

STATE OF IOWA DEPARTMENT OF
Health AND **Human**
SERVICES

2023 Emergency Medical Services
Annual Report

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Acknowledgments

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Executive Summary

To continuously improve and enhance our emergency medical services (EMS) systems across the State of Iowa, the Bureau of Emergency Medical and Trauma Services (BEMTS) has compiled an annual report of data obtained by BEMTS to identify trends, strengths, and opportunities for improvement that our EMS services, clinicians and systems face.

This report utilizes data obtained through the ImageTrend EMS Data Registry, the AMANDA licensure registry, and various programs offered through BEMTS (January 1, 2016 – January 1, 2023).

The following is a brief overview of the data included in the report:

- 10,710 total active EMS clinicians, a decrease of 0.3% from the previous year
 - 747 EMRs, a decrease of 5.0%
 - 6,131 EMTs, a decrease of 1.0%
 - 404 AEMTs, a decrease of 0.2%
 - 3,428 paramedics, an increase of 2.0%
- 61% of rostered positions are identified as volunteer
- 62% first-attempt success rate for certification exams in Iowa, compared to 69% nationally
- 77% of candidates in Iowa ultimately pass certification exams
- 729 authorized services covering 896 service locations
- 455,907 total EMS incidents reported to the state registry for 2022, an average of 640 per service

List of Acronyms

AEMT.....	Advanced Emergency Medical Technician
ALS.....	Advanced Life Support
BEMTS.....	Bureau of Emergency Medical and Trauma Services
BLS.....	Basic Life Support
CCP.....	Critical Care Paramedic
CQI.....	Continuous Quality Improvement
EMR.....	Emergency Medical Responder
EMS.....	Emergency Medical Services
EMSAC.....	Emergency Medical Services Advisory Council
EMSC.....	Emergency Medical Services for Children
EMT.....	Emergency Medical Technician
HHS.....	Iowa Department of Health and Human Services
IFT.....	Interfacility Transport
NEMESIS.....	National Emergency Medical Services Information System
NHTSA.....	National Highway Traffic Safety Administration
NREMT.....	National Association of Emergency Medical Technicians
PA.....	Physician Assistant
PSAP.....	Public Safety Answering Point
RN.....	Registered Nurse

Overview

The emergency medical services industry has faced many challenges over the last several years. A decline in volunteerism coupled with an increase in call volumes has made it difficult for agencies to meet the service demand. Reimbursement rates that fail to keep pace with the increasing cost of providing care have created significant fiscal challenges.

To overcome the challenges, agencies find new, innovative ways to operate more efficiently, accomplish goals, and continue providing quality care to communities. In some areas, agencies are partnering to centralize administrative work, collaborate on training and continuous quality improvement initiatives, and streamline processes and response methods. These efforts create a more regionalized, collaborative system of providing care, enhancing consistency and continuity of care for patients and reducing redundancy in many areas. By utilizing a single standard set of protocols, often developed by a single medical director or by a medical director group, services ensure that the clinical care provided across the region is effective, appropriate, consistent, and meets the current standard of care. These systems can also develop a regional continuous quality improvement (CQI) program, allowing multiple services to participate in a single program rather than requiring each service to build its own CQI program. Such systems have been developed between two individual services, throughout an entire county, or even spanning multiple counties.

As EMS systems develop creative solutions to remain sustainable and practical, local leaders are encouraged to communicate with the Bureau of Emergency Medical and Trauma Services staff to ensure compliance with the Iowa Code and Iowa Administrative Code.

EMS Clinicians

ALL CERTIFIED CLINICIANS

While the data remains concerning regarding the number of EMS clinicians and the staffing issues reported over the last several years, the data shows some positive points that may indicate a shift is beginning to occur. A review of the total number of active certified clinicians on January 1 of the last nine years demonstrates an ongoing decline in the number of clinicians in Iowa, beginning in 2019.

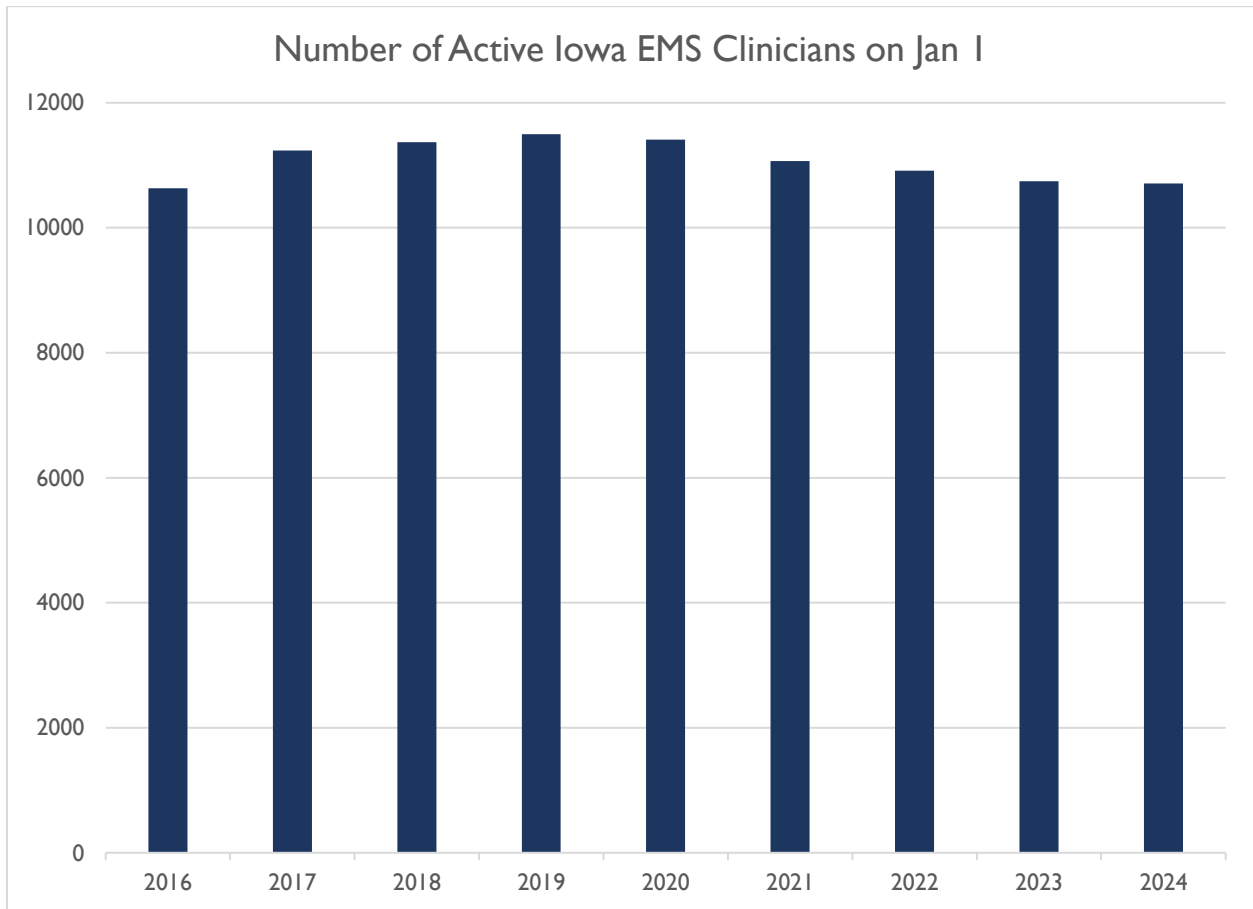


Figure 1: Active EMS Clinicians, Jan 1

However, reviewing the percentage of clinicians lost from year to year, the loss of certified clinicians in 2023, at only 0.3%, was the smallest decline in five years.

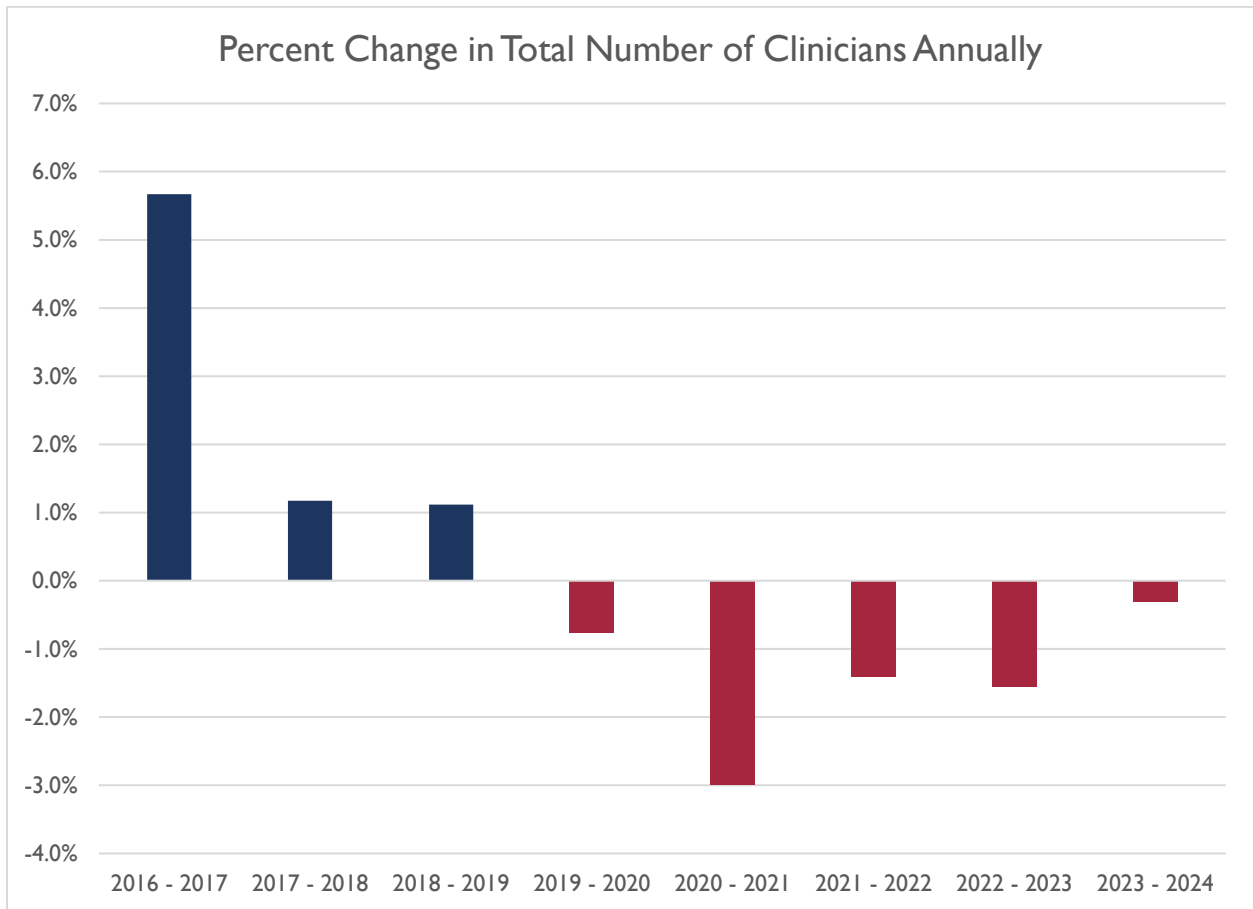


Figure 2: Percent Change in Total Number of Clinicians Annually

EMERGENCY MEDICAL RESPONDER (EMR)

The number of active BLS clinicians continued to trend downward. The number of certified EMRs in Iowa has decreased every year since 2016.

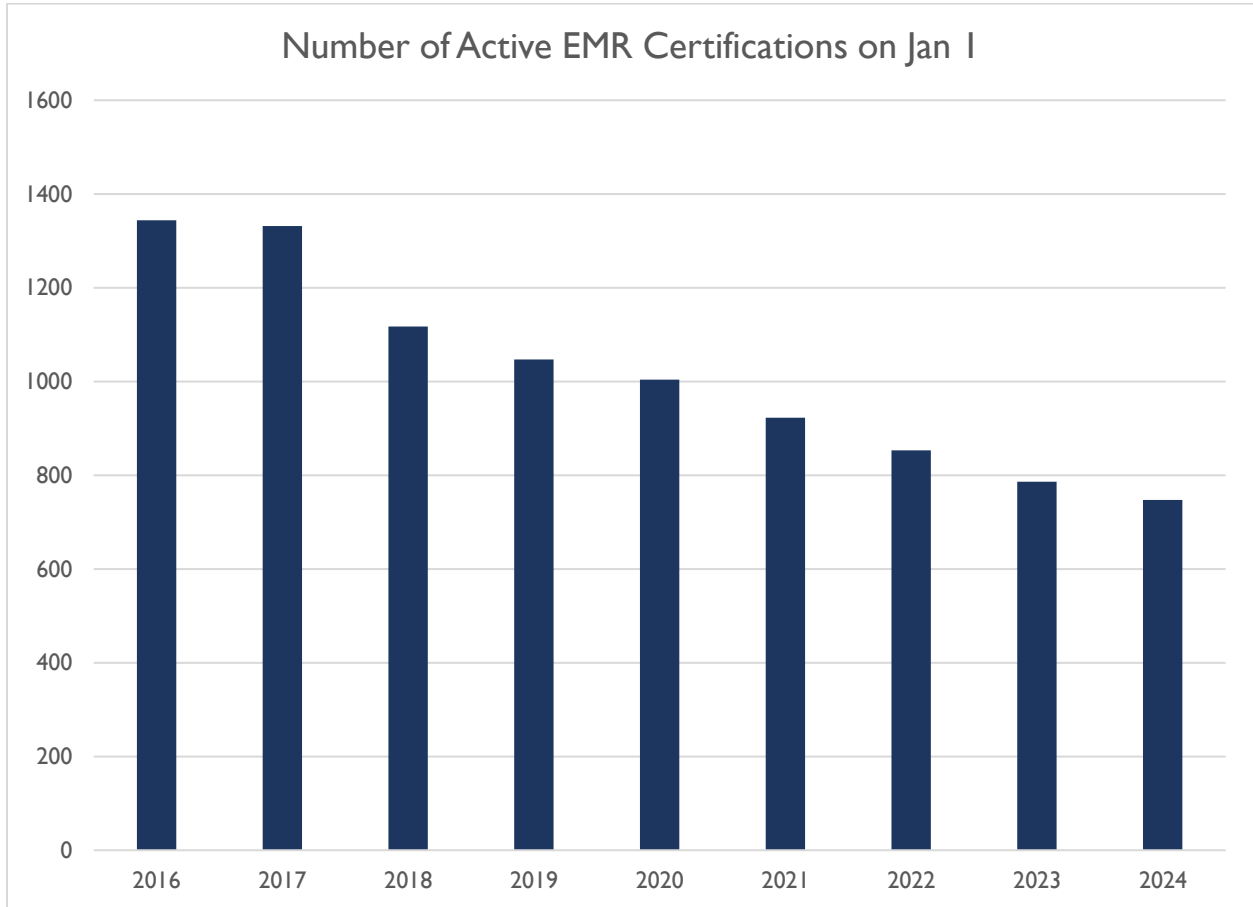


Figure 3: Number of Active EMR Certifications, Jan 1

While still showing a significant loss, the percentage change in the number of EMRs shows a minor change in 2023 compared to the last three years, at -5.0%.

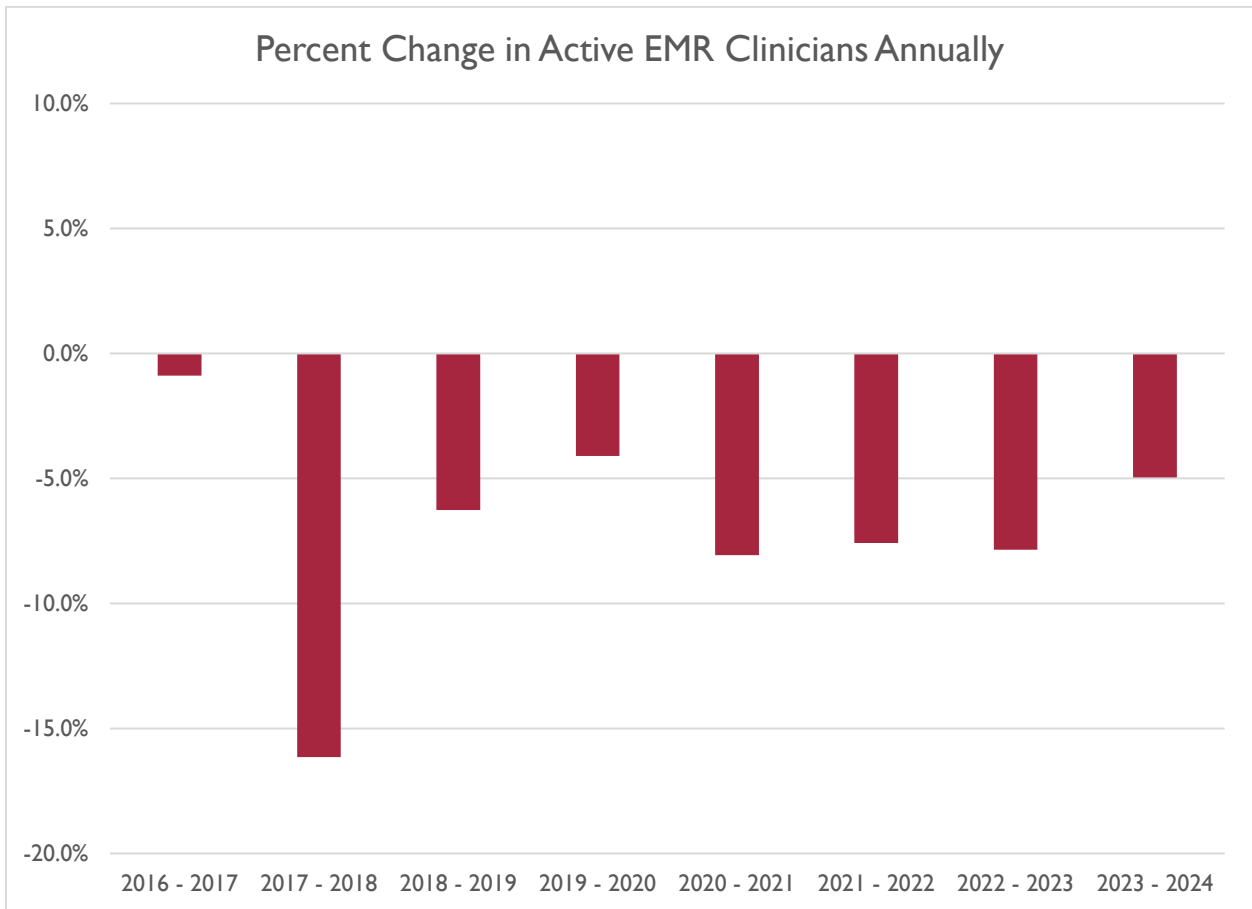


Figure 4: Percent Change in Active EMR Clinicians Annually

EMERGENCY MEDICAL TECHNICIAN (EMT)

The number of certified EMTs in Iowa declined for the seventh consecutive year.

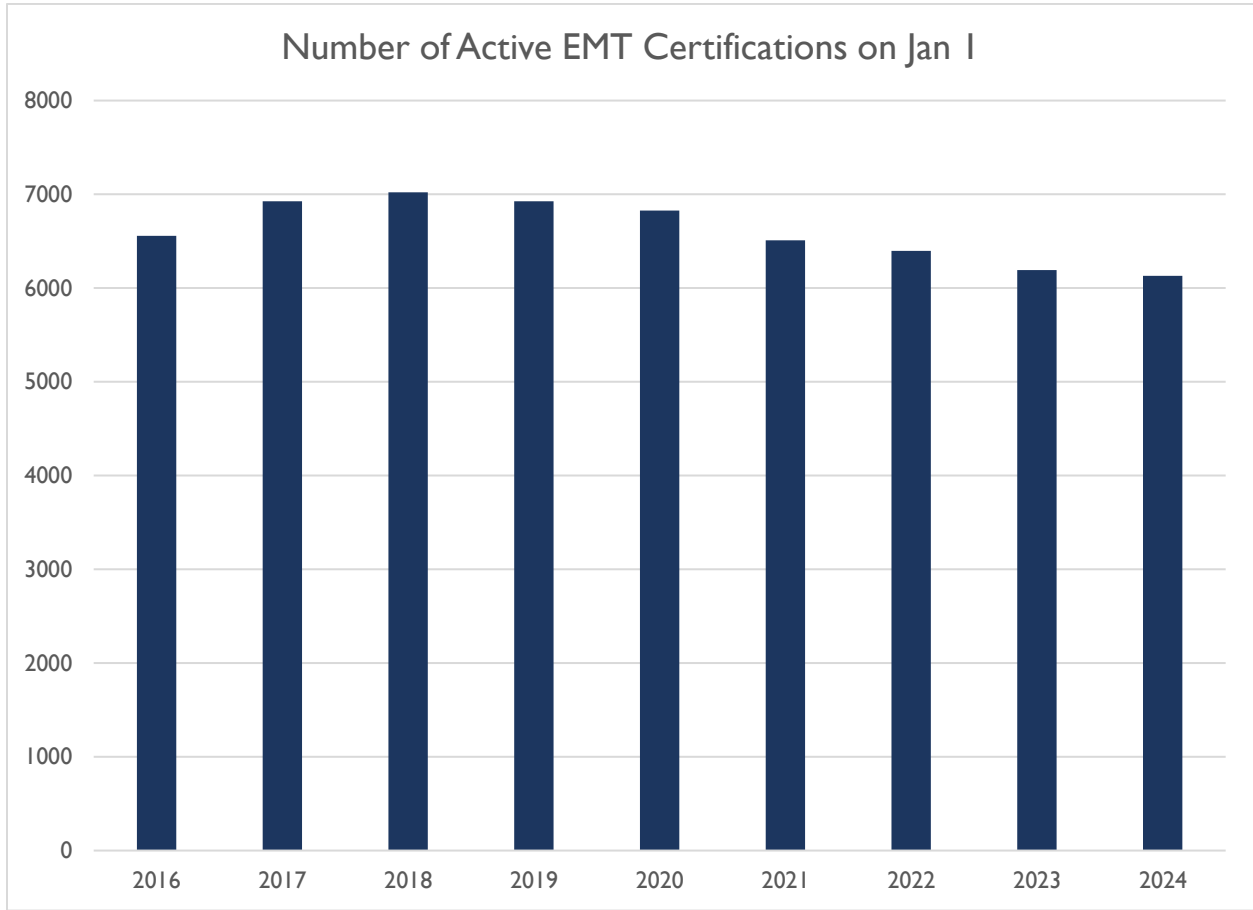


Figure 5: Number of Active EMT Certifications, Jan 1

The percent change in certified EMTs in 2023, at -1.0%, was the smallest decline observed in the last six years.

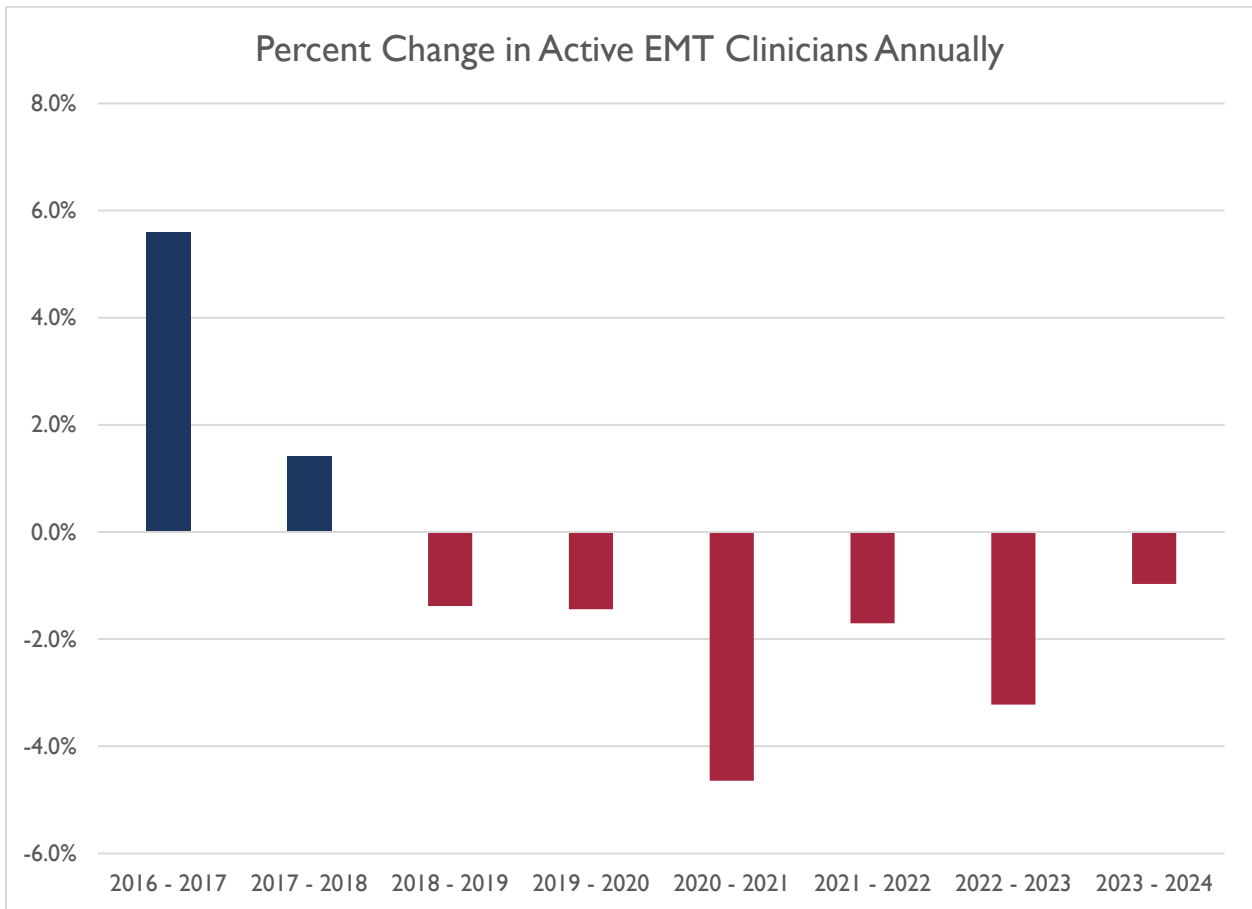


Figure 6: Percent Change in Active EMT Clinicians Annually

ADVANCED EMERGENCY MEDICAL TECHNICIAN (AEMT)

It is important to recognize that AEMTs make up a tiny portion of the total number of EMS clinicians in the state, and the relatively small number can amplify the changes from year to year. Additionally, since the AEMT certification was a new certification offering in the mid-2010s, we saw a significant jump in the first two years of the certification's existence as many clinicians obtained this new level. The number of active AEMTs remained relatively constant for the last several years, with a brief decline followed by a recovery in 2022.

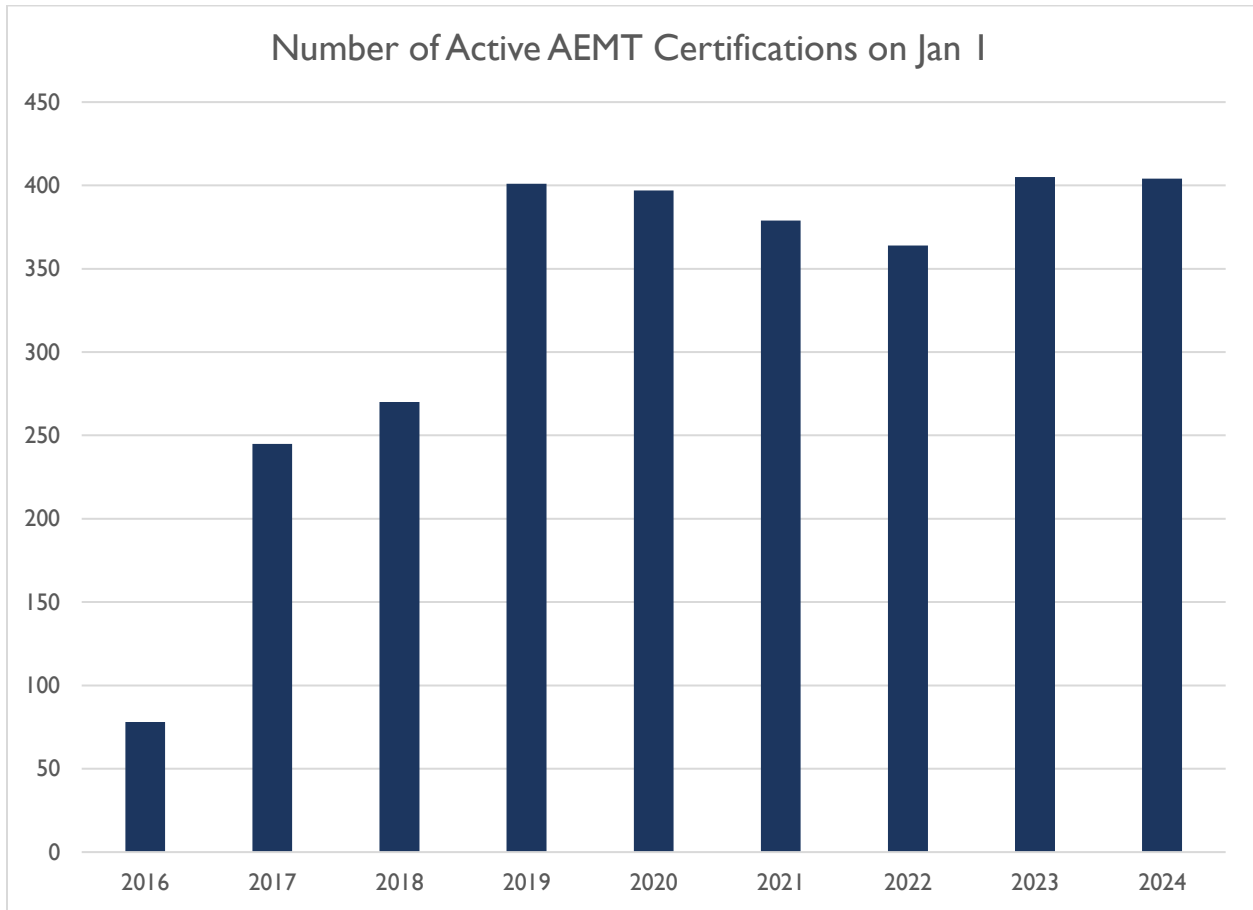


Figure 7: Number of Active AEMT Certifications, Jan 1

The percentage change in AEMTs in 2023 was negligible at 0.2%.

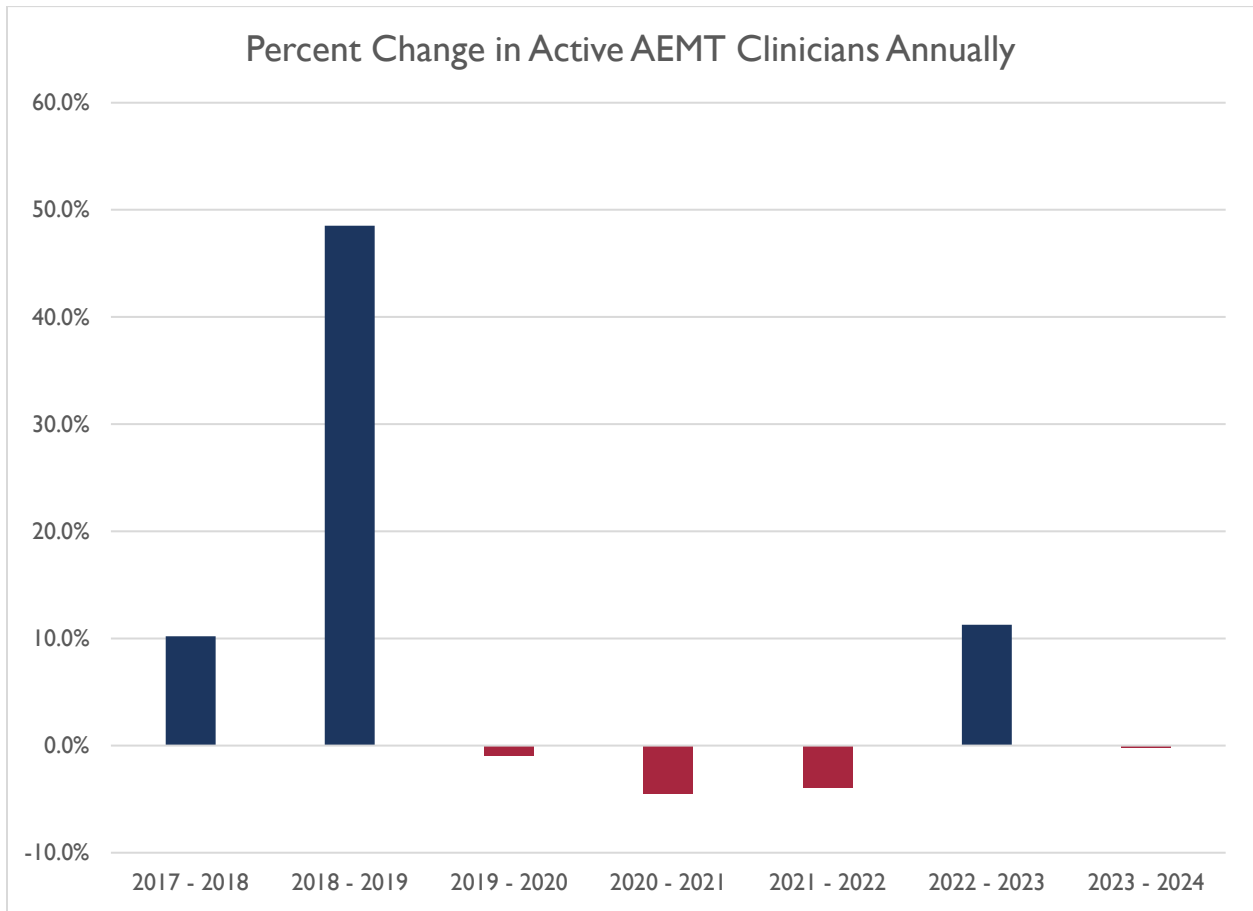


Figure 8: Percent Change in Active AEMT Clinicians Annually

PARAMEDIC

In 2023, the number of actively certified paramedic clinicians in Iowa continued the increase observed over the last several years.

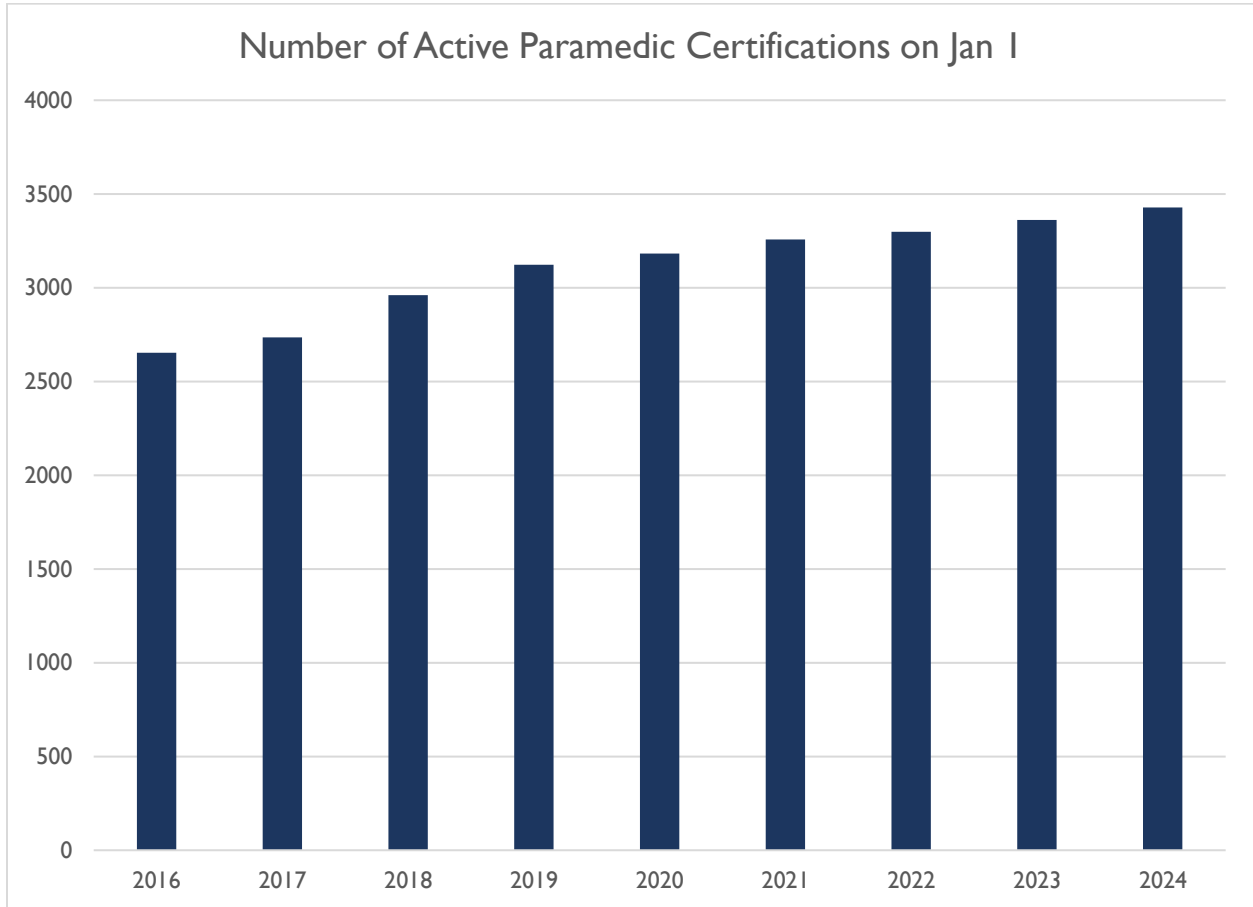


Figure 9: Number of Active Paramedic Certifications, Jan 1

The percentage increase in the number of paramedics in Iowa over the last five years shows a relatively steady climb of 1.2% to 2.4% per year.

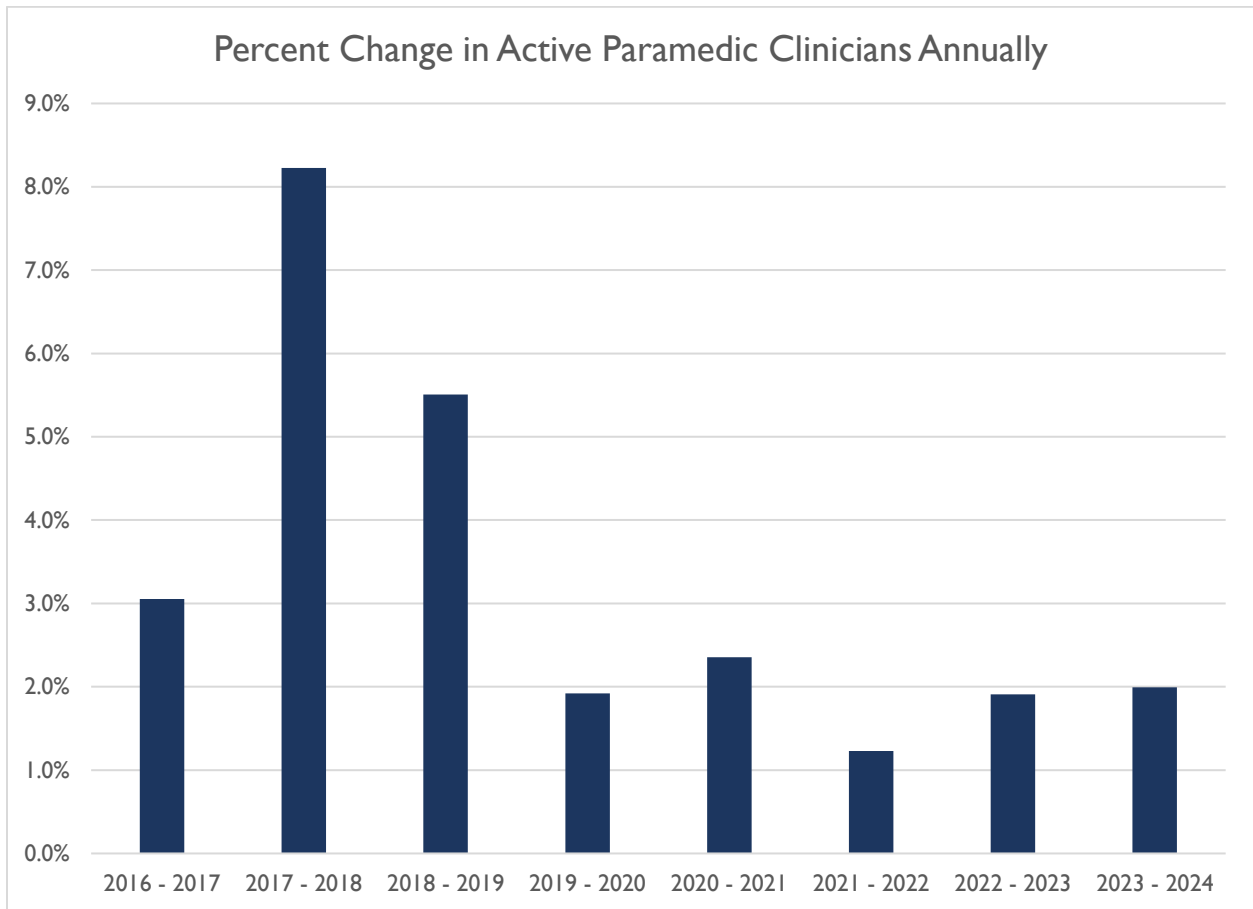


Figure 10: Percent Change in Active Paramedic Clinicians Annually

OVERALL SUMMARY OF CERTIFICATION CHANGES

A closer look at the data shows the various gains and losses at each certification level.

	EMR	EMT	AEMT	Paramedic	
Beginning 2023	786	6191	405	3361	
Gains	New Certification Issued ¹	70	837	9	87
	Transitioned Into this Level ²	1	15	41	186
	Subtotal	857	7043	455	3634
Losses	Did Not Renew ³	99	696	37	204
	Transitioned Out of this Level ⁴	11	216	14	2
Beginning 2024	747	6131	404	3428	

Table 1: Changes in Certification Levels, 2023

¹Individuals who were issued an Iowa certification in 2023 and did not hold an active Iowa certification at the beginning of 2023. This includes first-time certifications and those transferring into Iowa from another state.

²Individuals who held a different level of certification in Iowa at the beginning of 2023 and transitioned into this level during 2023.

³Individuals who held an Iowa certification at the beginning of 2023 but did not renew at this level, nor did they obtain a different level of certification.

⁴Individuals who held this level of certification in Iowa at the beginning of 2023 and transitioned to a different level during 2023.

The figures in the table above show that during 2023, there were 1,003 newly-certified individuals in Iowa across all levels. In addition, a large portion of the decreases was due to certified clinicians obtaining a different level of certification. This is most notable at the EMT level, where 216 clinicians moved to a new certification level, contributing to the decrease in the number of EMTs and the increase in the number of AEMTs and paramedics.

The data above indicates that the EMS industry may be improving recruitment and retention strategies. In addition to minimizing the loss of clinicians last year, there were changes in the trends regarding our EMS clinicians' age in Iowa. It has long been believed that our responders are aging. However, in 2023, there was a 14.2% increase in clinicians in the 17-30-year-old range, indicating a notable rise in younger individuals joining the EMS workforce.

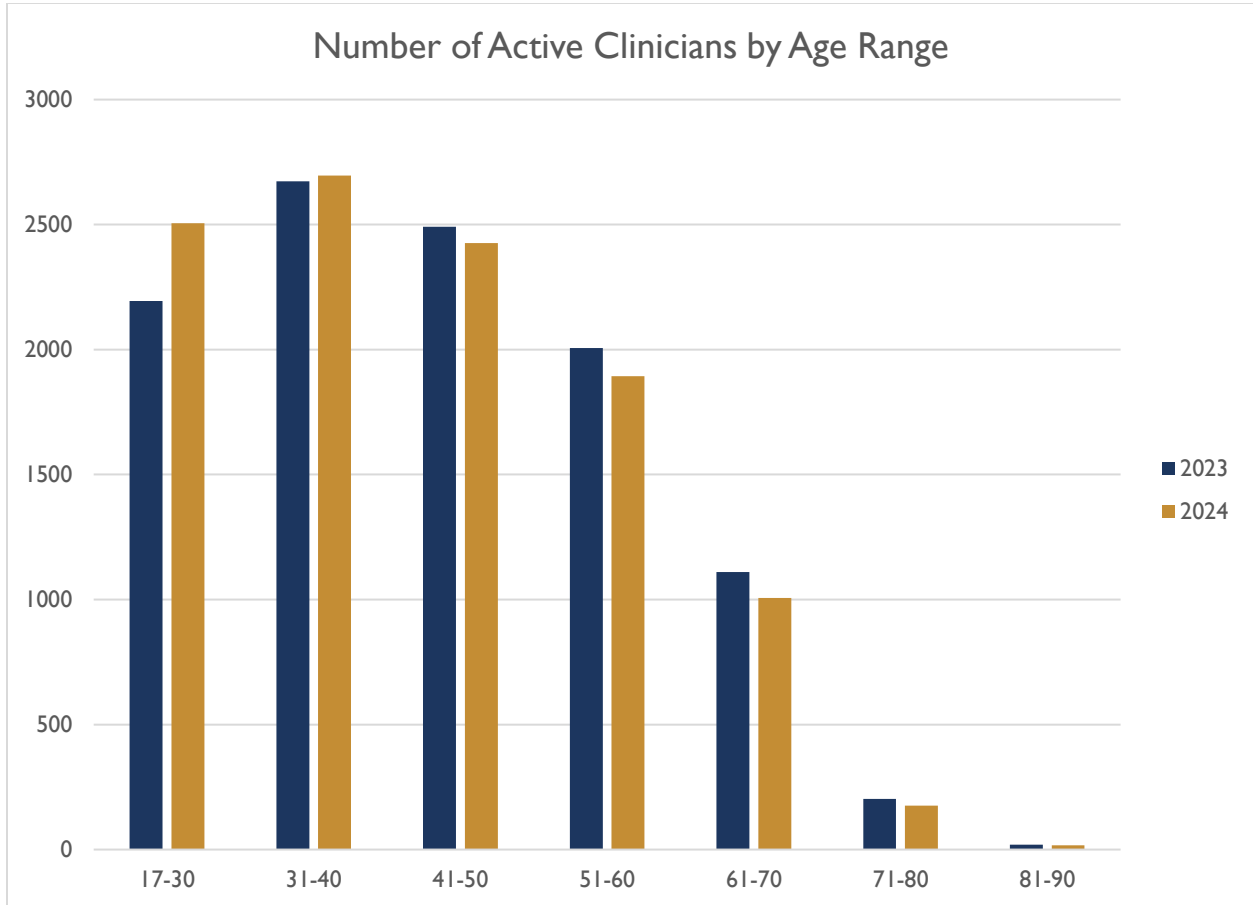


Figure 11: Number of Active Clinicians by Age Range

This influx contributed to a reduction in the average age of an EMS clinician in Iowa from 42.3 years old at the beginning of 2023 to 42.1 years old at the beginning of 2024. This data also indicates an increase in younger, likely less-experienced clinicians and may warrant more stringent orientation and credentialing processes to ensure that Iowa's EMS workforce is highly skilled and proficient.

EMS ENDORSEMENTS

In Iowa, EMS clinicians may qualify for endorsements attached to certifications. These endorsements include the EMS Evaluator, the EMS Instructor, and the Critical Care Paramedic (CCP). The EMS Evaluator allows the clinician to serve as a certified candidate evaluator for the psychomotor exam. The EMS Instructor grants the clinician the ability to function as the primary instructor of an initial education course up to the level of certification. The Critical Care Paramedic is available only to paramedics completing a recognized critical care program. This endorsement authorizes the paramedic to function under an expanded scope of practice.

The number of EMS Evaluator endorsements has remained relatively level over the last four years, while there has been a moderate increase in the number of EMS Instructors and Critical Care Paramedics in Iowa.

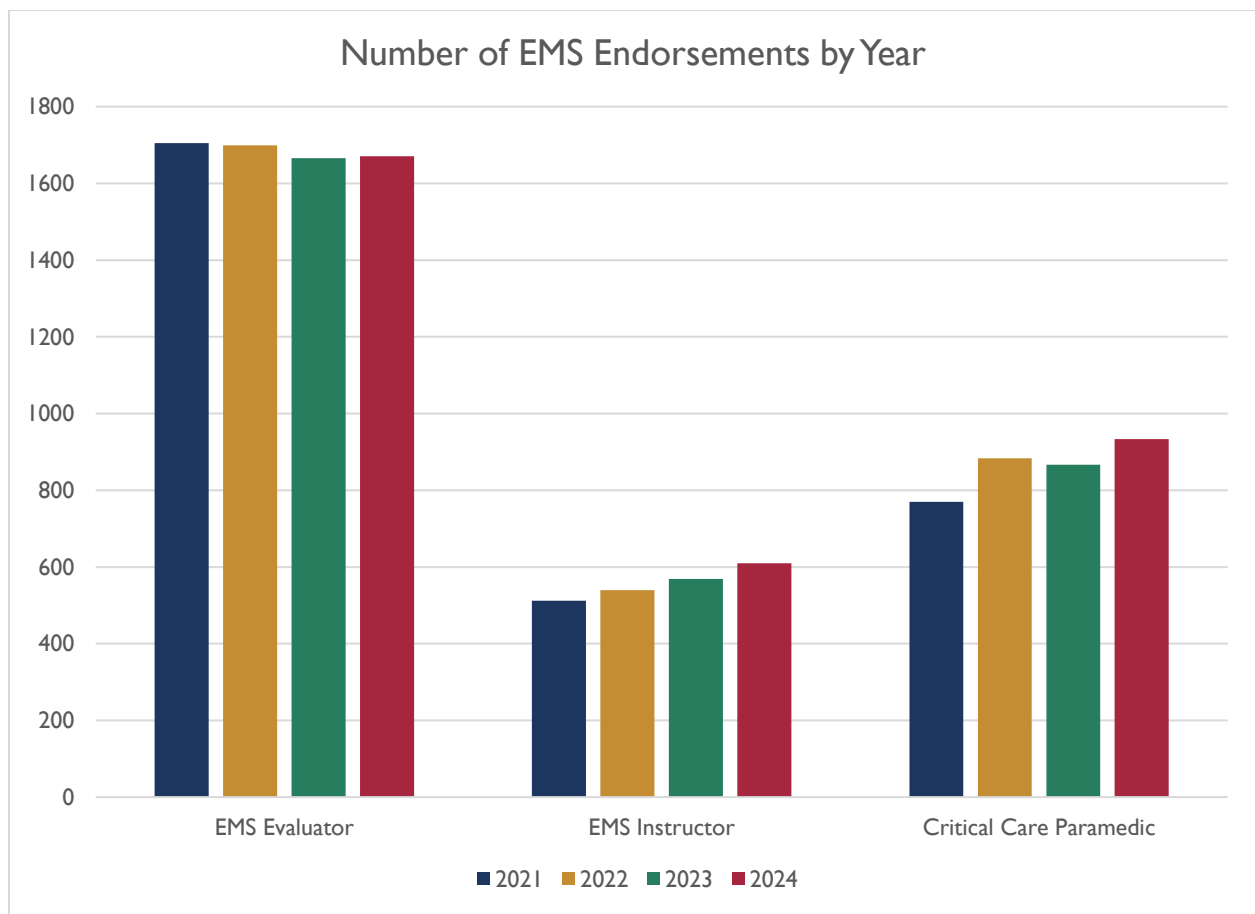


Figure 12: Number of EMS Endorsements by Year

ROSTERED POSITIONS

The total number of rostered positions in Iowa remained generally level in 2023, showing a slight decrease in the number of rostered drivers, EMRs and EMTs and an increase in the number of rostered AEMTs and paramedics. Again, this may indicate the development of more paid, advanced-level positions throughout the state.

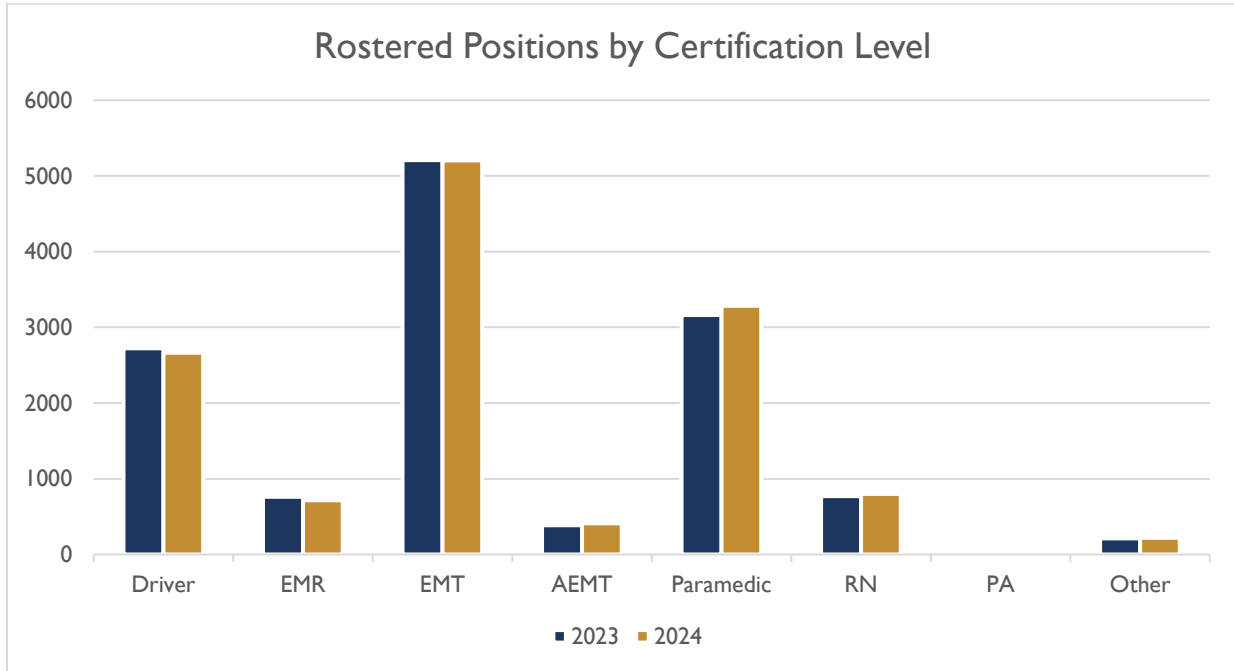


Figure 13: Rostered Positions by Certification Level

EMS Testing

FIRST ATTEMPT PASS RATES

Iowa, along with the vast majority of states, utilizes the National Registry of Emergency Medical Technicians (NREMT) testing process as the certification exam to obtain an Iowa EMS certification. This is a requirement of participation in the national EMS Personnel Licensure Interstate Compact. One part of this testing is a computer-based cognitive test. Candidates have two years from completing their course to pass their NREMT exam, during which time they are allowed six attempts. The first attempt passing rates for Iowa EMS candidates are shown below, separated by certification level attempted for each of the last four years.

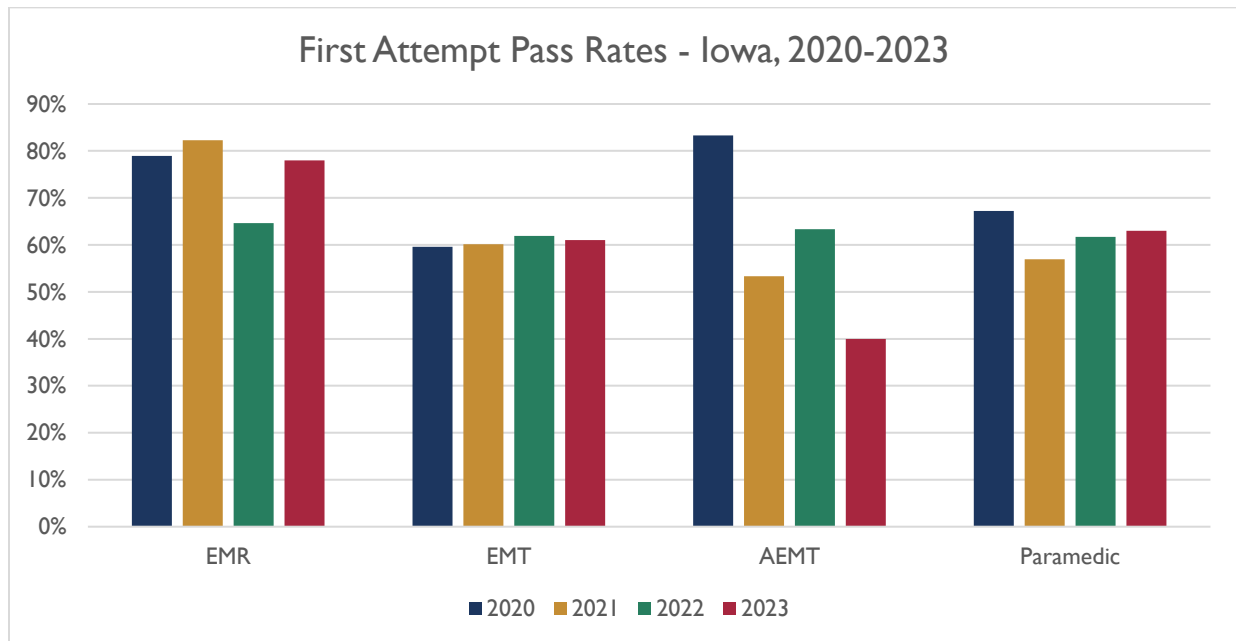


Figure 14: NREMT First Attempt Pass Rates, Iowa 2020-2023

IOWA PASS RATES VS NATIONAL PASS RATES

Compared to the national first-attempt pass rates, Iowa lags behind the national average overall but significantly outpaced the national pass rate at the Emergency Medical Responder level.

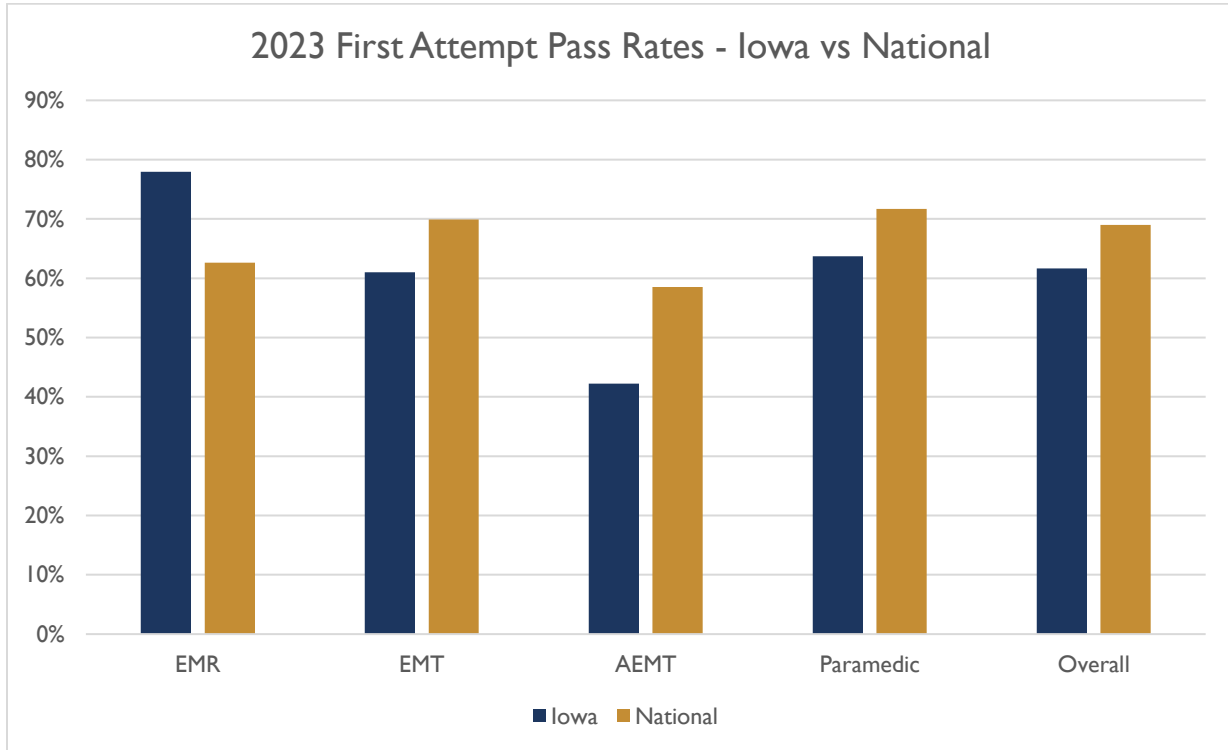


Figure 15: NREMT First Attempt Pass Rates - Iowa vs National

FINAL EMS CANDIDATE DISPOSITIONS

EMS licensure candidates have two years from completing a course to complete the NREMT testing process successfully and may attempt the test as many as six times during that period. For courses ending in 2021, the two years ended in 2023. The final disposition of students completing a course in 2021 is shown in the chart below. Overall, 23% of all EMS students do not complete all testing opportunities within two years and do not become certified clinicians. Fewer than 1% fail all six attempts.

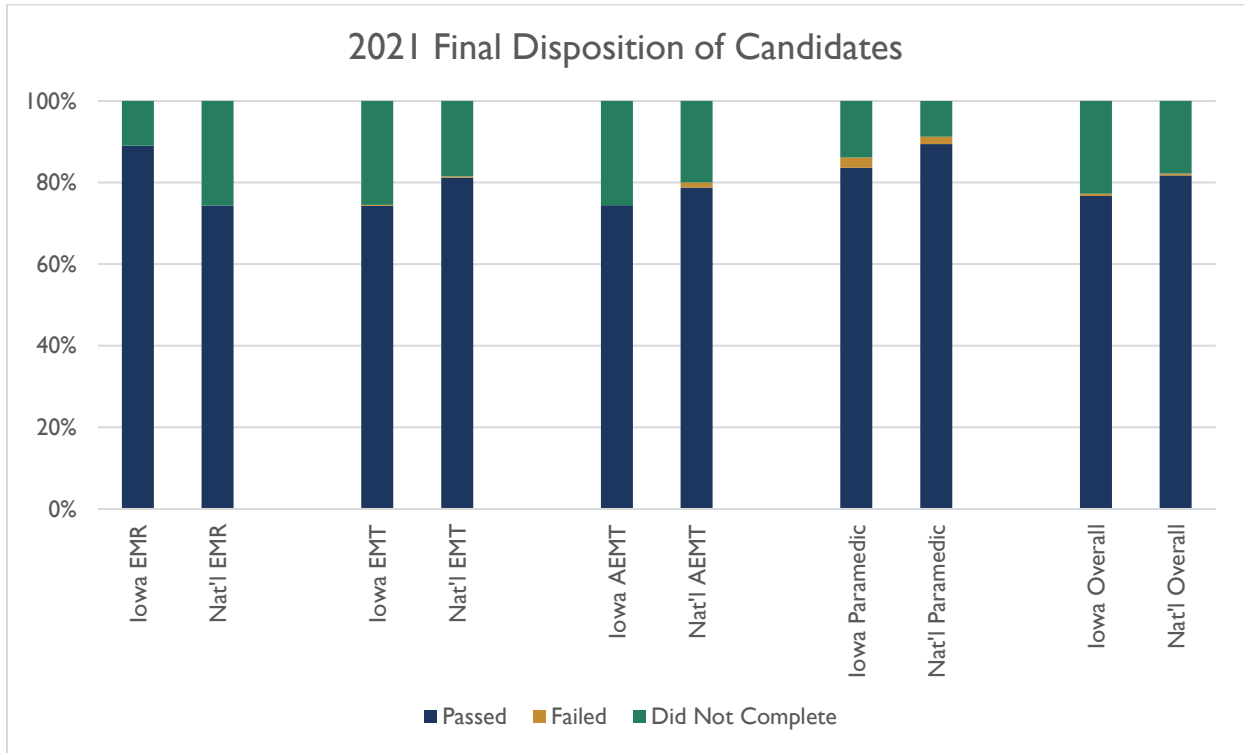


Figure 16: Final EMS Candidate Dispositions, 2021 Courses

EMS Service Programs

AUTHORIZATION TYPES

2023 was a year of many changes in EMS service programs throughout Iowa. Several services changed ownership, changed level of response capability, or changed transport authorization. The state also saw some restructuring of services, often through combining agencies, to offer the same or enhanced response to communities with increased efficiency by consolidating many administrative responsibilities for their regional EMS systems. While a few service locations closed the doors in 2023, some new services have opened to serve communities, resulting in a net loss of only one service location across Iowa.

As of January 1, 2024, 729 authorized services in Iowa were operating from 896 service locations.

During 2023, the state saw several services change transport authorization, resulting in a net increase in the number of service locations providing ambulance transportation over non-transport, on-scene care only.

A review of service authorizations shows that 82% of all services in Iowa have full authorization at the basic life support level, either as Emergency Medical Responder or Emergency Medical Technician services, with the remaining 18% fully authorized at the Advanced Emergency Medical Technician or paramedic level.

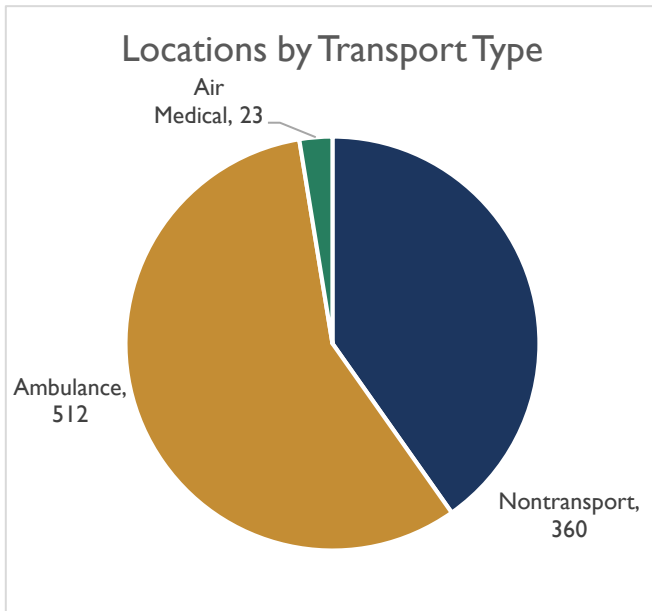


Figure 17: Service Locations by Transport Type

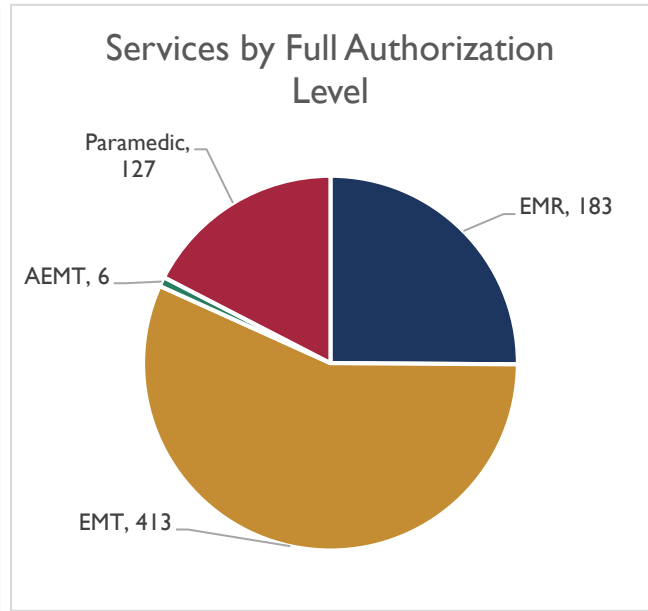


Figure 18: Services by Full Authorization Level

STAFFING TYPES

The majority of EMS service locations in Iowa are staffed utilizing volunteers, at least in part. 63% of services were staffed entirely by volunteers, with another 10% staffed by a combination of paid and volunteer personnel. The remaining 26% of services reported staffing entirely by career personnel.

This data demonstrates the heavy reliance on volunteer clinicians in much of the state.

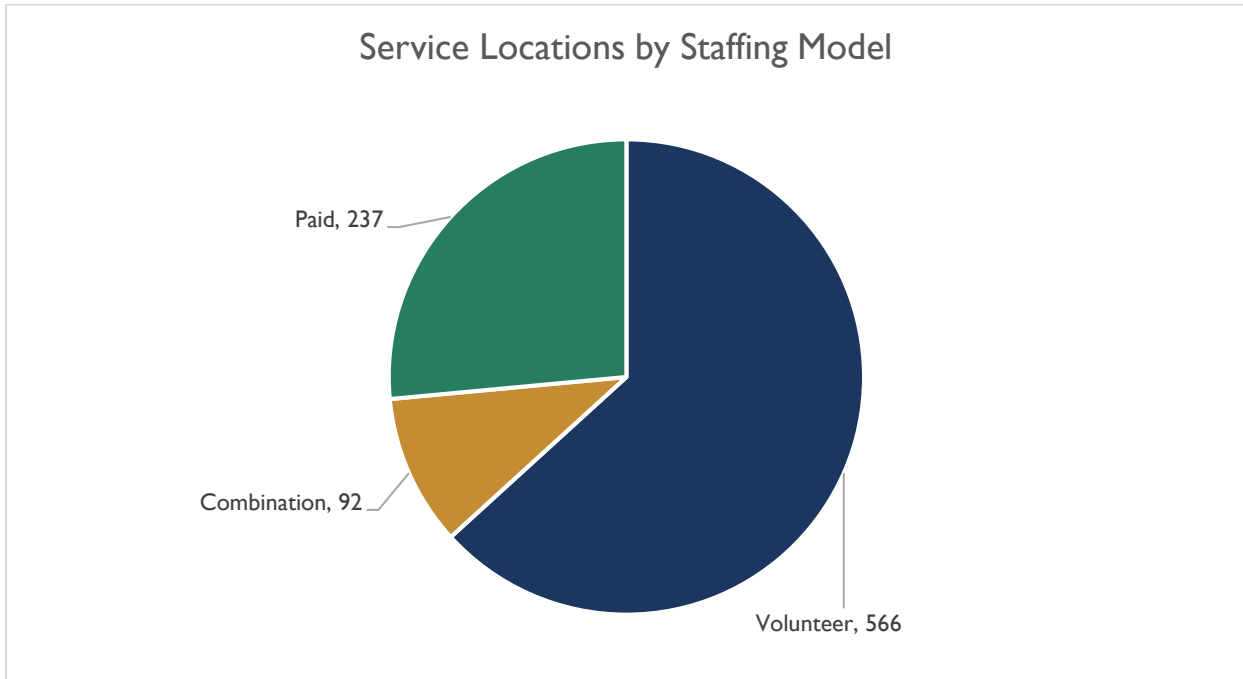


Figure 19: Service Locations by Staffing Model

Incident Data Reporting

2023 DATA REPORTING

In 2023, 455,907 incident data records were submitted to the Iowa ImageTrend registry, an increase of 0.5% over 2022.

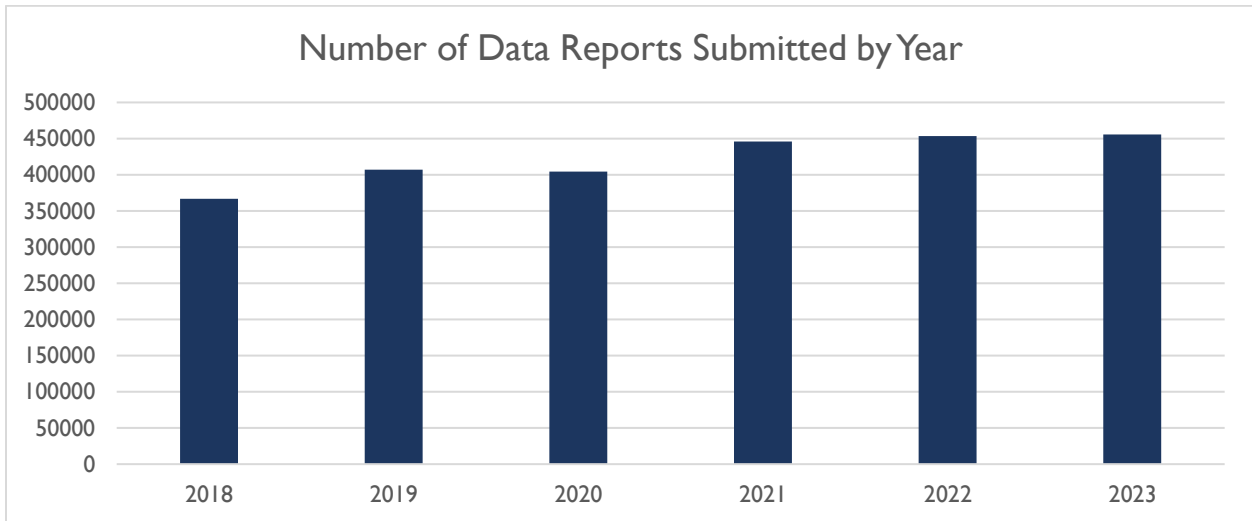


Figure 20: Data Reports Submitted by Year

All authorized EMS service programs in Iowa are required to submit data elements to the state's EMS data registry. BEMTS continues to work with service programs to ensure that all data is counted and all services are accurately represented in our registry. Over the last five years, there has been a steady increase in the number of EMS service programs submitting data. In 2023, 98% of authorized services submitted at least one incident report.

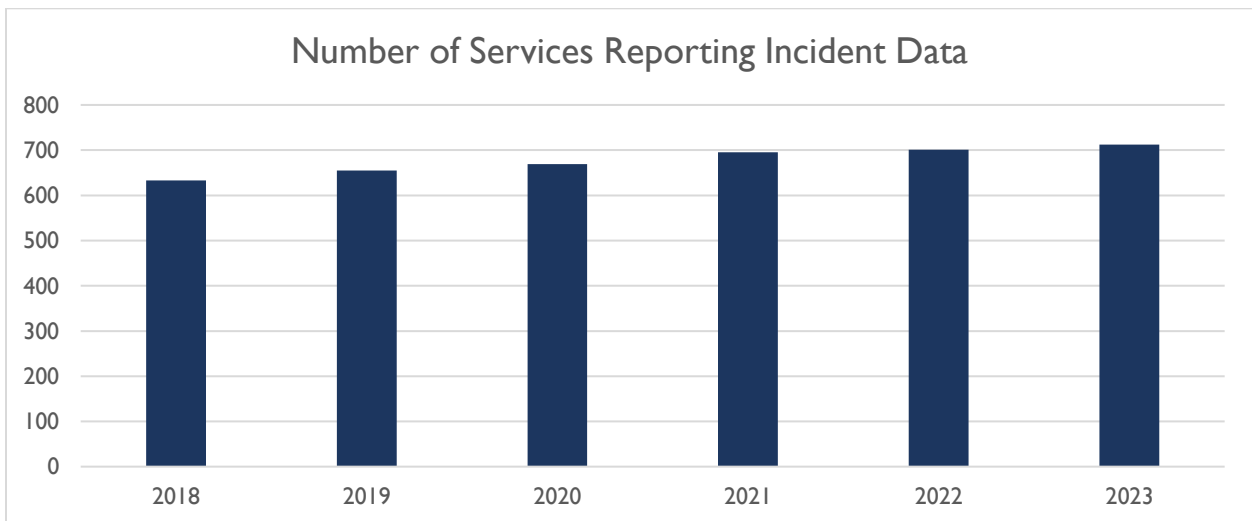


Figure 21: Number of Services Reporting Incident Data to Iowa Registry

The majority of EMS agencies in Iowa reported responding to 100 or fewer calls for service, with more than three-quarters responding to fewer than 500 incidents.

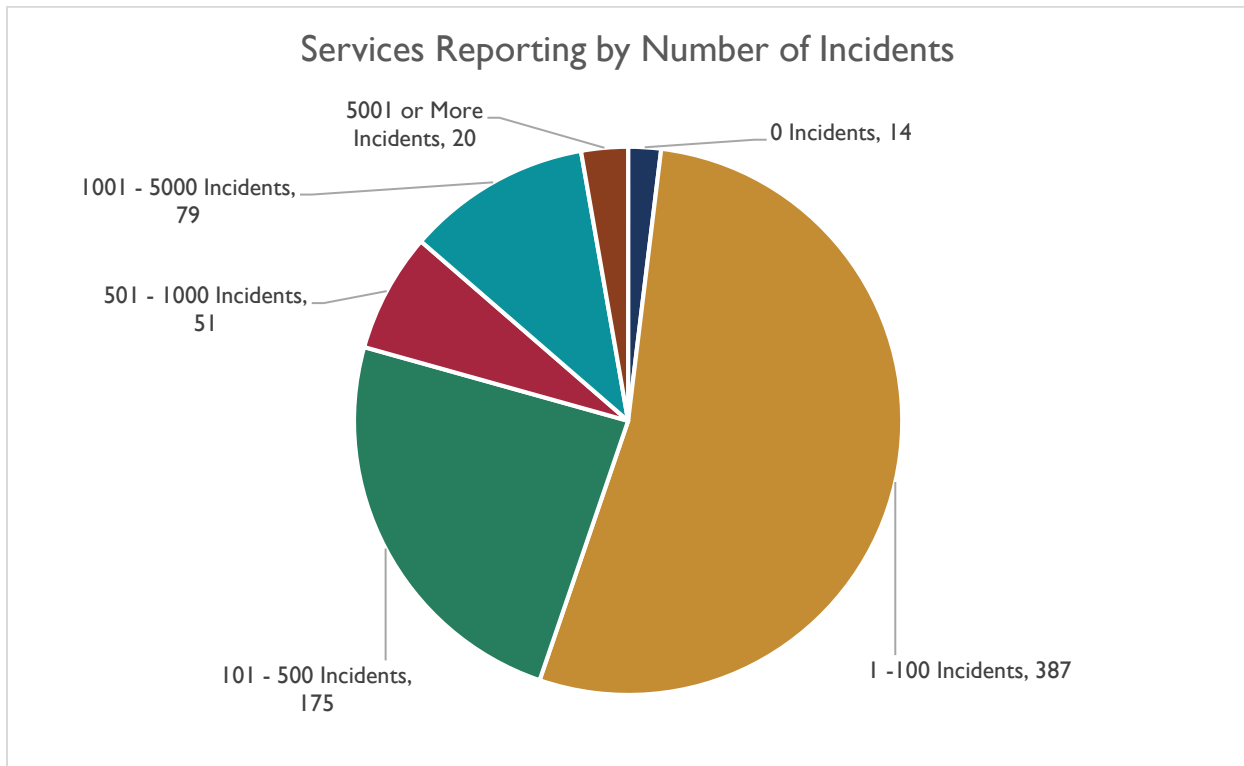


Figure 22: Number of Services Reporting by Number of Incidents Reported

TRANSITION TO NATIONAL EMERGENCY MEDICAL SERVICES INFORMATION SYSTEM (NEMSIS) VERSION 3.5

“The National Emergency Medical Services Information System (NEMSIS) is the national system used to collect, store and share EMS data from the U.S. States and Territories. NEMSIS develops and maintains a national standard for how patient care information resulting from prehospital EMS activations is document. This information is voluntarily submitted to the National EMS Data Repository at NEMSIS by State and Territory EMS Officials.

“NEMSIS is a collaborative system to improve prehospital patient care through the standardization, aggregation, and utilization of point of care EMS data at a local, state, and national level. NEMSIS is a program of NHTSA’s Office of EMS and hosted by the University of Utah.”¹

In the second half of 2023, Iowa adopted the latest version of the National Emergency Medical Services Information System (NEMSIS) standard, version 3.5. This change provided a more effective means of documenting the types of calls to which EMS agencies respond and the disposition of those incidents regarding patient contact, assessment, and transport. The change in the data collection enables EMS clinicians to more accurately and quickly identify these aspects of the incidents and will result in better aggregation and analysis of data at the service, state, and national levels.

The staff of the Bureau of Emergency Medical and Trauma Services aids services in making this transition. Please contact a BEMTS representative if you need assistance with complying with the NEMSIS version 3.5 standard.

For more information about NEMSIS, please visit www.nemsis.org.

¹ What is NEMSIS, nemsis.org/what-is-nemsis/

RESPONSE DATA

EMS is requested for a wide variety of reasons. The twelve most common 911 dispatch reasons from 2023 are listed below. These are the complaints received by the PSAPs and relayed to the EMS services in the initial dispatching information.

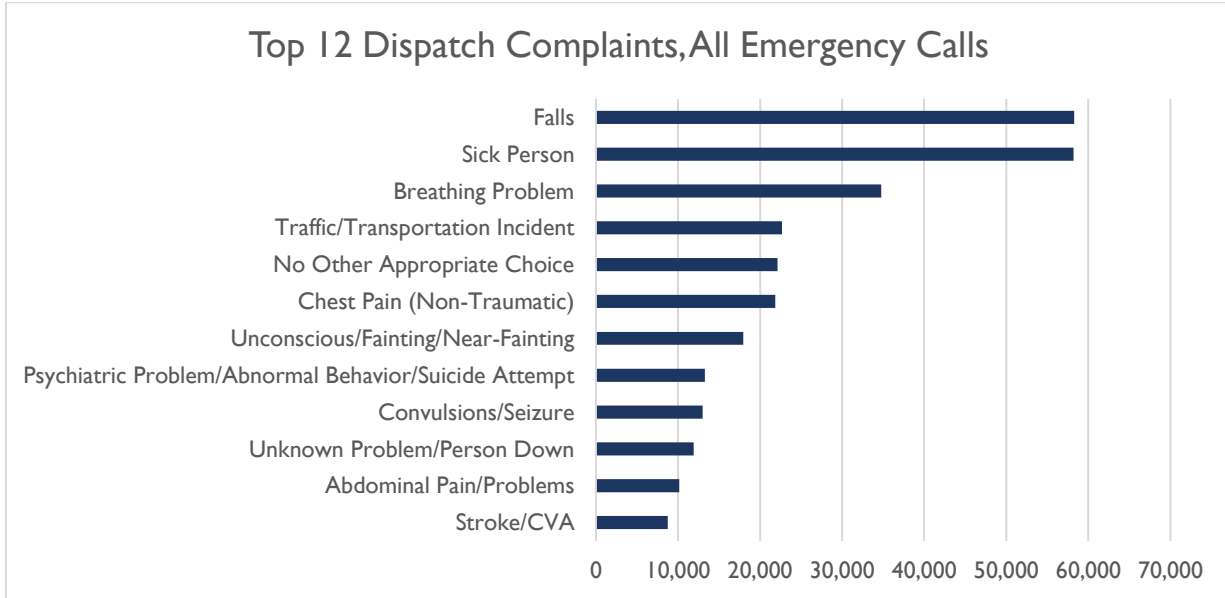


Figure 23: Top 12 Dispatch Complaints, All Emergency Calls

The chart below shows Iowa's 12 most common dispatch complaints for pediatric patients in 2023.

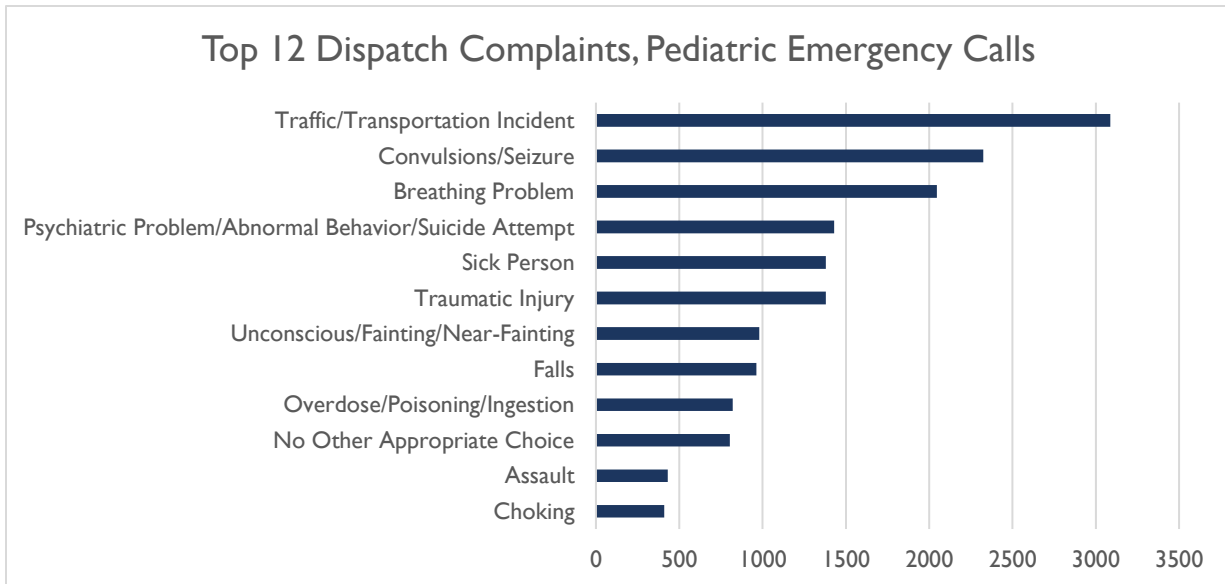


Figure 24: Top 12 Dispatch Complaints, Pediatric Emergency Calls

The Provider's Primary Impression is the most significant condition identified by the EMS clinician following the assessment of the patient, leading to the medical management given to the patient in the form of medications, treatments, or procedures. The tables below list the twelve most common primary impressions for 911 calls for all patient encounters and incidents involving pediatric patients.

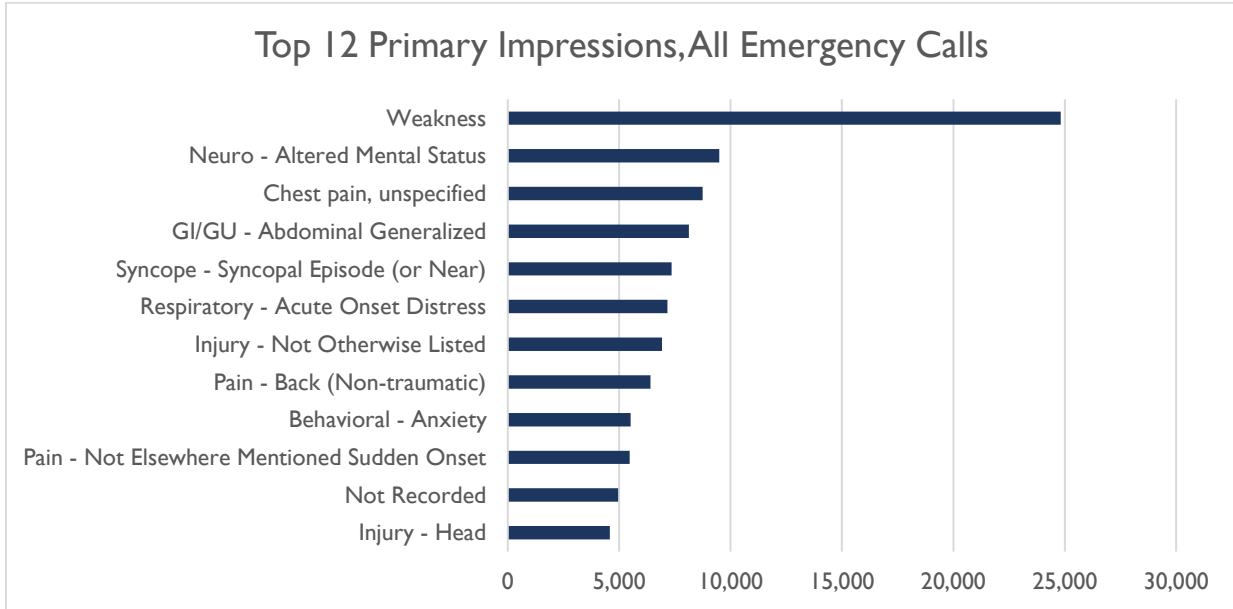


Figure 25: Top 12 Primary Impressions, All Emergency Calls

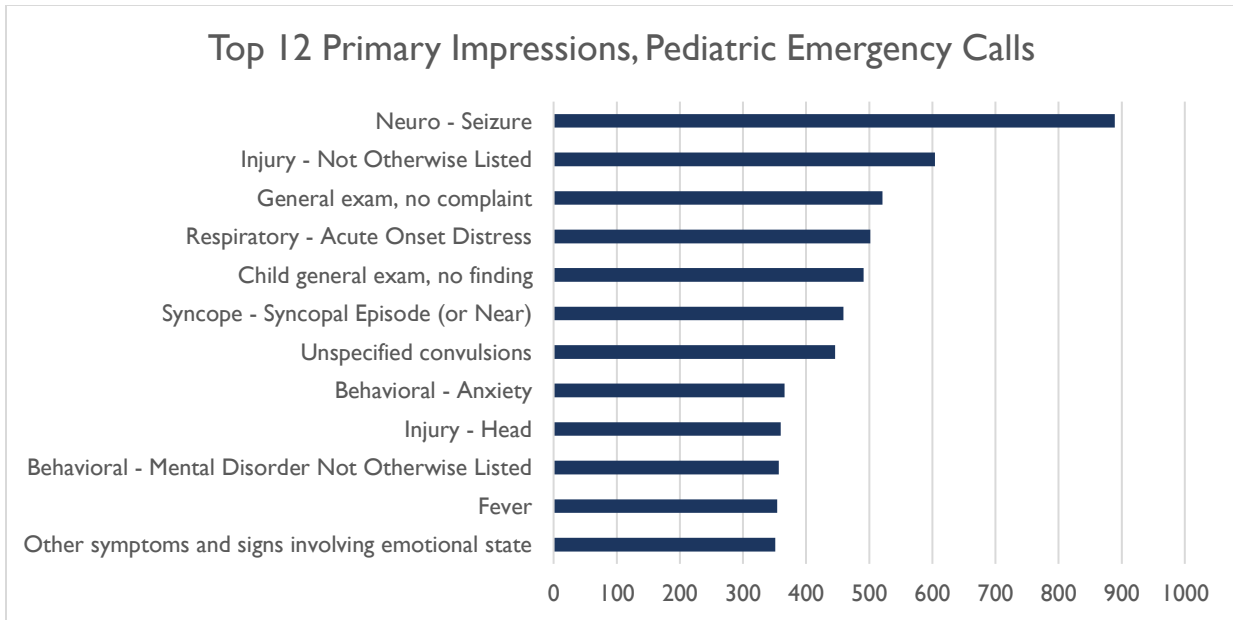


Figure 26: Top 12 Primary Impressions, Pediatric Emergency Calls

Pediatric calls account for only 6% of all patient contacts by EMS in Iowa. Reviewing the list of primary impressions for pediatric emergency calls, three impressions focus on behavioral health emergencies: Behavioral – Anxiety, Behavioral – Mental Disorder Not Otherwise Listed, and Other symptoms and signs involving emotional state. This data suggests that EMS agencies should be prepared to respond appropriately to these calls. They should consider identifying and cooperating with local community resources available to families dealing with behavioral health crises in children.

The most common provider primary impressions for interfacility transports in 2023, are listed in the charts below for all IFT responses and pediatric IFTs.

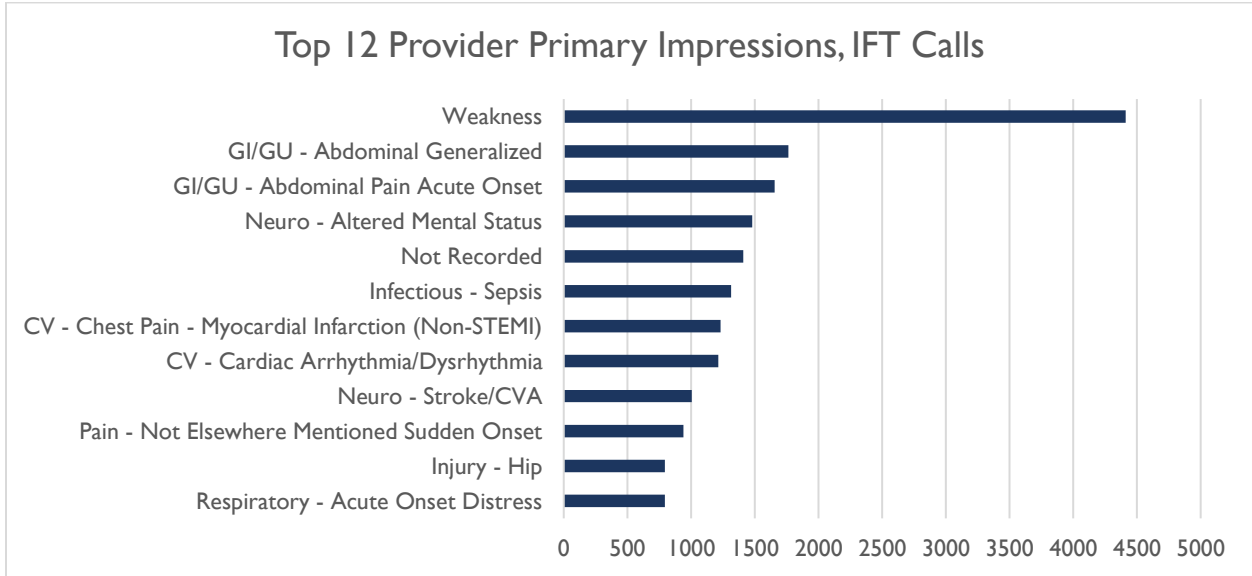


Figure 27: Provider Primary Impressions, IFT Calls

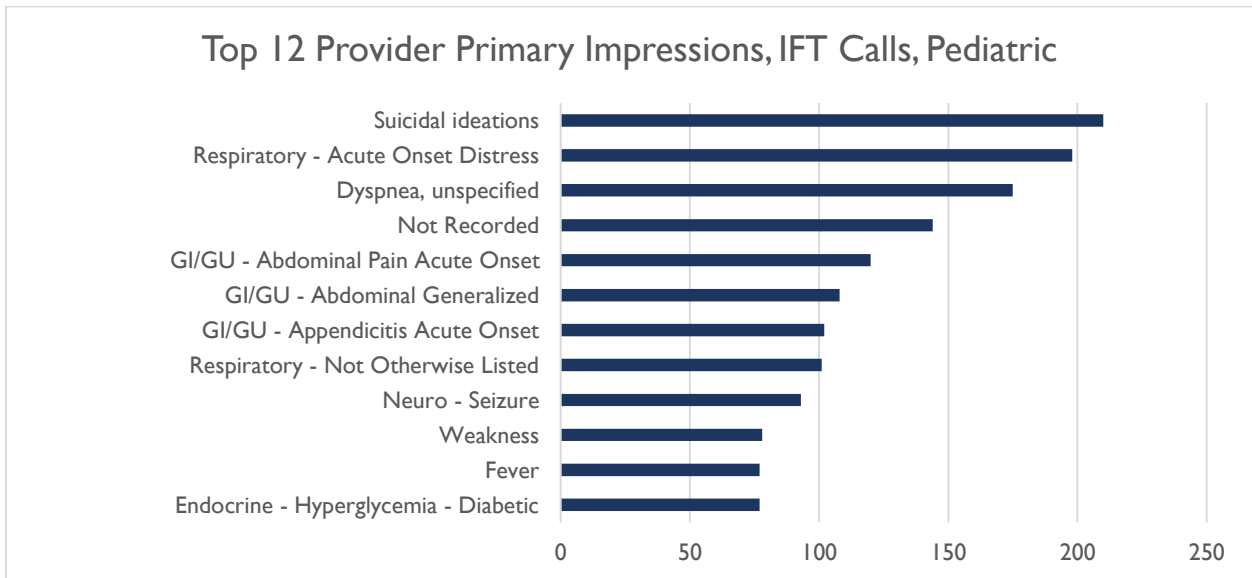


Figure 28: Provider Primary Impressions, IFT Calls, Pediatric

DEMAND-BASED STAFFING

As EMS agencies search for more efficient methods of deploying scarce resources, some have developed variable scheduling and staffing plans that increase resource availability during higher volume periods of the day and decrease staffing during low volume periods. Agencies with a more significant number of calls can more accurately predict peaks and troughs in call volume and may be able to structure staffing better to meet the fluctuations in demand. Services must ensure staffing to provide adequate service to the communities and should use caution in developing dynamic staffing models to meet the demand based on historic call volumes.

An aggregated review of dispatch times for emergency calls in Iowa for 2023 shows the most significant frequency of prehospital calls occurs between 9:00 AM and 9:00 PM.

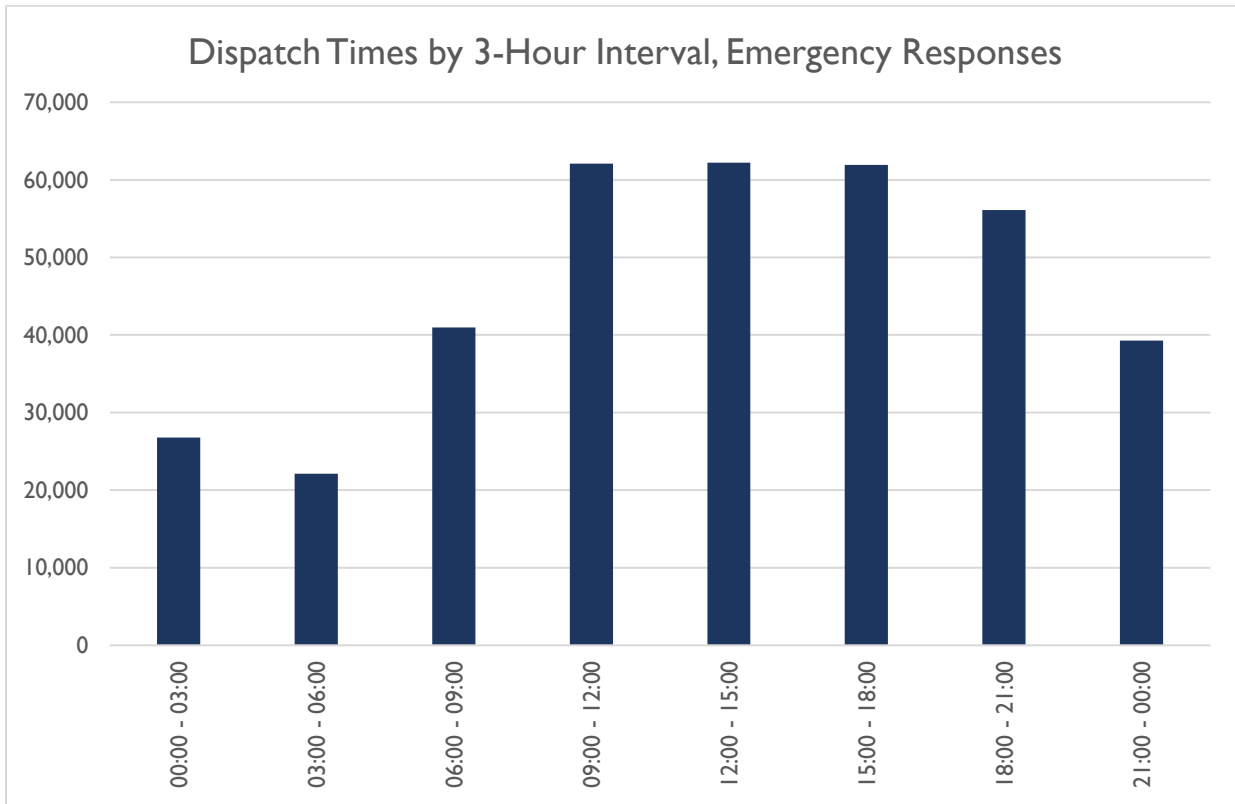


Figure 29: Dispatch Times by 3-Hour Interval, Emergency Responses

Summary

Emergency medical services in Iowa and across the nation continue to face significant challenges, and leaders must develop creative solutions to continue moving EMS forward. In the last year, some agencies have implemented new strategies to continue operations more effectively and efficiently by building stronger relationships with neighboring agencies to share scarce resources better and streamline the administrative work of managing an EMS service. Such collaboration reduces duplication of efforts and creates a more consistent delivery of care across their region.

The Bureau of Emergency Medical and Trauma Services staff stands ready to assist agencies in developing improvements that will streamline processes and enhance the ability to do what our EMS professionals are called to do: serve the citizens of Iowa in a time of greatest need.

Data Sources

Iowa EMS Registry: This registry contains data from EMS run reports for all Iowa-authorized EMS agencies. Data was obtained from this registry at <https://iowa.imagetrendelite.com/elite/organizationiowa/>.

AMANDA Registry: This registry contains all information regarding Iowa-certified individual EMS clinicians and Iowa-authorized EMS services. Data from this registry was used to compile information regarding EMS clinicians and services.

National Registry of Emergency Medical Technicians (NREMT): Data obtained from the NREMT was used to compile passing rates for Iowa EMS candidates and compare Iowa testing data to national testing data.