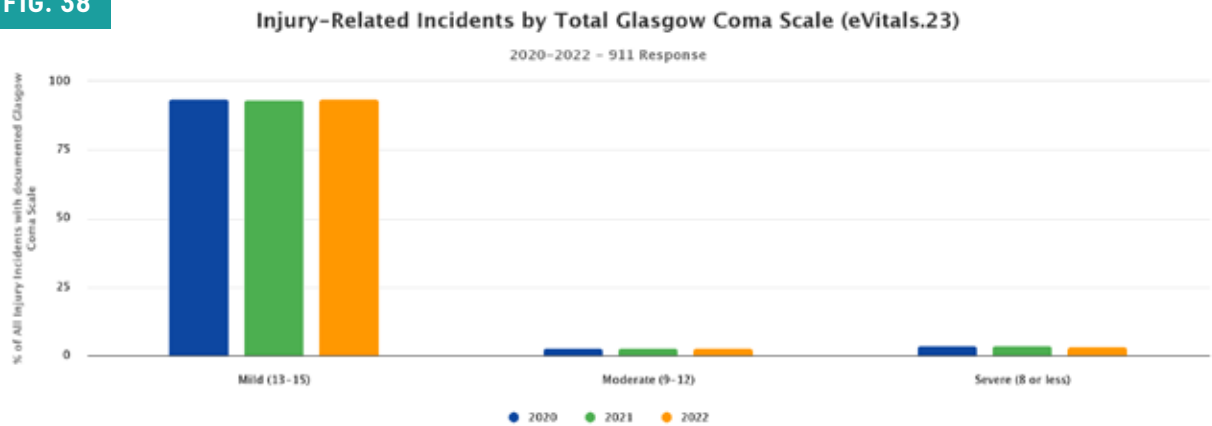


FIG. 38



# 6% OF INJURY INCIDENTS HAD A DESTINATION PREARRIVAL TRAUMA ALERT OR ACTIVATION

2020-2022



## Trauma Hospitals & Activations

For individuals that had a 911 response, were treated and transported, and met trauma center criteria (eInjury.03), 45% were transported to a designated trauma center. For those that were not transported to trauma centers, the top reason (multiple options can be selected) for alternative destinations included: Closest facility (49%), regional specialty center (25%), and patient's choice (16%).

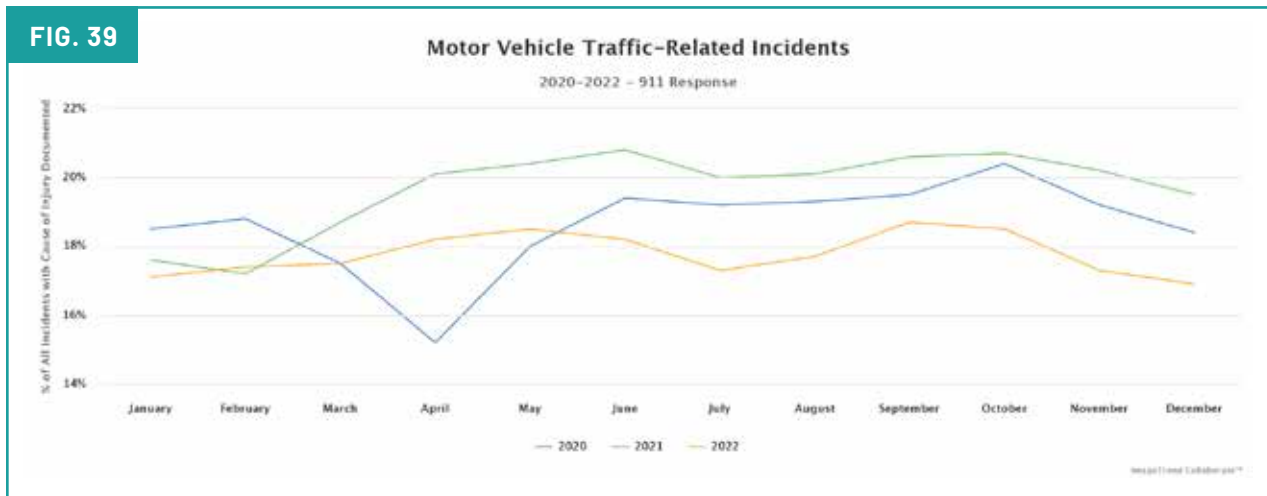
## Motor Vehicle Traffic Incidents

Annually, motor vehicle crashes have an economic burden to Americans of \$340 billion.<sup>29</sup> The National Highway and Transportation Safety Association reported an estimated 42,795 motor vehicle traffic crash deaths in 2022 and has reported that roadway fatalities have not improved over the last 10 years.<sup>30-31</sup> There were 656,016 motor vehicle traffic-related incidents from 2020-2022 within this dataset; this accounted for the 2nd leading cause of injuries for 911 responses. In 2022, 17% of incidents with a documented cause of injury code were attributed to motor vehicle traffic incidents (Fig. 39). This was a decline in incidents of 8% since 2020 and 13% since 2021. There was also a drop in these types of incidents at the start of the COVID-19 Pandemic. Since this topic has not been discussed before, we decided to look back to pre-pandemic incidents to see how trends have changed (Fig. 40). Overall, motor vehicle traffic incidents have had a decline since 2018 (15% decrease) but had a slight increase in 2021 before declining again.

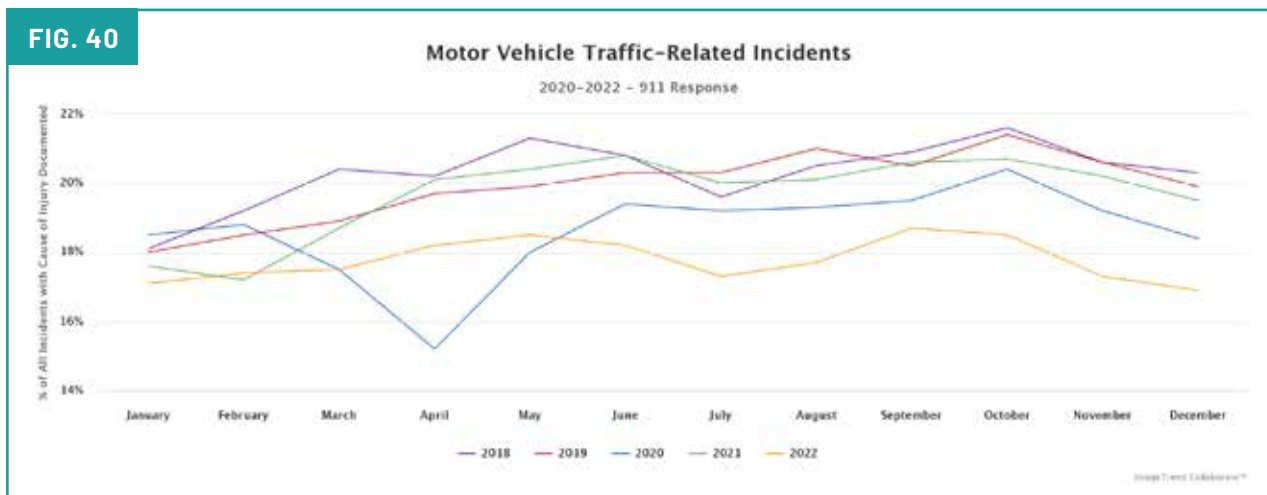
### References:

25. National Center for Health Statistics. National Hospital Ambulatory Medical Care Survey: 2020 Emergency Department Summary Tables. [https://www.cdc.gov/nchs/data/nhamcs/web\\_tables/2020-nhamcs-ed-web-tables-508.pdf](https://www.cdc.gov/nchs/data/nhamcs/web_tables/2020-nhamcs-ed-web-tables-508.pdf). Accessed 3 May 2023.
26. National Center for Injury Prevention and Control, Centers for Disease Control and Prevention. WISQARS: 10 Leading Causes of Death, United States, 2020. <https://wisqars.cdc.gov/>. Accessed 3 May 2023.
27. Anderson, MK & Butler DG, Jr. ImageTrend Clinical & Research Services. Annual ImageTrend Collaborate Report. Volume 2. Lakeville, Minnesota, 2022.
28. National EMS Quality Alliance: 2021 Trauma-01 Measure Package (2021). [https://nemsqa.memberclicks.net/assets/docs/NEMSQA-Trauma-01\\_2021.pdf](https://nemsqa.memberclicks.net/assets/docs/NEMSQA-Trauma-01_2021.pdf)

**FIG. 39**



**FIG. 40**



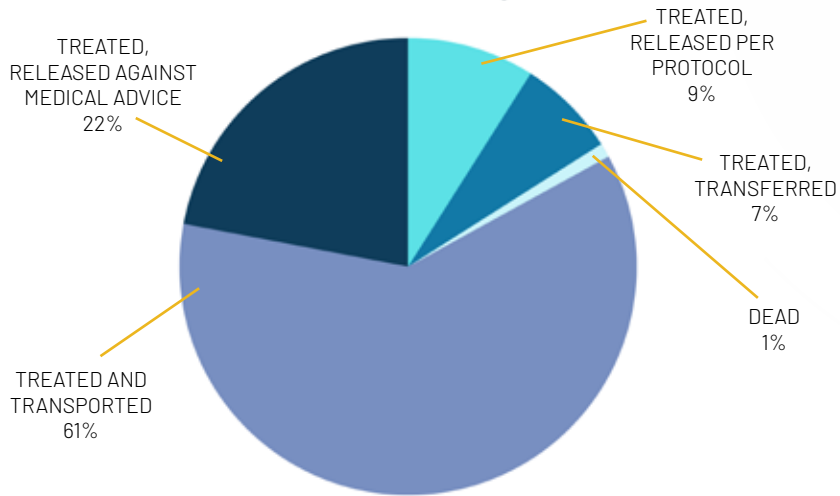
Initial patient acuity (eSituation.13) has shown an overall increase in motor vehicle traffic incidents causing death, critical and emergent events. A majority of motor vehicle traffic incidents were treated and transported (61%), followed by patients being treated and released against medical advice (22%) (Fig. 41). In 2022, almost 1 out of 1,000 motor vehicle traffic incidents resulted in a death documented by EMS. Another 63 out of 1,000 incidents had an initial patient acuity (eSituation.13) of “critical” and 166 out of 1,000 incidents were “emergent” (Fig. 42). From 2019 to 2020, the proportion of “critical” and “emergent” incidents have increased, 21% and 14% respectively. These levels have gone down slightly since 2020, but have not returned to pre-pandemic levels (Fig. 42).



**2% OF MOTOR  
VEHICLE TRAFFIC  
INCIDENTS  
ATTENDED BY EMS  
RESULTED IN DEATH  
PRIOR TO HOSPITAL  
ARRIVAL  
2020-2022**

**FIG. 41**

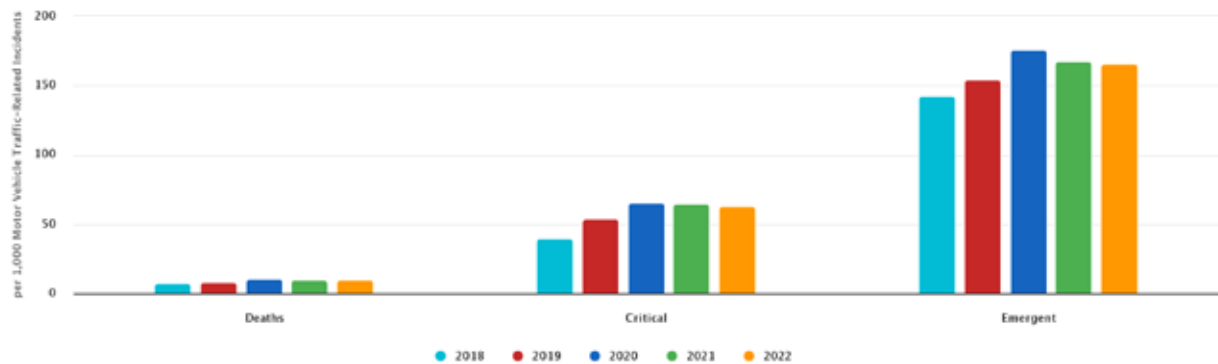
**Motor Vehicle Traffic Incident Patient  
Disposition (eDisposition.12)  
2020-2022 - 911 Response**



**FIG. 42**

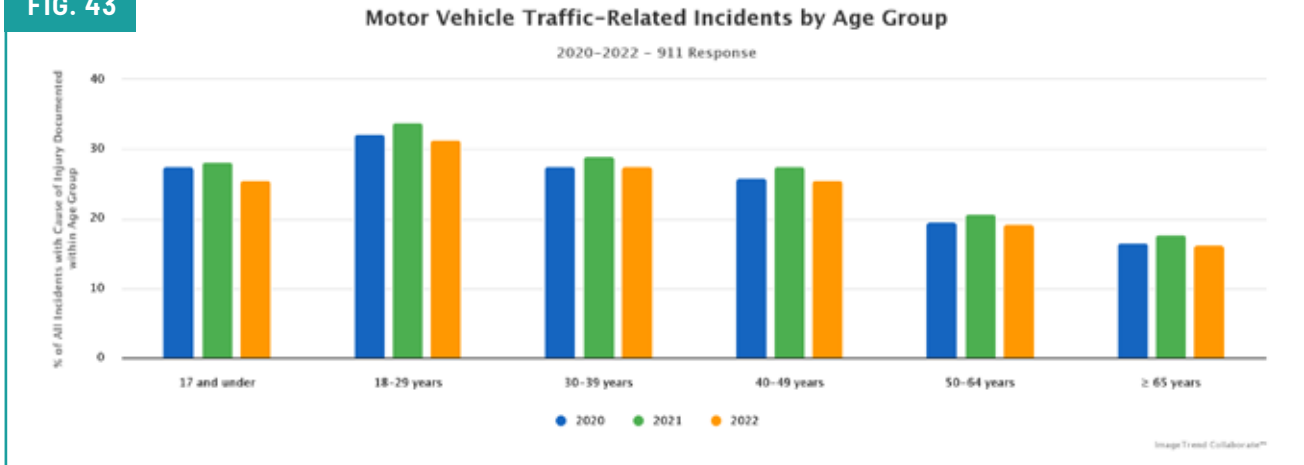
**Serious Motor Vehicle Traffic-Related Incidents by Initial Patient Acuity**

2018-2022 - 911 Response



The 18-29 year old age group had the highest proportion of incidents (31-34%) (Fig. 43). Males accounted for 53% of motor vehicle traffic incidents (Fig. 44) and 42% of incidents were of White race, and 23% unknown race (not all EMS agencies collect race demographics) (Fig. 45).

**FIG. 43**

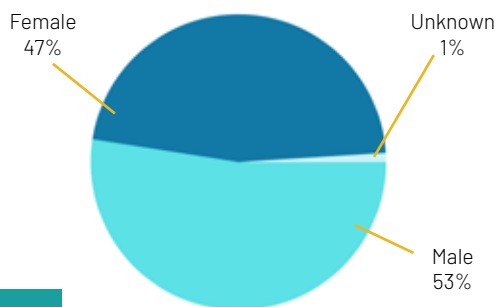


**8% OF 911 RESPONSE MOTOR VEHICLE TRAFFIC INCIDENTS HAD EVIDENCE OF ALCOHOL OR SUBSTANCE USE**

**2020-2022**

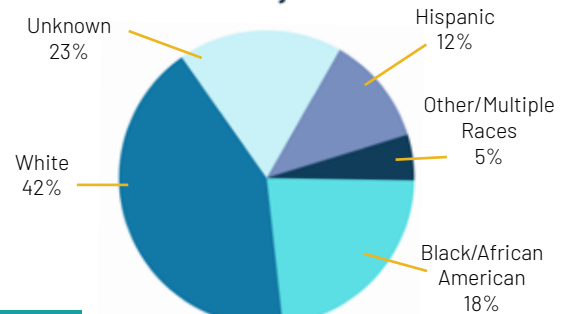


**Motor Vehicle Traffic-Related Incident by Sex**



**FIG. 44**

**Motor Vehicle Traffic-Related Incident by Race**



**FIG. 45**

**ALMOST 5% OF MOTOR VEHICLE  
TRAFFIC INCIDENTS INVOLVED A  
PEDESTRIAN IN 2020 AND INCREASED  
BY 50% IN 2022 (7.2%).**



## **Post-Crash Care**

22% of motor vehicle traffic accidents that were treated and transported had trauma team pre-arrival notifications and 16% of motor vehicle traffic incidents that were treated and transported were taken to trauma centers. If they had a final patient acuity (eDisposition.19) of "critical", almost 60% of patients were transported to a trauma center, which is similar to other findings.<sup>31</sup>

The purpose of identifying trauma center criteria is to ensure patients are receiving appropriate care for traumatic injuries.<sup>32</sup> The top three most identified criteria for trauma centers included: Glasgow Coma Score  $\leq 13$  (29%), High Risk Auto Crash (25%), and Auto/Pedestrian, Auto/Bike or Motorcycle Crash with Significant Impact (14%) (Table 8). Almost 60% of patients that were transported to a designated trauma center did not have trauma center criteria (eInjury.05) documented.

**2020-2022**

**8% OF MOTOR  
VEHICLE TRAFFIC  
INCIDENTS HAD  
TRAUMA CENTER  
CRITERIA**







**OVER 7% OF MOTOR VEHICLE  
TRAFFIC INCIDENTS INVOLVED  
A MOTORCYCLE FROM 2020  
THROUGH 2022. HELMET USE  
WAS DOCUMENTED IN ALMOST  
40% OF THESE INCIDENTS.**

**53% OF MOTOR VEHICLE TRAFFIC  
INCIDENT PATIENTS ARE MALE**

**2020-2022**



**ALMOST 9% OF MOTOR  
VEHICLE TRAFFIC  
INCIDENTS INVOLVED  
SUBSTANCE USE IN  
2020, THIS DECLINED  
TO 7% IN 2022.**

**Table 8. Top 3 Trauma Center Criteria (eInjury.05)  
for Motor Vehicle Traffic Incidents<sup>a-b</sup>**

Glasgow Coma Score ≤ 13	29.4%
High Risk Auto Crash	24.6%
Auto/Pedestrian, Auto/Bike or Motorcycle Crash with Significant Impact	14.0%

<sup>a</sup>Can have multiple selections.

<sup>b</sup>Values have been expanded beyond NEMSIS values at the request of ImageTrend clients.

**12% OF MV TRAFFIC INCIDENTS  
HAD AT LEAST 1 TRAUMA  
CENTER CRITERIA (EINJURY.03)**

**2020-2022**



References:

29. United States Department of Transportation. (2023). The Economic and Societal Impact of Motor Vehicle Crashes, 2019 (Revised). <https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/813403>. Accessed 10 May 2023.
30. United States Department of Transportation. (2023). NHTSA Estimates for 2022 Show Roadway Fatalities Remain Flat After Two Years of Dramatic Increases. <https://www.nhtsa.gov/press-releases/traffic-crash-death-estimates-2022>. Accessed 10 May 2023.
31. United States Department of Transportation. January 2022. National Roadway Safety Strategy. <https://www.transportation.gov/sites/dot.gov/files/2022-02/USDOT-National-Roadway-Safety-Strategy.pdf>. Accessed 10 May 2023.
32. Sasser SM, Hunt RC, Faul M, Sugerman D, Pearson WS, Dulski T, et al. (2012). Guidelines for field triage of injured patients: recommendations of the National Expert Panel on Field Triage, 2011. Morbidity and Mortality Weekly Report: Recommendations and Reports, 61(1), 1-20.

## Summary/Key Findings

### OVERVIEW



**52%** OF EMERGENT INCIDENTS RESULTED IN A PATIENT BEING TREATED & TRANSPORTED BY EMS.



**40%** OF EMERGENT INCIDENTS WITH PATIENT CONTACT ARE FROM PATIENTS 65+ YEARS AND OLDER.



**12%** OF EMERGENT INCIDENTS WITH PATIENT CONTACT RESULTED IN PATIENT REFUSING CARE AND/OR TRANSPORT AGAINST MEDICAL ADVICE.

### RESPIRATORY ILLNESSES



**9%** OF EMERGENT INCIDENTS WERE RELATED TO RESPIRATORY ILLNESSES.



**4%** OF EMERGENT INCIDENTS WERE INFLUENZA OR COVID-19-LIKE ILLNESSES RELATED.



THERE HAS BEEN A **34%** INCREASE IN EMERGENT RESPIRATORY ILLNESSES SINCE 2020 IN PEDIATRIC (17 YEARS AND YOUNGER) PATIENTS.

### BEHAVIORAL HEALTH



**11%** OF EMERGENT INCIDENTS ARE RELATED TO BEHAVIORAL HEALTH.



**67%** OF EMERGENT BEHAVIORAL HEALTH INCIDENTS ARE TREATED AND TRANSPORTED BY EMS.



"UNSPECIFIED MENTAL DISORDERS" ACCOUNT FOR AT LEAST **25%** OF PRIMARY PROVIDER IMPRESSIONS FOR ALL AGE GROUPS.

### SUSPECTED ALCOHOL & SUBSTANCE USE



**7%** OF EMERGENT INCIDENTS ARE RELATED TO ALCOHOL USE AND ANOTHER **4%** IS DUE TO OTHER SUBSTANCE USE.



ALCOHOL AND SUBSTANCE USE HAVE DECLINED BY **17%** AND **22%** SINCE 2020.



NALOXONE WAS ADMINISTERED IN **16%** OF ALL SUBSTANCE USE-RELATED INCIDENTS AND **39%** IN OPIOID-RELATED INCIDENTS.

### INJURIES



**4.6** MILLION INJURY INCIDENTS OR **23%** OF ALL 911 RESPONSE INCIDENTS WITH PATIENT CONTACT.



**11%** OF INJURY-RELATED INCIDENTS THAT WERE TREATED AND TRANSPORTED RECEIVED PAIN MEDICATION.



**45%** OF 911 RESPONSE, TREATED AND TRANSPORTED, AND MET TRAUMA CENTER CRITERIA (EINJURY.03) PATIENTS WERE TRANSPORTED TO A DESIGNATED TRAUMA CENTER.

### MOTOR VEHICLE TRAFFIC INCIDENTS



MOTOR VEHICLE TRAFFIC INCIDENTS IS **2ND** LEADING CAUSE OF INJURIES.



OVER **7%** OF MOTOR VEHICLE TRAFFIC INCIDENTS INVOLVED A MOTORCYCLE FROM 2020- 2022. HELMET USE WAS DOCUMENTED IN ALMOST **40%** OF THESE INCIDENTS.



**60%** OF INCIDENTS WITH A FINAL PATIENT ACUITY OF "CRITICAL" WERE TRANSPORTED TO A TRAUMA CENTER.

# Appendix A: Definitions & Topic Inclusion Criteria

## EMS SYSTEMS DATA DICTIONARY

### National Emergency Medical Services Information System (NEMSIS) V3.4.0

[https://nemsis.org/media/nemsis\\_v3/release-3.4.0/DataDictionary/PDFHTML/DEMEMS/index.html](https://nemsis.org/media/nemsis_v3/release-3.4.0/DataDictionary/PDFHTML/DEMEMS/index.html)

**Safe Harbor Regulations:** HIPAA Safe Harbor de-identification is the process of the removal of specified identifiers of the patient, and of the patient's relatives, household members, and employers. De-identified health information neither identifies nor provides a reasonable basis to identify a patient.

## TOPICS

**Alcohol Incidents:** Defined by capturing information from provider impressions (eSituation.11 or eSituation.12), patient symptoms (eSituation.09 or eSituation.10), or alcohol/drug use indicators (eHistory.17). Terms searched were "intoxicate," "intoxication," and "alcohol."

**Behavioral Health Incidents:** Defined by capturing information from provider impressions (eSituation.11 or eSituation.12) or patient symptoms (eSituation.09 or eSituation.10). Terms searched were "behavioral, stress (excluded terms: respiratory distress), schizo, psychotic, manic, bipolar, personality, emotional, depressive or depression, suicidal or suicide, anxiety, agitation, violent behavior, mental."

**COVID-19-Like-Illness (CLI):** Medical diagnosis of possible COVID-19 or other illness causing a set of common symptoms.

**Influenza-Like-Illness (ILI):** Medical diagnosis of possible influenza or other illness causing a set of common symptoms.

**Injuries:** Defined by capturing information from eSituation.11, eSituation.12, and eInjury.01 using ICD-10-CM Codes S00-T88 or eInjury.02 was "Yes."

**Motor Vehicle Traffic Incidents:** Defined by capturing information from injury causes (eInjury.01). Terms [https://www.cdc.gov/nchs/data/ice/icd10\\_transcode.pdf](https://www.cdc.gov/nchs/data/ice/icd10_transcode.pdf).

**Respiratory Illnesses:** Defined by capturing from eSituation.11, eSituation.12, and eSituation.09 using ICD-10-CM Codes B97.2, B97.4, J00-J18, J20-J22, P22, R05, R06, U07.

**Substance Use:** Defined by capturing information from eSituation.11, eSituation.12 or eSituation.09 or alcohol/drug use indicators (eHistory.17) using ICD-10-CM Codes F10-F19.

## DEFINITIONS

**911 Response:** Defined by utilizing eResponse.05. These were incidents where 911 service (emergent or immediate) was requested (e.g., 911, direct dial, walk-in, flagging down, air ambulance scene).

**Electronic Patient Care Reporting (ePCR):** Utilized to document patient information such as demographics, location, history, care/treatment provided, etc.

**Geriatric Incidents:** Defined by patients with documented age of 65 years or older.

**Interfacility Transport:** Any transfer, after initial assessment and stabilization, from and to a healthcare facility, to include specialty hospitals, for the purpose of continuation of acute care.

**Patient Contact:** Defined by utilizing eDisposition.12. These were incidents where a patient was available for evaluation and/or treatment.

**Pediatric Incidents:** Defined by patients with documented age of 17 years or younger.



## About ImageTrend

ImageTrend, Inc. is dedicated to connecting life's most important data in the healthcare and emergency response community. We deliver software solutions, data analytics and services for EMS, hospitals, community paramedicine/mobile integrated healthcare programs (CP/MIH), critical care, fire, and preparedness to enable fully integrated patient-centric healthcare and public safety. Our commitment to innovation, our clients, and providing world-class implementation and support is unsurpassed. Based in Lakeville, Minnesota, we combine business analysis, creative design, and data-driven architecture to offer scalable solutions and strategies for today and the future. | [www.ImageTrend.com](http://www.ImageTrend.com)

Author:  
Morgan K. Anderson  
Clinical & Research Services  
ImageTrend, LLC.

**IMAGETREND®**