2020 EMS Data Report

Bureau of Emergency Medical Services

October 2021

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 effort 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 2020, the EMS system in Pennsylvania was comprised of 1,324 agencies that responded to 2,204,969 calls for service. The overwhelming majority of these calls for services were 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 with various reports related to EMS utilization of naloxone. To highlight the EMS role in combating the opioid crisis, in 2020, a total of 21,277 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 15,754 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 2019'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 2020, a total of 3,436 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 2,288 individuals. Of these 2,288 expired EMT certifications, 43.75 percent 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.

Despite the rate of attrition and the hardships associated with COVID-19 the commonwealth experienced an overall increase in the number of emergency medical services providers when comparing year end 2019 to year end 2020. This is in part to the certification reinstatement initiative that the department undertook in an effort to bring previously expired individuals back into the system. As of January 30, 2021, the program had reinstated 1,130 individual EMS certifications.

Additions to this year's report include more county-based information particularly related to workforce, evaluation and statistics of different EMS agency types, and overall trending and comparisons to previous years data.

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 and to the department's various certification and licensure 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 serves 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, 2021, with an incident date identified between January 1, 2020, to December 31, 2020. 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 and licensure system, as reported between January 1, 2020, and December 31, 2020.

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 QRS, 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, 01/01/2020 – 12/31/2020

Metric	Count	% of Total
Type of service requested	2,204,969	
*911 response (scene)	1,653,624	74.99%
*Intercept	14,003	<1%
Interfacility transport	221,865	10.05%
Medical transport	300,079	13.60%
*Mutual aid	2,783	<1%
*Public assistance	4,897	<1%
Standby	7,716	<1%
Total emergency records	1,675,309	75.97%
EMS patients by gender		
Female	956,368	51.61%
Male	896,533	48.39%
EMS patients by age		
0 to 17 years	89,812	5%
18 years and older	1,758,743	95%
Cardiac arrests **By primary impression "cardiac arrest"**	18,954	<1%
Naloxone administration		
Number of naloxone doses administered (911)	21,277	
Number of 911 encounters with at least 1 dose of naloxone	15,754	

Source: Pennsylvania State EMS Data Bridge, 2021

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, 01/01/2020 – 12/31/2020

Source: Pennsylvania State EMS Data Bridge, 2021
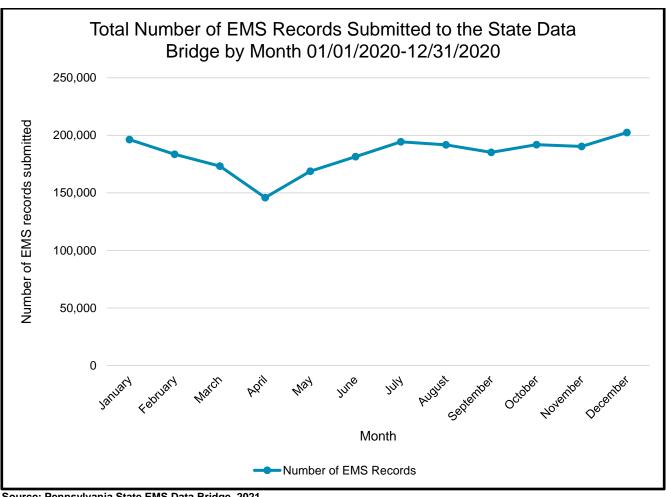
Figure 1 displays the number of records submitted to the state EMS data bridge by month for 2020. Unlike previous years, there was not a consistent rate of submissions. The month of April saw a 25 percent statewide reduction in the number of EMS records submitted. This timing corresponds with the most significant effects of mitigation measures related to the COVID-2019 pandemic.

Figure 2. Three Year Trend of EMS Records Submitted by Quarter 2018-2020

Three Year Trend of EMS Records Submitted by Quarter 2018-2020

Source: Pennsylvania State EMS Data Bridge, 2021

Figure 2 presents a yearly total of EMS records submitted to the state EMS data bridge by quarter. With the exception of quarter 2 of 2020, there have been overall increases in the number of electornic records transmitted to the department. Due to delays with some EMS agencies establishing electronic data reporting, readers of this report should not assume that all increases are the result of increased EMS utilization.

Table 2. EMS Records Submitted by Year, Type of Service Requested, and Regional Council of Incident 2018-2020

Regional Council	2018 Emergency	2018 Non-Emergency	2018 Total	2019 Emergency	2019 Non-Emergency	2019 Total	2020 Emergency	2020 Non-Emergency	2020 Total
Bucks County	51,267	14,077	65,344	56,592	16,033	72,625	56,766	17,478	74,244
Chester County	49,599	16,711	66,310	51,092	16,912	68,004	47,114	17,839	64,953
Delaware County	69,978	25,193	95,171	75,363	26,092	101,455	77,601	22,960	100,561
Eastern PA EMS Council	139,705	33,934	173,639	172,325	37,308	209,633	179,598	38,460	218,058
Emergency Health Services Federation	134,363	26,957	161,320	153,867	29,211	183,078	205,185	41,036	246,221
EMMCO West	72,492	22,025	94,517	77,646	23,936	101,582	75,407	21,928	97,335
EMS of Northeastern Pennsylvania	100,130	38,578	138,708	93,942	34,117	128,059	91,582	30,892	122,474
EMS West	430,101	117,264	547,365	432,656	117,338	549,994	362,103	130,198	492,301
LTS EMS Council	24,974	8,649	33,623	24,960	8,837	33,797	26,308	8,924	35,232
Montgomery County	54,510	26,910	81,420	58,584	30,973	89,557	75,917	33,885	109,802
No Incident County Listed Unable to Assign	26,798	10,093	36,891	28,260	17,360	45,620	29,481	15,890	45,371
Philadelphia	298,929	78,938	377,867	312,996	103,899	416,895	293,865	104,256	398,121
Seven Mountains	63,144	22,459	85,603	61,715	23,448	85,163	59,478	21,121	80,599
Southern Alleghenies EMS Council	62,914	19,821	82,735	64,331	19,684	84,015	61,930	17,132	79,062

Source: Pennsylvania State EMS Data Bridge, 2021

Table 2 displays, based on the incident county, by Pennsylvania Regional EMS Council a history of EMS records submitted categorized by service requested type. Responses that occurred out of the state or did not have an incident county are not captured in this table.

Figure 3. Volume of Ground Ambulance Responses, Distribution by EMS Agency, All Records, 01/01/2020-12/31/2020

Volume of Ground Ambulance Responses, Distribution by EMS Agency, All Records, 01/01/2020-12/31/2020

Count of EMS agencies

Range of ground ambulance responses

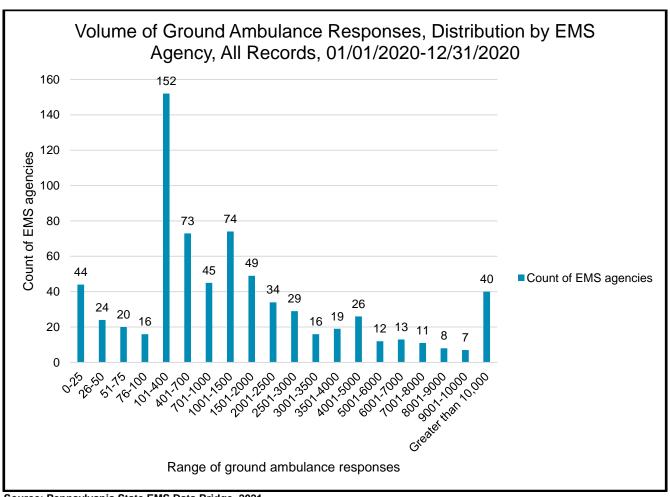Source: Pennsylvania State EMS Data Bridge, 2021

Figure 3 displays the frequency by which EMS agencies responded to a certain number of responses with a ground ambulance. Of the 712 EMS agencies submitting data to the state EMS data bridge, 152 (21 percent) had between 101 and 400 ground ambulance responses in calendar year 2020. 44 EMS agencies (6 percent) responded to 25 or less ground ambulance responses.

Patient Disposition

Table 3. EMS Incident Disposition Figures, 01/01/2020 – 12/31/2020

Incident/patient disposition	Count of incident disposition	% of incident dispositions
Assist, agency	17,431	0.79%
Assist, public	9,145	0.41%
Assist, unit	18,402	0.83%
Canceled (prior to arrival at scene)	141,279	6.41%
Canceled on scene (no patient contact)	41,531	1.88%
Canceled on scene (no patient found)	115,443	5.24%
Patient dead at scene-no resuscitation attempted (with transport)	373	0.02%
Patient dead at scene-no resuscitation attempted (without transport)	14,527	0.66%
Patient dead at scene-resuscitation attempted (with transport)	94	0.00%
Patient dead at scene-resuscitation attempted (without transport)	8,533	0.39%
Patient evaluated, no treatment/transport required	34,430	1.56%
Patient refused evaluation/care (with transport)	480	0.02%
Patient refused evaluation/care (without transport)	94,014	4.26%
Patient treated, released (AMA)	17,126	0.78%
Patient treated, released (per protocol)	39,263	1.78%
Patient treated, transferred care to another EMS unit	30,067	1.36%
Patient treated, transported by law enforcement	1,272	0.06%
Patient treated, transported by private vehicle	973	0.04%
Patient treated, transported by this EMS unit	1,604,052	72.75%
Standby-no services or support provided	5,960	0.27%
Standby-public safety, fire, or EMS operational support provided	10,439	0.47%
Transport non-patient, organs, etc.	135	0.01%

Source: Pennsylvania State EMS Data Bridge, 2021

Age Distribution of EMS Patient Contacts, Emergency Records Only, 01/01/2020-12/31/2020
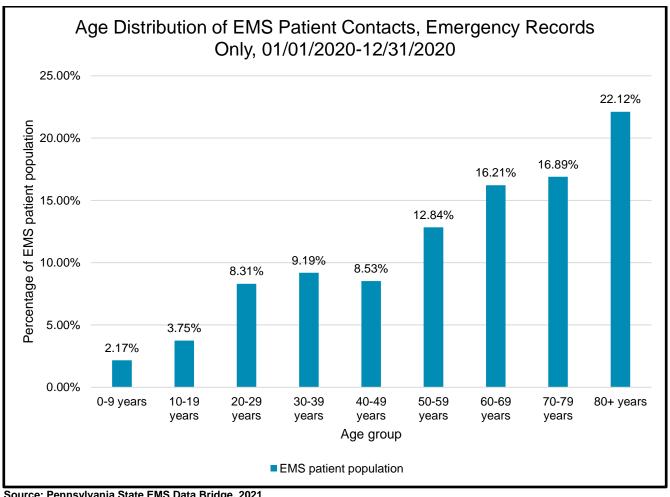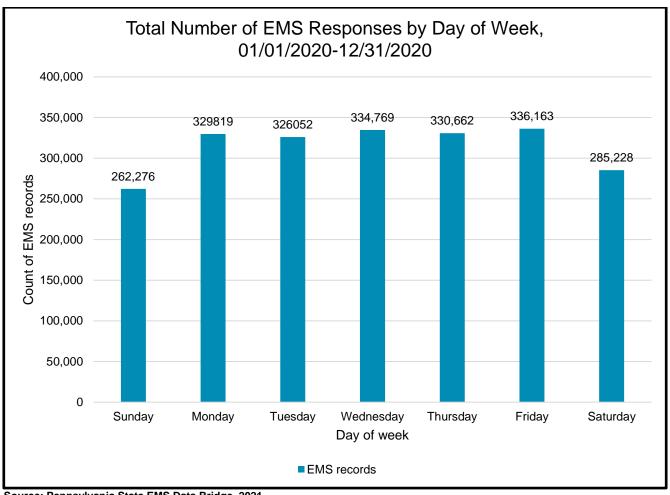
Source: Pennsylvania State EMS Data Bridge, 2021

Figure 4 displays the age demographic by percentage that presents to the EMS system for emergency records. The age group with the highest percentage utilization is 80+ years of age and older. A significant portion of the EMS patient population, 47.11 percent, have reached the medicare eligibility age of 65, which is pertinent to EMS agency administrators for the purposes of evaluating potential payor mix.

The Birth to nine 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 Pediatric Emergency Care Coordinator (PECC) program.

Operational Deployment

Figure 5. Total Number of EMS Responses by Day of Week, 01/01/2020 – 12/31/2020

Total Number of EMS Responses by Day of Week, 01/01/2020-12/31/2020

Day of week	EMS records
Sunday	262,276
Monday	329819
Tuesday	326052
Wednesday	334,769
Thursday	330,662
Friday	336,163
Saturday	285,228

Source: Pennsylvania State EMS Data Bridge, 2021

Figure 5 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 6. Total Number of EMS Responses by Hour of Day, 01/01/2020 – 12/31/2020

Source: Pennsylvania State EMS Data Bridge, 2021

Figure 6 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.
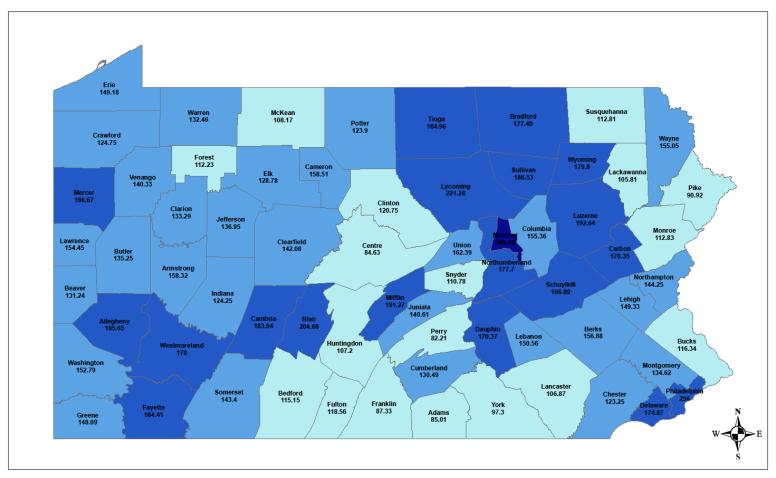
Table 4. EMS Responses by Day/Month, 01/01/2020 – 12/31/2020

Day	Jan.	Feb.	Mar.	Apr.	May	June	Jul.	Aug.	Sept.	Oct.	Nov	Dec.
1	5690	5603	5274	4852	5558	6038	6496	5710	6262	6339	5461	7000
2	6990	5167	6966	4779	5233	5875	6594	5311	6487	6563	6581	6816
3	7185	6987	6722	5051	4761	6431	6133	6546	6233	5823	6495	6892
4	5675	6920	6689	4359	5885	6473	5755	6791	6855	5082	6720	**7190**
5	5026	6456	6769	4038	5327	6419	5533	6704	5775	6507	6584	5796
6	6888	6671	6740	5286	5317	5428	6858	6505	5311	6473	7088	5284
7	6693	7039	5542	4933	5509	5058	6443	6528	5308	6560	5997	6999
8	6941	5490	5175	5024	5522	6258	6649	5824	6362	6417	5663	6830
9	6408	5132	6944	4751	4486	6240	6411	5468	6543	6863	7075	7046
10	6855	6812	6740	4778	4313	6499	6706	6660	6441	5722	6978	6875
11	5820	6467	6564	4257	5388	6205	5783	6551	6729	5276	6758	**7273**
12	5229	6586	6519	3874	5307	6357	5292	6713	5547	6297	6464	5989
13	6447	6564	6723	5089	5548	5473	6452	6409	5074	6304	6728	5450
14	6439	6659	5506	4899	5622	4775	6446	6723	6418	6420	5694	6736
15	6793	5529	4867	4951	6151	6033	6416	5409	6242	6567	5212	6821
16	6668	5360	6072	4793	5442	6189	6333	4911	6334	6501	6625	6720
17	6728	6754	5631	5043	4624	6130	6704	6570	6505	5584	6391	6737
18	5714	6904	5601	4389	5942	6272	5773	6304	6609	5112	6494	**7253**
19	5031	6650	5293	4175	5670	6469	5371	6090	5377	6291	6647	6036
20	6205	6454	5511	5217	5556	5607	6757	6345	5114	6378	7111	5356
21	6559	6921	4618	5074	5810	5148	6560	6899	6170	6742	5673	7184
22	6593	5836	4135	5240	5939	6702	6416	5859	6392	6648	5399	6809
23	6653	5420	4950	5073	5316	6434	6348	5156	6784	6939	6628	6959
24	6886	6833	5122	5299	4729	6216	6632	6650	6572	5618	6740	6680
25	5628	6659	4827	4614	5160	6249	5699	6496	6822	5063	7016	5279
26	5292	6746	4810	3971	6204	6789	5374	6537	5894	6664	5348	5862
27	6706	6532	5221	5482	6060	5458	6489	6416	5333	6304	6607	5612
28	6608	6849	4216	5524	6105	5294	6377	6651	6809	6467	5800	6851
29	6651	5564	4103	5517	6272	6499	6611	5636	6466	6259	5306	6701
30	6477		4867	5577	5275	6423	6428	5054	6402	6523	7009	6741
31	6803		4573		4727		6487	6278		5515		6639

Source: Pennsylvania State EMS Data Bridge, 2021

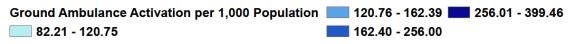Table 4 displays the total number of EMS responses by day and month based on values provided in the date/time unit dispatched field. The number of records, which are bolded, represent the three busiest days for EMS in 2020, all three of the busiest days occurred in the month of December.

Map 1 on the following page displays by county the rate of ground ambulance activations for all call types adjusted for population.

Map 1: Ground Ambulance Activations per 1,000 population 01/01/2020-12/31/2020

County	Value
Erie	149.18
Warren	132.46
McKean	108.17
Potter	123.9
Tioga	164.96
Bradford	177.49
Susquehanna	112.81
Crawford	124.75
Wayne	155.05
Forest	112.23
Elk	128.78
Cameron	158.51
Wyoming	179.8
Lackawanna	105.81
Venango	140.33
Sullivan	186.53
Pike	90.92
Mercer	166.67
Lycoming	221.28
Clarion	133.29
Clinton	120.75
Luzerne	192.64
Jefferson	136.95
Monroe	112.83
Lawrence	154.45
Clearfield	142.08
Centre	84.63
Union	162.39
Montour	399.46
Columbia	155.36
Carbon	170.35
Butler	135.25
Northumberland	177.7
Armstrong	158.32
Snyder	110.78
Schuylkill	166.89
Northampton	144.25
Beaver	131.24
Indiana	124.25
Mifflin	191.27
Juniata	140.61
Lehigh	149.33
Allegheny	185.65
Cambria	183.94
Blair	204.68
Perry	82.21
Dauphin	170.37
Berks	156.88
Westmoreland	170
Huntingdon	107.2
Lebanon	150.56
Bucks	116.34
Washington	152.79
Cumberland	130.49
Montgomery	134.62
Somerset	143.4
Bedford	115.15
Lancaster	106.87
Chester	123.25
Philadelphia	256
Greene	148.09
Fayette	184.41
Fulton	118.56
Franklin	87.33
Adams	85.01
York	97.3
Delaware	174.87

Legend

Ground Ambulance Activation per 1,000 Population

- 82.21 - 120.75
- 120.76 - 162.39
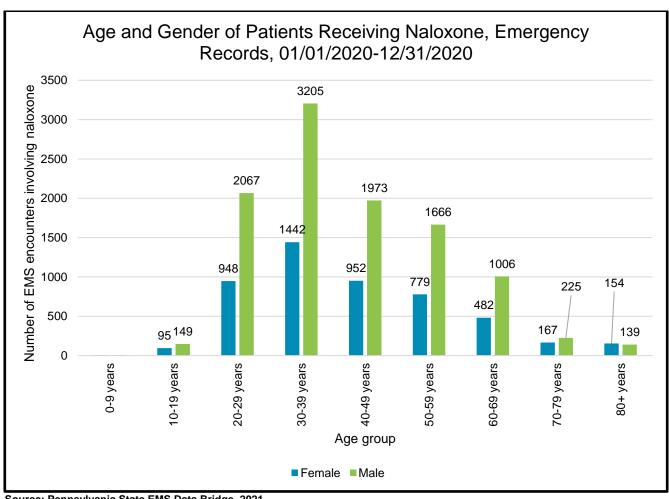- 162.40 - 256.00
- 256.01 - 399.46

Prepared by DJF 05/11/2021
Source: State EMS Data Bridge, 2021

16

Drug, Alcohol, and Toxicity

Figure 7. Age and Gender of Patients Receiving a Dose of Naloxone, Emergency Records Only, 01/01/2020 – 12/31/2020

Source: Pennsylvania State EMS Data Bridge, 2021

Figure 7 shows that males in the 30-39 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 8. Top 10 Dispatch Complaints Resulting in Naloxone Administration, Emergency Records, 01/01/2020 – 12/31/2020

Top 10 Dispatch Complaints Resulting in Naloxone Administration, Emergency Records Only, 01/01/2020-12/31/2020

Dispatch complaint	Number of EMS records submitted
Falls	209
Traffic/Transportation Incident	262
No Other Appropriate Choice	314
Breathing Problem	349
Convulsions/Seizure	454
Sick Person	784
Unknown Problem/Person Down	832
Cardiac Arrest/Death	2,509
Unconscious/Fainting/Near-Fainting	3,711
Overdose/Poisoning/Ingestion	5,720

Number of patients receiving naloxone

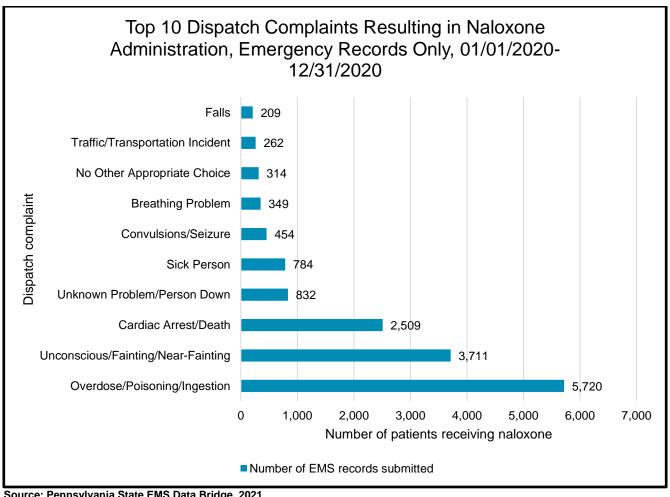**Source: Pennsylvania State EMS Data Bridge, 2021**

Figure 8 above displays the top 10 complaints reported by dispatch that ultimately resulted in naloxone administration by EMS.

Table 5. Reported Incident Location Type of Emergency Records Resulting in Naloxone Administration, 01/01/2020 – 12/31/2020

Incident location type	% of incident location
Agricultural site/farm	0.03%
Ambulatory surgery center	0.01%
Apartment	2.69%
Bike path	0.02%
Cultural building	0.04%
Health care provider office	0.40%
Hospital	0.09%
Industrial or construction site	0.14%
Military installation or base	0.01%
Not reported	31.37%
Nursing home	0.55%
Other ambulatory health services establishments	0.13%
Other institutional residence	0.23%
Other place	4.30%
Other private residence	15.51%
Prison	0.34%
Private residence	36.32%
Public administrative building	0.90%
Recreation area	0.37%
Religious institution	0.04%
Retail building	4.57%
School	0.06%
Sidewalk	0.70%
Sports area	0.04%
Urgent care center	0.01%
Vehicle (transport)	1.06%
Wilderness area	0.08%

Source: Pennsylvania State EMS Data Bridge, 2021

Table 5 displays the reported incident location where a patient received a dose of naloxone administered by EMS providers. Approximately 50 percent of patient encounters of this type occurred in a private residence. Unfortunately, nearly 35 percent 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, local officials, and the Department to better focus local and regional needs for public access naloxone deployment.

Number of EMS Patients, Emergency Records Only, Receiving Naloxone by Month, 01/01/2018-12/31/2020

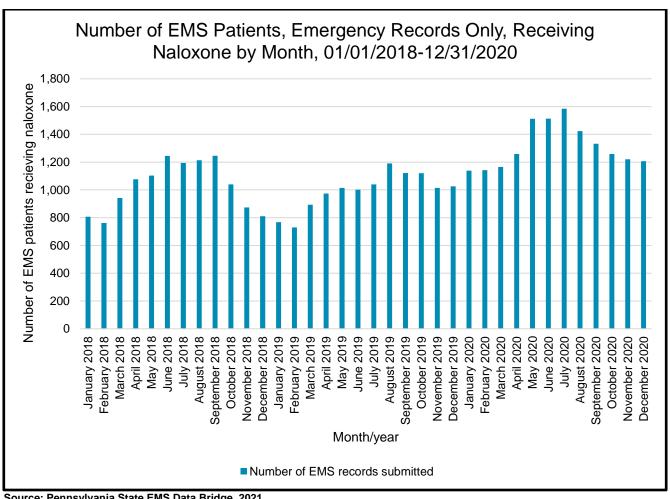**Source: Pennsylvania State EMS Data Bridge, 2021**

Figure 9 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 period of January 2018 through December 2020. The frequency has ranged from a high of 1,569 patients in July of 2020 to a low of 736 in February 2019. Despite marked reductions in overall EMS call volume in 2020, the number of EMS patient encounters resulting in naloxone administration increased.

Map 2 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.

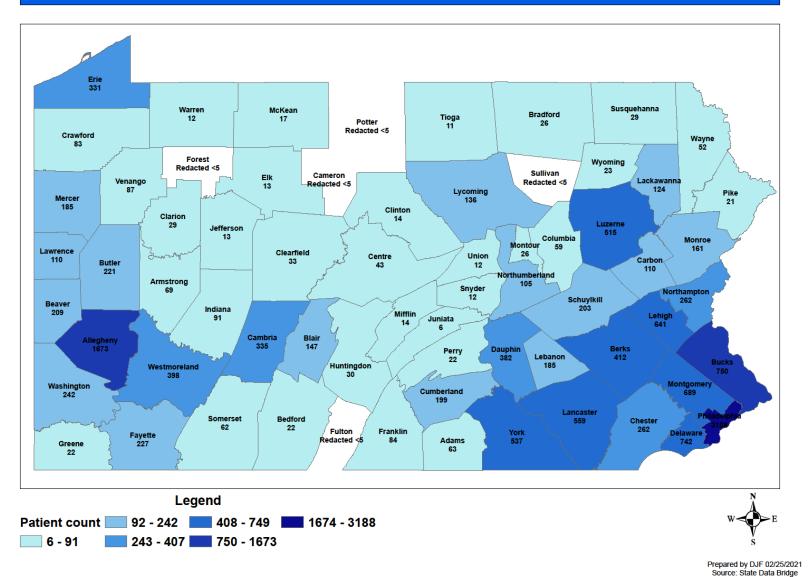# Map 2: 2020 Count of Emergency Patients with Naloxone Administration

Erie 331
Warren 12
McKean 17
Potter Redacted <5
Tioga 11
Bradford 26
Susquehanna 29
Wayne 52
Crawford 83
Forest Redacted <5
Elk 13
Cameron Redacted <5
Sullivan Redacted <5
Wyoming 23
Lackawanna 124
Pike 21
Venango 87
Lycoming 136
Mercer 185
Clarion 29
Jefferson 13
Clinton 14
Luzerne 515
Monroe 161
Lawrence 110
Clearfield 33
Centre 43
Union 12
Montour 26
Columbia 59
Carbon 110
Northampton 262
Butler 221
Armstrong 69
Northumberland 105
Schuylkill 203
Lehigh 641
Beaver 209
Indiana 91
Snyder 12
Mifflin 14
Juniata 6
Allegheny 1673
Cambria 335
Blair 147
Perry 22
Dauphin 382
Lebanon 185
Berks 412
Bucks 750
Westmoreland 398
Huntingdon 30
Montgomery 689
Washington 242
Cumberland 199
Lancaster 559
Chester 262
Philadelphia 3188
Somerset 62
Bedford 22
Fulton Redacted <5
Franklin 84
Adams 63
York 537
Delaware 742
Greene 22
Fayette 227

Legend

Patient count
- 6 - 91
- 92 - 242
- 243 - 407
- 408 - 749
- 750 - 1673
- 1674 - 3188

Prepared by DJF 02/25/2021
Source: State Data Bridge

21

Table 6. Number of EMS Patients, Emergency Records Only, by Regional EMS Council Receiving Naloxone by Year, 01/01/2018 – 12/31/2020

Regional Council	2018	2019	2020
Seven Mountains	207	212	291
Bucks County	693	631	750
Chester County	232	239	262
Delaware County	637	605	742
Eastern PA EMS Council	1070	1382	1789
Emergency Health Services Federation	545	675	2031
EMMCO West	580	610	729
EMS West	2688	2783	3340
LTS EMS Council	146	134	150
Montgomery County	418	351	689
EMS of Northeastern Pennsylvania	847	593	790
Philadelphia	3582	2983	3188
Southern Alleghenies EMS Council	343	417	599
No Incident County Listed Unable to Assign	224	178	214

Source: Pennsylvania State EMS Data Bridge, 2021

Table 6 summarizes the historical number of emergency related EMS records, aggregated by Pennsylvania Regional EMS Council that resulted in naloxone administration. Caution should be made in inferring significant increases in naloxone use when there was an inexplicable spike, particularly when comparing 2019 to 2020. There were certain areas of the commonwealth where the department is aware of underreporting of EMS incidents for calendar year 2019, as a result year to year comparisons at a regional level should be approached with a level of caution.

EMS Incident Disposition of Emergency Records Involving
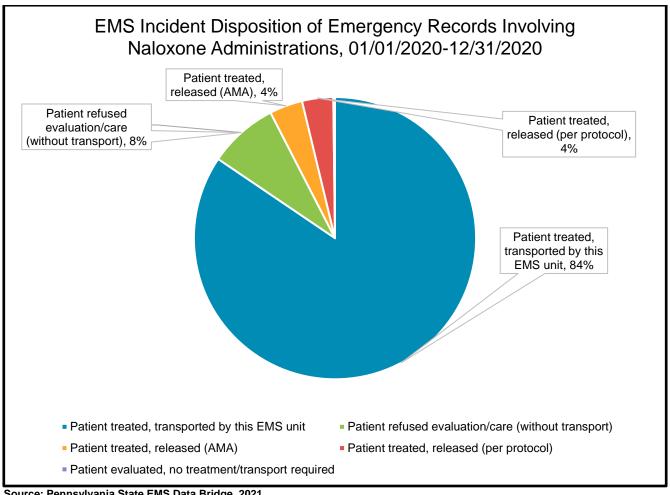Naloxone Administrations, 01/01/2020-12/31/2020

Patient treated, released (AMA), 4%

Patient refused evaluation/care (without transport), 8%

Patient treated, released (per protocol), 4%

Patient treated, transported by this EMS unit, 84%

- Patient treated, transported by this EMS unit
- Patient refused evaluation/care (without transport)
- Patient treated, released (AMA)
- Patient treated, released (per protocol)
- Patient evaluated, no treatment/transport required

Source: Pennsylvania State EMS Data Bridge, 2021

Figure 10 above displays the transport rate for patients who received at least one dose of naloxone in the emergency out of hospital setting by month from January of 2020 through December of 2020. 2020 saw reductions in the rate at which patients who received a dose of naloxone were transported by EMS, particuraly during the early phases of the COVID-2019 pandemic.

Tracking of this metric can assist state, regional, and local leaders in identifying opportunities 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 11. EMS Rate of Transport of Emergency Records by Quarter, 01/01/2018 – 12/31/2020

EMS Rate of Transport of Emergency Records by Quarter Involving Naloxone Administration, 01/01/2018-12/31/2020

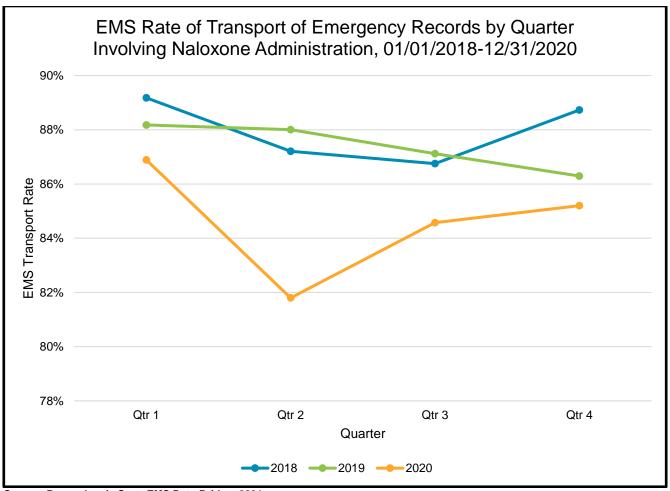Source: Pennsylvania State EMS Data Bridge, 2021

Figure 11 summarizes by quarter the percentage of EMS patient encounters, which had at least one administration of naloxone documented within the patients E-PCR, whom were ultimately transported to a hospital for further treatment.

Attributable at least in part to the COVID-2019 pandemic Pennsylvania saw a reduction in the rate of transport from 87 percent to 82 percent comparing quarters 1 and 2 of 2020.

Source: Pennsylvania State EMS Data Bridge, 2021

Figure 12 represents the number of EMS patient encounters categorized by the cumulative dose of naloxone that a patient recived. Only patient records that had medication dosage units reported in miligrams were included in this analysis. Seventy percent of patients received a cumulative dose of naloxone of 3.8 Mg or less. 4.3 percent of EMS patients required more than 7 Mg of naloxone. 14,483 patient interactions were considered in this analysis

Table 7. Heat Map of total Naloxone Administrations by Day of Week and Hour, Emergency Records, 01/01/2020 – 12/31/2020

Hour	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
0:00	119	73	95	97	98	107	114
1:00	103	60	80	63	81	67	106
2:00	95	46	64	75	67	70	81
3:00	73	55	61	53	49	58	72
4:00	52	44	49	52	52	52	61
5:00	45	37	62	33	47	44	66
6:00	38	50	38	42	35	37	68
7:00	54	56	50	41	60	56	62
8:00	61	66	56	55	71	60	55
9:00	68	51	63	76	62	69	51
10:00	78	68	64	77	86	70	79
11:00	80	77	70	73	98	102	101
12:00	87	92	108	91	101	108	115
13:00	81	96	102	93	139	105	87
14:00	92	111	109	109	114	117	99
15:00	108	97	116	120	127	143	123
16:00	104	123	113	104	116	139	140
17:00	111	143	142	147	143	161	147
18:00	109	125	132	132	139	125	139
19:00	110	119	117	131	147	138	125
20:00	136	138	109	117	148	162	132
21:00	116	132	132	139	138	150	133
22:00	123	125	99	131	138	128	160
23:00	103	121	105	120	110	129	117

Source: Pennsylvania State EMS Data Bridge, 2021

Table 7 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. Friday nights in the 8 P.M. hour had the highest number of EMS patient encounters resulting in naloxone administration by EMS.

Clinical Markers

Table 8. Top 25 EMS Provider Primary Impression, All Records, 01/01/2020 – 12/31/2020

Providers primary impression	Count of providers primary impression
Not reported	868,384
Weakness	176,806
Generalized abdominal pain	137,818
Injury, unspecified	109,910
Acute pain, not elsewhere classified	99,660
Altered mental status	89,938
Encounter, adult, no findings or complaints	81,696
Respiratory distress, acute	61,639
Chest Pain, Other [non-cardiac]	52,134
Syncope and collapse	39,768
Respiratory disorder	39,427
Malaise	32,288
Cardiac arrhythmia/dysrhythmia	25,759
Reduced mobility	23,428
Cardiac arrest	18,954
Seizures with status epilepticus	17,839
Injury of head	17,182
TIA	16,706
Traumatic shock	15,782
Back Pain	15,639
Hypoglycemia	15,405
Seizures without status epilepticus	12,747
Death	12,477
Angina	11,885
Bedridden	10,955

Source: Pennsylvania State EMS Data Bridge, 2021

Table 8 displays the top 25 provider primary impressions for all EMS calls for service between January 1, 2020, and December 31, 2020. 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.
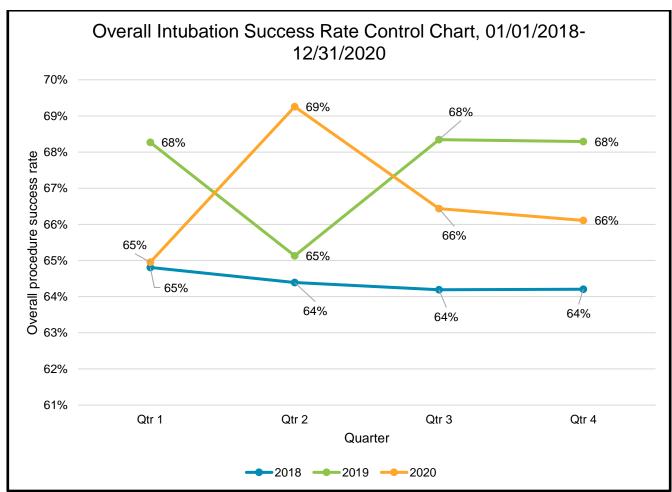
Figure 13. Overall Intubation Success Rate Control Chart, 01/01/2018 – 12/31/2020
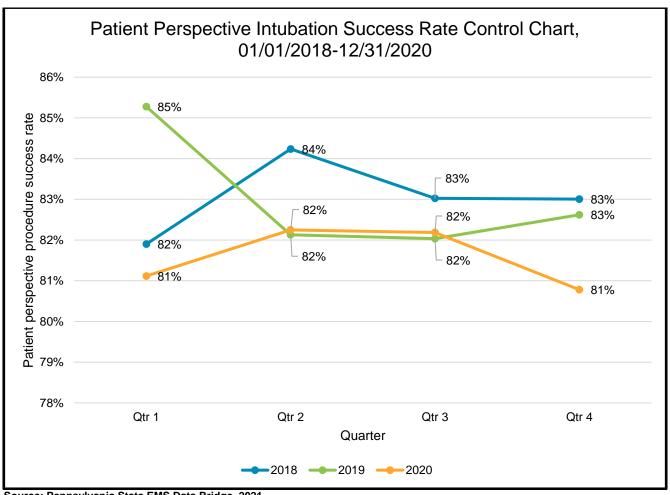

Source: Pennsylvania State EMS Data Bridge, 2021

Figure 13 displays as a control chart the overall rate of successful intubation by EMS providers of all types and includes all call types. The overall intubation success rate is calculated by taking the total number of patients successfully intubated and dividing it by the total number of intubation attempts.

Data is displayed by quarter for a three-year period from January of 2018 through December of 2020. During that time the overall successful intubation rate varied from a low of 64 percent to a high of 69 percent. There are numerous factors including patient anatomy, experience of the provider, and scene conditions that all contribute to a procedure's outcome.

The overall success rates are relatively consistent although increases from the 2018 baseline were noted during analysis.

Figure 14. Patient Perspective Intubation Success Rate Control Chart, 01/01/2018 – 12/31/2020

Source: Pennsylvania State EMS Data Bridge, 2021

Figure 14 displays as a control chart the rate of successful intubation from a patient perspective by EMS providers of all types and includes all call types. The patient perspective intubation success rate is calculated by taking the total number of patients successfully intubated and dividing it by the total number of patients on whom intubation was attempted.

Data is displayed by quarter for a three-year period from January of 2018 through December of 2020. During that time the patient perspective successful intubation rate varied from a low of 81 percent to a high of 85 percent.

Rate of End Tidal Capnography Compliance After Sucessful Intubation, 01/01/2020-12/31/2020

84.58%, 85.49%, 82.37%, 81.36%, 85.21%, 85.44%, 82.97%, 85.78%, 85.29%, 84.21%, 83.84%, 86.30%

Rate of Capnography Usage with Sucessful Intubation

Source: Pennsylvania State EMS Data Bridge, 2021

Figure 15 displays by month for calendar year 2020 the percentage by which EMS providers documented an end tidal capnography reading after successfully intubating a patient. End Tidal capnography is the gold standard in verifying that the endotracheal tube has been placed in the proper location, and that the patient is being adequately oxygenated and ventilated.

Figure 16 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 16. Advanced Airway Dashboard, 01/01/2020 – 12/31/2020
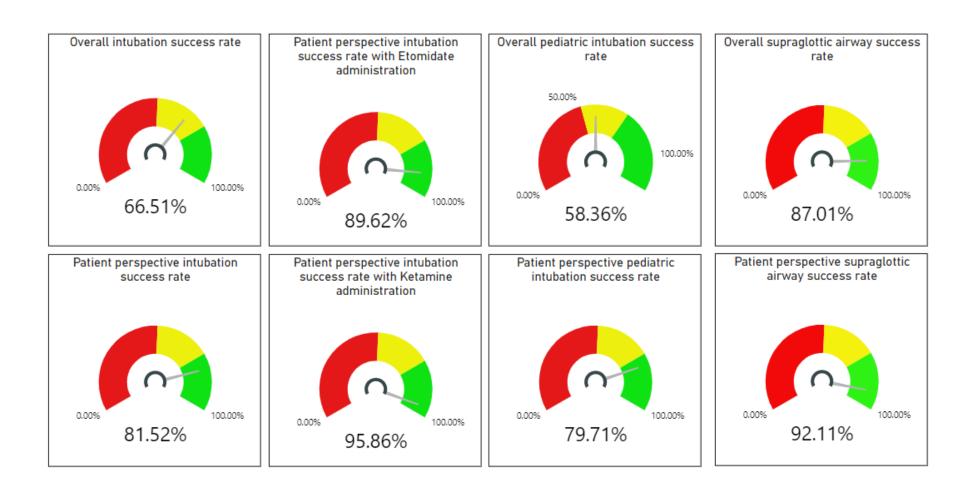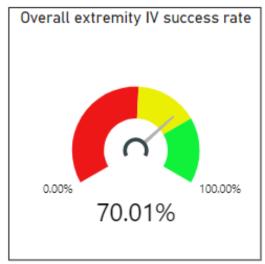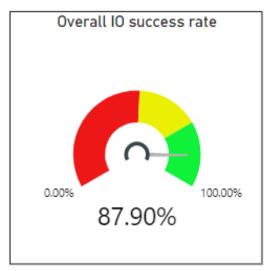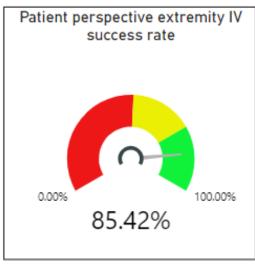
Figure 17 on the following page displays the success rates for vascular access by ALS providers. These statistics were compiled from all record types including 911 and interfacility transfers. ALS services are encouraged to utilize this data to benchmark their agencies' performances against that of the 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.

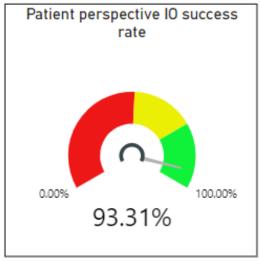**Figure 17. Vascular Access Dashboard, 01/01/2020 – 12/31/2020**

Overall extremity IV success rate

0.00%   100.00%

70.01%

Overall IO success rate

0.00%   100.00%

87.90%

Patient perspective extremity IV success rate

0.00%   100.00%

85.42%

Patient perspective IO success rate

0.00%   100.00%

93.31%

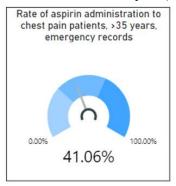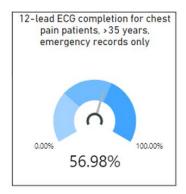**Source: Pennsylvania State EMS Data Bridge, 2021**

Figure 18 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. With the addition of 12-lead ECG's to the BLS scope of practice, this measure is no longer restricted to advanced life support units as it was in previous versions of this report.

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 for ST segment elevated myocardial infarction (STEMI) scene times are 15 minutes or less.

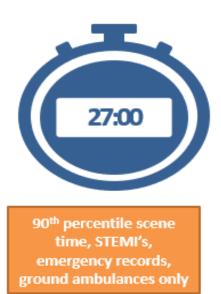**Figure 18. Chest Pain/STEMI Report, All Records, 01/01/2020 – 12/31/2020**

Rate of aspirin administration to chest pain patients, >35 years, emergency records

0.00%   100.00%

41.06%

12-lead ECG completion for chest pain patients, >35 years, emergency records only

0.00%   100.00%

56.98%

27:00

90th percentile scene time, STEMI's, emergency records, ground ambulances only

41:11

Average dispatch to hospital arrival, STEMI's, emergency records, ground ambulances only

Source: Pennsylvania State EMS Data Bridge, 2021

90th Percentile Scene Time, Primary Impression "STEMI", Emergency Records, Ground Ambulances 01/01/2018-12/31/2020
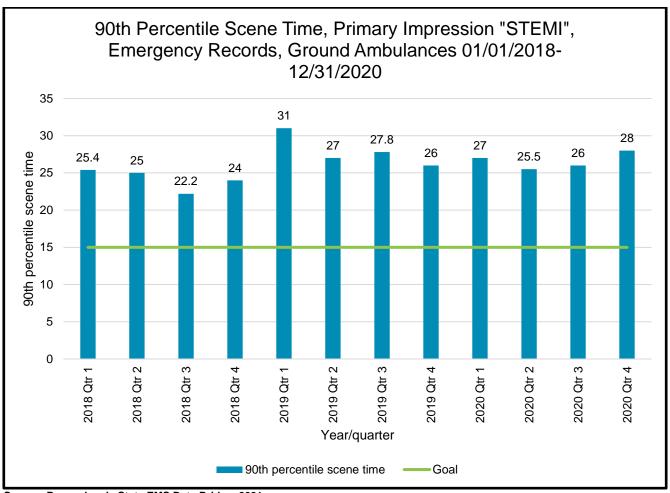
Source: Pennsylvania State EMS Data Bridge, 2021

Figure 19 displays by year and quarter the 90th percentile amount of time that a ground ambulance spent on scene with a patient, when the EMS provider documented a provider's primary impression of a "STEMI". Industry goals for ST segment elevated myocardial infarction (STEMI) scene times are 15 minutes or less.

Average Dispatch to Hospital Arrival, Primary Impression "STEMI",Emergency Records, Ground Ambulances,01/01/2018-12/31/2020

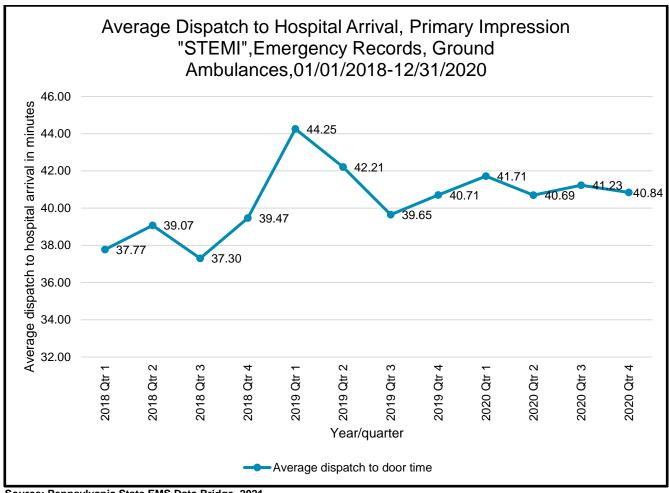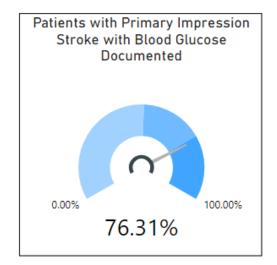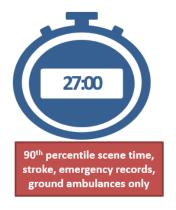**Source: Pennsylvania State EMS Data Bridge, 2021**

Figure 20 displays by year and quarter the average interval of elapsed time from when a ground ambulance was dispatched to hospital arrival, when the EMS provider documented a provider's primary impression of a "STEMI". There Is currently not an industry standard for dispatch to hospital arrival, and as a result a goal is not established. However, the measure Is included to assess overall efficiency of time sensitive systems of care.

Figure 21 on the following page displays various clinical performance benchmarks in EMS stroke patients. These statistics were calculated using only emergency records. EMS agencies can utilize these statewide averages as a way to benchmark their performance.

Figure 21. Stroke Report, Emergency Records, 01/01/2020 – 12/31/2020

Patients with Primary Impression Stroke with Blood Glucose Documented

0.00%   100.00%

76.31%

27:00

90th percentile scene time, stroke, emergency records, ground ambulances only

40:30

Average dispatch to hospital arrival, stroke, emergency records, ground ambulances only
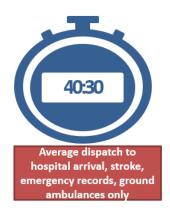
90th Percentile Scene Time, Primary Impression "Stroke", Emergency Records, Ground Ambulances, 01/01/2018-12/31/2020

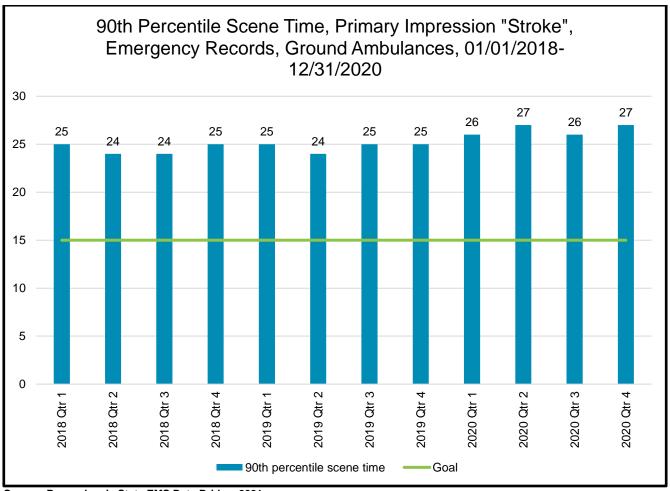**Source: Pennsylvania State EMS Data Bridge, 2021**

Figure 22 displays by year and quarter the 90th percentile amount of time that a ground ambulance spent on scene with a patient, when the EMS provider documented a provider's primary impression of a "Stroke". Industry goals for stroke scene times are 15 minutes or less.

Figure 23. Average Dispatch to Hospital Arrival, Primary Impression "Stroke", Emergency Records, Ground Ambulances, 01/01/2018-12/31/2020

Average Dispatch to Hospital Arrival, Primary Impression "Stroke", Emergency Records, Ground Ambulances, 01/01/2018-12/31/2020

Source: Pennsylvania State EMS Data Bridge, 2021

Figure 23 displays by year and quarter the average interval of elapsed time from when a ground ambulance was dispatched to hospital arrival, when the EMS provider documented a provider's primary impression of a "Stroke". There is currently not an industry standard for dispatch to hospital arrival, and as a result a goal is not established. However, the measure is included to assess overall efficiency of time sensitive systems of care.

Table 9. Medication Administration, Emergency Records Only, 01/01/2020 – 12/31/2020

Medication given	Total count of administrations
Acetaminophen (e.g., Tylenol, Anacin)	1,747
Adenosine (e.g., Adenocard)	2,342
Albuterol (e.g., Proventil, Ventolin, AccuNeb)	22,187
Albuterol/ipratropium (e.g., Combivent, Duoneb)	6,673
Alteplase (e.g., Activase)	7
Amiodarone (e.g., Cordarone)	1,677
Aspirin	38,324
Atropine	2,138
Calcium chloride	529
Captopril (e.g., Capoten)	9
D10 (dextrose 10% per 250 ml)	5,078
D10 (dextrose 10% per 500 ml	22
D25 (dextrose 25%)	115
D5 injectable solution (dextrose 5%)	93
D50 (dextrose 50% solution)	1,382
Dexamethasone (e.g., Decadron)	112
Diazepam (e.g., Valium)	453
Diltiazem (e.g., Cardizem)	1,593
Diphenhydramine (e.g., Bendadryl)	2,904
Dopamine	103
Enalapril (e.g., Vasotec)	9
Epi 1:1,000 (epinephrine 1 mg/ml)	4,145
Epi 1:10,000 (epinephrine 0.1 mg/ml)	47,883
Epinephrine auto-injector, adult (0.3 ml of epi 1.0 mg/ml)	41
Epinephrine auto-injector, junior (0.3 ml of epi 0.5 mg/ml)	19
Epinephrine, Racemic HCl	17
Etomidate (e.g., Amidate)	673
Fentanyl	25,707
Furosemide (e.g., Lasix)	52
Glucagon	2,106
Glucose oral gel (e.g., Glutose, Insta-Glucose)	4,349
Heparin	134
Hydrocortisone (e.g., Solu-Cortef)	5
Ibuprofen (e.g., Advil)	21
Ipratropium (e.g., Atrovent)	853

Ketamine (e.g., Ketalar)	1,425
Ketorolac (e.g., Toradol)	2,233
Labetalol (e.g., Normodyne)	27
Lactated Ringers (e.g., LR, RL)	403
Lidocaine	1,333
Lorazepam (e.g., Ativan)	2,860
Magnesium sulfate	824
Mannitol (e.g., Osmitrol)	5
Methylprednisolone (e.g., Solu-Medrol)	8,829
Midazolam	8,960
Morphine	2,737
Naloxone (e.g., Narcan)	21,277
Nicardipine (e.g., Cardene)	27
Nitroglycerin	39,216
Nitrous oxide	96
Norepinephrine (e.g., Levophed)	128
Ondansetron (e.g., Zofran)	36,948
Oxytocin (e.g., Pitocin)	13
Phenylephrine (e.g., Sudafed, Neo-Synephrine	25
Propofol (e.g., Diprivan)	8
Rocuronium (e.g., Zemuron)	532
Sodium bicarbonate	1,367
Sodium chloride 3% injectable solution (NaCl 3%)	27
Succinylcholine (e.g., Anectine)	247
Terbutaline (e.g., Breathine)	685
Tetracaine (e.g., Altacaine)	5
Vasopressin	23
Vecuronium (e.g., Norcuron)	59
Verapamil	121

Source: Pennsylvania State EMS Data Bridge, 2021

Table 9 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 10 on the following pages 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.
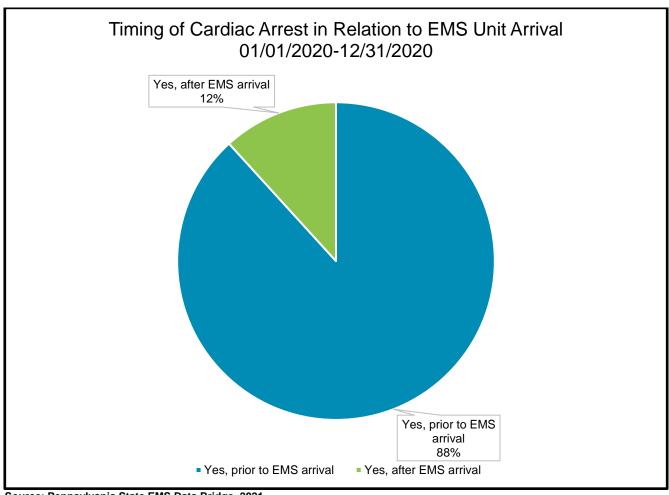
Table 10. Procedure Counts, Emergency Records Only, 01/01/2020 – 12/31/2020

Procedure	Number of patients
12- lead ECG obtained	196,640
15-lead ECG obtained	136
3-lead ECG obtained	88,244
Airway device removal	92
Airway opened	530
Artery, insertion of catheter (unspecified)	5
Assisted ventilations (via mask)	8,796
Assisted ventilations (via tube)	1,062
BiPAP	28
Blood product, unspecified	1,716
Burn care	402
Cardioversion	338
Central line care	14
Cervical collar applied	9,007
Chest compressions (mechanical device)	5,951
Childbirth	207
CPAP	7,073
CPR, manual	5,496
Cricothyrotomy, surgical	20
C-spine stabilization, manual	103
Decontamination	63
Defibrillation, AED	379
Defibrillation, manual	1,208
ETCO2 digital capnography	2,426
Eye irrigation	37
Foreign body removal	69
Heimlich maneuver	126
Hemostatic agent	122
Immobilization using long board	6,692
Immobilization using short extrication splint	466
Impedance threshold device	15
Induction, rapid sequence	31
Intracranial pressure monitoring	127
Intubation, nasal	117
Intubation, oral	5,705
IO cannulation	7,953
Laryngeal mask airway insertion	718
Laryngoscopy, direct	203

Laryngoscopy, indirect (e.g. video laryngoscopy)	973
Left ventricular assist device care	5
Mouth-to-mask/mouth ventilation	5
Nasal airway insertion	5,544
Nasogastric tube insertion	47
Needle decompression	383
Occlusive dressing	114
Oral airway insertion	3,522
Orogastric tube insertion	113
Orthostatic vital signs	784
Pacing, cardiac	941
Patient cooling (cold pack or general)	2,883
Patient warming (warm pack or general)	517
Precordial thump	16
Pressure dressing	437
Restraint applied, chemical	16
Restraint applied, physical	10,004
Spinal immobilization, cervical	12,547
Spinal immobilization, full	18,983
Splinting, general	3,529
Splinting, pelvic binder/sling	168
Splinting, traction	2,735
Suction airway	5,338
Supraglottic airway insertion (double lumen)	2,044
Supraglottic airway, single lumen (i.e. King)	456
Tourniquet	414
Vagal maneuver	560
Vein, blood draw	18,434
Vein, catheter removal	223
Vein, external jugular	191
Vein, extremity	354,758
Vein, femoral	17
Ventilator care and adjustment	650

Source: Pennsylvania State EMS Data Bridge, 2021

Cardiac Arrest

Figure 24. Timing of Cardiac Arrest in Relation to EMS Unit Arrivial, 01/01/2020 – 12/31/2020

Timing of Cardiac Arrest in Relation to EMS Unit Arrival
01/01/2020-12/31/2020

Yes, after EMS arrival
12%

Yes, prior to EMS arrival
88%

■ Yes, prior to EMS arrival   ■ Yes, after EMS arrival

Source: Pennsylvania State EMS Data Bridge, 2021

Figure 24 shows that approximately 90 percent of the cardiac arrests documented by EMS providers occurred prior to the arrival of an EMS unit.
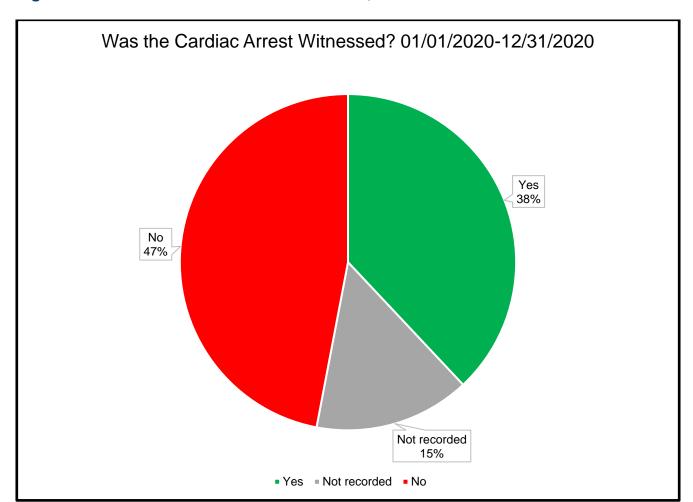
Figure 25. Was the Cardiac Arrest Witnessed?, 01/01/2020 – 12/31/2020

Was the Cardiac Arrest Witnessed? 01/01/2020-12/31/2020

Yes 38%

No 47%

Not recorded 15%

■ Yes ■ Not recorded ■ No

Source: Pennsylvania State EMS Data Bridge, 2021

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 25 shows that 38 percent of reported cardiac arrests were witnessed. Fifteen percent of reported cardiac arrests did not have this value recorded, so there exists the possibility that this metric is higher than reported.
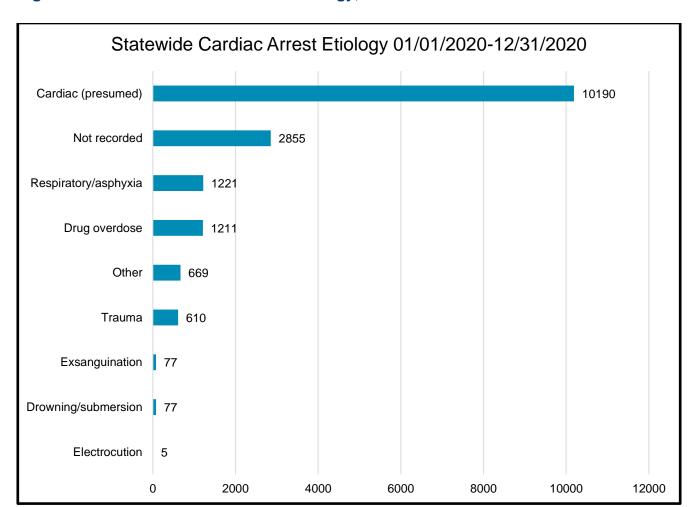
Figure 26. Statewide Cardiac Arrest Etiology, 01/01/2020 – 12/31/2020

Statewide Cardiac Arrest Etiology 01/01/2020-12/31/2020

Category	Value
Cardiac (presumed)	10190
Not recorded	2855
Respiratory/asphyxia	1221
Drug overdose	1211
Other	669
Trauma	610
Exsanguination	77
Drowning/submersion	77
Electrocution	5

Source: Pennsylvania State EMS Data Bridge, 2021

Figure 26 displays the etiology of cardiac arrests reported to the Department, when it was documented that the cardiac arrest occurred prior to EMS arrival. 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.

Gender Distribution of Reported Cardiac Arrests 01/01/2020-12/31/2020

Source: Pennsylvania State EMS Data Bridge, 2021

Figure 27 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 11. Reason CPR or Resucitation Discontinued by EMS, 01/01/2020 – 12/31/2020

Reason CPR/resuscitation discontinued	Count of reason CPR/resuscitation discontinued
DNR	398
Medical control order	4,647
Not applicable/not reported	8,955
Obvious signs of death	1,805
Physically unable to perform	13
Protocol/policy requirements completed	630
Return of spontaneous circulation (pulse or BP noted)	2,721

Source: Pennsylvania State EMS Data Bridge, 2021

Table 11 displays the breakdown of reason for discontinuing CPR and/or other resuscitative efforts.

Table 12. End of EMS Cardiac Arrest Event, 01/01/2020 – 12/31/2020

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	2,730	14.24%
Expired in the field	8,346	43.53%
Not applicable/not recorded	2,932	15.29%
Ongoing resuscitation by other EMS	91	<1%
Ongoing resuscitation in ED	2,120	11.05%
ROSC (Return of Spontaneous Circulation) in the ED	1,059	5.5%
ROSC in the field	1,891	9.86%

Source: Pennsylvania State EMS Data Bridge, 2021

Table 12 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.
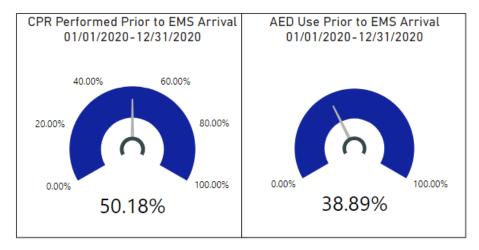
The Bureau recommends that all EMS agencies participate in the CARES project. CARES is a registry that tracks cardiac arrest survival and includes a mechanism for collecting the final hospital outcomes; it is the current gold standard in tracking cardiac arrest statistics in the nation.

The statistics included in Figure 28 on page 52 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.

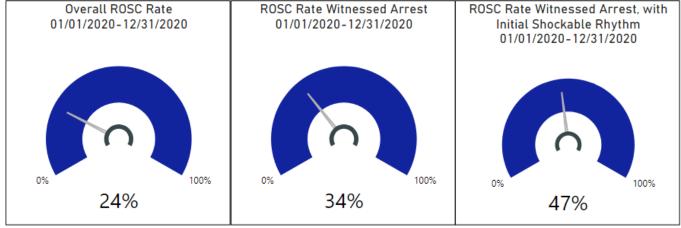**Figure 28. Statewide Cardiac Arrest Performance Metrics, 01/01/2020 – 12/31/2020**

Source: Pennsylvania State EMS Data Bridge, 2021

ROSC Rate Control Chart of Witnessed Cardaic Arrests, Initial Shockable Rhythm, 01/01/2018-12/31/2020

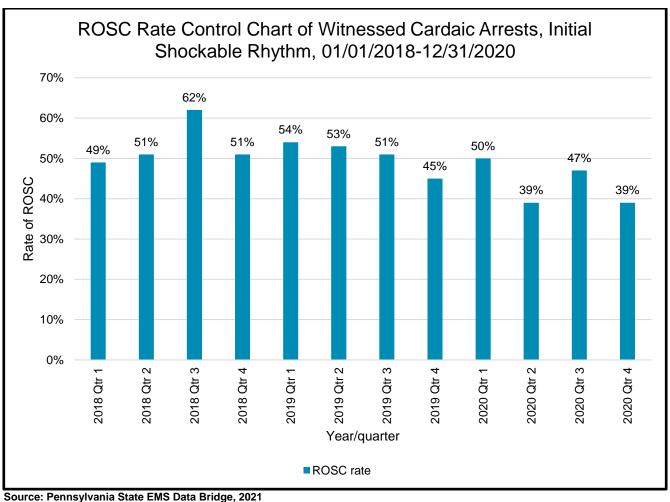**Source: Pennsylvania State EMS Data Bridge, 2021**

Figure 29 displays the return of spontaneous circulation rate in instances where the cardiac arrest was witnessed, and that the initial rhythm encountered by EMS was shockable. This data is displayed by year and quarter for benchmarking and trending purposes.

Rate of CPR Performed Prior to Arrival of Ground Ambulance
Control Chart 01/01/2018-12/31/2020

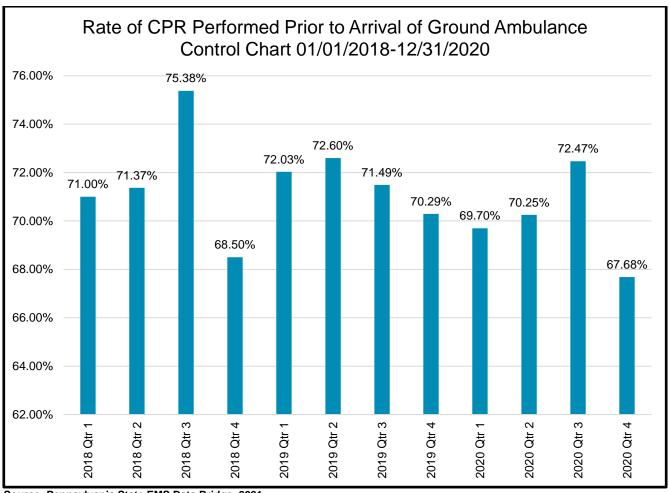**Source: Pennsylvania State EMS Data Bridge, 2021**

Figure 30 displays the rate of documented CPR prior to arrival of a ground ambulance. This data is displayed by year and quarter for benchmarking and trending purposes.

COVID Compare

COVID-2019 had a profound impact across the nation in 2020. There were numerous changes to EMS demand and practice. What follows in this section is the evaluation of select metrics comparing calendar year 2019 to calendar year 2020, by the week of the year. These measures are presented to quantify some of the effects that COVID-2019 had on the practice of EMS. With limited exceptions, significant variation of EMS data began to be detected during week 12 in the year to year comparisons. For reference, week 12 of 2020 ran from March 23, 2020 through March 29, 2020.

Additionally, it is noted that there were noticeable deviations in interfacility transport ventilator usage, and increased influenza like illness primary impressions as early as week 2 of 2020, which ran January 6, 2020 through January 12, 2020.
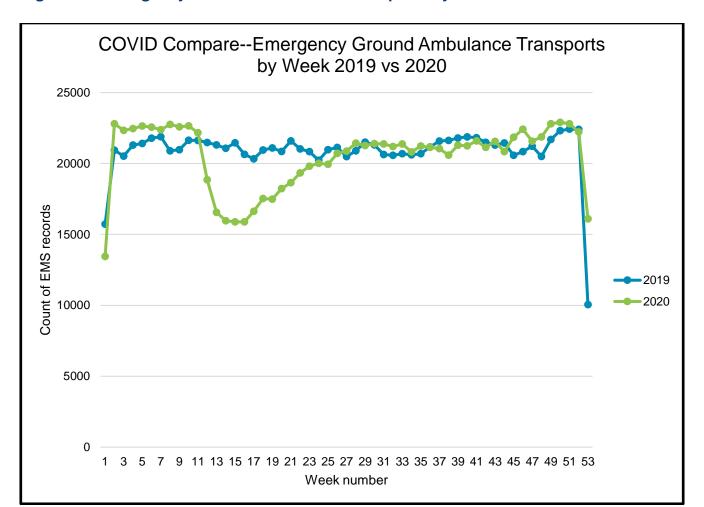
Figure 31. Emergency Ground Ambulance Transports by Week 2019 vs 2020

COVID Compare--Emergency Ground Ambulance Transports by Week 2019 vs 2020

Source: Pennsylvania State EMS Data Bridge, 2021.

Figure 31 shows the number of transports conducted by ground ambulances, on emergency type calls. Beginning in week 12 there was a substantial drop in emergency transport volume, falling approximately 50,000 transports a week. At the height of the reduction, emergency transport volume statewide fell nearly 25 percent.

COVID Compare--Emergency Ground Ambulance Motor Vehicle Accident Dispatches by Week 2019 vs 2020

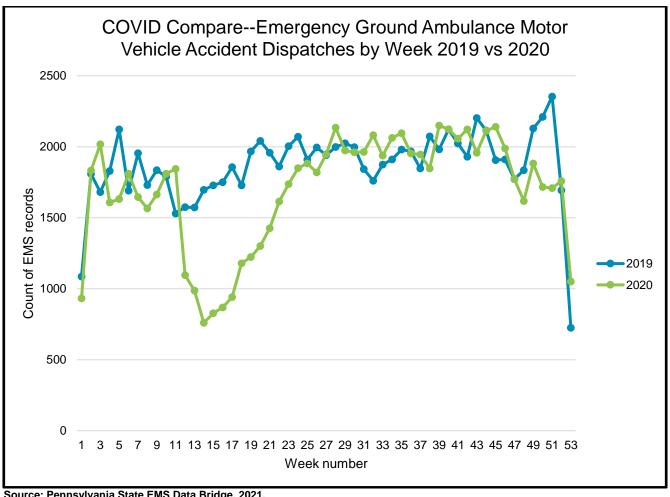**Source: Pennsylvania State EMS Data Bridge, 2021.**

Figure 32 shows the number of dispatches received by ground ambulances to respond to motor vehicle accidents within the commonwealth. Similarly, to figure 31 significant reductions in this call type began in week 12 of 2020. Week 14 saw the largest deviation, as motor vehicle accidents had fallen 123 percent for that specific week.

Source: Pennsylvania State EMS Data Bridge, 2021.

Figure 33 displays for ground ambulances the number of patient interactions where the EMS provider documented a primary impression that met the Bureau of EMS influenza like illness syndrome. Primary Impressions that were considered for inclusion include fever, infectious disease, influenza, pneumonia, or SARS. While this data is illuminating, it should not be considered in the context of exact figures. This measure relies solely on the providers primary impression field. Thirty-eight percent of the patient care records submitted to the department lacked a provider's primary impression and as a result could not be analyzed for inclusion.

Figure 34. Interfacility Transfer Ventilator Usage, all Vehicle Types by Week 2019 vs 2020
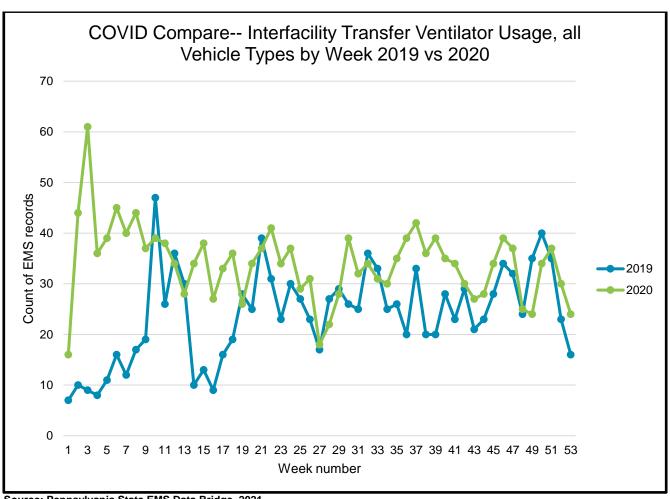

Source: Pennsylvania State EMS Data Bridge, 2021.

Figure 34 displays for all vehicle types the number of patient interactions where the EMS provider documented a procedure involving a transport ventilator. Documented interfacility ventilator usage reached its peak during week 3 of 2020 and was up over 500 percent. Overall ventilator usage stabilized but was still above the 2019 baseline.

Figure 35. Average Hospital Turnaround Time of Emergency Ground Ambulances 2019 vs 2020

Source: Pennsylvania State EMS Data Bridge, 2021.

Figure 35 displays the average hospital turnaround time for ground ambulances on emergency responses. While the average turnaround time did increase with the first wave of the pandemic, it was not overly substantial. In subsequent waves the average turnaround time for the state increased by two minutes. Because time of hospital transfer is not a data point that is regularly available, the calculation for this measure considered the elapsed time between the time that the unit arrived at the hospital, to the time that the unit reported being back in service.

Response Time

Figure 36. Statewide 90th Percentile Interval Times, Emergency Records Only, 01/01/2020 – 12/31/2020

Figure 36 displays the statewide 90th percentile times for emergency calls for service for various intervals. Response time is a commonly requested metric. The commonwealth's 90th percentile response time is 16 minutes. This means that 90 percent of emergency calls in the commonwealth are responded to and an EMS agency is on scene in 16 minutes from the time that it was dispatched. 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, so the chute time is part of the response time.

Percent Distribution of Response Time in Minutes, Emergency Records, Ground Ambulances, 01/01/2020-12/31/2020

Source: Pennsylvania State EMS Data Bridge, 2021.

Figure 37 displays the percentage of emergency record type calls that are responded to in each minute of elapsed time. Seventy one 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. Table 13 on pages 64 through 66 provides detailed county level information related to response time.

Table 13. Ground Ambulance Response Time Information by County, Emergency Records Only, 01/01/2020 – 12/31/2020

County	Number of EMS records	Valid records	Validity rate	90th percentile response time	Average response Time	Median response time
Adams	6,241	6,234	99.89%	16.0	9.79	9
Allegheny	154,447	153,219	99.20%	15.0	9.30	8
Armstrong	8,364	8,319	99.46%	21.0	11.95	10
Beaver	14,756	14,594	98.90%	19.0	10.79	10
Bedford	4,382	4,367	99.66%	24.0	13.24	11
Berks	52,269	52,246	99.96%	15.0	9.55	9
Blair	18,490	18,432	99.69%	14.0	7.70	6
Bradford	7,104	7,057	99.34%	23.4	11.20	8
Bucks	51,937	51,435	99.03%	14.0	8.91	8
Butler	19,287	19,252	99.82%	17.0	9.87	9
Cambria	20,974	20,886	99.58%	15.0	9.01	8
Cameron	736	736	100.00%	24.0	10.03	7
Carbon	8,758	8,741	99.81%	20.0	11.25	10
Centre	8,505	8,494	99.87%	19.0	11.64	11
Chester	41,638	41,454	99.56%	13.0	8.17	8
Clarion	4,599	4,587	99.74%	19.0	9.70	8
Clearfield	9,176	9,139	99.60%	20.0	11.27	10
Clinton	3,810	3,793	99.55%	22.0	12.53	10
Columbia	8,204	8,184	99.76%	20.0	11.78	10
Crawford	8,324	8,287	99.56%	20.0	10.38	8
Cumberland	22,999	22,974	99.89%	13.0	8.42	8
Dauphin	33,833	33,821	99.96%	15.0	9.25	8
Delaware	62,080	61,765	99.49%	10.0	6.87	6
Elk	3,046	3,042	99.87%	17.0	9.59	8
Erie	31,154	31,084	99.78%	15.0	8.69	8
Fayette	18,074	18,022	99.71%	18.0	9.59	8
Forest	710	704	99.15%	41.0	25.67	27

County	Number of EMS records	Valid records	Validity rate	90th percentile response time	Average response Time	Median response time
Franklin	10,393	10,375	99.83%	14.0	8.63	8
Fulton	1,049	1,044	99.52%	23.0	12.29	11
Greene	3,076	3,073	99.90%	24.0	13.25	11
Huntingdon	3,883	3,850	99.15%	28.0	14.94	13
Indiana	7,204	7,194	99.86%	22.0	13.12	12
Jefferson	4,899	4,887	99.76%	20.0	10.55	9
Juniata	2,781	2,765	99.42%	20.0	11.83	11
Lackawanna	14,716	14,547	98.85%	15.0	8.04	7
Lancaster	44,541	44,528	99.97%	15.0	9.31	8
Lawrence	10,186	10,137	99.52%	19.0	10.17	9
Lebanon	15,489	15,477	99.92%	14.0	8.11	7
Lehigh	39,110	39,031	99.80%	14.0	8.24	7
Luzerne	41,498	41,385	99.73%	16.0	9.05	8
Lycoming	16,683	16,556	99.24%	17.0	10.06	8
McKean	3,161	3,149	99.62%	18.0	9.10	7
Mercer	14,273	14,174	99.31%	19.0	9.94	8
Mifflin	4,300	4,278	99.49%	18.0	9.73	8
Monroe	15,541	15,456	99.45%	19.0	11.04	10
Montgomery	69,702	69,558	99.79%	12.0	7.75	7
Montour	3,061	3,059	99.93%	22.0	10.34	7
Northampton	32,529	32,434	99.71%	14.0	8.59	8
Northumberland	14,760	14,718	99.72%	18.0	9.35	7
Perry	3,552	3,551	99.97%	22.0	13.37	12
Philadelphia	258,432	257,832	99.77%	15.0	8.43	7
Pike	4,158	3,963	95.31%	28.0	16.30	15
Potter	1,493	1,482	99.26%	27.0	13.92	11
Schuylkill	17,048	17,016	99.81%	19.0	11.00	10
Snyder	2,496	2,490	99.76%	20.0	11.49	10
Somerset	8,500	8,453	99.45%	21	11.41	10
Sullivan	907	903	99.56%	38.8	22.86	22

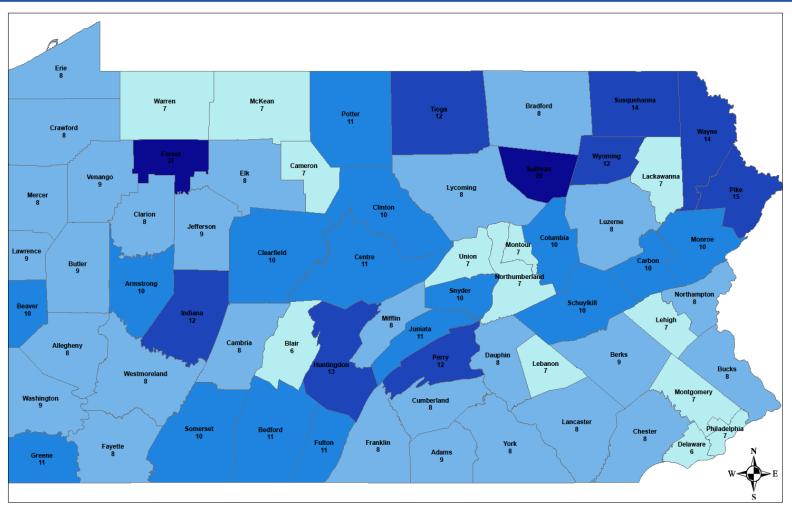| County	Number of EMS records	Valid records	Validity rate	90th percentile response time	Average response Time	Median response time
Susquehanna	3,817	3,617	94.76%	27	15.19	14
Tioga	4,853	4,832	99.57%	31	14.56	12
Union	4,294	4,280	99.67%	15	8.25	7
Venango	5,482	5,433	99.11%	19	10.26	9
Warren	4,101	4,099	99.95%	20	9.63	7
Washington	25,102	24,877	99.10%	19	10.62	9
Wayne	6,162	6,113	99.20%	26	14.60	14
Westmoreland	40,477	40,405	99.82%	15	9.12	8
Wyoming	3,736	3,696	98.93%	23	13.02	12
York	32,454	32,438	99.95%	15	9.20	8
No incident county listed	26,034					

Source: Pennsylvania State EMS Data Bridge, 2021

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 and the en route date/time must have been later than the dispatch date/time. Additionally, the criteria for this table have been updated from previous reports. This table now only includes response time data for ground ambulances, non-transport units and air ambulances have been excluded.

Included in the table are the number of valid records as defined above, the 90th percentile response time, the average response time, and the median response time. The 90th percentile indicates that 90 percent 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 50th percentile, meaning 50 percent of calls are answered in less time and 50 percent 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 times listed in this table by the incident county.

Map 2: 2020 Median Response Time for Ground Ambulances, Emergency Records, 01/01/2020-12/31/2020

Legend

Median response time (minutes)

6.00 - 7.00

7.01 - 9.00

9.01 - 11.00

11.01 - 15.00

15.01 - 27.00

Prepared by DJF 01/27/2021
Source: State EMS Data Bridge, 2021

EMS Workforce

Table 14. Number of Pennsylvania EMS Certifications Expiring, by Certification Type, 01/01/2020 – 12/31/2020

Primary certification	Number of certifications expiring
Emergency Medical Services Vehicle Operator	743
Emergency Medical Responder	347
Emergency Medical Technician	2,288
Advanced Emergency Medical Technician	No Data
Paramedic	48
Pre-Hospital Registered Nurse	10

Source: Pennsylvania State EMS Certification Registry, 2021

Table 14 summarizes the number of individuals by certification type that allowed their certification to expire in 2020. The EMT certification level had the most expirations. The number of expirations for providers at and above the level of AEMT are lower due to the fact that most ALS level providers expire on the last day of the year of odd numbered years.

Table 15. Number of Pennsylvania Licensed EMS Agencies as of 12/31/2020

Highest level on agency license	Count of agencies
QRS	459
BLS squad	21
BLS ambulance	425
ALS squad	29
ALS ambulance	374
Air ambulance services	16
Total number of agencies	**1,324**

Source: Pennsylvania State EMS Licensure System, 2021

Table 15 summarizes the number of licensed EMS agencies by the highest level of their EMS agency license.

Table 16. Number of Pennsylvania Licensed EMS Agencies 2013-2020

Level/Year	2013	2014	2015	2016	2017	2018	2019	2020
QRS Only	**616**	**599**	**548**	**424**	**405**	**431**	**468**	**459**
BLS Ambulance	U/K	U/K	U/K	U/K	U/K	U/K	447	425
BLS Squad	U/K	U/K	U/K	U/K	U/K	U/K	10	21
BLS Sub Total	**626**	**591**	**557**	**505**	**478**	**444**	**457**	**446**
ALS Ambulance	U/K	U/K	U/K	U/K	U/K	U/K	368	374
ALS Squad	U/K	U/K	U/K	U/K	U/K	U/K	29	29
ALS Sub Total	**386**	**393**	**381**	**381**	**344**	**366**	**397**	**403**
Air Ambulance	**17**	**16**	**16**	**20**	**18**	**17**	**17**	**16**
Total EMS Organizations	**1,645**	**1,599**	**1,502**	**1,330**	**1,245**	**1,258**	**1,339**	**1,324**

Source: Pennsylvania State EMS Licensure System, 2021

Table 16 summarizes the calendar year end number of licesned EMS agencies for 2013-2020 by the highest level of their EMS agency license.
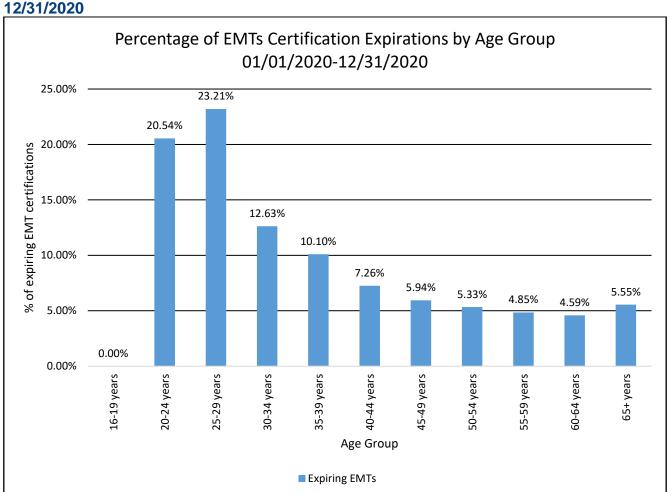
Percentage of EMTs Certification Expirations by Age Group
01/01/2020-12/31/2020

Source: Pennsylvania State EMS Certification Registry, 2021

Figure 38 shows that 63 percent 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 which had less than 5 individuals' EMT certifications expire have had those values suppressed. 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: 2020 EMT Expirations by County

Legend

Count of EMT Expirations: 1 - 16 | 17 - 34 | 35 - 59 | 60 - 114 | 115 - 193

Percentage of Paramedic Certification Expirations by Age Group
01/01/2020-12/31/2020

Source: Pennsylvania State EMS Certification Registry, 2021

Figure 39 shows that nearly 46 percent of individuals with an expiring paramedic certification were under the age of 40. Approximately 18 percent 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.

Figure 40. Number of Certified EMTs by Age Group, 01/01/2020 – 12/31/2020

Number of Certified EMTs by Age Group 01/01/2020-12/31/2020

Source: Pennsylvania State EMS Certification Registry, 2021

Figure 40 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 41. Number of Certified Paramedics by Age Group, 01/01/2010 – 12/31/2020

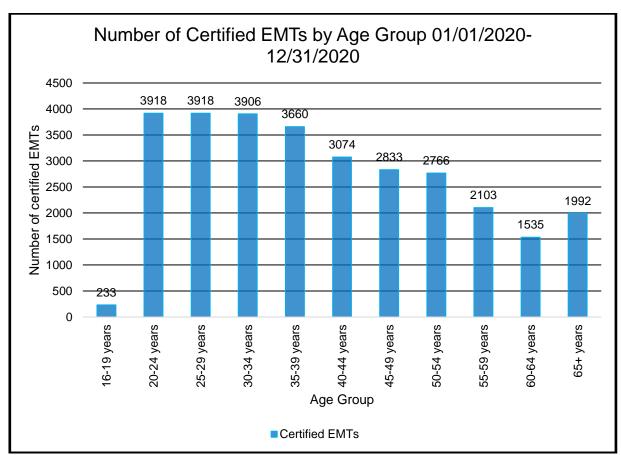Number of Certified Paramedics by Age Group 01/01/2020-12/31/2020

Source: Pennsylvania State EMS Certification Registry, 2021

Figure 41 displays the age range distribution of certified paramedics within Pennsylvania's EMS system. It is important to note that this is the available workforce, not necessarily the "active" workforce.

Table 17. Pennsylvania Certified EMS Workforce as of 01/15/2021

Primary certification	Number of certification holders	Net change from 2018
EMR	2,782	**(243)**
EMT	29,938	**695**
AEMT	396	**78**
Paramedic	7,185	**509**
PHRN	1,407	**179**

Source: Pennsylvania State EMS Certification Registry, 2021

The above numbers in Table 17 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 2019. This value was calculated by comparing the values for year ending 2020 to the values previously reported in the 2019 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 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 2019-2020.

Map 6 displays the percentage change of emergency medical technicans (EMT), from 2019-2020.

Map 7 displays the percentage change of paramedics, from 2019-2020.

Map 4: 2020 Year End Number of Certified EMS Providers by County

Legend

Count of Certification Holders

20 - 270	
271 - 602	1103 - 1675
603 - 1102	1676 - 3786

Prepared by DJF 01/26/2021
Source PA EMS Certification Registry

Erie 1002
Warren 269
McKean 161
Potter 106
Tioga 320
Bradford 239
Susquehanna 190
Wayne 232
Crawford 351
Forest 20
Cameron 27
Sullivan 85
Wyoming 134
Lackawanna 811
Elk 162
Venango 302
Lycoming 626
Pike 220
Mercer 297
Clarion 144
Jefferson 199
Clinton 165
Luzerne 1042
Monroe 445
Lawrence 233
Clearfield 270
Union 157
Montour 63
Columbia 206
Carbon 219
Northampton 817
Butler 522
Armstrong 268
Centre 432
Northumberland 338
Schuylkill 540
Lehigh 934
Beaver 399
Indiana 315
Snyder 180
Mifflin 170
Juniata 117
Berks 1102
Allegheny 3844
Cambria 658
Blair 358
Bucks 1675
Westmoreland 1219
Huntingdon 304
Perry 236
Dauphin 602
Lebanon 479
Montgomery 1595
Washington 674
Somerset 328
Bedford 249
Cumberland 673
Lancaster 1543
Chester 1263
Philadelphia 3786
Greene 202
Fayette 479
Fulton 72
Franklin 502
Adams 426
York 1235
Delaware 1460

76

Map 5: 2019 to 2020 % Net Change of EMS Providers by County

Legend

% Net change of EMS providers 2019 to 2020

- -13.0% - -6.18% (red)
- -6.17% - -0.69% (orange)
- -0.68% - 2.42% (grey)
- 2.42% - 8.05% (light green)
- 8.051% - 26% (bright green)

Prepared by DJF 01/28/2021
Source PA EMS Certification Registry

77

Map 6: 2019 to 2020 % Net Change of EMTs by County

Legend

% Net change of EMTs 2019 to 2020   ▮ -8.33% - -0.99%   ▯ -0.98% - 0.99%   ▮ 1.00% - 23.33%

Prepared by DJF 01/29/2021
Source PA EMS Certification Registry

78

Map 7: 2019 to 2020 % Net Change of Paramedic by County

Legend

% Net change of paramedics 2019 to 2020 ▮ -25.00% - -0.99% ▯ -0.98% - 0.99% ▮ 1.00% - 44.44%

Table 18. Pennsylvania EMT Workforce Engagement Rate as of 01/15/2021

County Name	Count of certified EMTs	Count of individuals appearing on an electronic roster	EMT engagement rate
Adams	305	166	54.43%
Allegheny	2,339	1,317	56.31%
Armstrong	190	73	38.42%
Beaver	261	141	54.02%
Bedford	168	118	70.24%
Berks	730	378	51.78%
Blair	244	140	57.38%
Bradford	174	96	55.17%
Bucks	1,300	583	44.85%
Butler	340	147	43.24%
Cambria	390	215	55.13%
Cameron	21	13	61.90%
Carbon	162	79	48.77%
Centre	328	142	43.29%
Chester	926	388	41.90%
Clarion	96	52	54.17%
Clearfield	178	124	69.66%
Clinton	123	76	61.79%
Columbia	145	85	58.62%
Crawford	263	188	71.48%
Cumberland	474	221	46.62%
Dauphin	431	172	39.91%
Delaware	1,123	497	44.26%
Elk	105	60	57.14%
Erie	683	473	69.25%
Fayette	297	111	37.37%
Forest	14	9	64.29%

County Name	Count of certified EMTs	Count of individuals appearing on an electronic roster	EMT engagement rate
Franklin	399	266	66.67%
Fulton	53	37	69.81%
Greene	143	55	38.46%
Huntingdon	206	148	71.84%
Indiana	216	90	41.67%
Jefferson	133	75	56.39%
Juniata	92	59	64.13%
Lackawanna	562	321	57.12%
Lancaster	1,066	567	53.19%
Lawrence	148	94	63.51%
Lebanon	357	197	55.18%
Lehigh	572	250	43.71%
Luzerne	745	412	55.30%
Lycoming	427	287	67.21%
McKean	105	74	70.48%
Mercer	207	108	52.17%
Mifflin	118	73	61.86%
Monroe	317	155	48.90%
Montgomery	1,200	583	48.58%
Montour	37	24	64.86%
Northampton	551	276	50.09%
Northumberland	230	137	59.57%
Perry	147	84	57.14%
Philadelphia	3,184	1,817	57.07%
Pike	159	96	60.38%
Potter	67	59	88.06%
Schuylkill	385	240	62.34%
Snyder	141	105	74.47%
Somerset	230	104	45.22%
Sullivan	57	50	87.72%

County Name	Count of certified EMTs	Count of individuals appearing on an electronic roster	EMT engagement rate
Susquehanna	136	112	82.35%
Tioga	236	162	68.64%
Union	124	79	63.71%
Venango	203	138	67.98%
Warren	180	131	72.78%
Washington	482	206	42.74%
Wayne	171	110	64.33%
Westmoreland	807	358	44.36%
Wyoming	100	56	56.00%
York	888	424	47.75%

Source: Pennsylvania State EMS Licensure System, 2021

Of the nearly 30,000 Pennsylvania certified emergency medical technicians (EMTs), only half are affiliated with an EMS agency by way of appearing on an electronic roster within the EMS agency licensure system. Table 18 analyzes by county what percentage of EMTs reporting residence within a county appear on at least one EMS agency's electronic roster. Potter county had the highest EMT engagement rate, with 88.06 percent of the EMTs living in the county appearing on at least one EMS agency roster. There were numerous counties reporting engagement rates in the range of 30 to 40 percent.

Table 19. Pennsylvania Paramedic Workforce Engagement Rate as of 01/15/2021

County Name	Count of certified paramedics	Count of individuals appearing on an electronic roster	Paramedic engagement rate
Adams	57	48	84.21%
Allegheny	875	648	74.06%
Armstrong	48	41	85.42%
Beaver	85	60	70.59%
Bedford	27	24	88.89%
Berks	190	156	82.11%
Blair	63	52	82.54%
Bradford	32	30	93.75%
Bucks	265	213	80.38%
Butler	120	88	73.33%
Cambria	125	107	85.60%
Cameron	<5	<5	100.00%
Carbon	35	30	85.71%
Centre	52	46	88.46%
Chester	190	144	75.79%
Clarion	30	25	83.33%
Clearfield	48	41	85.42%
Clinton	12	11	91.67%
Columbia	32	27	84.38%
Crawford	40	37	92.50%
Cumberland	92	73	79.35%
Dauphin	104	78	75.00%
Delaware	232	169	72.84%
Elk	27	23	85.19%
Erie	116	98	84.48%
Fayette	122	82	67.21%
Forest	No Data	No Data	No Data
Franklin	70	53	75.71%

County Name	Count of certified paramedics	Count of individuals appearing on an electronic roster	Paramedic engagement rate
Fulton	6	5	83.33%
Greene	33	29	87.88%
Huntingdon	19	14	73.68%
Indiana	56	48	85.71%
Jefferson	29	24	82.76%
Juniata	14	13	92.86%
Lackawanna	117	108	92.31%
Lancaster	229	187	81.66%
Lawrence	51	39	76.47%
Lebanon	67	50	74.63%
Lehigh	155	134	86.45%
Luzerne	194	159	81.96%
Lycoming	102	83	81.37%
McKean	29	26	89.66%
Mercer	52	39	75.00%
Mifflin	23	22	95.65%
Monroe	75	57	76.00%
Montgomery	264	214	81.06%
Montour	10	8	80.00%
Northampton	139	110	79.14%
Northumberland	60	53	88.33%
Perry	24	17	70.83%
Philadelphia	531	418	78.72%
Pike	25	20	80.00%
Potter	7	6	85.71%
Schuylkill	71	56	78.87%
Snyder	13	10	76.92%
Somerset	52	43	82.69%
Sullivan	<5	<5	100.00%
Susquehanna	16	14	87.50%

County Name	Count of certified paramedics	Count of individuals appearing on an electronic roster	Paramedic engagement rate
Tioga	25	23	92.00%
Union	16	13	81.25%
Venango	40	35	87.50%
Warren	17	12	70.59%
Washington	104	73	70.19%
Wayne	27	23	85.19%
Westmoreland	292	221	75.68%
Wyoming	13	9	69.23%
York	199	155	77.89%

Source: Pennsylvania State EMS Licensure System, 2021

Of the just over 7,000 Pennsylvania certified paramedics, 80 percent are affiliated with an EMS agency by way of appearing on an electronic roster within the EMS agency licensure system. Table 19 analyzes by county what percentage of paramedics reporting residence within a county appear on at least one EMS agency's electronic roster. Sullivan and Cameron counties, though the underlying data is suppressed due to low volume, had 100 percent of paramedics living in those counties appearing on an electronic roster. Mifflin county had the highest paramedic engagement rate for counties where the underlying data did not have to be suppressed, with 95.65 percent of the paramedics living in the county appearing on at least one EMS agency roster. There were few counties reporting paramedic engagement rates less than 75 percent.

EMS Agency Roster Size, Certified Providers Only, Transporting EMS Agencies Only, as of 01/15/2021

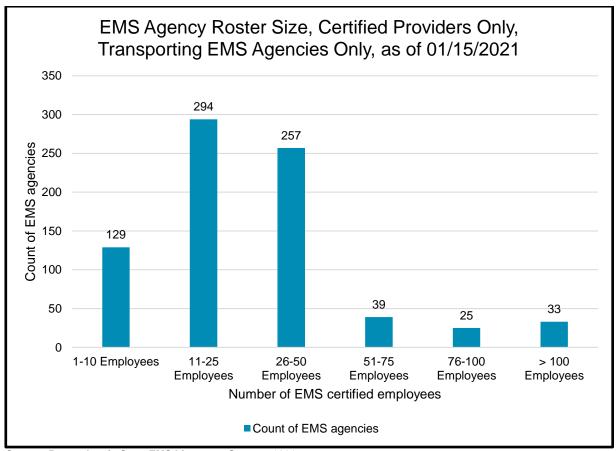**Source: Pennsylvania State EMS Licensure System, 2021**

Figure 42 displays the frequency of an EMS agency's roster size. This analysis is restricted to EMS agencies with at minimum, licensure as a BLS ambulance. Data was obtained from EMS agencies electronic rosters as reported to the electronic EMS agency licensure system. 129 EMS agencies (16 percent of the sample) reported having between 1 and 10 certified employees on staff. 551 EMS agencies (71 percent of the sample) reported having between 11 and 50 certified employees on staff.

Number of Affiliated EMS Agencies by Unique Certified Rostered Provider as of 01/15/2021

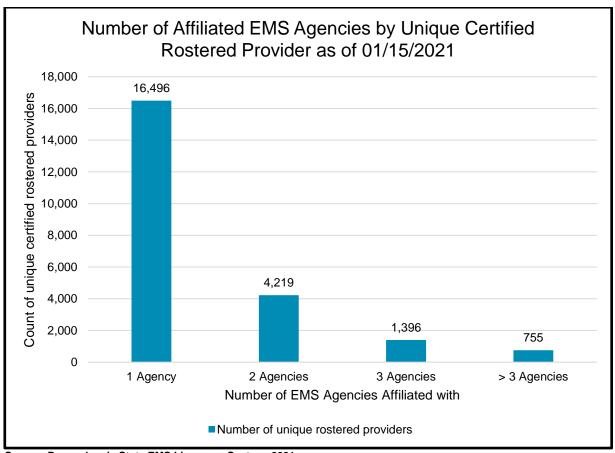**Source: Pennsylvania State EMS Licensure System, 2021**

Figure 43 displays the frequency by which a certified EMS provider appears on an EMS agency's electronic roster. Data was obtained from EMS agencies electronic rosters as reported to the electronic EMS agency licensure system. 16,496 certified EMS providers (72 percent of the sample) appeared on the electronic roster for only one EMS agency, whereas the remaining 28 percent appeared on more than one EMS agency roster.

Staffing Model by EMS Agency(QRS Only Agencies Excluded) as of 01/15/2021

All volunteer staffing, 18%

Combination staffing, 30%

All paid staffing, 52%

■ All volunteer staffing   ■ All paid staffing   ■ Combination staffing

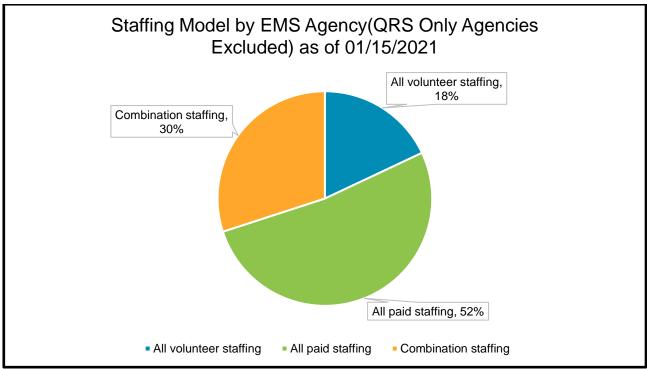**Source: Pennsylvania State EMS Licensure System, 2021**

Figure 44 displays what percentage of EMS agencies, excluding quick response squad only agencies, are all volunteer staffing, all paid staffing, or use a combination of paid and volunteer staffing. 52 percent of the EMS agencies in the state, above the level of a QRS utilize all paid staff and 30 percent utilize a combination staffing model. Data for this analysis came from EMS agency electronic rosters.

Table 20. National Registry of Emergency Medical Technician Exam Statistics, by Year of Course Completion 2016-2020 [1]

Testing metric	2016	2017	2018	2019	2020
PA EMT overall pass rate	**78%**	**77%**	**79%**	**78%**	**75%**
National EMT overall pass rate	82%	81%	82%	80%	78%
EMT successful completion	2,084	1,964	2,134	2,333	1,833
PA paramedic overall pass rate	**83%**	**84%**	**88%**	**92%**	**86%**
National paramedic overall pass rate	89%	90%	90%	89%	83%
Paramedic successful completion	227	167	200	195	186

Source: National Registry of Emergency Medical Technicians, 2021

Table 20 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 2019 and 2020 are dynamic, as students are still testing. Values for 2018 still have the potential to change because of testing extensions granted by the National Registry because of COVID-2019.

Reinstatement Initiative

On March 3, 2020 the Department of Health Bureau of EMS issued EMS Information Bulletin 2020-05. This bulletin implemented a time limited regulatory exception to the established process for re registering certifications that had previously expired. As part of the program. individuals who had previously expired on or after February 1, 2010 would have their requirements for testing removed, and the number of continuing education hours reduced. This exception ended on September 3, 2021.

From March 3, 2020 through January 30, 2021, the Bureau of EMS processed 1,130 individuals through the reinstatement program. For comparison purposes, the Bureau processed 122 applications for reinstatement in all of 2019. This represents an 826 percent increase in EMS certification reinstatements. The figures that follow demonstrate key metrics, effects, and performance related to this program.
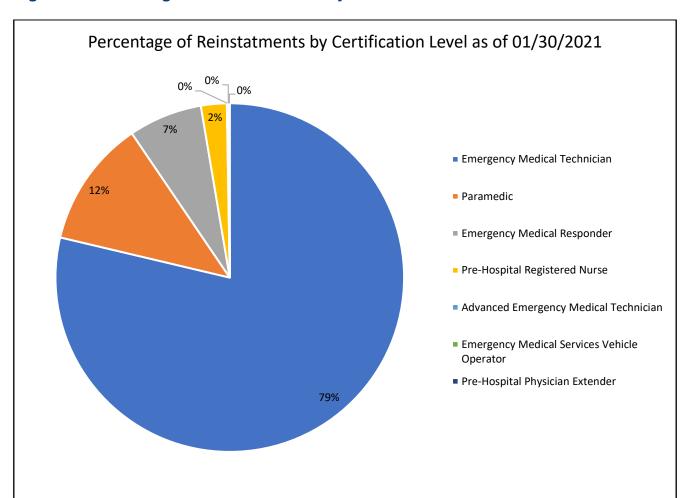
Figure 45. Percentage of Reinstatements by Certification Level as of 01/30/2021

Percentage of Reinstatments by Certification Level as of 01/30/2021

- Emergency Medical Technician
- Paramedic
- Emergency Medical Responder
- Pre-Hospital Registered Nurse
- Advanced Emergency Medical Technician
- Emergency Medical Services Vehicle Operator
- Pre-Hospital Physician Extender

Source: EMS Certification Registry, 2021

Figure 45 displays by certification level, what percentage individuals reinstated their certification out of the total number of reinstatements (1,130). Seventy-nine percent of the reinstatements (887 individuals) were emergency medical technicians. Twelve percent of the reinstatements (133) were paramedics.

Table 21. Number of EMS Reinstatements by Regional EMS Council (Based on County of Residence) as of 01/30/2021

Regional EMS Council	Number of Reinstatements
Bucks	39
Chester	34
Delaware	55
Eastern	97
EMMCO West	98
EMS West	225
Emergency Health Services Federation	165
LTS EMS Council	30
Montgomery	51
EMS of Northeastern Pennsylvania	107
Philadelphia	74
Seven Mountains Regional EMS Council	70
Southern Alleghenies EMS Council	82

Source: EMS Certification Registry, 2021

Table 21 displays by Regional EMS Council the total number of EMS certification reinstatements completed under the lapse of registration regulatory exception through 01/30/2021.

Table 22. Percentage of Reinstated Providers Appearing on an EMS Agency Roster by Regional EMS Council (Based on County of Residence) as of 01/30/2021

Regional EMS Council	% of Reinstatements Rostered
Bucks	26.31%
Chester	8.82%
Delaware	9.09%
Eastern	20.61%
EMMCO West	21.42%
EMS West	17.33%
Emergency Health Services Federation	12.65%
LTS EMS Council	13.33%
Montgomery	11.76%
EMS of Northeastern Pennsylvania	24.29%
Philadelphia	20.27%
Seven Mountains Regional EMS Council	25.71%
Southern Alleghenies EMS Council	26.82%

Source: EMS Certification Registry, 2021

Table 22 displays what percetage of individuals reinstating their certification as outlined on table 21, appered on an EMS agencies electornic roster as of 01/30/2021.

Table 23. Percentage of Reinstated Providers Appearing on an EMS Patient Care Report by Regional EMS Council (Based on County of Residence) as of 01/30/2021

Regional EMS Council	% of Reinstatements Appearing on a PCR
Bucks	21.05%
Chester	23.50%
Delaware	14.54%
Eastern	27.83%
EMMCO West	15.30%
EMS West	16.88%
Emergency Health Services Federation	11.44%
LTS EMS Council	26.66%
Montgomery	19.60%
EMS of Northeastern Pennsylvania	28.03%
Philadelphia	22.97%
Seven Mountains Regional EMS Council	18.57%
Southern Alleghenies EMS Council	26.82%

Source: EMS Certification Registry, 2021

Table 23 displays what percetage of individuals reinstating their certification as outlined on table 21, appered on an EMS patient care report in calendar year 2020. In some instances the percentage appearing on a PCR is higher than the roster rate in table 21. In those instances it is likely that EMS agencies have not kept their electronic rosters up to date over the course of their 3 year license.

Citations

1. National Registry of Emergency Medical Technicians. (2021). Pennsylvania state pass/fail reports. Retrieved from www.nremt.org.