# 2019 EMS Data Report

**Bureau of Emergency Medical Services**

**October 2020**

pennsylvania
DEPARTMENT OF HEALTH

# Executive Summary

The Pennsylvania Department of Health (Department) Bureau of Emergency Medical Services (Bureau) publishes a statewide data report annually. This end of year report is a continuation of that efforts to provide detailed clinical, operational, and workforce data to the public and the Emergency Medical Services (EMS) community pertaining to the Commonwealth of Pennsylvania's EMS system.

In 2019, the EMS system in Pennsylvania was comprised of 1,339 agencies that responded to 2,171,285 calls for service. The overwhelming majority of these calls for services constituted emergency responses to incident scenes.

As a part of the Department's role in combating the opioid crisis, the Bureau has provided the Opioid Command Center various reports related to EMS utilization of naloxone. To highlight the EMS role in combating the opioid crisis, in 2019, a total of 15,556 administrations of naloxone on 911 responses by EMS providers were reported to the state EMS data bridge. Of these administrations, the Bureau can identify that there were 11,884 unique patient encounters in which EMS providers administered naloxone.

Recruitment and retention are topics that continue to generate a significant amount of discussion. Building on the successes of 2018's yearend data report, the Bureau is continuing to provide information on the aggregate characteristics of individuals who are leaving the EMS profession. To demonstrate the ongoing discussion of recruitment and retention, in 2019, a total of 4,313 EMS certifications were not renewed.

To demonstrate this, the highest number of provider certifications to expire by level were those certified as emergency medical technicians (EMTs), totaling 2,827 individuals. Of these 2,921 expired EMT certifications, 41.5 % are under the age of 30. Retaining younger individuals in the EMS system must be a priority for EMS leaders within the commonwealth. While the number of individuals seeking initial certification as an EMT remains steady statewide, the rate of newly certified providers does not balance the rate of attrition.

The accuracy of certain data elements and datasets contained within this report are only as accurate as the information provided by field providers through electronic patient care records (ePCR) systems. For example, if an EMS provider only documents the administration of a medication in the narrative portion of the ePCR, this will not be reflected in datasets reported. The Bureau is aware that the datasets are not perfect but demonstrate a reasonable account of the efficacy of the commonwealth's EMS system.

Commonwealth EMS system leaders at all levels should continue to utilize data for a variety of different decision-making processes, which include policy development and recommendations to regional and state medical advisory committees (MACs) for protocol development. Additionally, this data can be used to address operational and staffing concerns throughout the commonwealth. It is the Bureau's intent that this report serve as a benchmark to help individual agencies and municipalities to assess their EMS system performance against statewide datasets.

If there are questions regarding any of the information contained in this report, please contact the Bureau of Emergency Medical Services.

Dylan J Ferguson, Director
Bureau of Emergency Medical Services

# Methods

The Bureau of Emergency Medical Services utilized a variety of sources to obtain the datasets to construct this comprehensive report. Most of the raw data is obtained from the state EMS data bridge. Pursuant to 28 Pa. Code § 1021.8 and § 1021.41, all EMS agencies are required to submit electronic patient care records to this state data bridge. All patient care data collected for the purposes of this report was submitted in the NEMSIS 3.4 standard.

For this report, the Bureau utilized data that has been uploaded to the state data bridge as of January 31, 2020, with an incident date identified between January 1, 2019, to December 31, 2019. Unless otherwise specified with the notation of “emergency records,” the data in this report includes all types of EMS requests for service.

Other sources of data in this report include the National Registry of EMTs, and the Bureau’s EMS certification registry, as reported between January 1, 2019, and December 31, 2019.

Quick response service (QRS) agencies are currently exempt from submitting data to the state EMS data bridge and are only required to complete paper PCRs. As a result, information related to calls, interventions, medications, etc, provided by a QRS may not be reflected in this report. This is particularly important to note regarding the naloxone data contained within this report. Naloxone administration from QRSs, the public, or law enforcement may not be reflected in this report, unless an EMS transport provider documented the medication as given prior to EMS arrival.

# Findings

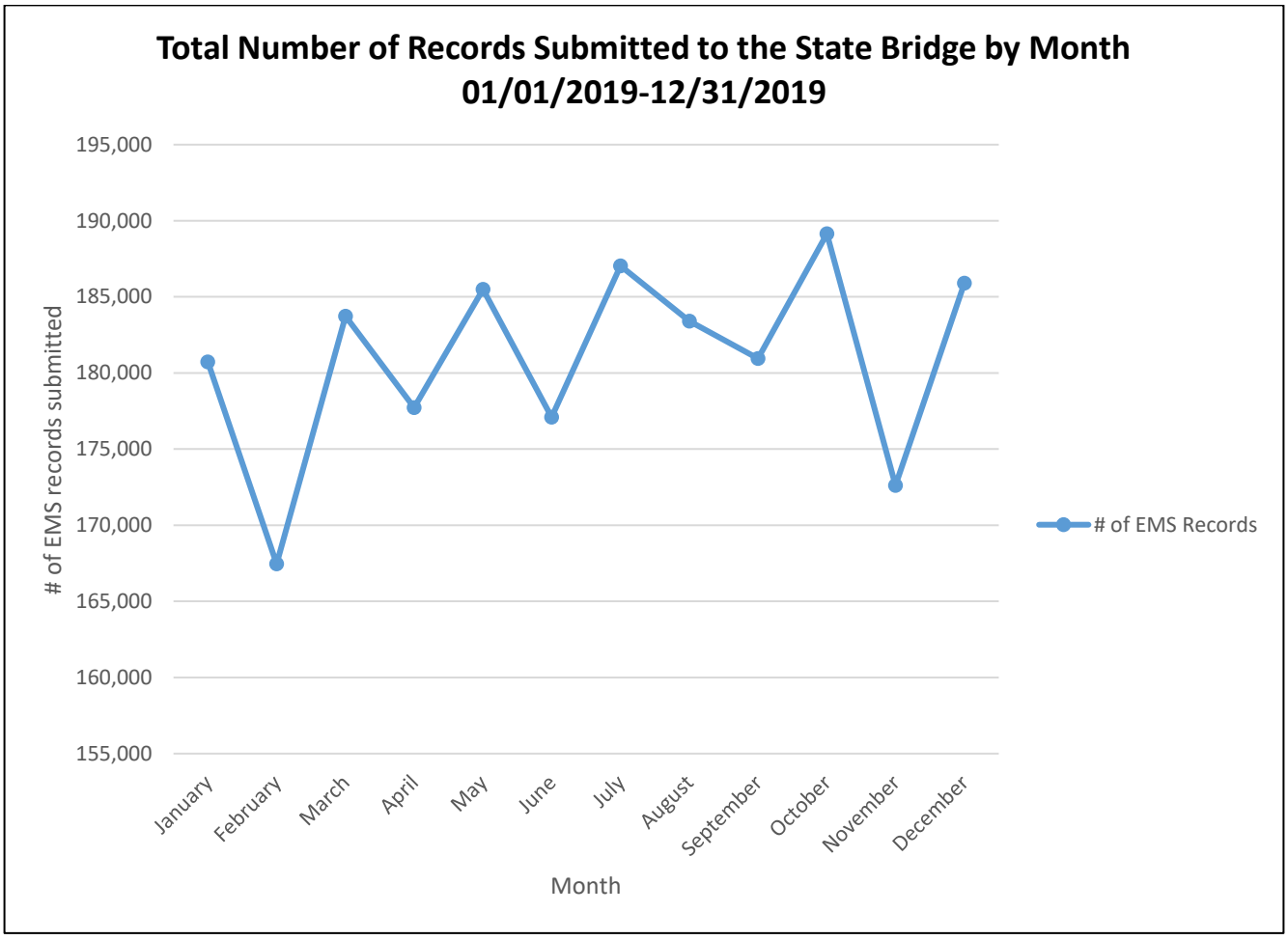
## Table 1. EMS Data Summary Figures, 01/01/2019 – 12/31/2019

| Metric | Count | % of Total |
|---|---|---|
| **Type of service requested** | 2,171,285 | |
| *911 response (scene) | 1,663,001 | 77% |
| *Intercept | 16,124 | <1% |
| Interfacility transport | 232,852 | 11% |
| Medical transport | 239,618 | 11% |
| *Mutual aid | 3,373 | <1% |
| *Public assistance | 3,325 | <1% |
| Standby | 12,992 | <1% |
| | | |
| **Total emergency records** | 1,685,823 | |
| | | |
| **EMS patients by gender** | | |
| Female | 937,432 | 53% |
| Male | 844,641 | 47% |
| | | |
| **EMS patients by age** | | |
| 0 to 17 years | 103,003 | 6% |
| 18 years and older | 1,677,288 | 94% |
| | | |
| **Cardiac arrests** By primary impression "cardiac arrest" | 15,774 | <1% |
| | | |
| **Naloxone administration** | | |
| Number of naloxone doses administered (911) | 15,556 | |
| Number of 911 encounters with at least 1 dose of naloxone | 11,884 | |

**Source: Pennsylvania State EMS Data Bridge, 2020**

**Note: For the purposes of this report, all types of service requested that have an * notated above are considered as an emergency record, regardless of how a call was received.**

## Figure 1. Total Number of Records Submitted to the State Data Bridge by Month of EMS Response, 01/01/2019 – 12/31/2019




**Source: Pennsylvania State EMS Data Bridge, 2020**

Figure 1 displays the number of records submitted to the state EMS data bridge by month for 2019. Overall the rate of submission is consistent, with overall submission rates raging from 167,000 in Febuary to a high of nearly 190,000 in October. 2019 was the first year with the NEMSIS 3.4 data set that did not have a large number of EMS agencies involved in data set transition.

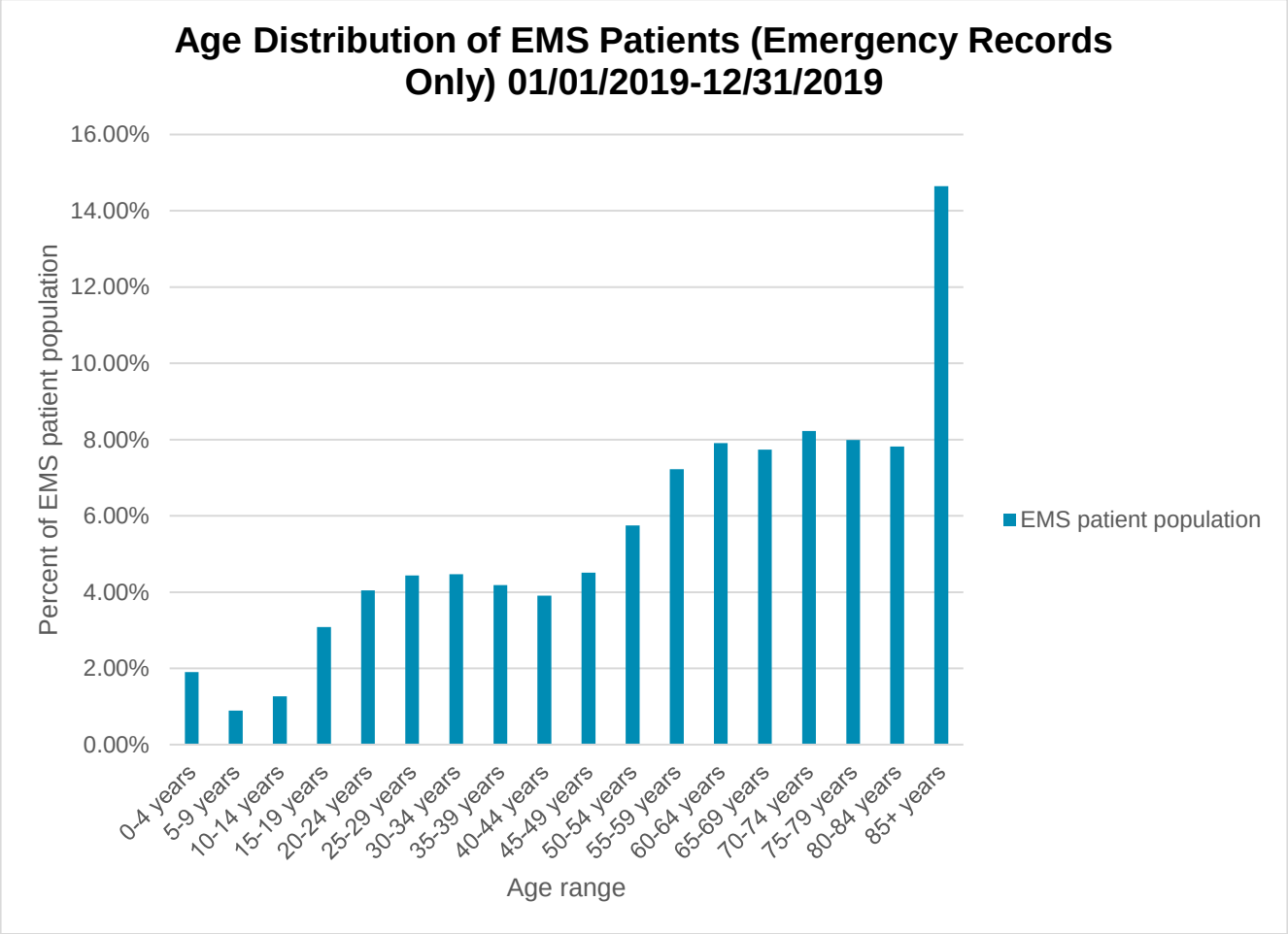
## Patient Disposition

### Table 2. EMS Incident Disposition Figures, 01/01/2019 – 12/31/2019

| Incident/patient disposition | Count of incident disposition | % of incident dispositions |
|---|---|---|
| Assist, agency | 12,466 | 0.574% |
| Assist, public | 6,795 | 0.313% |
| Assist, unit | 17,225 | 0.793% |
| Canceled (prior to arrival at scene) | 161,877 | 7.455% |
| Canceled on scene (no patient contact) | 38,059 | 1.753% |
| Canceled on scene (no patient found) | 102,353 | 4.714% |
| Patient dead at scene -- no resuscitation attempted (with transport) | 169 | 0.008% |
| Patient dead at scene -- no resuscitation attempted (without transport) | 11,338 | 0.522% |
| Patient dead at scene -- resuscitation attempted (with transport) | 63 | 0.003% |
| Patient dead at scene -- resuscitation attempted (without transport) | 6,335 | 0.292% |
| Patient evaluated, no treatment/transport required | 29,015 | 1.336% |
| Patient refused evaluation/care (with transport) | 495 | 0.023% |
| Patient refused evaluation/care (without transport) | 87,501 | 4.030% |
| Patient treated, released (AMA) | 11,960 | 0.551% |
| Patient treated, released (per protocol) | 32,615 | 1.502% |
| Patient treated, transferred care to another EMS unit | 31,435 | 1.448% |
| Patient treated, transported by law enforcement | 1,242 | 0.057% |
| Patient treated, transported by private vehicle | 996 | 0.046% |
| Patient treated, transported by this EMS unit | 1,573,055 | 72.448% |
| Standby -- no services or support provided | 34,560 | 1.592% |
| Standby -- public safety, fire or EMS operational support provided | 11,576 | 0.533% |
| Transport non-patient, organs, etc. | 155 | 0.007% |
| | **N= 2,171,285** | |

**Source: Pennsylvania State EMS Data Bridge, 2020**

## Figure 2. Age Distribution of all EMS Patient Contacts, 01/01/2019 – 12/31/2019

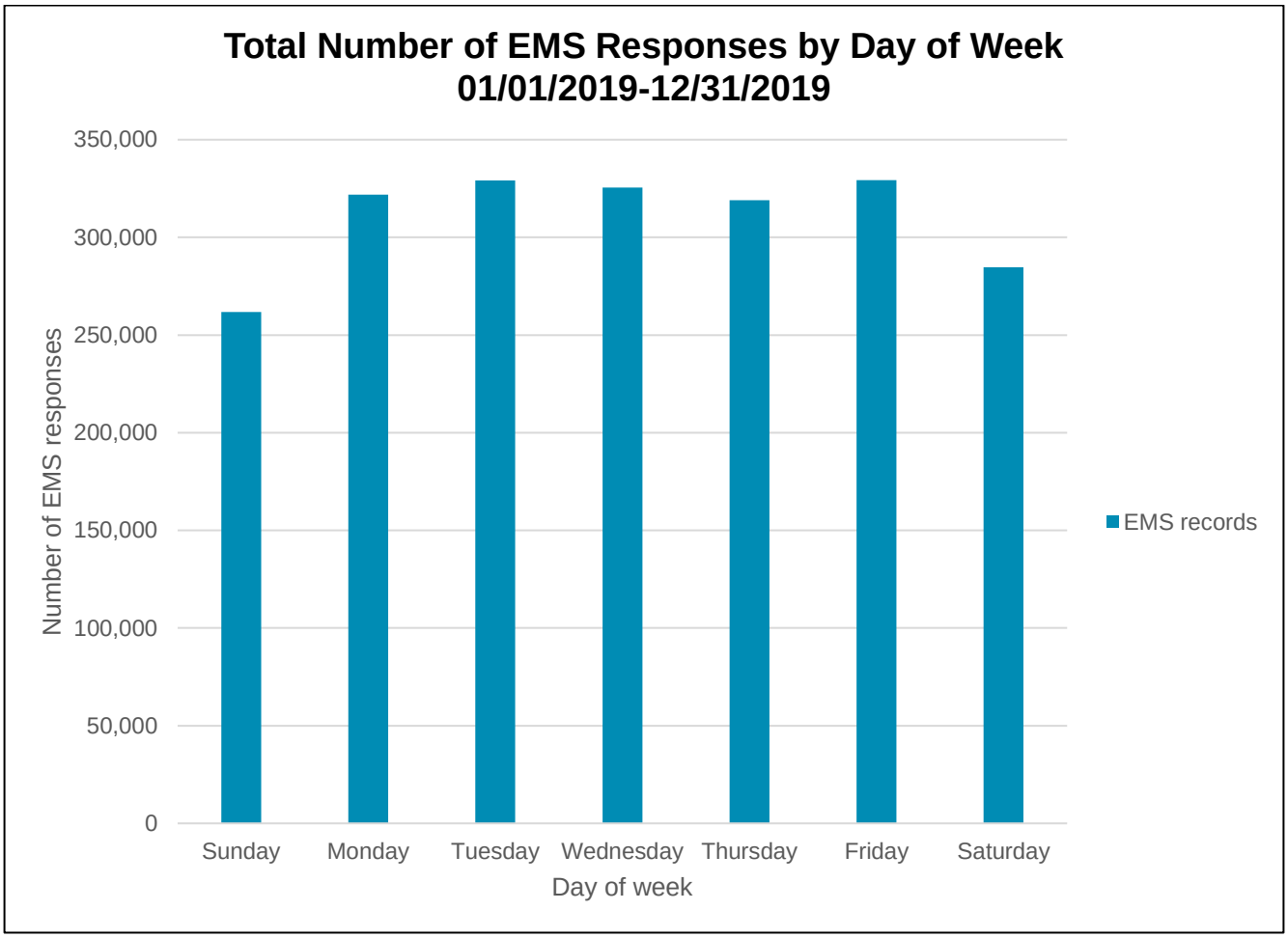



**Source: Pennsylvania State EMS Data Bridge, 2020**

Figure 2 displays the age demographic by percentage that presents to the EMS system for emergency records. The age group with the highest percentage utilization is 85 years of age and older. A significant portion of the EMS patient population, 45% have reached the medicare eligibility age of 65. The 5- to 9-year demographic presented to the EMS system the least. With minimal exposure to pediatric patients, it is important for EMS providers to remain proficent in pediatric patient management. The Bureau encourages EMS agencies to participate in the voluntary pediatric recgonition program, in addition to the newly implemented Pediatric Emergency Care Coordinator (PECC) program

## Operational Deployment

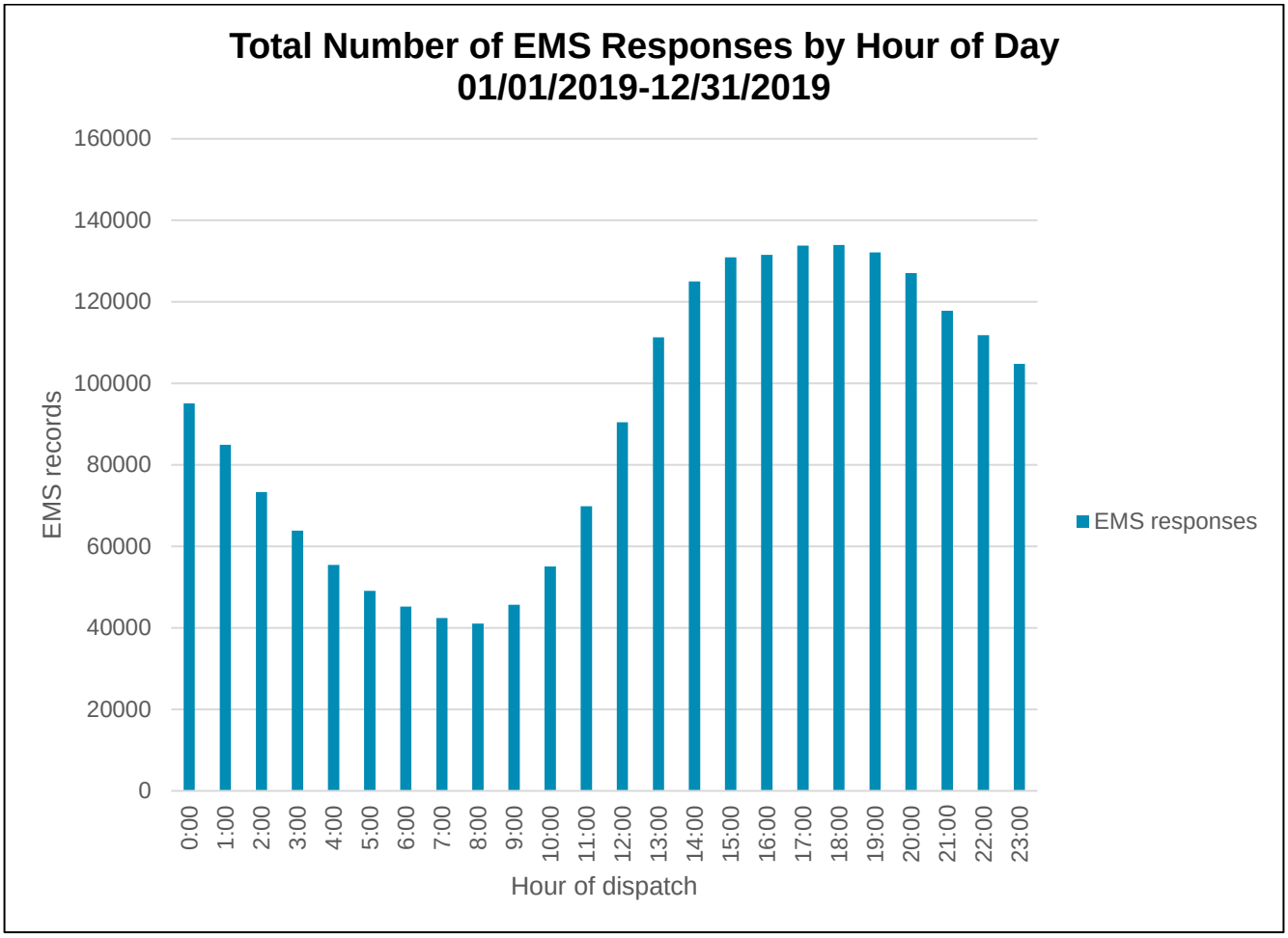
### Figure 3. Total Number of EMS Responses by Day of Week, 01/01/2019 – 12/31/2019




**Source: Pennsylvania State EMS Data Bridge, 2020**

Figure 3 shows that the number of calls for service by day is consistent from day-to-day. Sunday has the lowest number of requests for service. EMS leaders can utilize this data and local versions of this data to assist with resource deployment decisions.

## Figure 4. Total Number of EMS Responses by Hour of Day, 01/01/2018 – 12/31/2018




**Source: Pennsylvania State EMS Data Bridge, 2020**

Figure 4 shows the number of EMS responses by hour of day. The hour of day is displayed along with how many EMS calls for service were received during that time frame. There is a peak of requested responses in the early evening hours, before beginning to decrease after the midnight hour, and ultimately picking up again in the noon hour.

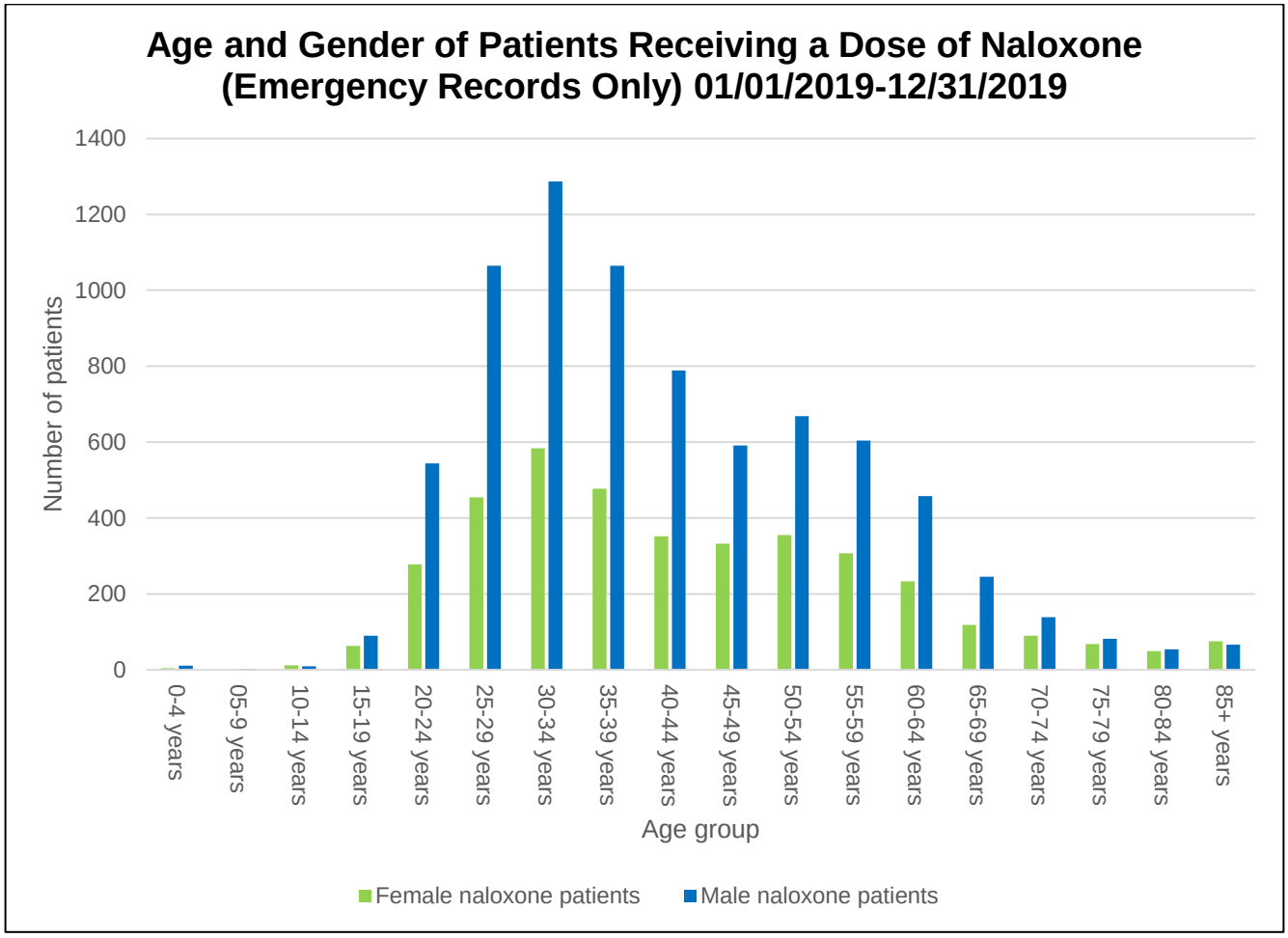
## Table 3. EMS Responses by Day/Month, 01/01/2019 – 12/31/2019

| Day | Jan. | Feb. | Mar. | Apr. | May | Jun. | Jul. | Aug. | Sept. | Oct. | Nov. | Dec. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **1** | 5477 | 6509 | 6008 | 6276 | 6280 | 5595 | 6294 | 6016 | 5029 | 6705 | 6314 | 4876 |
| **2** | 6108 | 5649 | 5453 | 5989 | 6331 | 4976 | 6374 | 6423 | 5179 | 6742 | 5372 | 6010 |
| **3** | 6292 | 5200 | 5068 | 6423 | 6334 | 5939 | 6206 | 5544 | 6383 | 6367 | 4973 | 6410 |
| **4** | 6323 | 6537 | 6269 | 6261 | 5370 | 6271 | 5127 | 5116 | 6392 | 6561 | 5934 | 6391 |
| **5** | 5471 | 6410 | 6382 | 6102 | 4931 | 6455 | 6221 | 6286 | 6264 | 5644 | 6177 | 6079 |
| **6** | 4747 | 6335 | 6090 | 5612 | 6345 | 6160 | 5588 | 6124 | 6366 | 5212 | 5984 | 6280 |
| **7** | 6129 | 6401 | 6300 | 5193 | 6497 | 6387 | 5034 | 6201 | 5513 | 6362 | 5868 | 5385 |
| **8** | 6234 | 6291 | 6321 | 6505 | 6249 | 5309 | 6395 | 5951 | 5197 | 6448 | 6172 | 4858 |
| **9** | 6000 | 5226 | 5407 | 6411 | 5923 | 4944 | 6132 | 5962 | 6244 | 6398 | 5185 | 6431 |
| **10** | 5862 | 5021 | 5110 | 6312 | 6391 | 6138 | 6457 | 5430 | 6402 | 6397 | 4858 | 6580 |
| **11** | 6194 | 6406 | 6198 | 6208 | 5340 | 6055 | 6241 | 5143 | 6585 | **6708** | 6033 | 6344 |
| **12** | 5115 | 6074 | 6220 | 6366 | 4520 | 6158 | 6269 | 6184 | 6472 | 5682 | 6034 | 6452 |
| **13** | 4666 | 6566 | 6341 | 5770 | 6004 | 6080 | 5628 | 6113 | 6225 | 5090 | 5978 | 6762 |
| **14** | 6093 | 6177 | 6413 | 4964 | 5920 | 5966 | 4981 | 6211 | 5631 | 6509 | 6033 | 5554 |
| **15** | 5722 | 6483 | 6702 | 6121 | 6314 | 5468 | 6128 | 6075 | 5222 | 6334 | 6242 | 4945 |
| **16** | 6046 | 5502 | 5237 | 6042 | 6273 | 4940 | 6325 | 6067 | 6367 | 6540 | 5307 | 6275 |
| **17** | 5824 | 4926 | 4889 | 6466 | 6467 | 6251 | 6384 | 5702 | 6188 | 6085 | 4844 | 6396 |
| **18** | 6016 | 6156 | 6453 | 6113 | 5641 | 6034 | 6411 | 5276 | 6201 | 6444 | 6073 | 6649 |
| **19** | 5291 | 6123 | 6296 | 5995 | 5544 | 6227 | 6779 | 6280 | 6133 | 5588 | 6118 | 6255 |
| **20** | 4767 | 5987 | 6212 | 5252 | **6691** | 6391 | 6037 | 6373 | **6708** | 5254 | 6263 | 6852 |
| **21** | 5851 | 6205 | 6119 | 4459 | 6373 | 6291 | 5417 | 6294 | 6021 | 6492 | 6055 | 5323 |
| **22** | 6308 | 6288 | 6388 | 5856 | 6282 | 5604 | 6668 | 6086 | 5486 | 6376 | 6258 | 5299 |
| **23** | 6544 | 5322 | 5184 | 6295 | 6335 | 5172 | 6284 | 6086 | 6445 | 6419 | 5476 | 6433 |
| **24** | 6483 | 4988 | 5131 | 6310 | 6434 | 6299 | 6328 | 5388 | 6041 | 6139 | 5001 | 5925 |
| **25** | 6488 | 6249 | 6169 | 5961 | 5386 | 6220 | 6144 | 5089 | 6337 | 6060 | 6077 | 4542 |
| **26** | 5351 | 6053 | 6012 | 6202 | 4699 | 6213 | 6358 | 5806 | 6194 | 4821 | 6447 | 6261 |
| **27** | 5035 | 6249 | 6214 | 5304 | 5133 | 6348 | 5429 | 5877 | 6386 | 5184 | 6204 | 6692 |
| **28** | 6020 | 6126 | 6280 | 4731 | 6251 | 6471 | 4988 | 6057 | 5838 | 6161 | 4635 | 5614 |
| **29** | 6292 | | 6240 | 6007 | 6552 | 5604 | 6115 | 6007 | 5387 | 6187 | 5619 | 5292 |
| **30** | 6051 | | 5642 | 6228 | 6310 | 5128 | 6057 | 6458 | 6121 | 6140 | 5085 | 6524 |
| **31** | 5926 | | 4980 | | 6371 | | 6233 | 5787 | | 6092 | | 6203 |

**Source: Pennsylvania State EMS Data Bridge, 2020**

Table 3 displays the total number of EMS responses by day and month based on values provided in the date/time unit dispatched field. The number of records, which are bolded, represent the three busiest days for EMS in 2019.

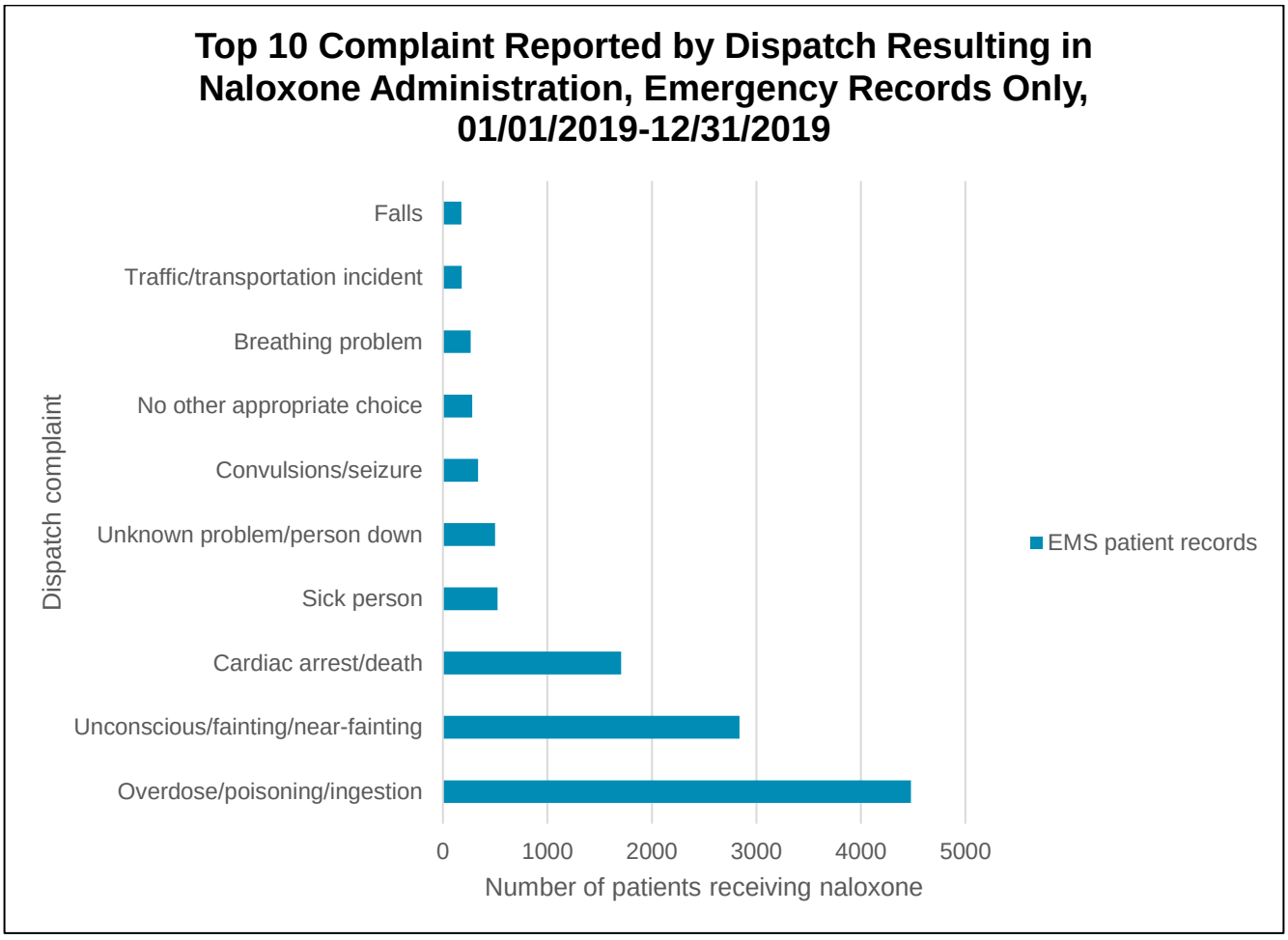
## Figure 5. Age and Gender of Patients Receiving a Dose of Naloxone, Emergency Records Only, 01/01/2019 – 12/31/2019




**Source: Pennsylvania State EMS Data Bridge, 2020**

Figure 5 shows that males in the 30-34 year age group are the most likely to be administered a dose of naloxone, compared to all other groups. This information is of particular importance to EMS and public health leaders alike in further refining the response to the opioid crisis.

**Figure 6. Top 10 Complaints Reported by Dispatch Resulting in Naloxone Administration, Emergency Records Only, 01/01/2019 – 12/31/2019**




**Source: Pennsylvania State EMS Data Bridge, 2020**

Figure 6 below displays the top 10 complaints reported by dispatch that resulted in naloxone administration by EMS.

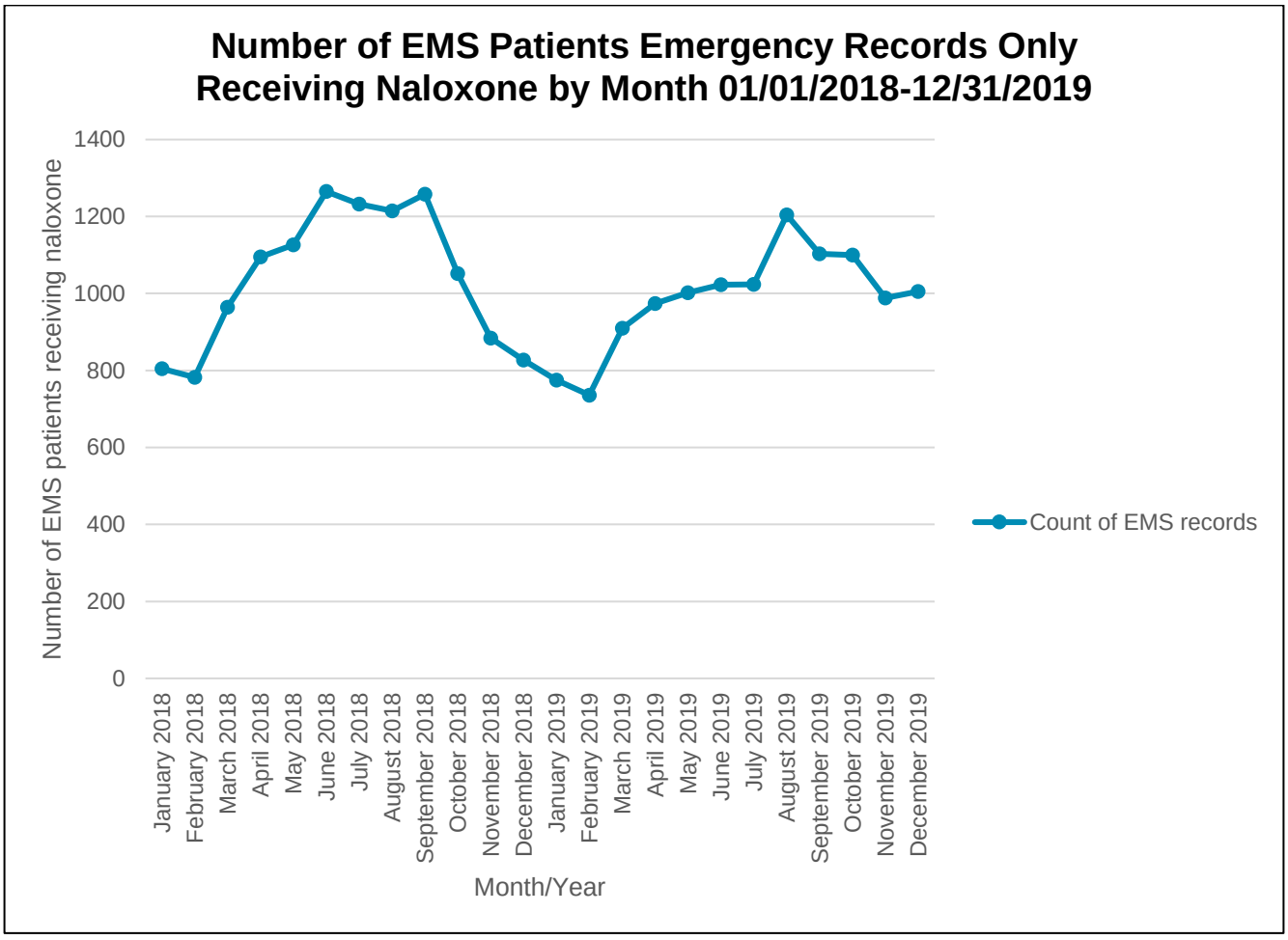
## Table 4. Reported Incident Location Type of Emergency Records Resulting in Naloxone Administration, 01/01/2019 – 12/31/2019

| Incident location type | % of incident location |
|---|---|
| Agricultural site/farm | 0.04% |
| Ambulatory surgery center | 0.01% |
| Apartment | 2.28% |
| Blank or not reporting | 34.82% |
| Cultural building | 0.18% |
| Health care provider office | 0.56% |
| Hospital | 0.14% |
| Industrial or construction site | 0.11% |
| Nursing home | 0.68% |
| Other ambulatory health services establishments | 0.08% |
| Other institutional residence | 0.18% |
| Other place | 4.61% |
| Other private residence | 8.00% |
| Prison | 0.40% |
| Private residence | 40.11% |
| Public administrative building | 1.19% |
| Recreation area | 0.51% |
| Religious institution | 0.05% |
| Retail building | 3.66% |
| School | 0.09% |
| Sidewalk | 0.67% |
| Sports area | 0.05% |
| Urgent care center | 0.03% |
| Vehicle (transport) | 1.44% |
| Wilderness area | 0.12% |

**Source: Pennsylvania State EMS Data Bridge, 2020**

Table 4 displays the reported incident location where a patient received a dose of naloxone administered by EMS providers. Approximately 50% of patient encounters of this type occurred in a private residence. Unfortunately, nearly 35% of the submitted records were reported as blank or not recorded, which limits the applicability of this data. By increasing the accuracy of this measurement and active tracking of this metric, EMS can assist in the improvement of public health during the opioid crisis. This will allow public health partners and the Department to better focus local and regional needs for public access naloxone deployment.

**Figure 7. Number of EMS Patients, Emergency Records Only, Receiving Naloxone by Month, 01/01/2018 – 12/31/2019**

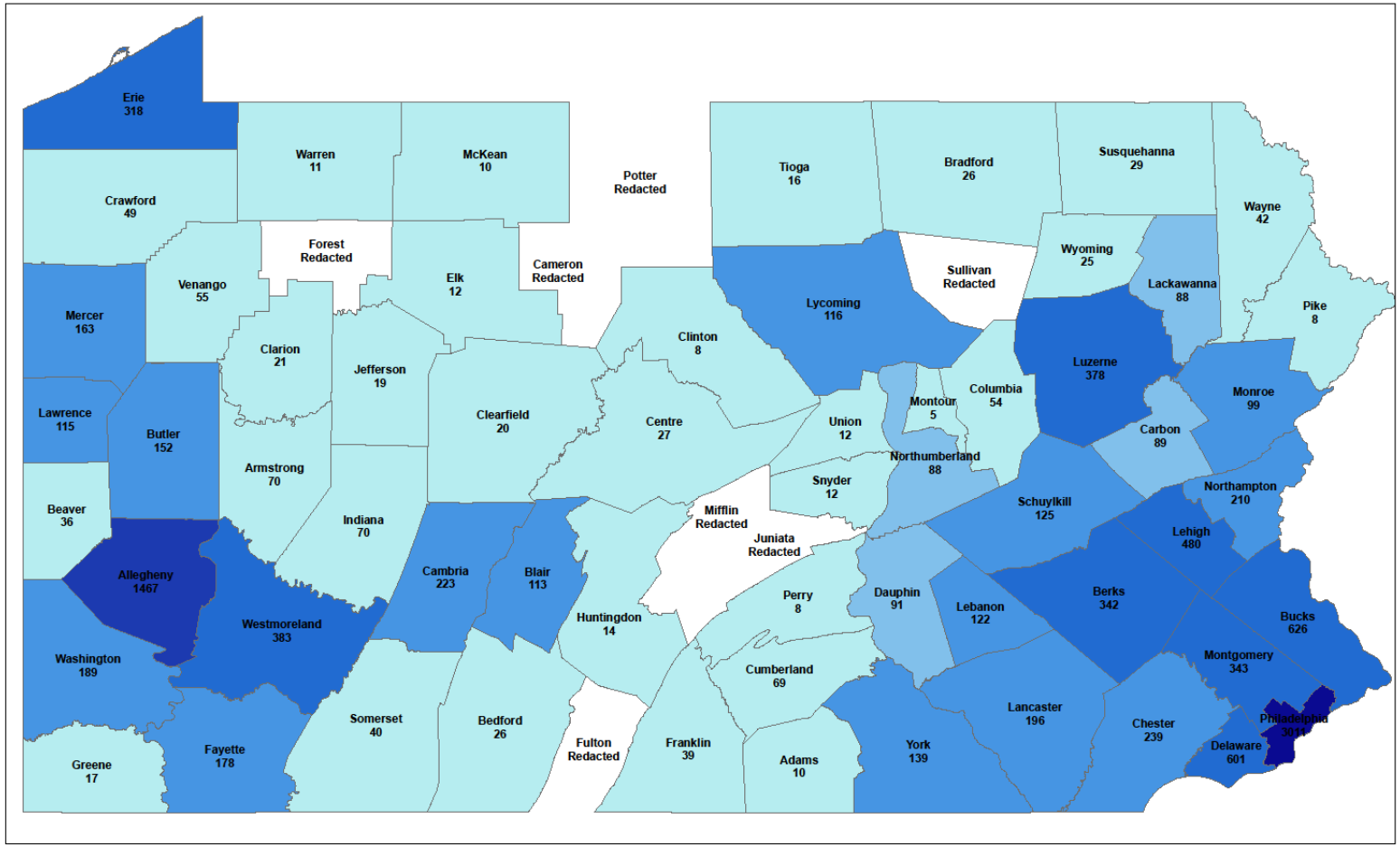



**Source: Pennsylvania State EMS Data Bridge, 2020**

Figure 7 displays the number of EMS patients, where a patient received a dose of naloxone administered by an EMS provider. This data is categorized my month and covers a time period of January 2018 through December 2019. The frequency has ranged from a high of 1,265 patients in June of 2018 to a low of 736 in February 2019. Long term trending of naloxone usage is a key indicator in gauging the severity of the opioid crisis.

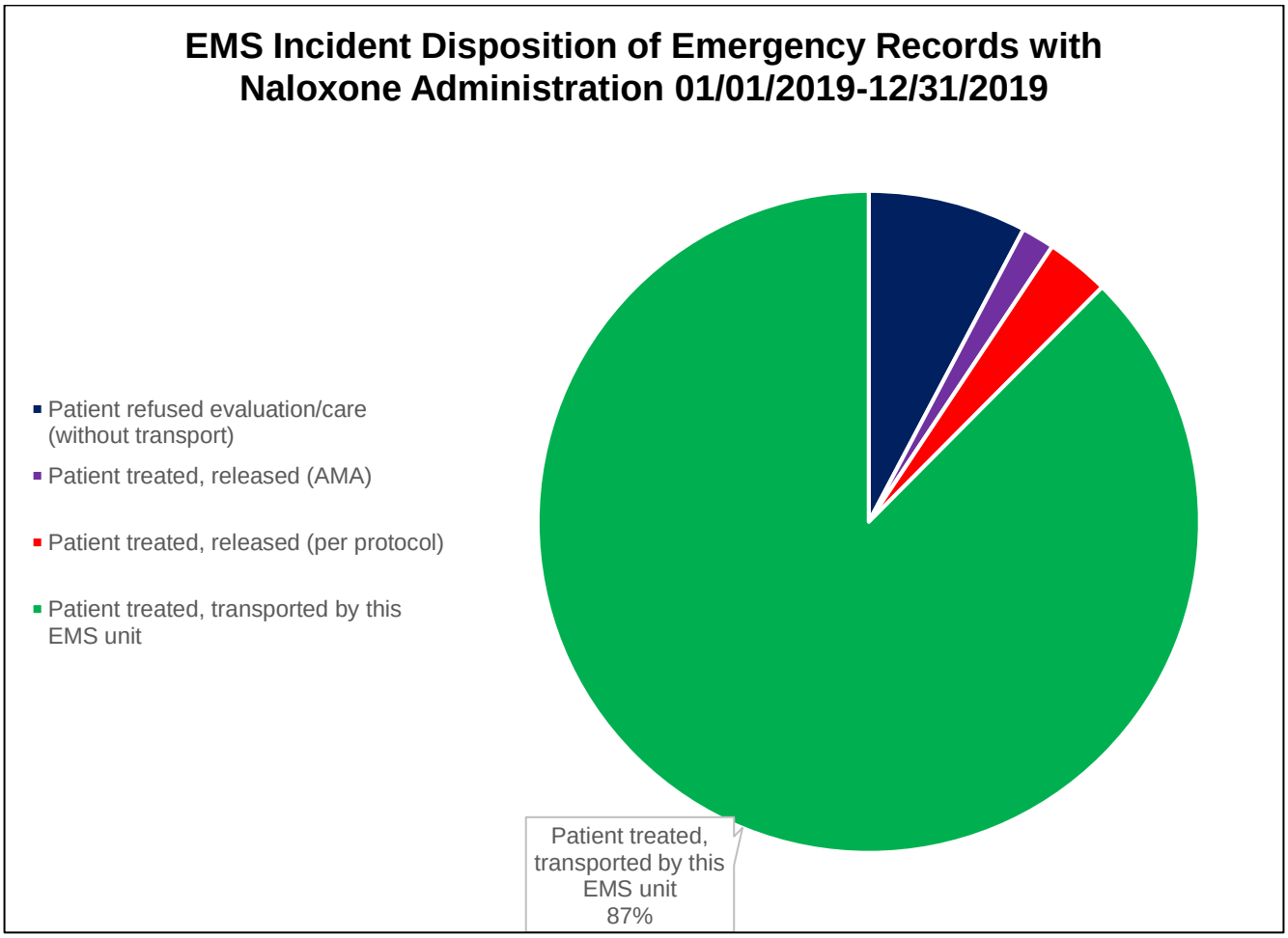
Map 1 on the following page displays the count of unique emergency patient records by the incident county, which contained at least one administration of naloxone. Counties in white had less than 5 reported records. In accordance with Bureau reporting policies, the information for these counties has been redacted to protect patient privacy.

# Map 1: 2019 Count of Emergency Patients with Naloxone Administration




Prepared by DJF 02/14/2020
Source: State EMS Data Bridge, 2020

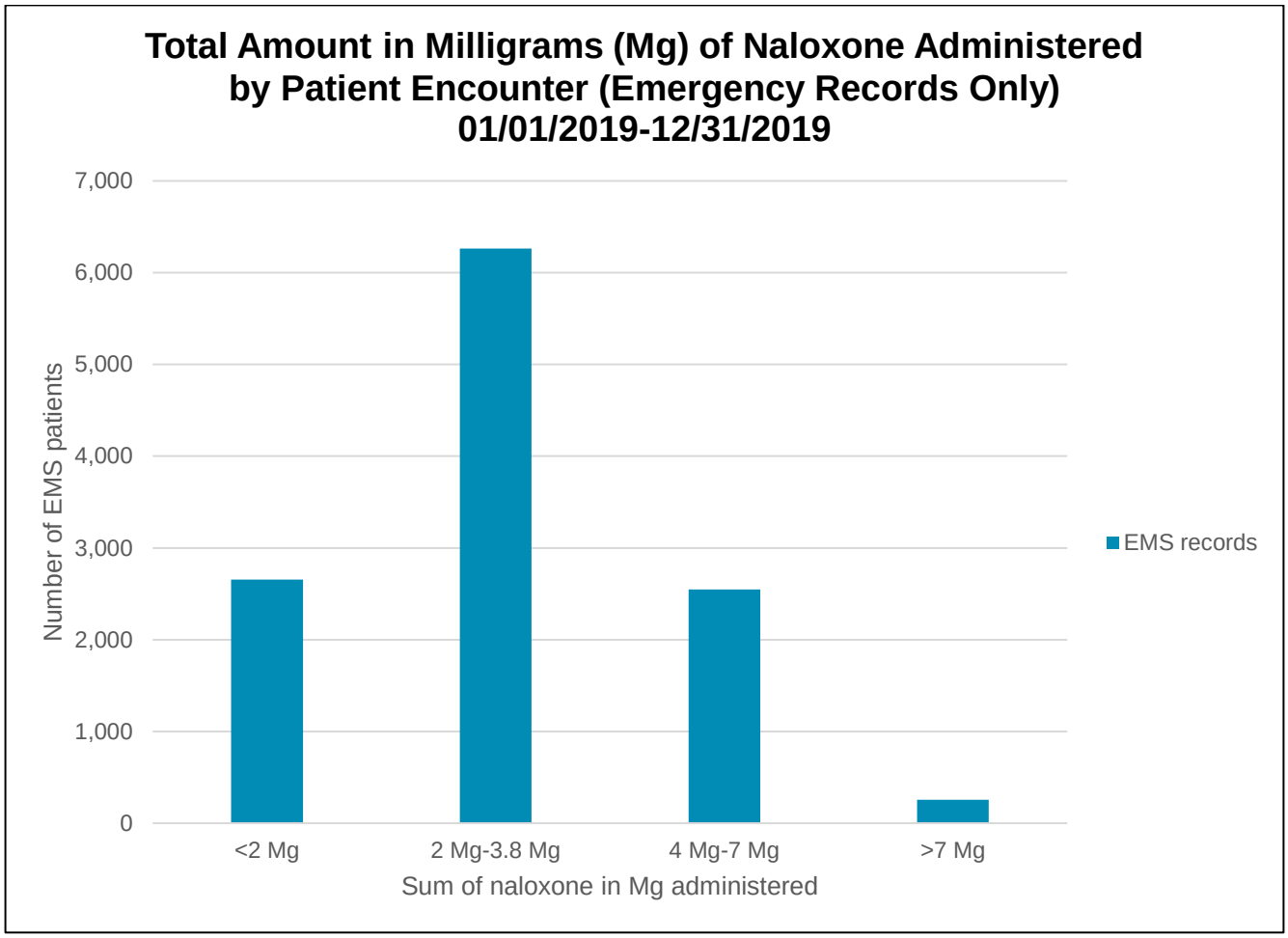
## Figure 8. EMS Incident Disposition of Emergency Records Involving Naloxone Administration, 01/01/2019 – 12/31/2019




**Source: Pennsylvania State EMS Data Bridge, 2020**

Figure 8 above displays the transport vs. refusal dispositions for patients who received at least one dose of naloxone in the emergency out of hospital setting. Eighty-seven percent of patients who have a documented dose of naloxone are ultimately transported to a health care facility for further evaluation and treatment. Tracking of this metric can assist state, regional, and local leaders in identifying oppurtunities for participation in the EMS naloxone leave-behind program endorsed by the Department and the Bureau. The increase in effectiveness of data reporting in NEMSIS 3.4 not only allows stakeholders to better respond to the opioid crisis but also to greatly improve other aspects of public health as well.

## Figure 9.Total Amount in Milligrams (Mg) of Naloxone Administered by Patient Encounter, 01/01/2019 – 12/31/2019




**Source: Pennsylvania State EMS Data Bridge, 2020**

Figure 9 represents the number of EMS patient encounters categorized by the cumulative dose of naloxone that patient recived. Only patient records that had medication dosage units reported in miligrams were included in this analysis. Seventy-six percent of patients received a cumulative dose of naloxone of 3.8 Mg or less. Only 2% of EMS patients required more than 7 Mg of naloxone.

## Table 5. Heat Map of total Naloxone Administrations by Day of Week and Hour, Emergency Records, 01/01/2019 – 12/31/2019

| Hour | Sunday | Monday | Tuesday | Wednesday | Thursday | Friday | Saturday |
|---|---|---|---|---|---|---|---|
| 0:00 | 107 | 88 | 100 | 85 | 97 | 95 | 125 |
| 1:00 | 105 | 84 | 80 | 97 | 92 | 97 | 126 |
| 2:00 | 87 | 77 | 87 | 75 | 76 | 94 | 123 |
| 3:00 | 95 | 50 | 79 | 69 | 83 | 73 | 117 |
| 4:00 | 77 | 58 | 52 | 63 | 43 | 63 | 76 |
| 5:00 | 57 | 29 | 53 | 48 | 34 | 45 | 75 |
| 6:00 | 58 | 35 | 32 | 40 | 48 | 47 | 57 |
| 7:00 | 45 | 32 | 29 | 37 | 36 | 31 | 49 |
| 8:00 | 33 | 25 | 25 | 26 | 29 | 27 | 38 |
| 9:00 | 33 | 24 | 22 | 29 | 27 | 26 | 43 |
| 10:00 | 34 | 31 | 32 | 30 | 25 | 39 | 44 |
| 11:00 | 47 | 45 | 46 | 29 | 49 | 38 | 58 |
| 12:00 | 52 | 50 | 41 | 47 | 42 | 52 | 54 |
| 13:00 | 55 | 54 | 45 | 56 | 55 | 53 | 49 |
| 14:00 | 69 | 53 | 63 | 44 | 51 | 76 | 61 |
| 15:00 | 76 | 56 | 70 | 66 | 75 | 81 | 84 |
| 16:00 | 81 | 71 | 78 | 73 | 80 | 85 | 97 |
| 17:00 | 86 | 72 | 63 | 69 | 79 | 86 | 88 |
| 18:00 | 98 | 103 | 91 | 84 | 93 | 108 | 87 |
| 19:00 | 91 | 100 | 86 | 89 | 97 | 111 | 115 |
| 20:00 | 89 | 94 | 89 | 93 | 92 | 90 | 110 |
| 21:00 | 88 | 76 | 93 | 93 | 101 | 125 | 118 |
| 22:00 | 97 | 85 | 107 | 110 | 102 | 127 | 110 |
| 23:00 | 120 | 85 | 92 | 116 | 103 | 111 | 110 |

**Source: Pennsylvania State EMS Data Bridge, 2020**

Table 5 displays, via the heatmap method, naloxone administrations by EMS providers on emergency response calls. The day of week and time were extracted from the date and time that the EMS unit was dispatched. Shades of red and orange represent the highest number of doses, whereas shades of yellow and green represent lower numbers. The number of occurrences is included within the table for reference. Saturday mornings in the midnight hour had the highest number of doses.

## Clinical Markers

### Table 6. Top 25 EMS Provider Primary Impression, All Records, 01/01/2018 – 12/31/2018

| Providers primary impression | Count of providers primary impression |
|---|---|
| Acute pain not elsewhere classified | 55527 |
| Alcohol use, with intoxication | 11921 |
| Altered mental status | 90632 |
| Angina | 11149 |
| Back pain | 14770 |
| Bedridden | 11183 |
| Cardiac arrest | 15774 |
| Cardiac arrhythmia/dysrhythmia | 22971 |
| Chest pain, other [non-cardiac] | 59840 |
| Death | 9479 |
| Encounter, adult, no findings or complaints | 66699 |
| Generalized abdominal pain | 150537 |
| Hypoglycemia | 17180 |
| Injury of head | 14425 |
| Injury, unspecified | 133847 |
| Malaise | 27580 |
| Reduced mobility | 9708 |
| Respiratory disorder | 25893 |
| Respiratory distress, acute | 71297 |
| Seizures with status epilepticus | 19608 |
| Seizures without status epilepticus | 12173 |
| Syncope and collapse | 34693 |
| TIA | 18565 |
| Traumatic shock | 15292 |
| Weakness | 128809 |

**Source: Pennsylvania State EMS Data Bridge, 2020**

Table 7 displays the top 25 provider primary impressions for all EMS calls for service between January 1, 2019, and December 31, 2019. Accurate reporting of primary impression creates an accurate picture as to the clinical severity and demographic of the patient population. Information such as this can help drive protocol development in the future.

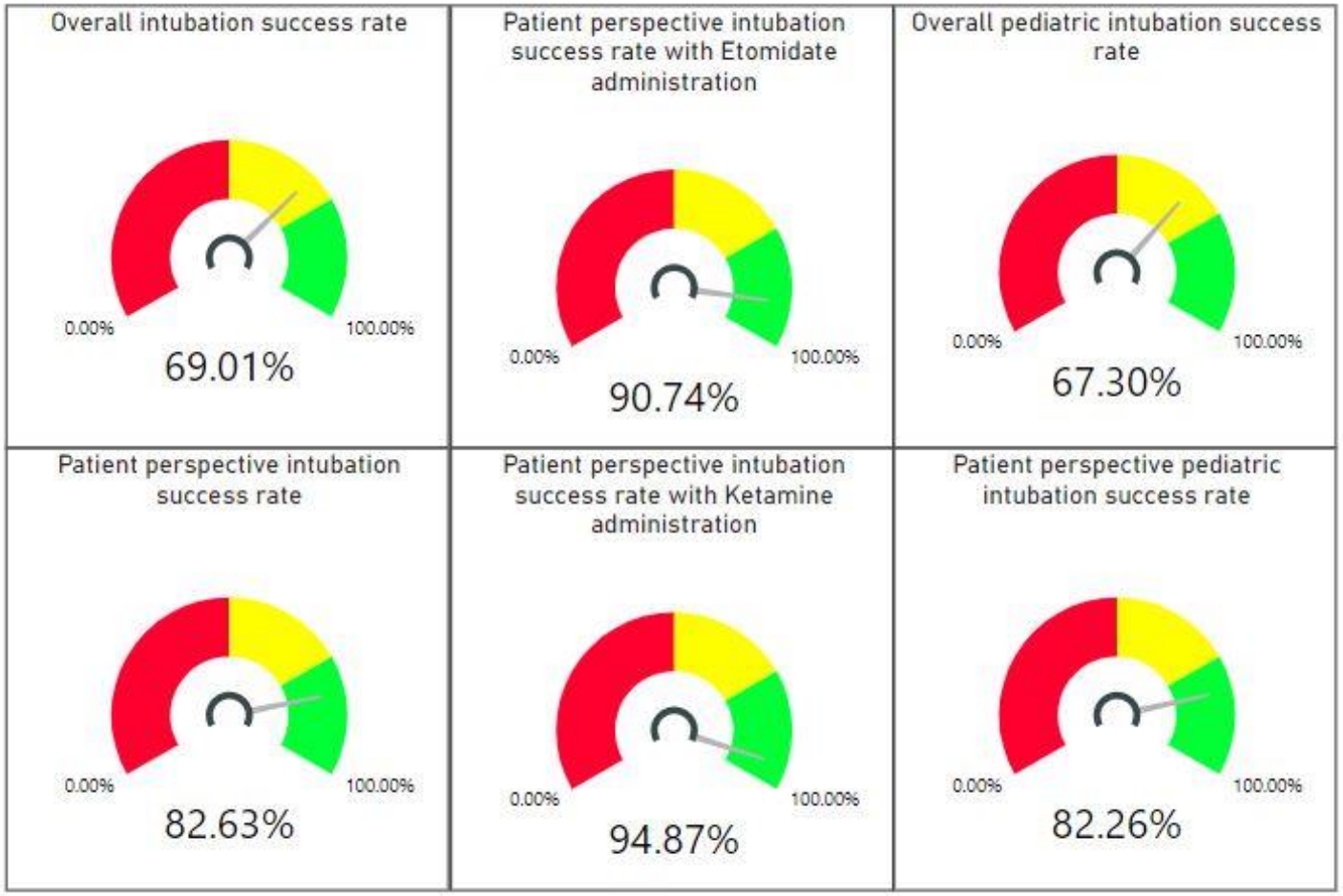
Figure 10 on the following page displays the success rates for advanced airway management conducted by advanced life support (ALS) providers. These statistics were compiled from all record types including 911 and interfacility transfers. ALS services are encouraged to utilize this data to benchmark their agencies' performances against that of the commonwealth. Proficiency in these procedures is indicative of safe and quality pre-hospital care.

Where the term overall is utilized, this number is calculated by taking the total number of successes and dividing by the total number of attempts. Where the term patient perspective is used, this number is calculated by taking the number of patients for whom the procedure was successful (regardless of number of attempts) and dividing it by the total number of patients who had the procedure performed.

In measures where a specific medication is specified, the results were further filtered to only include those results where that medication was properly documented as being administered.

For pediatric measures, those records were restricted to patients with ages listed less than 16 years of age.

## Figure 10. Advanced Airway Skills Report, All Records, 01/01/2019 – 12/31/2019

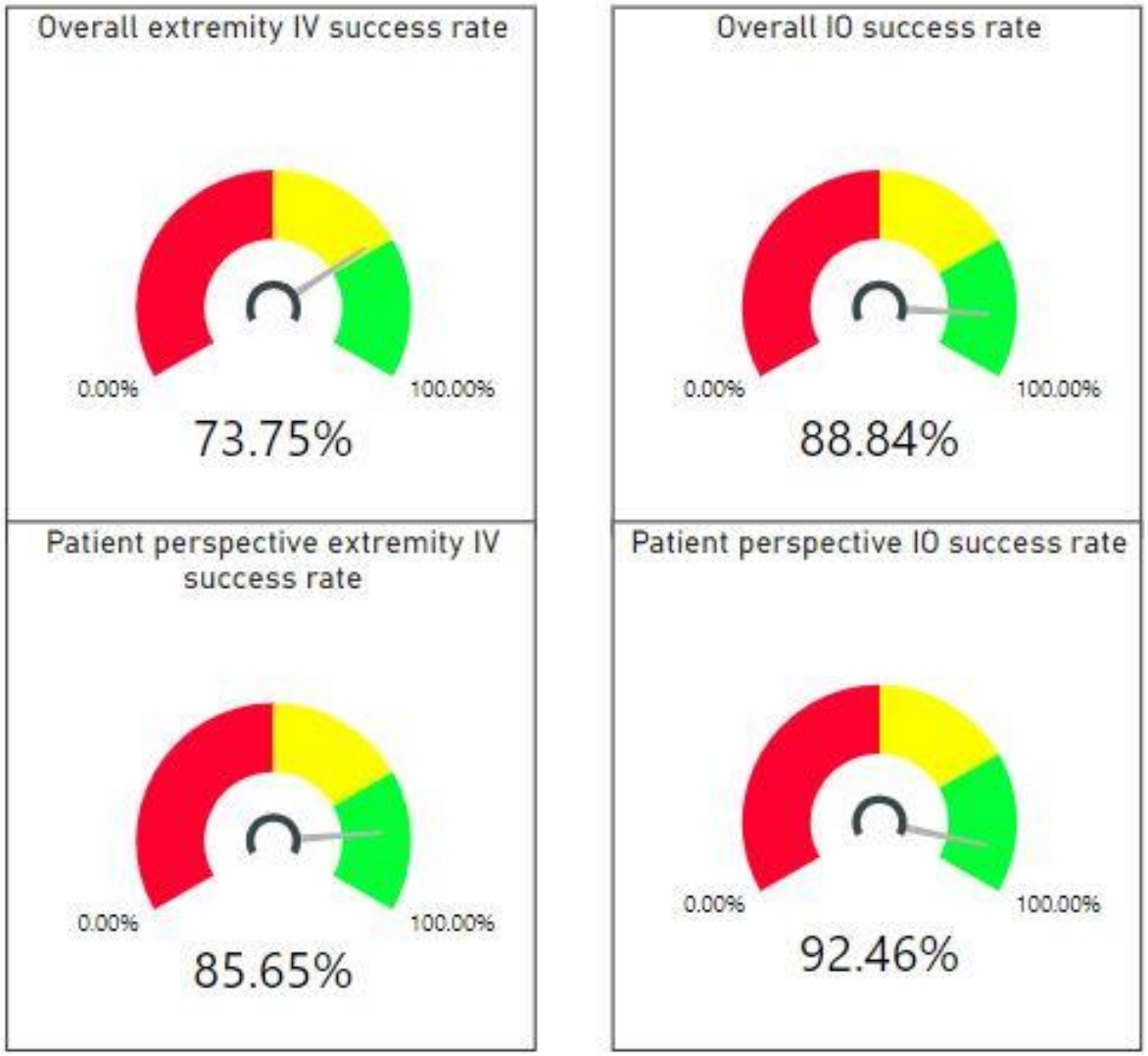



**Source: Pennsylvania State EMS Data Bridge, 2020**

Figure 11 on the following page displays the success rates for vascular access by ALS providers. These statistics were compiled from all record types including 911 and interfacility transfers. ALS services are encouraged to utilize this data to benchmark their agencies' performances against that of the commonwealth. Proficiency in these procedures is indicative of safe and quality pre-hospital care.

Where the term overall is utilized, this number is calculated by taking the total number of successes and dividing by the total number of attempts. Where the term patient perspective is used, this number is calculated by taking the number of patients for whom the procedure was successful (regardless of number of attempts) and dividing it by the total number of patients who had the procedure performed.

**Figure 11. Vascular Access Report, All Records, 01/01/2019 – 12/31/2019**



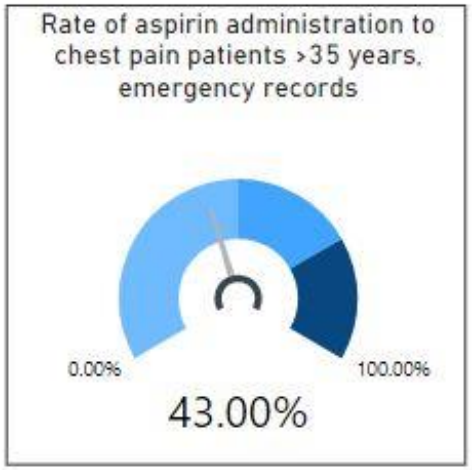

**Source: Pennsylvania State EMS Data Bridge, 2020**

Figure 12 on the following page displays various clinical performance benchmarks. These statistics were calculated using only emergency records. EMS agencies can utilize these statewide averages as a way to benchmark their performance. The administration rate for aspirin in cases of chest pain is a metric utilized by the American Heart Association and is also part of the EMS Compass performance metric project.

Completion of a 12-lead electrocardiogram in the pre-hospital enviroment is one of many interventions that EMS can complete in the pre-hospital enviroment and, ultimately, influence the definitive care of the patient. This metric was further filtered to only count transports completed by an ALS ambulance.

Evidence-based standards state that EMS scene times should be kept to a minimum and that timely transport to definitive care is the most effective treatment. Industry goals ST segment elevated myocardial infarction (STEMI) scene times are 15 minutes or less.

## Figure 12. Chest Pain/STEMI Report, All Records, 01/01/2019 – 12/31/2019





**Average STEMI scene time, emergency records**



**Average STEMI dispatch to hospital arrival, emergency records**

**Source: Pennsylvania State EMS Data Bridge, 2020**

## Table 7. Medication Administration, Emergency Records Only, 01/01/2019 – 12/31/2019

| Medication given | Total count of administrations |
|---|---|
| Acetaminophen (e.g. Tylenol, Anacin) | 1477 |
| Adenosine (e.g. Adenocard) | 2291 |
| Albuterol (e.g. Proventil, Ventolin, AccuNeb) | 40985 |
| Albuterol/ipratropium (e.g. Combivent, Duoneb) | 8998 |
| Amiodarone (e.g. Cordarone) | 1308 |
| Aspirin | 38288 |
| Atropine | 1896 |
| Calcium chloride | 351 |
| Captopril (e.g. Capoten) | 6 |
| D10 (dextrose 10% per 250 ml) | 2403 |
| D10 (dextrose 10% per 500 ml | 11 |
| D25 (dextrose 25%) | 76 |
| D5 injectable solution (dextrose 5%) | 68 |
| D50 (dextrose 50% solution) | 3079 |
| Dexamethasone (e.g. Decadron) | 139 |
| Diazepam (e.g. Valium) | 254 |
| Diltiazem (e.g., Cardizem) | 1219 |
| Diphenhydramine (e.g. Bendadryl) | 2850 |
| Dopamine | 106 |
| Enalapril (e.g. Vasotec) | 18 |
| Epi 1:1,000 (epinephrine 1 mg/ml) | 2689 |
| Epi 1:10,000 (epinephrine 0.1 mg/ml) | 37178 |
| Epinephrine auto-injector, adult (0.3 ml of epi 1.0 mg/ml) | 69 |
| Epinephrine auto-injector, junior (0.3 ml of epi 0.5 mg/ml) | 23 |
| Epinephrine, Racemic HCl | 27 |
| Etomidate (e.g. Amidate) | 614 |
| Fentanyl | 24075 |
| Furosemide (e.g. Lasix) | 77 |
| Glucagon | 1681 |
| Glucose oral gel (e.g. Glutose, Insta-Glucose) | 3799 |
| Heparin | 121 |
| Hydrocortisone (e.g. Solu-Cortef) | 5 |
| Ibuprofen (e.g. Advil) | 12 |
| Ipratropium (e.g. Atrovent) | 1468 |
| Ketamine (e.g. Ketalar) | 1046 |
| Ketorolac (e.g. Toradol) | 1485 |
| Labetalol (e.g. Normodyne) | 21 |

| Medication given | Total count of administrations |
|---|---|
| Lactated Ringers (e.g. LR, RL) | 297 |
| Lidocaine | 1193 |
| Lorazepam (e.g. Ativan) | 2703 |
| Magnesium sulfate | 804 |
| Mannitol (e.g. Osmitrol) | 5 |
| Methylprednisolone (e.g. Solu-Medrol) | 12447 |
| Midazolam | 7132 |
| Morphine | 2707 |
| Naloxone (e.g. Narcan) | 15566 |
| Nicardipine (e.g. Cardene) | 20 |
| Nitroglycerin | 40974 |
| Nitrous oxide | 105 |
| Norepinephrine (e.g. Levophed) | 101 |
| Ondansetron (e.g. Zofran) | 34698 |
| Oxytocin (e.g. Pitocin) | 9 |
| Phenylephrine (e.g. Sudafed, Neo-Synephrine | 6 |
| Propofol (e.g. Diprivan) | 12 |
| Rocuronium (e.g. Zemuron) | 481 |
| Sodium bicarbonate | 1081 |
| Sodium chloride 3% injectable solution (NaCl 3%) | 28 |
| Succinylcholine (e.g. Anectine) | 170 |
| Tetracaine (e.g. Altacaine) | 9 |
| Vasopressin | 15 |
| Vecuronium (e.g. Norcuron) | 41 |
| Verapamil | 184 |

**Source: Pennsylvania State EMS Data Bridge, 2020**

Table 7 displays the number of medication administrations by EMS providers during an emergency record type call. Normal saline and oxygen were excluded. In addition, any medication that had less than 5 administrations was excluded from publishing. This table also reflects any medications administered and documented by an air ambulance on a scene flight.

Table 8 on pages 31-32 display the frequency with which an EMS procedure was performed on an emergency record type EMS call. These procedures are unduplicated counts, which means that, even if a procedure was performed on a single patient multiple times, it was only counted once. Finally, it is not indicative of a successful completion of the procedure; it only captures the number of patients on which a procedure was attempted. Any procedure that had less than 5 attempts was excluded from publishing. This table also reflects any procedures performed and documented by an air ambulance on a scene flight.

## Table 8. Procedure Counts, Emergency Records Only, 01/01/2019 – 12/31/2019

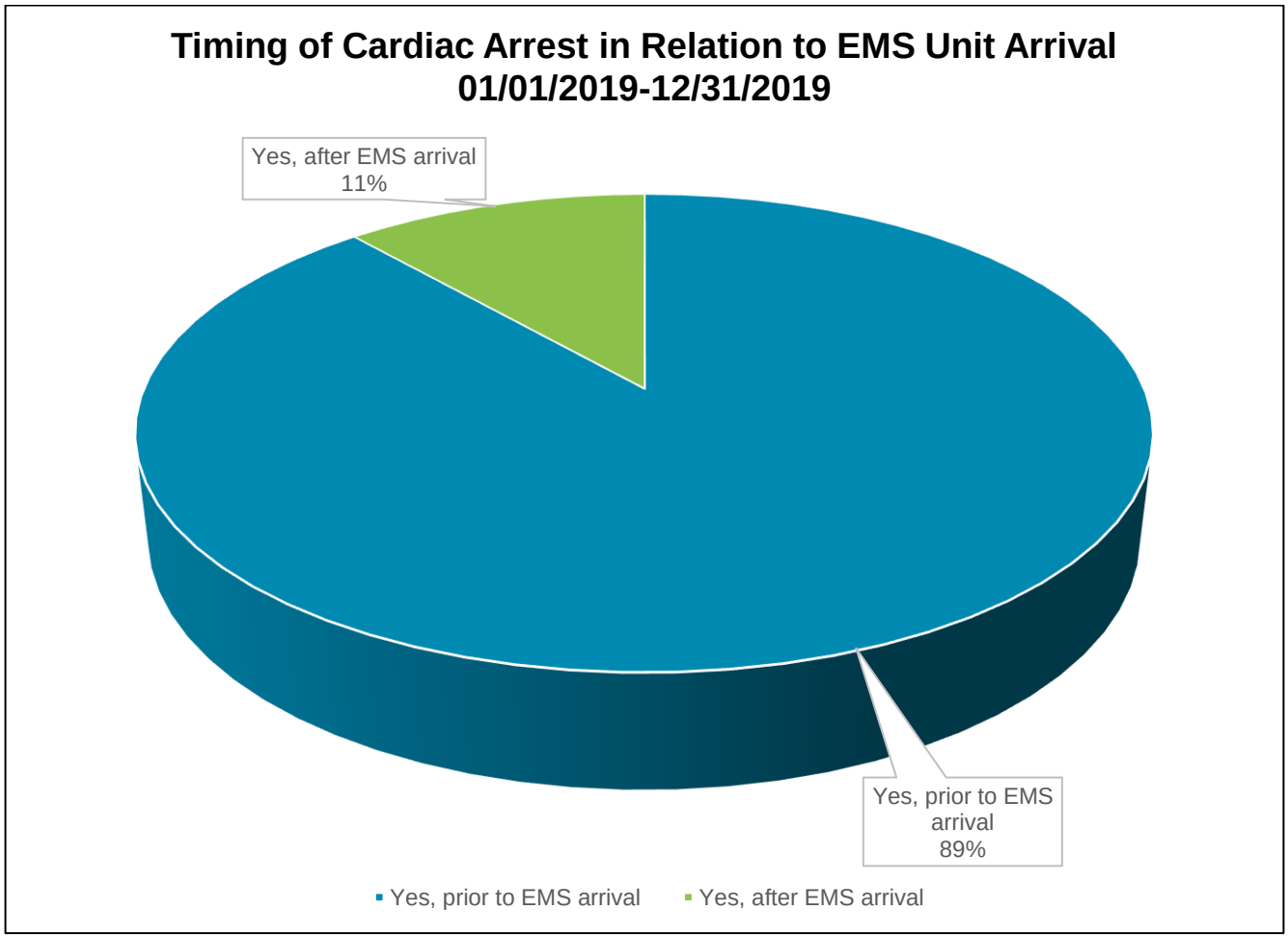
| Procedure | Number of patients |
|---|---|
| 12- lead ECG obtained | 173446 |
| 15-lead ECG obtained | 210 |
| 18-lead ECG obtained | 18 |
| 3-lead ECG obtained | 64233 |
| Airway device removal | 45 |
| Airway opened | 348 |
| Artery, blood draw | 7 |
| Artery, insertion of catheter (unspecified) | 387 |
| Assisted ventilations (via mask) | 7852 |
| Assisted ventilations (via tube) | 1008 |
| BiPAP | 35 |
| Blood product, unspecified | 5558 |
| Burn care | 1226 |
| Cardioversion | 232 |
| Central line care | 7 |
| Central venous pressure monitoring | 14 |
| Cervical collar applied | 14290 |
| Chest compressions (mechanical device) | 3525 |
| Chest tube insertion | 5 |
| Childbirth | 176 |
| CPAP | 8566 |
| CPR, manual | 4546 |
| Cricothyrotomy, surgical | 9 |
| C-spine stabilization, manual | 588 |
| Decontamination | 17 |
| Defibrillation, AED | 239 |
| Defibrillation, manual | 1346 |
| ETCO2 colorimetric detection | 6 |
| ETCO2 digital capnography | 1665 |
| Eye irrigation | 32 |
| Foreign body removal | 66 |
| Heimlich maneuver | 105 |
| Hemostatic agent | 443 |
| Immobilization using long board | 6853 |
| Immobilization using short extrication splint | 560 |
| Impedance threshold device | 46 |
| Induction, rapid sequence | 147 |
| Intracranial pressure monitoring | 201 |
| Intubation, nasal | 101 |
| Intubation, oral | 5473 |
| IO cannulation | 5844 |
| Laryngeal mask airway insertion | 220 |

| Procedure | Number of patients |
|---|---|
| Laryngoscopy, direct | 297 |
| Laryngoscopy, indirect (e.g. video laryngoscopy) | 427 |
| Left ventricular assist device care | 6 |
| Mouth-to-mask/mouth ventilation | 9 |
| Nasal airway insertion | 3974 |
| Nasogastric tube insertion | 35 |
| Needle decompression | 327 |
| Occlusive dressing | 163 |
| Oral airway insertion | 2649 |
| Orogastric tube insertion | 126 |
| Orthostatic vital signs | 1891 |
| Pacing, cardiac | 1186 |
| Patient cooling (cold pack or general) | 2310 |
| Patient warming (warm pack or general) | 290 |
| Precordial thump | 21 |
| Pressure dressing | 949 |
| Restraint applied, chemical | 12 |
| Restraint applied, physical | 6349 |
| Spinal immobilization, cervical | 9204 |
| Spinal immobilization, full | 13694 |
| Splinting, general | 3742 |
| Splinting, pelvic binder/sling | 229 |
| Splinting, traction | 1912 |
| Suction airway | 4367 |
| Supraglottic airway insertion (double lumen) | 1282 |
| Supraglottic airway, single lumen (i.e. King) | 183 |
| Tourniquet | 334 |
| Vagal maneuver | 468 |
| Vascular access via existing port (i.e. Portacath) | 473 |
| Vein, blood draw | 13010 |
| Vein, catheter removal | 161 |
| Vein, external jugular | 961 |
| Vein, extremity | 339020 |
| Vein, femoral | 259 |
| Ventilator care and adjustment | 459 |

**Source: Pennsylvania State EMS Data Bridge, 2020**

## Cardiac Arrest

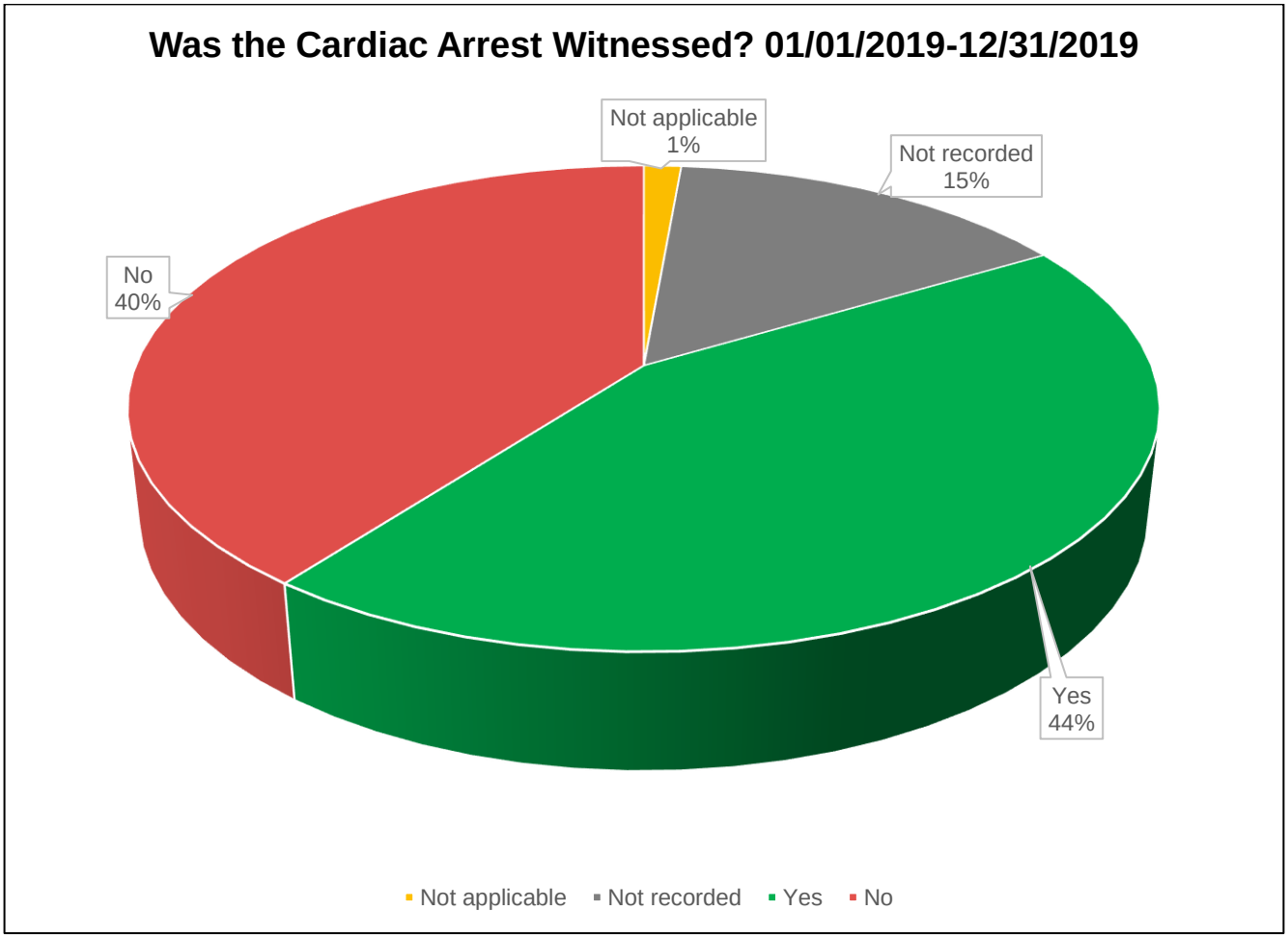
### Figure 13. Timing of Cardiac Arrest in Relation to EMS Unit Arrival, 01/01/2019 – 12/31/2019




**Source: Pennsylvania State EMS Data Bridge, 2020**

Figure 13 shows that approximately 90% of the cardiac arrests documented by EMS providers occurred prior to the arrival of an EMS unit.

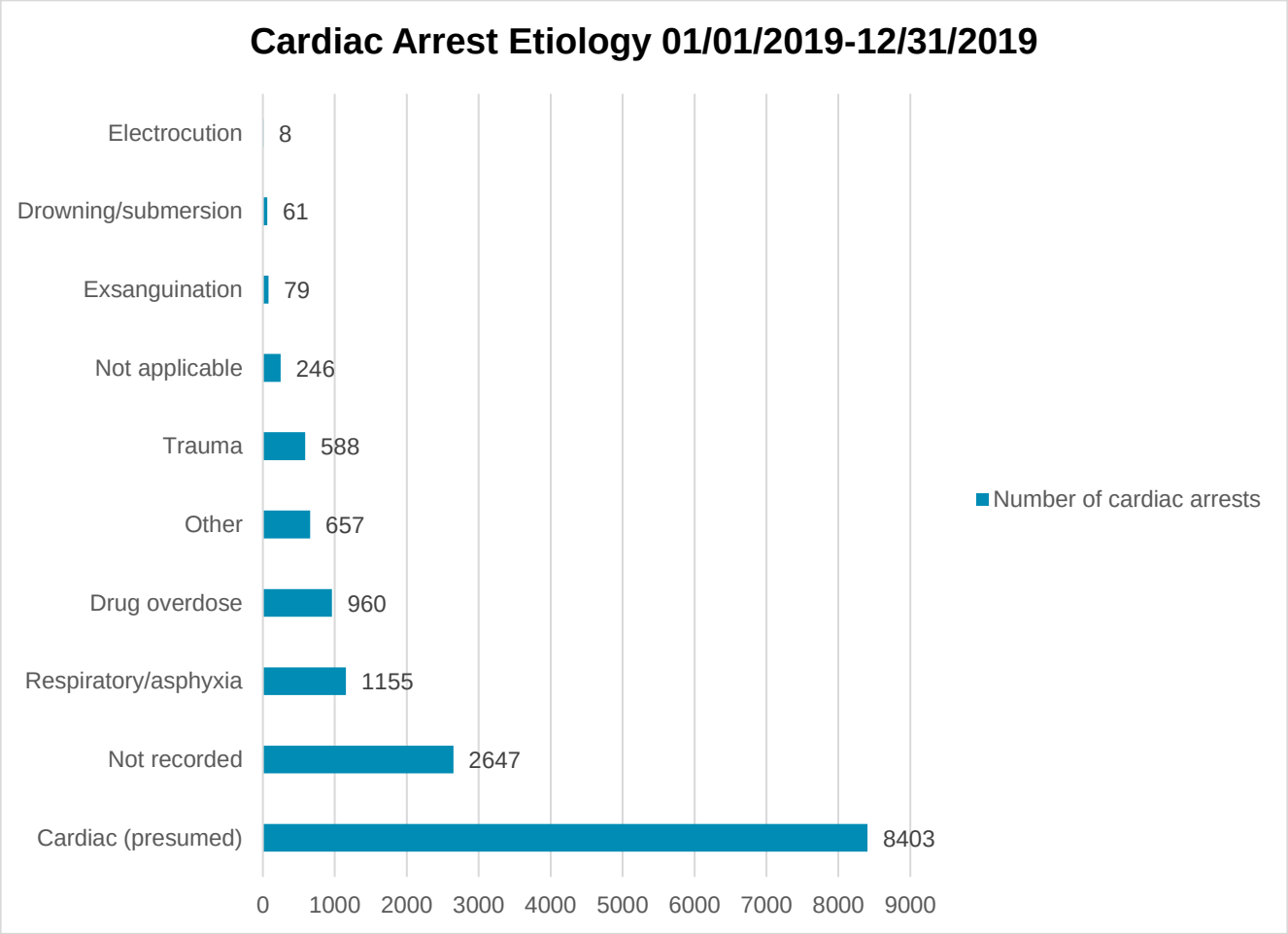
## Figure 14. Was the Cardiac Arrest Witnessed?, 01/01/2019 – 12/31/2019




**Source: Pennsylvania State EMS Data Bridge, 2020**

Activation of the EMS system is the first step in the cardiac arrest chain of survival. When a cardiac arrest is witnessed by a family member or bystander, that activation can occur sooner and ultimately give the patient a greater chance of survival--even more so when it is combined with bystander CPR. Figure 14 shows that 44% of reported cardiac arrests were witnessed. Sixteen percent of reported cardiac arrests did not have this value recorded, so there exists the possibility that this metric is higher than reported.

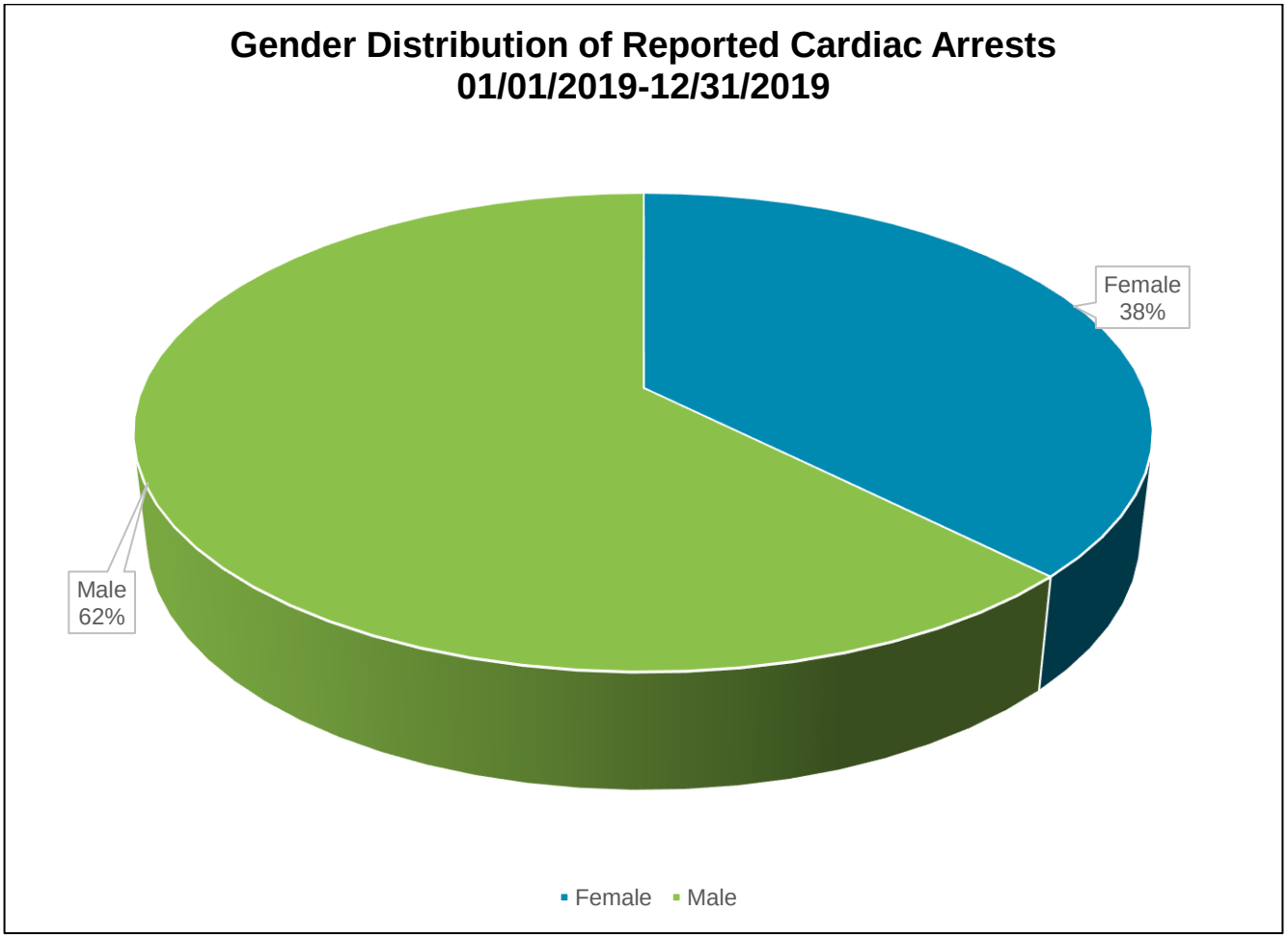
## Figure 15. Statewide Cardiac Arrest Etiology, 01/01/2019 – 12/31/2019




**Source: Pennsylvania State EMS Data Bridge, 2020**

Figure 15 displays the etiology of cardiac arrests reported to the Department. The overwhelming number of these arrests were categorized Cardiac (presumed). Based upon this information, Pennsylvania's cardiac arrest etiology breakdown is consistent with national statistics based on previous Cardiac Arrest Registry to Enhance Survival (CARES) reports.

## Figure 16. Gender Distribution of Reported Cardiac Arrests, 01/01/2019 – 12/31/2019




**Source: Pennsylvania State EMS Data Bridge, 2020**

Figure 16 summarizes the gender distribution of reported cardiac arrests. In the cardiac arrests that were reported to the data bridge, males had nearly 2 times the number of out- of-hospital cardiac arrests compared to females.

### Table 9. Reason CPR or Resucitation Discontinued by EMS, 01/01/2019 – 12/31/2019

| Reason CPR/resuscitation discontinued | Count of reason CPR/resuscitation discontinued |
|---|---|
| DNR | 329 |
| Medical control order | 2749 |
| Not applicable | 933 |
| Not recorded | 6922 |
| Obvious signs of death | 1265 |
| Physically unable to perform | 7 |
| Protocol/policy requirements completed | 350 |
| Return of spontaneous circulation (pulse or BP noted) | 2249 |

**Source: Pennsylvania State EMS Data Bridge, 2020**

Table 9 displays the breakdown of reason for discontinuing CPR and/or other resuscitative efforts.

### Table 10. End of EMS Cardiac Arrest Event, 01/01/2019 – 12/31/2019

| End of EMS cardiac arrest event | Count of end of EMS cardiac arrest event | Percentage of end of EMS cardiac arrest event |
|---|---|---|
| Expired in ED | 2656 | 17.9% |
| Expired in the field | 5515 | 37.2% |
| Not applicable | 628 | 4.2% |
| Not recorded | 1550 | 10.4% |
| Ongoing resuscitation by other EMS | 81 | <1% |
| Ongoing resuscitation in ED | 1734 | 11.7% |
| ROSC (Return of Spontaneous Circulation) in the ED | 769 | 5.1% |
| ROSC in the field | 1871 | 12.6% |

**Source: Pennsylvania State EMS Data Bridge, 2020**

Table 10 summarizes the final EMS status of all patients who were reported in cardiac arrest. The best metric for evaluating cardiac arrest performance is neurologically intact survival. However, currently, there is no mechanism to collect ultimate outcome information in the state data bridge.

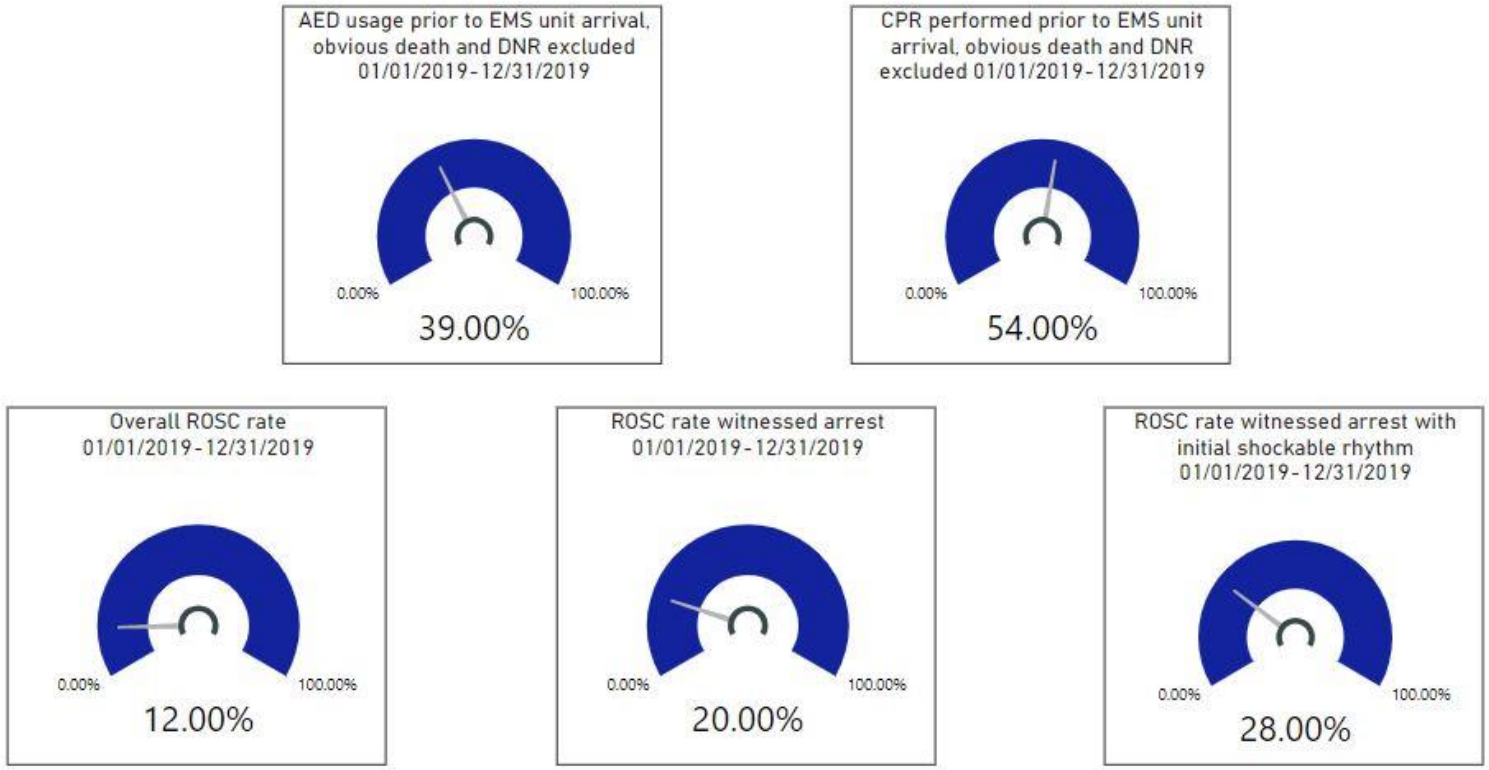
The Bureau recommends that all EMS agencies participate in the CARES project. CARES is a registry that tracks cardiac arrest survival and includes a mechanism for collecting the final hospital outcomes; it is the current gold standard in tracking cardiac arrest statistics in the nation.

The statistics included in Figure 17 on page 39 focus largely on return of spontaneous circulation (ROSC). For the purposes of this report, ROSC was counted if it was documented as sustained for at least 20 minutes and/or was documented as ROSC on arrival to the emergency department.

There are 3 separate ROSC rates. The first looks at all cardiac arrests that were presumed cardiac in nature, excluding those with a do-not-resuscitate (DNR) order and cases where obvious death was documented. The second looks at the same sample but with an additional filter that the cardiac arrest was witnessed. The third incorporates the characteristics of the first 2 but has an additional filter of the initial rhythm for EMS being a shockable rhythm.

Rates of CPR and AED usage prior to EMS arrival are also included to gauge the success of bystander education programs.

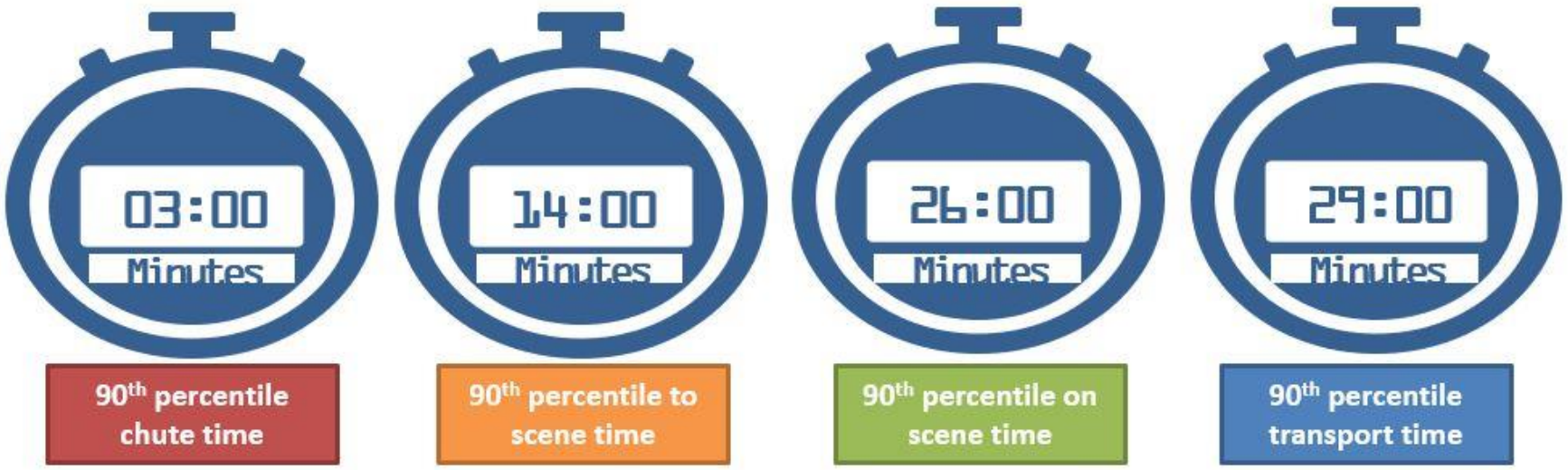
## Figure 17. Statewide Cardiac Arrest Performance Metrics, 01/01/2019 – 12/31/2019




**Source: Pennsylvania State EMS Data Bridge, 2020**

## Response Time

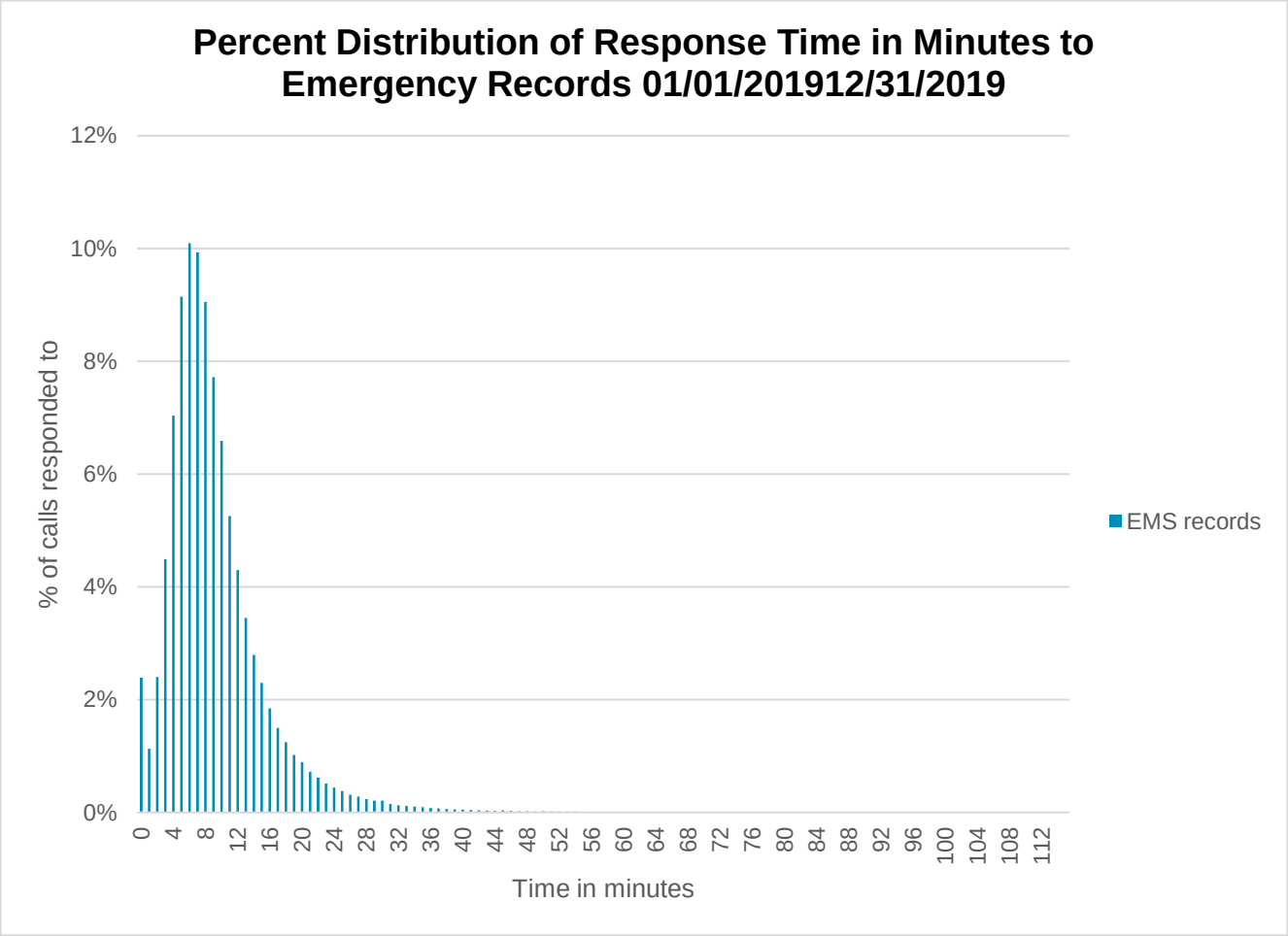
### Figure 18. Statewide 90th Percentile Interval Times, Emergency Records Only, 01/01/2019 – 12/31/2019




**Source: Pennsylvania State EMS Data Bridge, 2020**

Figure 18 displays the statewide 90th percentile times for emergency calls for service for various intervals. Response time is a commonly requested metric. To calculate the 90th percentile response time, we can add the 90th percentile chute time and the 90th percentile to scene time. The commonwealth's 90th percentile response time is 17 minutes. This means that 90% of emergency calls in the commonwealth are responded to and an EMS agency is on scene in 17 minutes. Chute time is the interval between a unit being notified by dispatch of a call for service and the unit being en route to the call.

## Figure 19. Percent Distribution of Response Times in Minutes Emergency Records, 01/01/2019 – 12/31/2019




**Source: Pennsylvania State EMS Data Bridge, 2019.**

Figure 19 displays the percentage of emergency record type calls that are responded to in each minute of elapsed time. Seventy percent of emergency calls for service received a response time of 10 minutes or less. Response time is measured from the time that the unit was notified by dispatch to the time that the unit arrived on scene. Both data points had to be present to be calculated. Ninety percent of records submitted had both points present for analysis. Table 12 on pages 43 through 45 provides detailed county level information related to response time.

## Table 11. Response Time Information by County, Emergency Records Only, 01/01/2019 – 12/31/2019

| County | Number of valid records | 90th percentile response time (minutes) | Average response time (minutes) | Median of response time (minutes) |
|---|---|---|---|---|
| Adams | 4,003 | 17 | 10.69 | 10 |
| Allegheny | 184,827 | 16 | 9.50 | 8 |
| Armstrong | 8,591 | 21 | 11.99 | 10 |
| Beaver | 4,564 | 18 | 11.02 | 10 |
| Bedford | 4,979 | 24 | 13.40 | 12 |
| Berks | 47,052 | 15 | 9.27 | 9 |
| Blair | 20,571 | 14 | 7.81 | 6 |
| Bradford | 7,693 | 24 | 11.16 | 8 |
| Bucks | 51,637 | 14 | 8.94 | 8 |
| Butler | 18,827 | 16 | 9.13 | 8 |
| Cambria | 23,543 | 15 | 9.07 | 8 |
| Cameron | 1,023 | 30 | 14.22 | 9 |
| Carbon | 8,937 | 20 | 11.30 | 10 |
| Centre | 13,069 | 20 | 11.68 | 10 |
| Chester | 48,661 | 13 | 8.07 | 7 |
| Clarion | 4,820 | 19 | 9.86 | 8 |
| Clearfield | 11,440 | 20 | 10.74 | 9 |
| Clinton | 3,839 | 20 | 11.90 | 10 |
| Columbia | 7,963 | 20 | 11.54 | 10 |
| Crawford | 9,256 | 20 | 9.81 | 8 |
| Cumberland | 15,100 | 13 | 8.42 | 8 |
| Dauphin | 24,974 | 15 | 9.14 | 8 |
| Delaware | 68,002 | 10 | 6.60 | 6 |
| Elk | 3,671 | 19 | 10.23 | 8 |
| Erie | 33,925 | 16 | 9.09 | 8 |
| Fayette | 20,336 | 19 | 9.67 | 8 |
| Forest | 908 | 37 | 19.49 | 19 |

| County | Number of valid records | 90th percentile response time (minutes) | Average response time (minutes) | Median of response time (minutes) |
|---|---|---|---|---|
| Franklin | 10,326 | 15 | 8.81 | 8 |
| Fulton | 1,177 | 25 | 13.34 | 12 |
| Greene | 3,955 | 25 | 13.28 | 11 |
| Huntingdon | 3,926 | 27 | 14.65 | 13 |
| Indiana | 8,446 | 22 | 13.19 | 12 |
| Jefferson | 5,667 | 20 | 11.03 | 10 |
| Juniata | 3,220 | 19 | 11.33 | 10 |
| Lackawanna | 18,324 | 15 | 8.14 | 7 |
| Lancaster | 33,269 | 15 | 9.07 | 8 |
| Lawrence | 11,351 | 21 | 10.80 | 9 |
| Lebanon | 17,411 | 16 | 8.85 | 8 |
| Lehigh | 42,968 | 14 | 8.32 | 7 |
| Luzerne | 41,791 | 16 | 8.84 | 8 |
| Lycoming | 16,922 | 16 | 9.32 | 8 |
| McKean | 3,101 | 18 | 8.76 | 6 |
| Mercer | 15,714 | 18 | 9.74 | 8 |
| Mifflin | 4,395 | 18 | 9.81 | 8 |
| Monroe | 11,775 | 19 | 10.84 | 10 |
| Montgomery | 53,777 | 12 | 7.84 | 7 |
| Montour | 2,150 | 28 | 12.73 | 8 |
| Northampton | 34,574 | 14 | 8.21 | 7 |
| Northumberland | 14,789 | 17 | 9.12 | 7 |
| Perry | 3,979 | 23 | 13.78 | 13 |
| Philadelphia | 265,756 | 15 | 8.62 | 7 |
| Pike | 4,487 | 27 | 15.12 | 14 |
| Potter | 1,845 | 31 | 15.96 | 14 |
| Schuylkill | 15,637 | 20 | 11.08 | 10 |
| Snyder | 3,300 | 21 | 11.99 | 11 |
| Somerset | 8,479 | 20 | 11.27 | 10 |
| Sullivan | 1,154 | 41 | 23.31 | 22 |

| County | Number of valid records | 90th percentile response time (minutes) | Average response time (minutes) | Median of response time (minutes) |
|---|---|---|---|---|
| Susquehanna | 4,272 | 27 | 15.68 | 15 |
| Tioga | 5,451 | 31 | 14.81 | 13 |
| Union | 6,322 | 15 | 8.31 | 7 |
| Venango | 7,829 | 18 | 9.18 | 7 |
| Warren | 4,122 | 19 | 9.38 | 7 |
| Washington | 28,701 | 19 | 10.62 | 9 |
| Wayne | 7,140 | 26.3 | 14.44 | 13 |
| Westmoreland | 98,651 | 21 | 10.78 | 9 |
| Wyoming | 4,583 | 23 | 13.71 | 12 |
| York | 31,768 | 15 | 9.03 | 8 |

**Source: Pennsylvania State EMS Data Bridge, 2020**

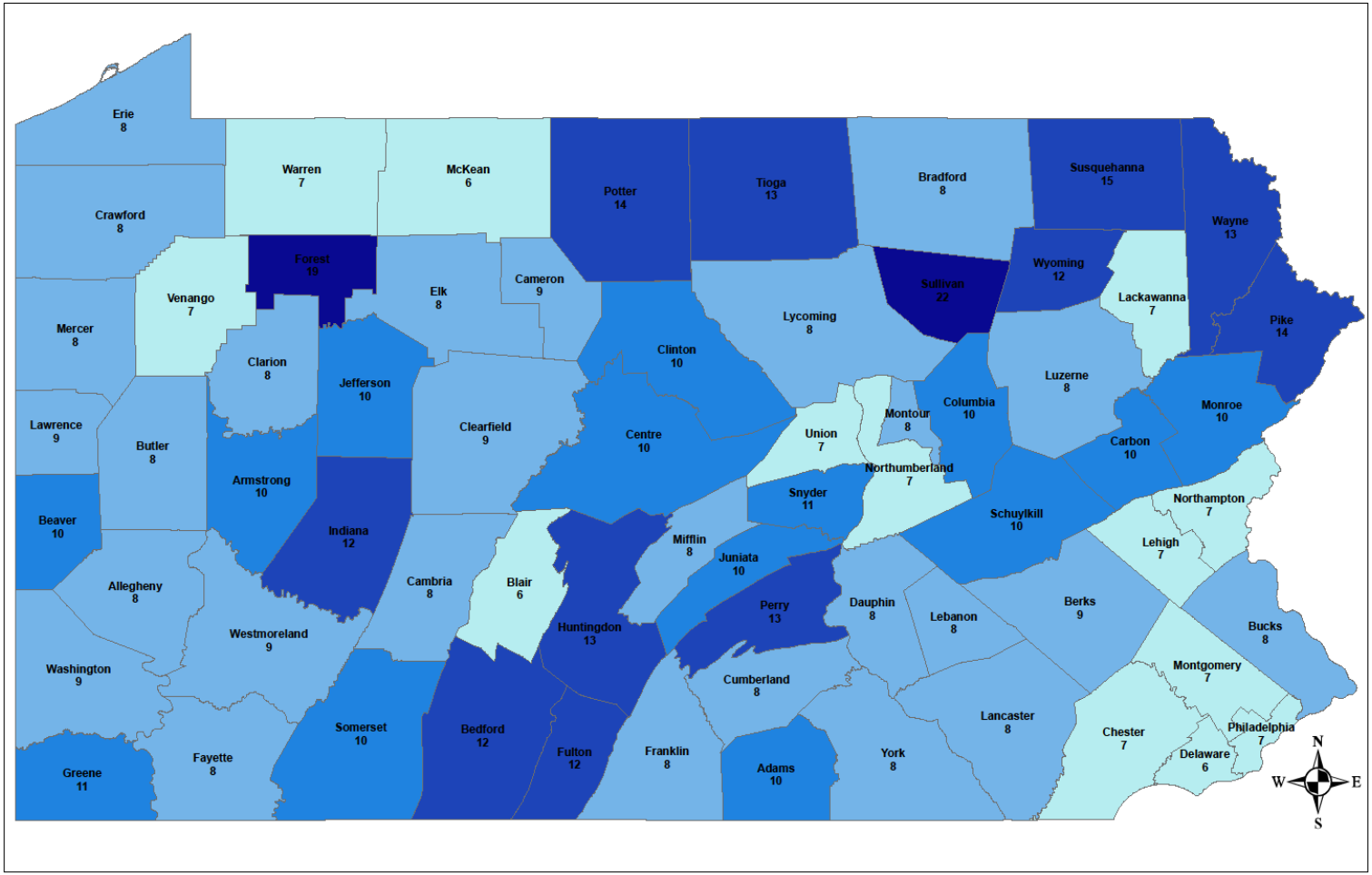
Response time is defined as the difference between the EMS unit's arrival on scene and the time notified by dispatch. Both data points had to be present to be calculated. Most of the records rejected in data analysis to create this calculation did not have a dispatch time present. This lack of data is attributed to the accuracy of the information provided by field providers

Included in the table are the number of valid records as defined above, the 90$^{th}$ percentile response time, the average response time and the median response time. The 90$^{th}$ percentile indicates that 90% of emergency calls for service in the selected county are answered in that time frame. The average response time is calculated by adding all the response times together and dividing by the total number of records. Finally, the median response time is also included; the median is calculated by listing the response time of all the applicable records and selecting the one that is in the middle. The median can also be referred to as the 50$^{th}$ percentile, meaning 50% of calls are answered in less time and 50% are answered in more time.

**These figures are provided as a benchmark and are provided for a high-level overview. Because of variations in data reporting and validity, the Bureau encourages anyone who has specific questions regarding response times in their jurisdiction to contact their local 911 center, particularly if the number of valid records is not consistent with what is expected for the county.**

Map 2 on the following page provides a visual representation of the median response time by incident county**.**

# Map 2: 2019 Median Response Time for Emergency Records by County in Minutes




**Legend**

Median of response time in minutes: 6 - 7 | 8 - 9 | 10 - 11 | 12 - 15 | 16 - 22

Prepared by DJF 01/15/2020
Source: EMS State Data Bridge, 2020

## EMS Workforce

### Table 12. Number of Pennsylvania EMS Certifications Expiring, by Certification Type, 01/01/2019 – 12/31/2019

| Primary certification | Number of certifications expiring |
|---|---|
| EMSVO | 8 |
| EMR | 472 |
| EMT | 2,921 |
| AEMT | 21 |
| Paramedic | 719 |
| PHRN | 172 |

**Source: Pennsylvania State EMS Certification Registry, 2020**

Table 13 summarizes the number of individuals by certification type that allowed their certification to expire in 2019. The EMT certification level had the most expirations. The number of expirations for providers at and above the level of AEMT are higher in the past, due to the process of all advanced level certifications expiring on the last day of December in odd numbered years, pursuant to regulation. 2019 was the first year this was implemented.

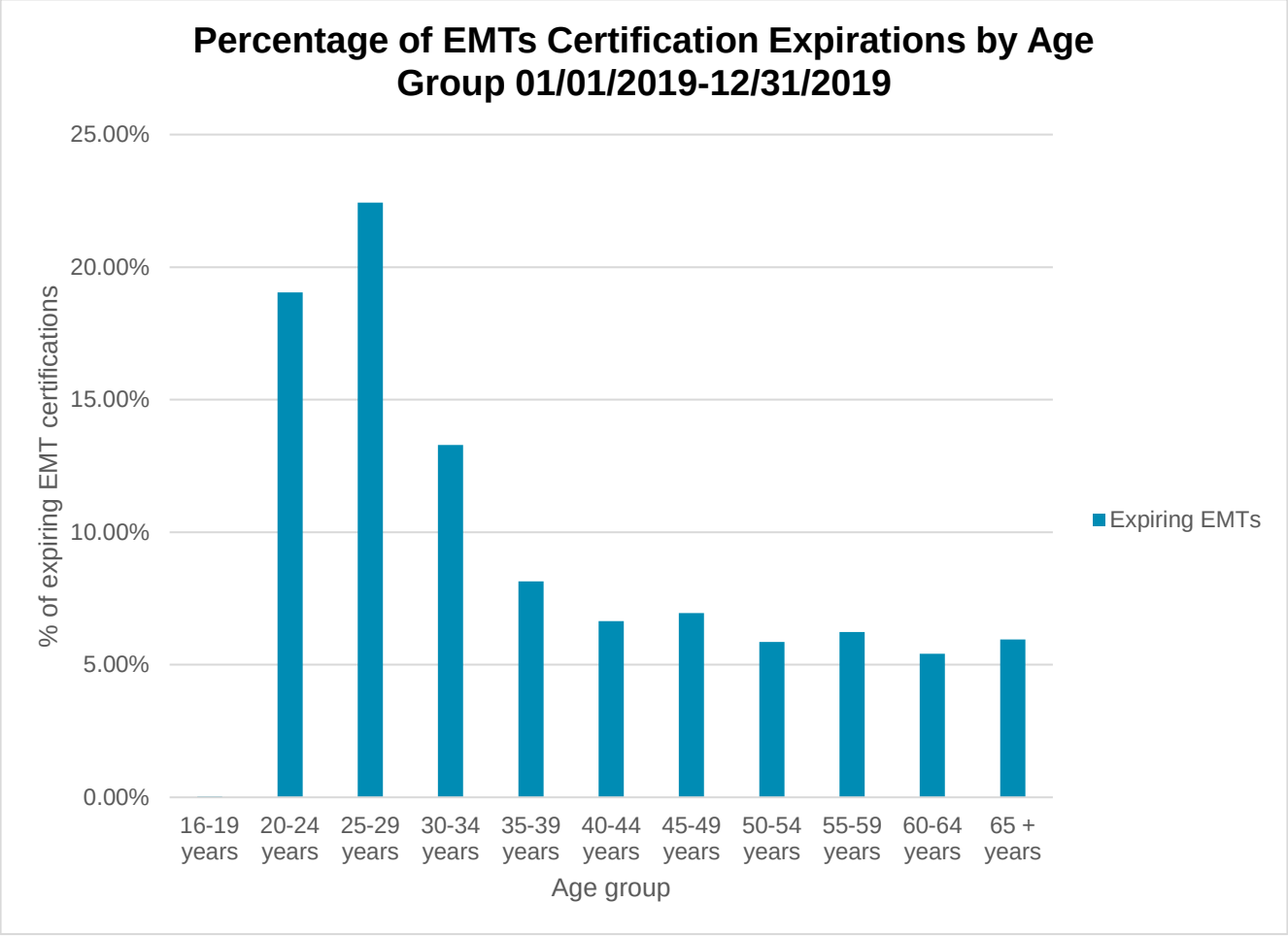
### Table 13. Number of Pennsylvania Licensed EMS Agencies as of 12/31/2019

| Highest level on agency license | Count of agencies |
|---|---|
| QRS | 468 |
| BLS squad | 10 |
| BLS ambulance | 447 |
| ALS squad | 29 |
| ALS ambulance | 368 |
| Air ambulance services | 17 |
| **Total number of agencies** | **1,339** |

**Source: Pennsylvania State EMS Certification Registry, 2020**

Table 14 summarizes the number of licensed EMS agencies by the highest level of their EMS agency license.

## Figure 20. Percentage of EMTs Certification Expirations by Age Group, 01/01/2019 – 12/31/2019

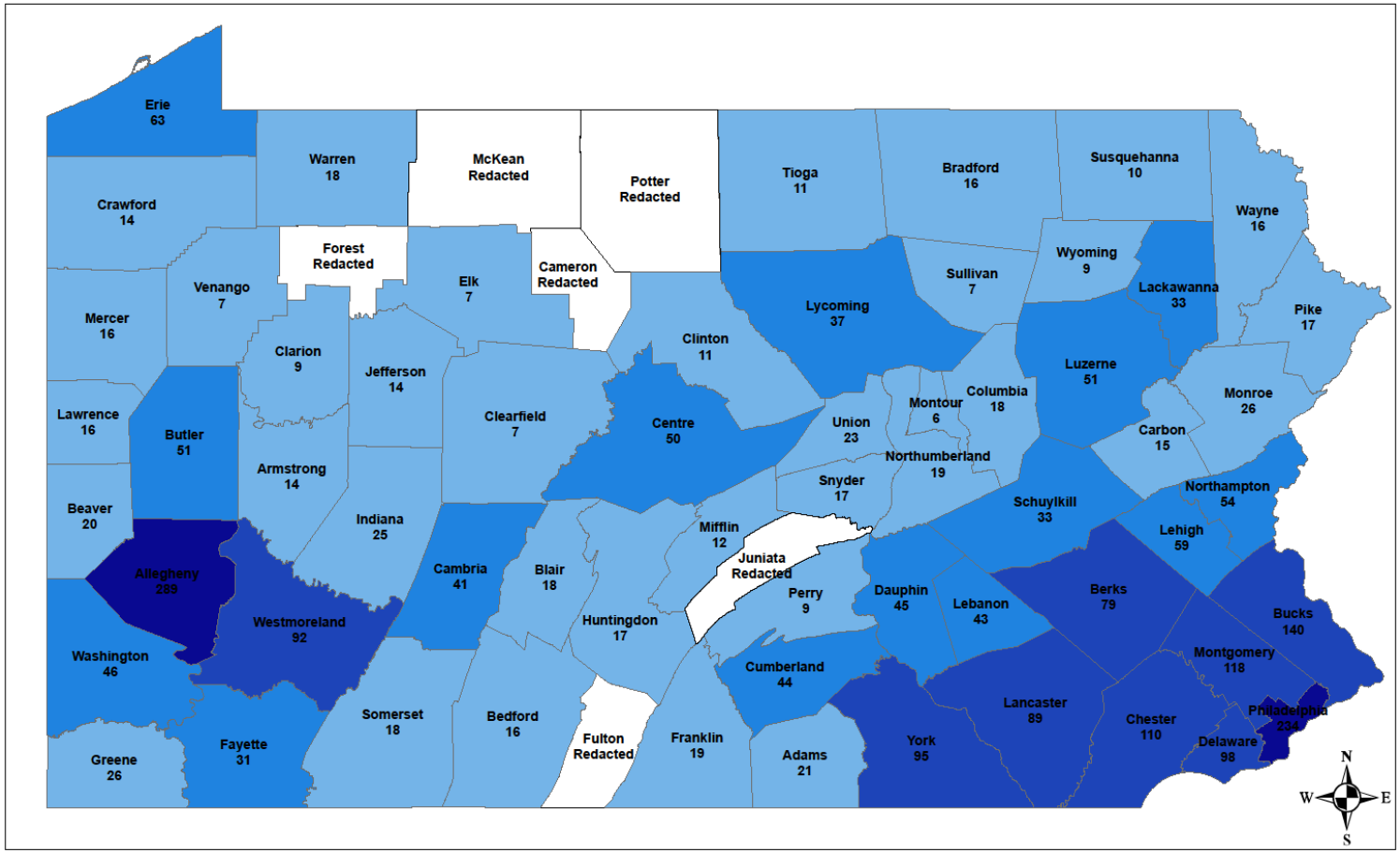



**Source: Pennsylvania State EMS Certification Registry, 2020**

Figure 20 shows that 63% of individuals with an expiring EMT certification were under the age of 40. Forty-one percent of expiring EMTs are under the age of 30. The rate at which younger EMTs are leaving the system remains a concern. This information is important to monitor and trend to allow for targeted retention strategies to be implemented at the state, regional, and local levels. Those who hold EMT certification are the pipeline for paramedics. Continued inabilities to retain EMTs will exacerbate the challenge to recruit paramedics.

Map 3 on the following page displays geographically the number of EMT certifications by county of residence. Counties in white had less than 5 individuals' EMT certifications expire. In accordance with Bureau reporting policies, the information for these counties has been redacted to protect provider privacy. This map does not account for individuals who held a Pennsylvania EMS certification but who reside outside of Pennsylvania.

## Map 3: Count of 2019 EMT Expirations by County

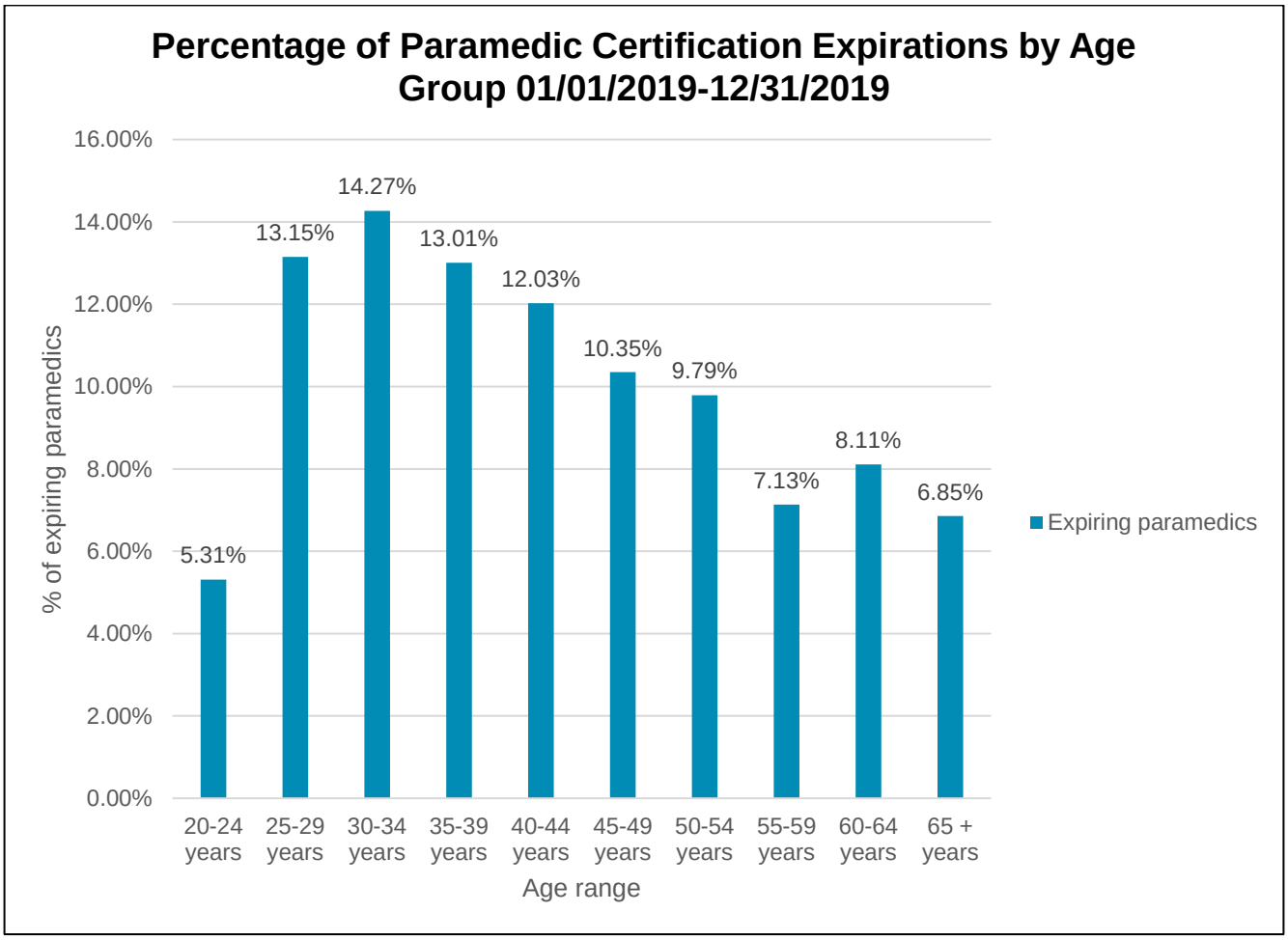



**Legend**

Number of EMT expirations: 1 - 5 | 6 - 30 | 31 - 63 | 64 - 140 | 141 - 289

Prepared by DJF 01/15/2020
Source: EMS Certification Registy, 2020

**Figure 21. Percentage of Paramedic Certification Expirations by Age Group, 01/01/2019 – 12/31/2019**

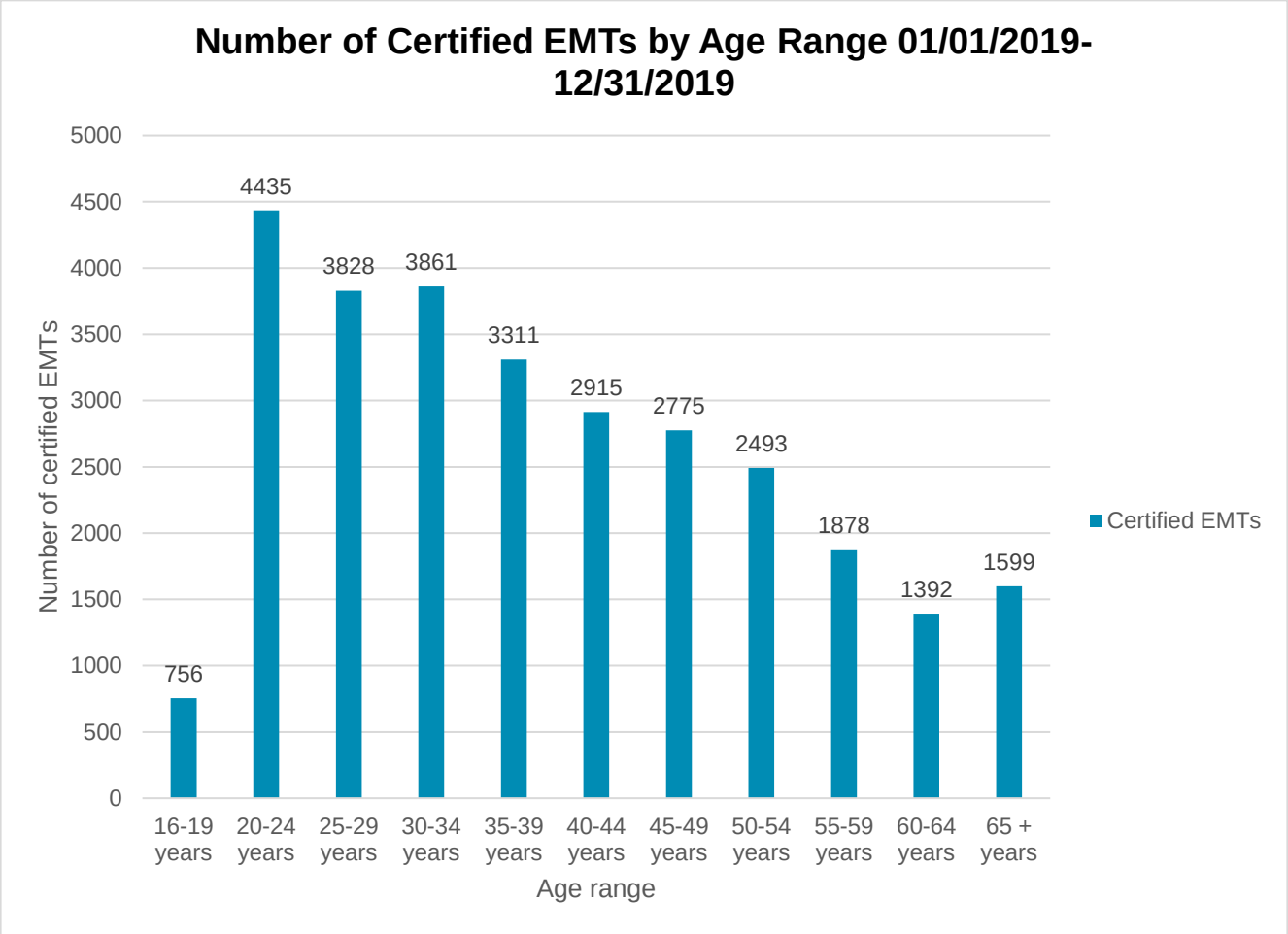



**Source: Pennsylvania State EMS Certification Registry, 2020**

Figure 21 shows that nearly 46% of individuals with an expiring paramedic certification were under the age of 40. Approximately 18% of expiring paramedics are under the age of 30. The rate at which younger paramedics are leaving the system is still concerning, but not to the extent of the EMT level. This information is important to monitor and trend to allow for targeted retention strategies to be implemented at the state, regional, and local levels.

2019 was the first year in which new requirements for all advanced level providers to expire on the last day of December in odd numbered years was fully implemented. This data establishes the new baseline as it relates to advanced level providers.

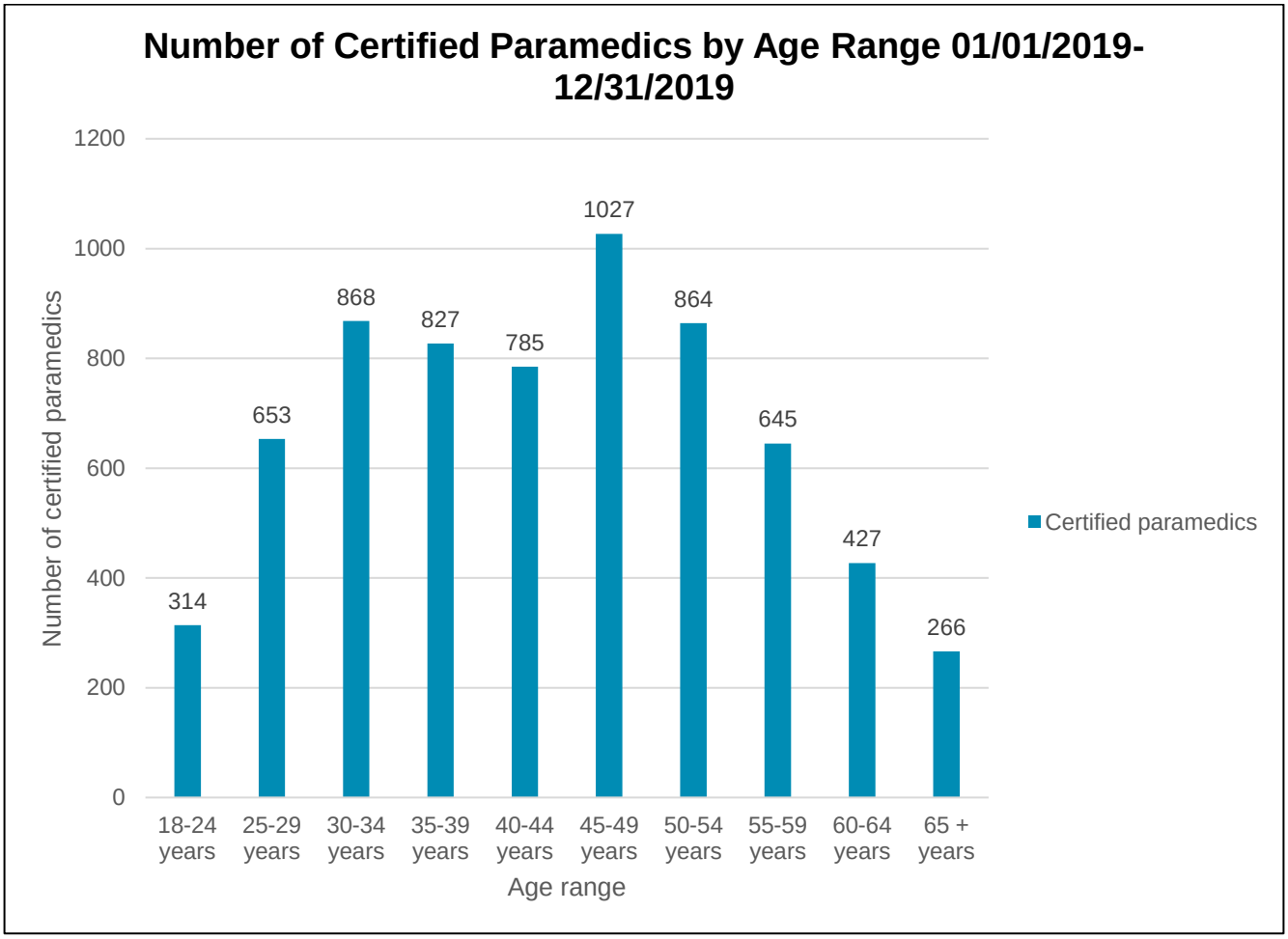
## Figure 22. Number of Certified EMTs by Age Range, 01/01/2019 – 12/31/2019




**Source: Pennsylvania State EMS Certification Registry, 2020**

Figure 22 displays the age range distribution of certified EMTs within Pennsylvania's EMS system. It is important to note that this is the available workforce, not necessarily the "active" workforce.

## Figure 23. Number of Certified Paramedics by Age Range, 01/01/2019 – 12/31/2019




**Source: Pennsylvania State EMS Certification Registry, 2020**

Figure 23 displays the age range distribution of certified paramedic within Pennsylvania's EMS system. It is important to note that this is the available workforce, not necessarily the "active" workforce.

## Table 14. Pennsylvania Certified EMS Workforce as of 01/15/2020

| Primary certification | Number of certification holders | Net change from 2018 |
|---|---|---|
| EMSVO | 1,119 | 172 |
| EMR | 3,025 | (231) |
| EMT | 29,243 | (262) |
| AEMT | 318 | 73 |
| Paramedic | 6,676 | (272) |
| PHRN | 1,228 | (18) |

**Source: Pennsylvania State EMS Certification Registry, 2020**

The above numbers in Table 15 are all individuals who hold a certification at that level and, as such, are considered part of the available workforce. Also included is the net change from 2017. This value was calculated by comparing the values for year ending 2018 to the values previously reported in the 2017 year end report. It is important to note that this is the available workforce, not necessarily the "active" workforce.

Map 4 on the following page displays the total number of certified field providers through the level of PHRN by county of residence. This map does not account for individuals who hold a Pennsylvania EMS certification but who reside outside of Pennsylvania.

Maps 4-7 on the following pages highlight different EMS workforce measures related specifically to county.

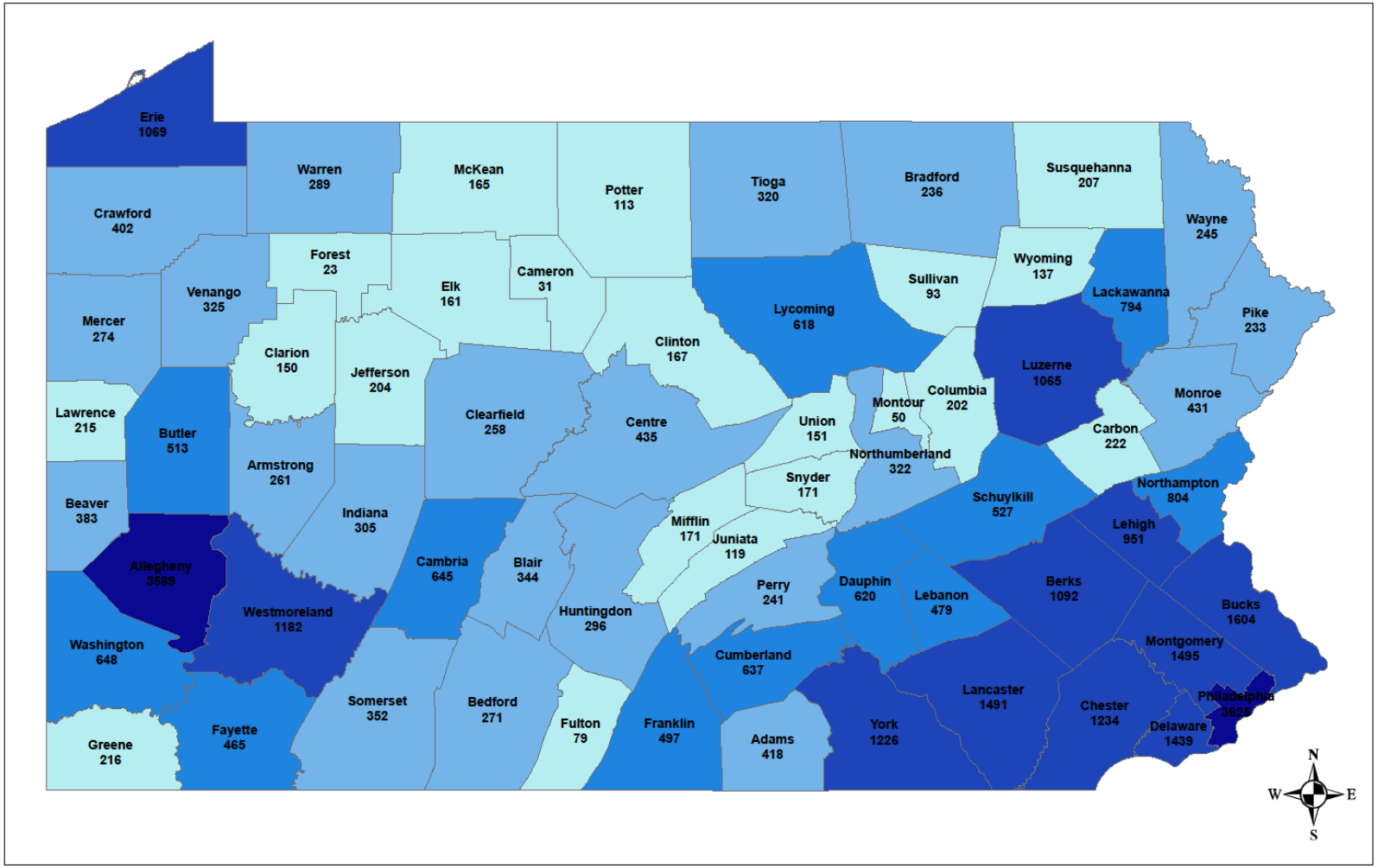
Map 4 displays the total number of certified EMS providers through the level of pre-hospital physician (PHP) that reside in each Pennsylvania county.

Map 5 displays the percentage change of EMS providers, through the level of pre-hospital physician (PHP), from 2018-2019.

Map 6 displays the percentage change of emergency medical technicans (EMT), from 2018-2019.

Map 7 displays the percentage change of paramedics, from 2018-2019.

# Map 4: 2019 Year End Number of Certified EMS Providers by County

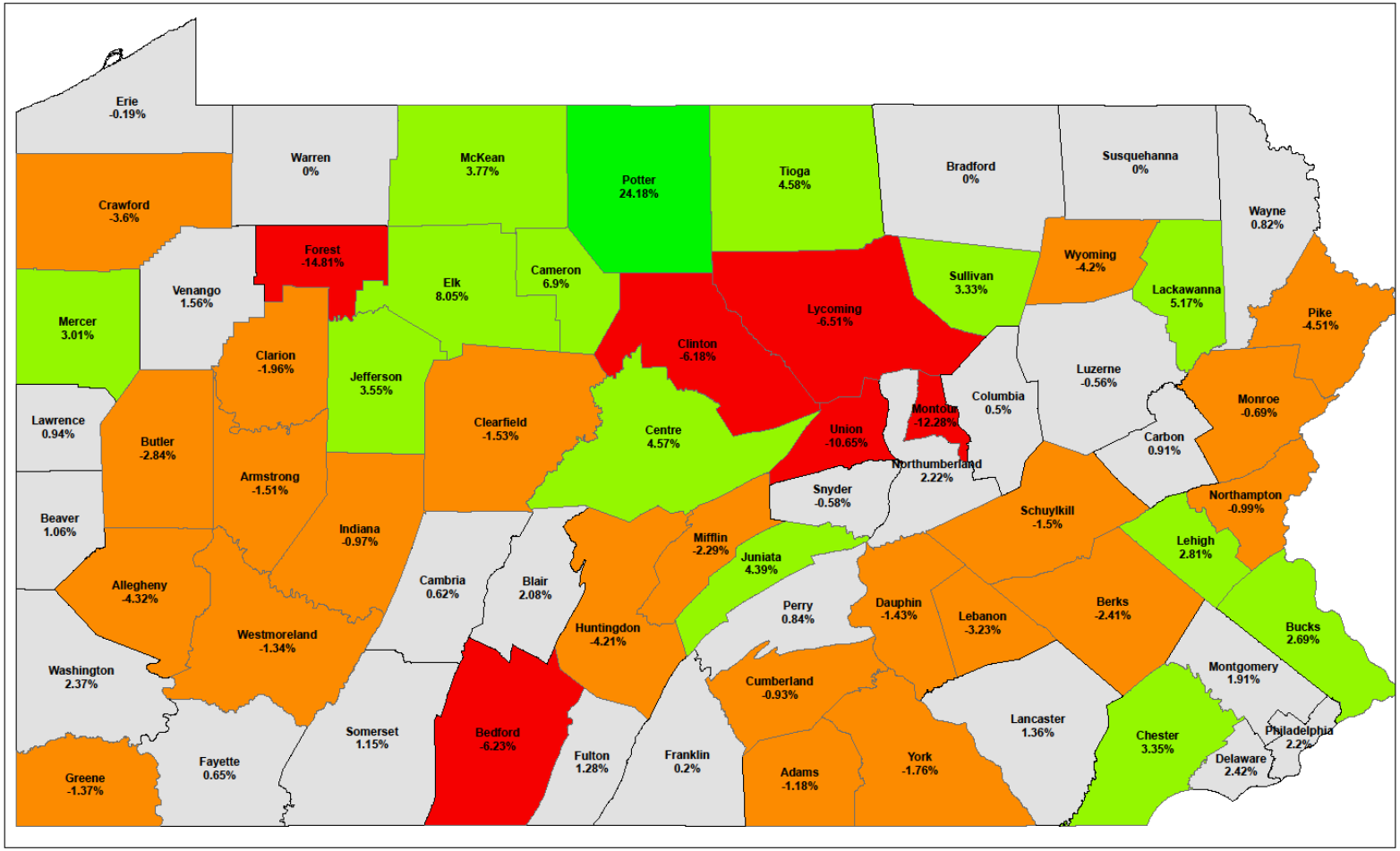



**Legend**

**Number of certified EMS providers** 23 - 222 | 223 - 435 | 436 - 804 | 805 - 1604 | 1605 - 3625

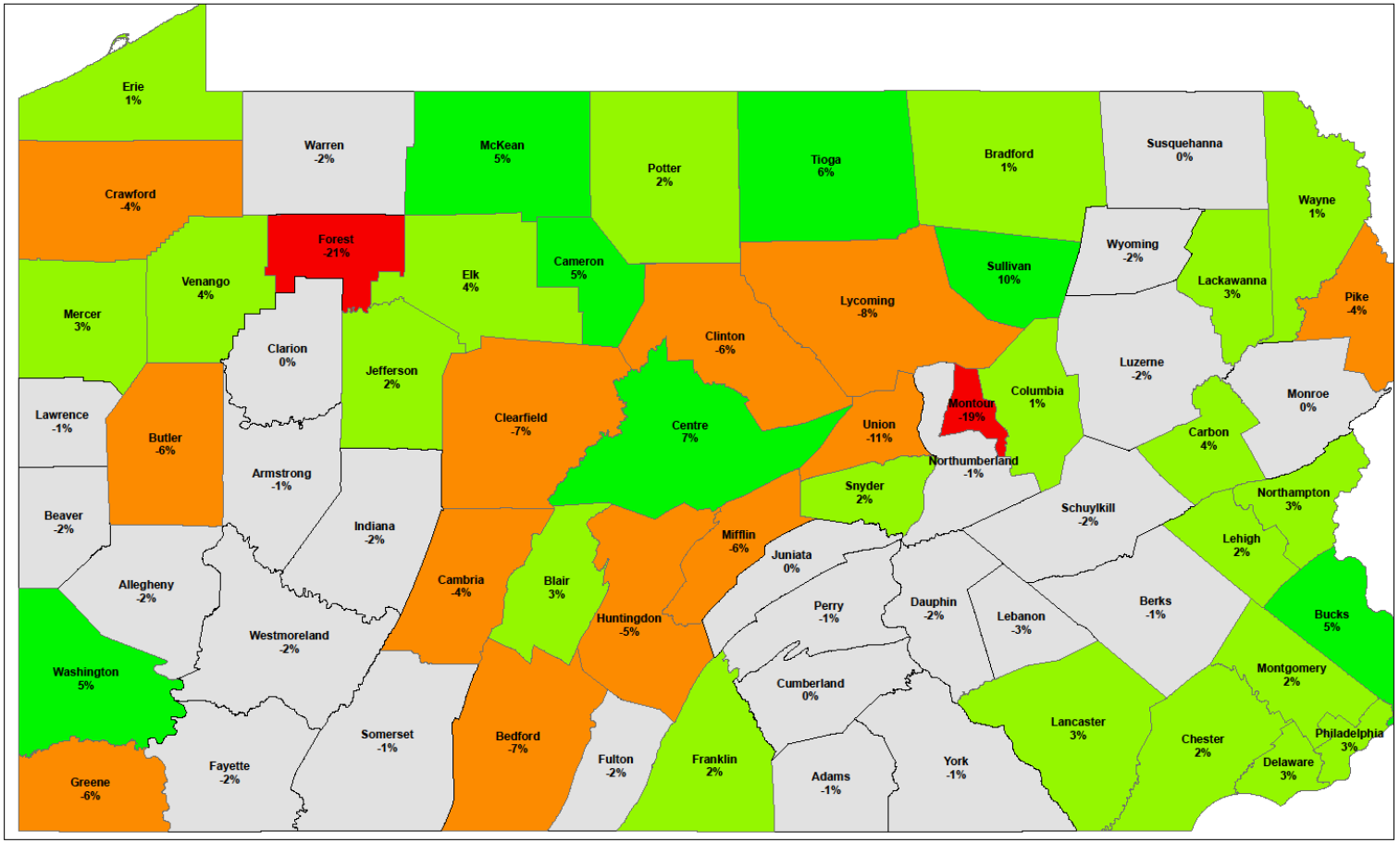
Prepared by DJF 01/15/2020
Source PA EMS Certification Registry

# Map 5: 2018 to 2019 % Net Change of EMS Providers by County



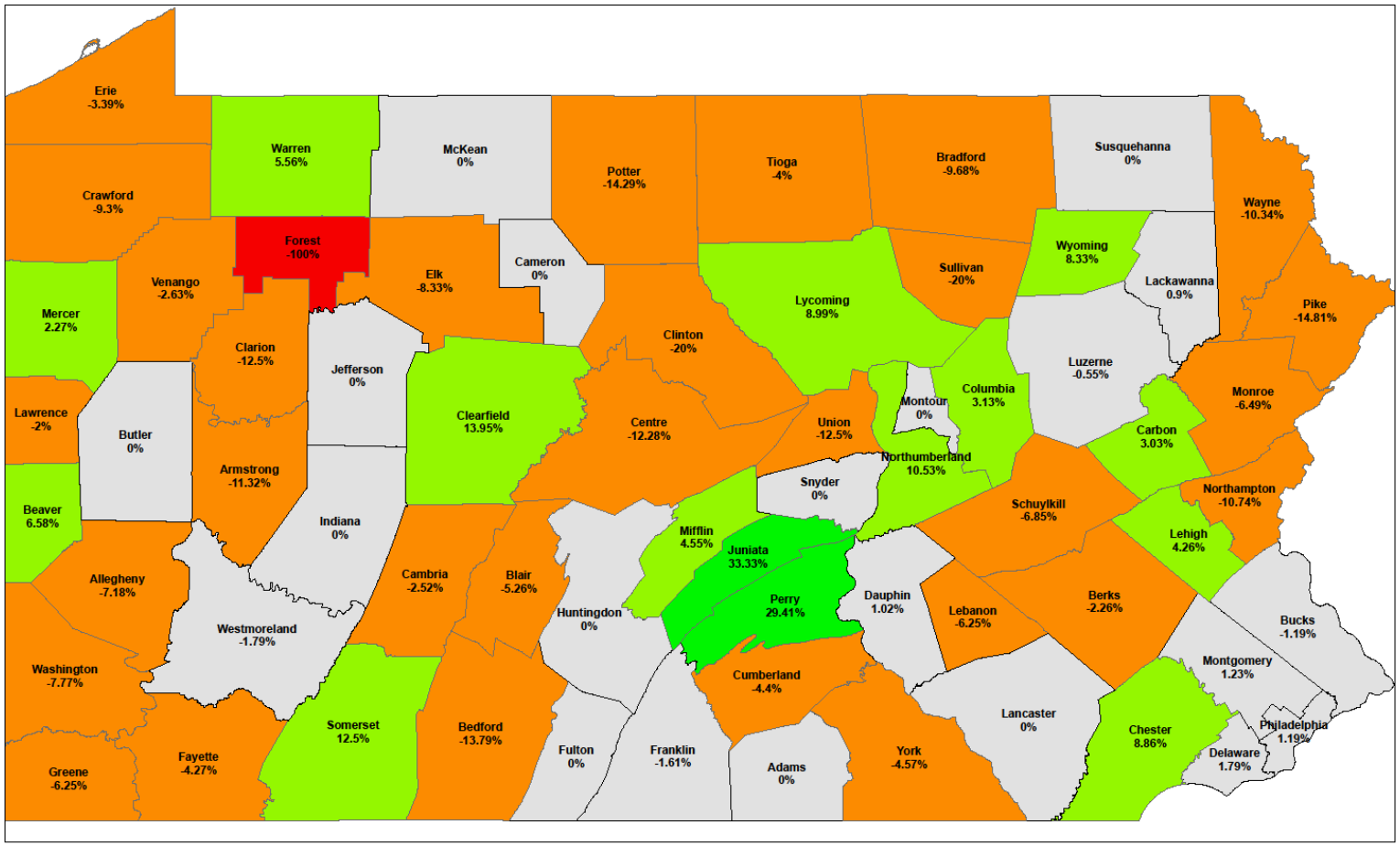

Prepared by DJF 01/15/2020
Source PA EMS Certification Registry

# Map 6: 2018 to 2019 % Net Change of Certified EMTs by County




Prepared by DJF 01/16/2020
Source PA EMS Certification Registry

# Map 7: 2018 to 2019 % Net Change of Certified Paramedics by County




Prepared by DJF 01/16/2020
Source PA EMS Certification Registry

## Table 15. National Registry of Emergency Medical Technician Exam Statistics, by Year of Course Completion 2016-2019 [1]

| Testing metric | 2016 | 2017 | 2018 | 2019 |
|---|---|---|---|---|
| **PA EMT overall pass rate** | **78%** | **77%** | **78%** | **76%** |
| National EMT overall pass rate | 82% | 81% | 81% | 79% |
| EMT successful completion | 2,084 | 1,964 | 2,100 | 2,117 |
| **PA paramedic overall pass rate** | **83%** | **84%** | **87%** | **88%** |
| National paramedic overall pass rate | 89% | 90% | 87% | 86% |
| Paramedic successful completion | 227 | 167 | 197 | 175 |

**Source: National Registry of Emergency Medical Technicians, 2020**

Table 15 above shows the number of students successfully passing the National Registry of Emergency Medical Technician (NREMT) EMT and paramedic cognitive exams, by year of course completion. Pennsylvania overall pass rates are also included. National overall pass rates are also included for benchmarking purposes. The values for 2016 and 2017 are now static, as the 2-year window for exam completion has passed. The numbers for 2018 and 2019 are dynamic, as students are still testing.

# Citations

1. National Registry of Emergency Medical Technicians. (2019). Pennsylvania state pass/fail reports. Retrieved from www.nremt.org.