



Ambulance Patient Offload Delays

Emergency Medical Services Authority

California Health and Human Services Agency

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Most Californians have pulled to the side of the road to allow an ambulance to race past them, lights and siren blaring, on its way to a sick or injured patient. Few Californians imagine that, upon arriving at the hospital, not only the patient, but also the ambulance and medical crew that staff it will sometimes wait. Each year, roughly 70,000 Californians wait over an hour on an ambulance gurney once they arrive at the hospital before their care is assumed by the emergency department staff and they are moved to a hospital bed.

Emergency medical services (EMS) systems and hospital emergency departments (ED) are fundamental components of California's health care delivery network. Together they provide the state's safety net for health care with 24/7 access to emergency health services. Unfortunately, especially in California's urban areas, many¹ EMS and hospital partners who provide these vital services have struggled for decades to ensure that ambulances and ED hospital beds are available when patients need them.

This persistent problem has been given a name: "Ambulance Patient Offload Delays," or "APOD," and the method for measuring this phenomenon is called "Ambulance Patient Offload Time" or "APOT." APOD creates extensive, potentially dangerous wait times for patients and results in idle ambulances and ambulance crews that could instead be responding to other emergencies.

For purposes of evaluating APOT across the state, the EMS Authority, in collaboration with EMS system stakeholders, determined that 20 minutes is the maximum time any Californian transported to a hospital by an ambulance should ever wait at any emergency department in the state before being transferred to a hospital bed.²

Background

A multiplicity of factors combined cause APODs, and the imperative to better understand these factors has united EMS system participants, and ultimately led to chaptered legislation:

- In 2015, Assembly Bill (AB) 1223 (O'Donnell, Chapter 379) required effective January 1, 2016, that EMSA create a standard methodology for

¹ Graph 1 below identifies the 90th percentile time (i.e. One out of ten patients wait longer than this time) for individual California hospitals as represented within the data available to EMSA. In many cases there are clearly very few APOT times that are extended, in others, APOT times are frequently excessive.

² Backer, H., D'Arcy, N., Davis, A., Barton, B., & Sporer, K. (2019). Statewide Method of Measuring Ambulance Patient Offload Times. *Prehospital emergency care : official journal of the National Association of EMS Physicians and the National Association of State EMS Directors*, 23(3), 319-326.

APOT calculation and reporting with stakeholder engagement and approval from the Commission on EMS.

- AB 1223 also permits Local EMS Agencies (LEMSAs) to adopt policies to calculate and report APOT based on the standard methodology outlined in Health and Safety Code (H&SC) 1797.120. However, APOT reporting was not mandated by the bill, and only nine of the 33 LEMSAs provided some APOT information in 2017.
- In 2018, AB 2961 (O'Donnell, Chapter 656) required that LEMSAs submit APOT reports quarterly to the EMS Authority effective July 1, 2019. The bill also requires the EMS Authority to calculate APOT times provided by the LEMSAs and provide biannual reports to EMS Commission and a legislative report on or by December 1, 2020.

Table 1: LEMSA Submissions

LEMSA	2019		2020	
	Q3	Q4	Q1	Q2
Alameda	11/5/2019	1/2/2020	4/23/2020	7/13/2020
Central California	10/21/2019	1/28/2020		
Coastal Valleys	11/27/2019			
Contra Costa	10/30/2019	2/3/2020	8/12/2020	8/12/2020
El Dorado	11/1/2019	1/15/2020		
Imperial				
Inland Counties	10/18/2019	7/21/2020	7/21/2020	7/16/2020
Kern	10/21/2019	1/22/2020	4/23/2020	8/3/2020
Los Angeles	12/16/2019	5/1/2020	6/25/2020	9/23/2020
Marin	11/19/2019			
Merced	10/4/2019	1/16/2020	4/14/2020	7/2/2020
Monterey	10/31/2019	1/30/2020	6/11/2020	7/30/2020
Mountain Valley	11/1/2019	6/17/2020	6/17/2020	7/13/2020
Napa	10/30/2019	1/18/2020	9/15/2020	9/15/2020
NorCal	10/23/2019	1/15/2020	4/30/2020	7/29/2020
North Coast	10/31/2019	1/15/2020		8/30/2020
Orange	10/8/2019	1/8/2020	4/20/2020	7/7/2020
Riverside	10/22/2019	1/16/2020	4/7/2020	
Sacramento	10/10/2019	1/8/2020	5/7/2020	7/7/2020
San Benito	10/31/2019	1/9/2020	4/7/2020	7/9/2020
San Diego	10/10/2019	1/15/2020	8/14/2020	8/12/2020
San Francisco	11/19/2019	3/16/2020	6/18/2020	8/3/2020
San Joaquin	10/10/2019	1/6/2020	4/10/2020	7/13/2020
San Luis Obispo	10/24/2019	1/22/2020		
San Mateo	10/7/2019	1/2/2020	5/4/2020	7/2/2020

Santa Barbara	11/13/2019	2/11/2020		
Santa Clara	10/30/2019	1/29/2020	4/2/2020	7/29/2020
Santa Cruz	10/30/2019	2/11/2020	4/10/2020	7/7/2020
Sierra-Sac Valley	10/7/2019	1/5/2020	4/3/2020	7/23/2020
Solano	12/20/2019	1/13/2020	4/23/2020	7/28/2020
Tuolumne	12/26/2019			
Ventura	12/3/2019	1/3/2020	4/7/2020	7/13/2020
Yolo	10/30/2019	1/7/2020		

*Updated 10/14/2020

As noted, APOD has been of concern in some jurisdictions for many decades. These issues include, but are not limited to, simple ED overcrowding.

“Throughput,” or the sum of the services provided by the hospital per unit of time, is considered a significant contributor to APOD. Cited among a long list of identified or likely causes of decreased throughput are increasingly complex patient conditions, a lack of specialty care physicians, a lack of primary care providers, and increased psychiatric holds due to a lack of community mental health resources³.

Upon arrival at the hospital emergency department, the ambulance crew is required to formally transfer responsibility for the patient's care to a member of the hospital staff who is of equal or higher certification. To do otherwise would endanger the patient and constitute gross negligence per (H&SC) 1798.200. Typically, this individual at the hospital assuming care of the patient is a registered nurse. Until there is a nurse or other hospital staff member available to accept the patient, the ambulance crew must wait, regardless of the length of that wait.

EMS resources are unavailable to respond to another 911 call until the patient is transferred or admitted to the hospital. There are a finite number of ambulances available in any EMS system, and a lack of available ambulances inevitably leads to slower EMS responses with potentially detrimental results for those who require immediate EMS care.

³ From “White Paper: EMS Patient Offload Delays in the ED” on page 12: <https://www.gao.gov/new.items/d09347.pdf>

EMS Authority APOT Program Activities

In August 2014, the California Hospital Association (CHA), the EMS Authority, and a group of stakeholders published the Toolkit to Reduce Ambulance Patient Offload Delays in the Emergency Department. In part, the publication was intended to help system participants develop metrics to better quantify and understand the problem. In December 2016, the Commission on EMS approved the APOT Standardized Methods for Data Collection and Reporting which established two statewide measurements: APOT-1 and APOT-2. APOT-1 and APOT-2 data are submitted to the EMS Authority by LEMSAs. ⁴

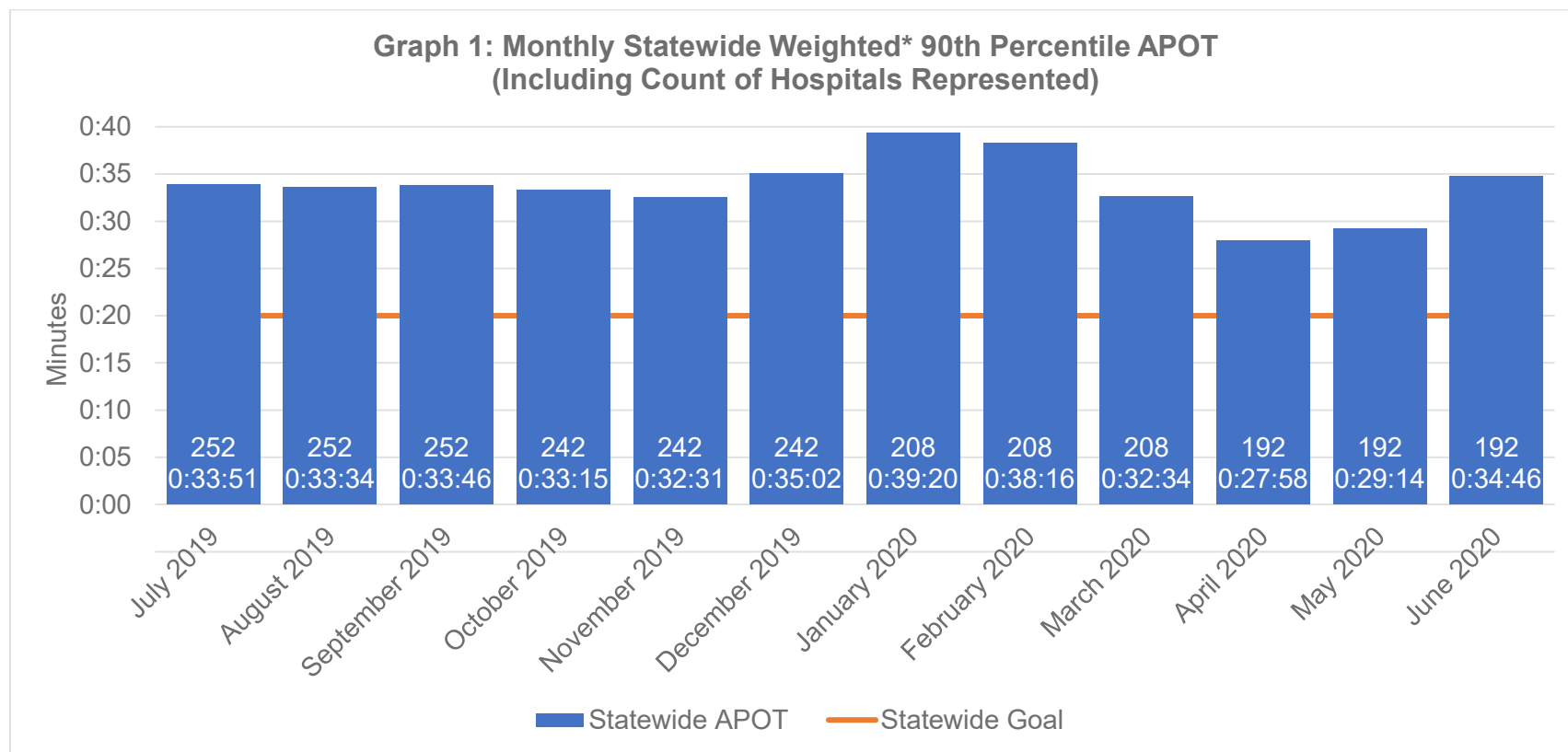
The EMS Authority tracks all APOT submissions and reviews and consolidates the information for analysis. Analysis is performed to determine total hours of delay throughout the state, to identify trends, and to help establish benchmarks. Because the LEMSAs data submissions to EMSA did not include the totality of California' ambulance response areas, not all hospitals are represented in the graphs displayed below.⁵

⁴ Additionally, EMSA collects electronic prehospital care patient data from LEMSAs using the California Emergency Medical Services Information System (CEMSIS). EMSA staff has been developing LEMSA-CEMSIS Comparison reports for each LEMSA that has submitted APOT reports and submits data into CEMIS. This serves as a quality assurance tool for a LEMSA to verify their data submission and show LEMSAs how their APOT within CEMIS compare with those of other LEMSAs. In the future EMS Authority's will generate all LEMSA APOT reports in CEMIS to provide data that can be more quickly aggregated and reliably compared, and to reduce an unnecessary replication of effort by LEMSAs.

⁵ The California Health Care Foundation's 2018 California Health Care Almanac found that "in 2016, 334 acute care hospitals in California operated EDs." P. 2. <https://www.chcf.org/wp-content/uploads/2018/08/CAEmergencyDepartments2018.pdf>

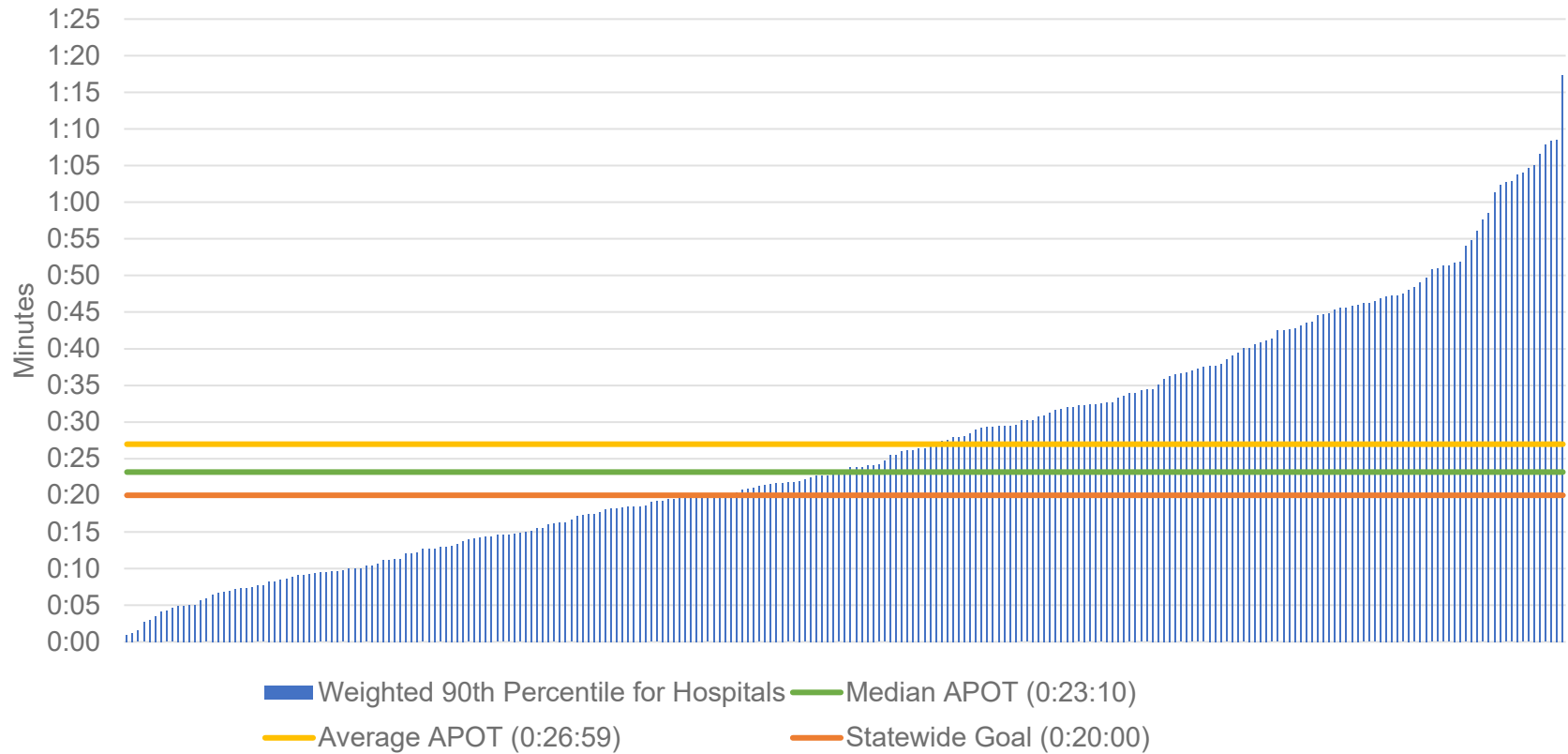
APOT-1

APOT-1 identifies the number of 911 transports to an emergency department and the 90th percentile time for each hospital. For APOT-1, the weighted 90th percentile is used so all transports hold the same value. This approach allows the opportunity to compare APOT times within a jurisdiction across the state or across multiple months and quarters.



* Graph 1 shows that in July of 2019, the statewide weighted 90th percentile APOT was 33 minutes and 51 seconds, with 252 hospitals included in the data.

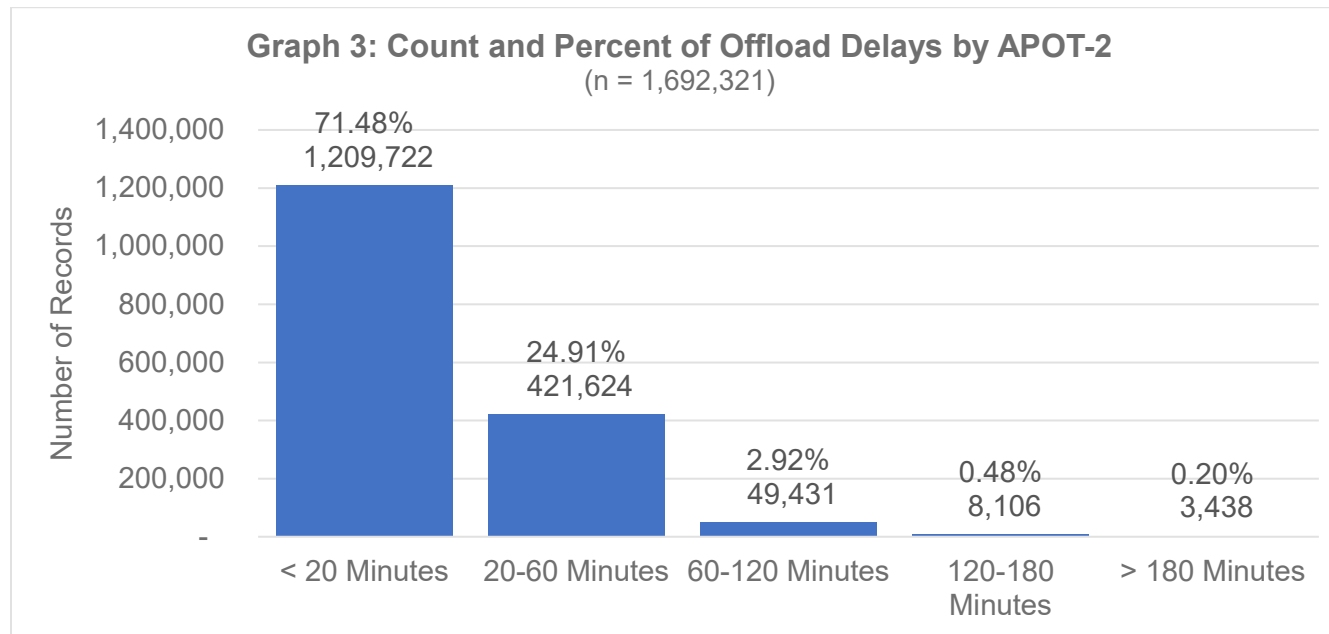
Graph 2: Deidentified Distribution of Weighted 90th Percentile APOT (n=253) reported by LEMSAs between July 2019 and June 2020 for all In-Jurisdiction



*Graph 2 shows the weighted 90th percentile APOT data for all 253 hospitals represented in the data collected between July 2019 and June 2020. Each blue line on the x-axis represents one of the 253 hospitals, with the y-axis representing the average APOT for the duration of the reporting interval.

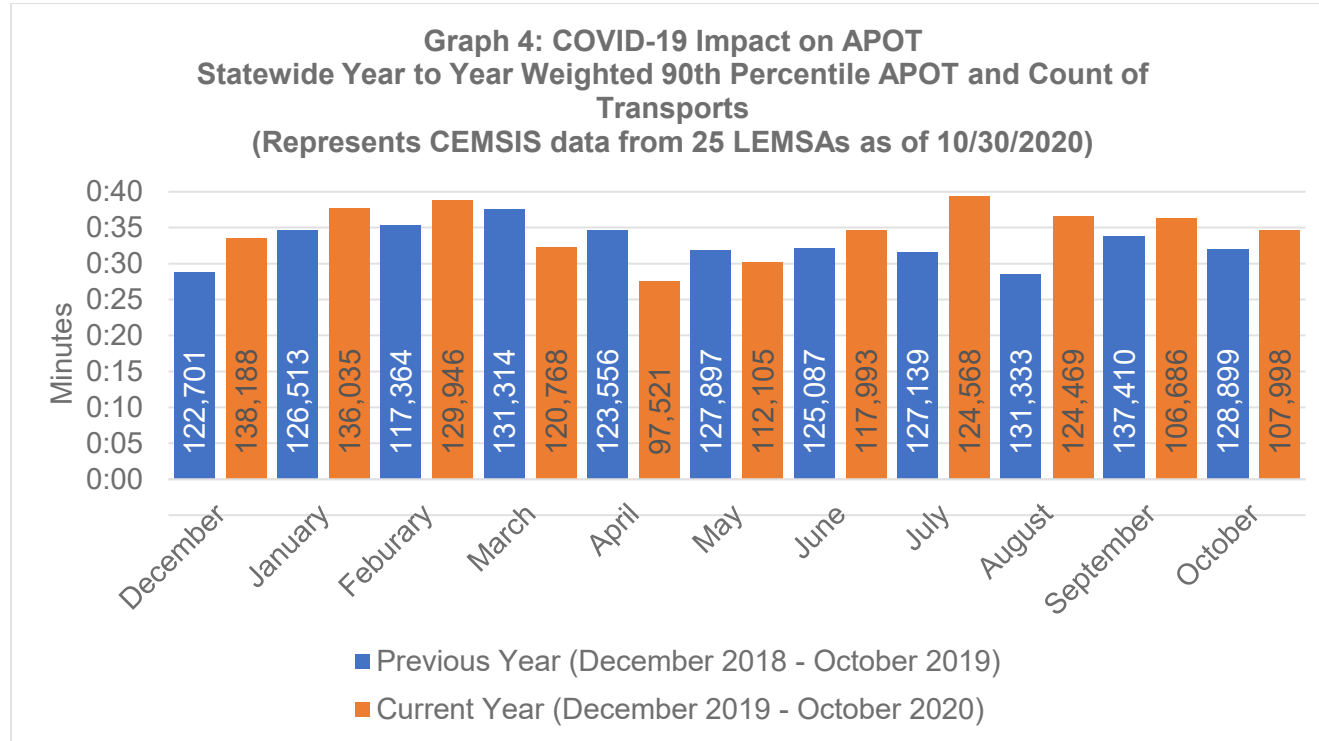
APOT-2

APOT-2 identifies five consecutive time intervals into which transports can be grouped. These time intervals are: Less than 20 minutes, between 20 minutes and 60 minutes, between 60 minutes and 120 minutes, 120 minutes to 180 minutes, and greater than 180 minutes (see Graph 3).



APOT and COVID-19

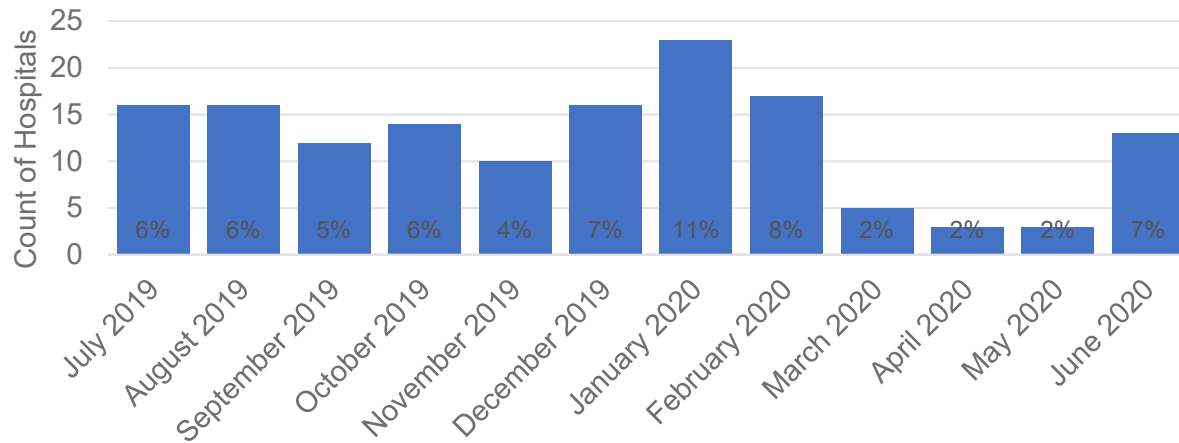
The EMS Authority has also been tracking the COVID-19 Impact on APOT by running a year-to-year comparison of CEMSIS APOT data from December 2018 to present. EMSA staff continues to monitor, report findings, and identify any trends of 911 transport utilization.⁶



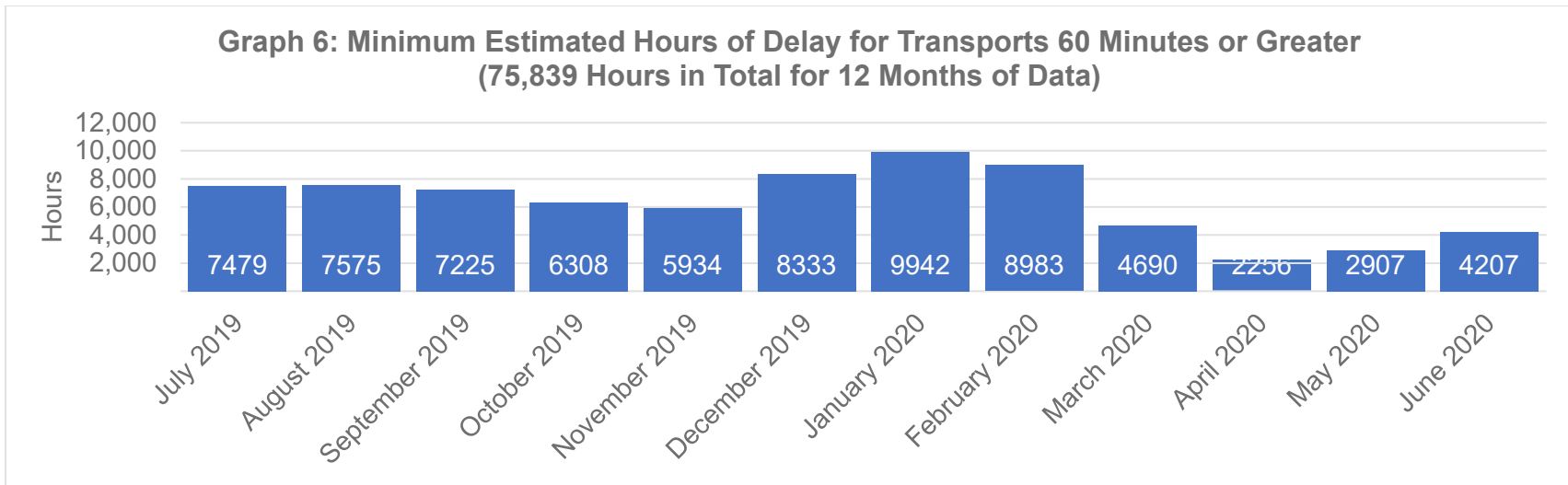
*Graph 4 shows APOT-1 data separated by 12-month intervals within EMSA's data collection period. For example, in February 2019, the statewide APOT-1 was 35 minutes across 117,364 transports. By contrast, February 2020 had an APOT-1 of nearly 40 minutes across 129,946 transports.

⁶ Of the 33 LEMSAs, 32 LEMSAs have provided at least one quarter's worth of data while 22 LEMSAs have provided a full year's worth of data (July 2019-June 2020).

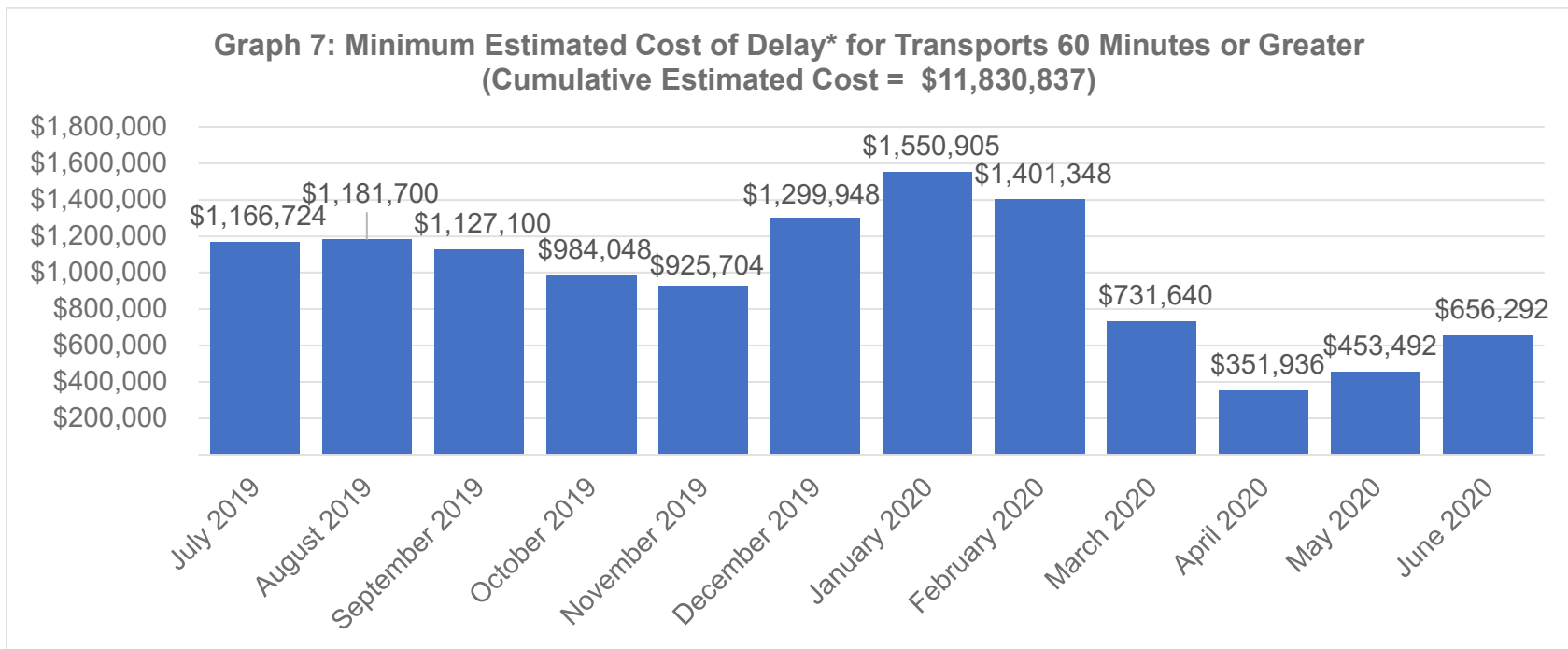
Graph 5: Count of Hospitals Reporting 90th Percentile APOT of 60 minutes or Greater (Including Percent of all Hospitals Represented)



*Graph 5 shows the 90th percentile of ambulance patient offload times that are 60 minutes or greater. For example, in January 2020, LEMSAs reported 11% of offload times were 60 minutes or greater



*Graph 6 shows the estimated total hours of delay for all transports occurring between July 2019 and June 2020 that were 60 minutes or greater. For example, in January 2020, the estimated total hours of delay resulting from transports that took 60 or more minutes was 9,942.

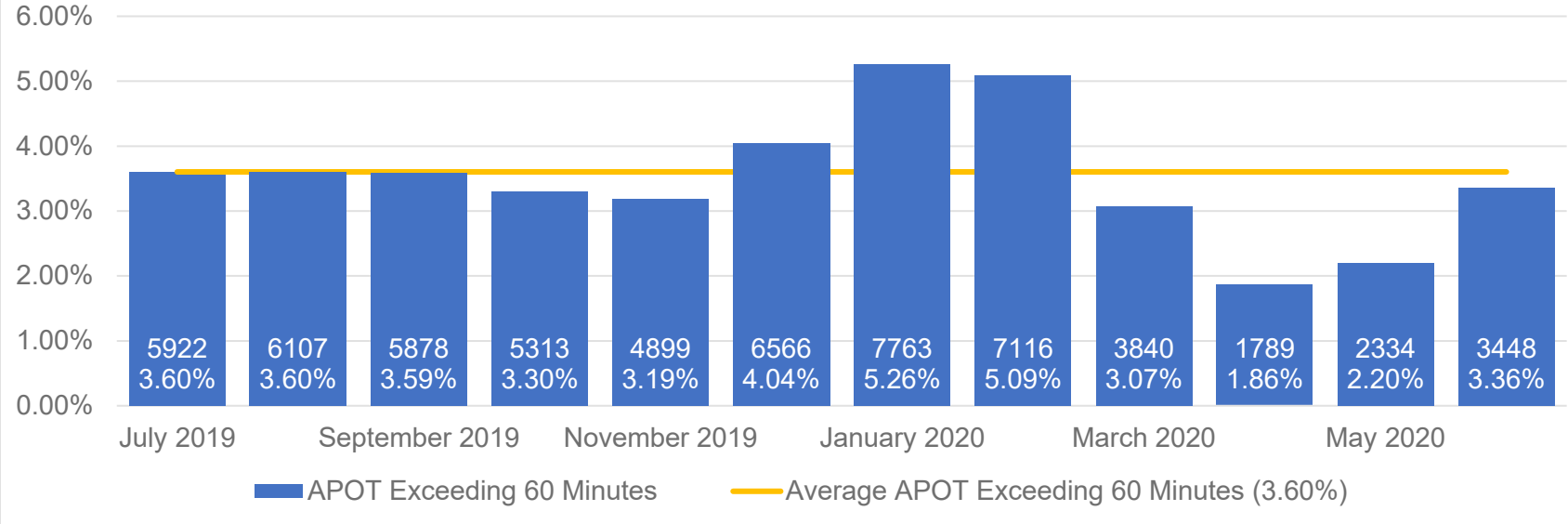


*The hour/cost was derived from the "Toolkit to Reduce Ambulance Patient Offload Delays in the Emergency Department" on page 4: <https://ems.ca.gov/wp-content/uploads/sites/71/2017/07/Toolkit-Reduce-Amb-Patient.pdf>

The number of transports to a given hospital seems to directly correlate to their APOT. More transport typically means higher times. Generally, rural counties and their hospitals have significantly lower APOT than urban counties and their hospitals.

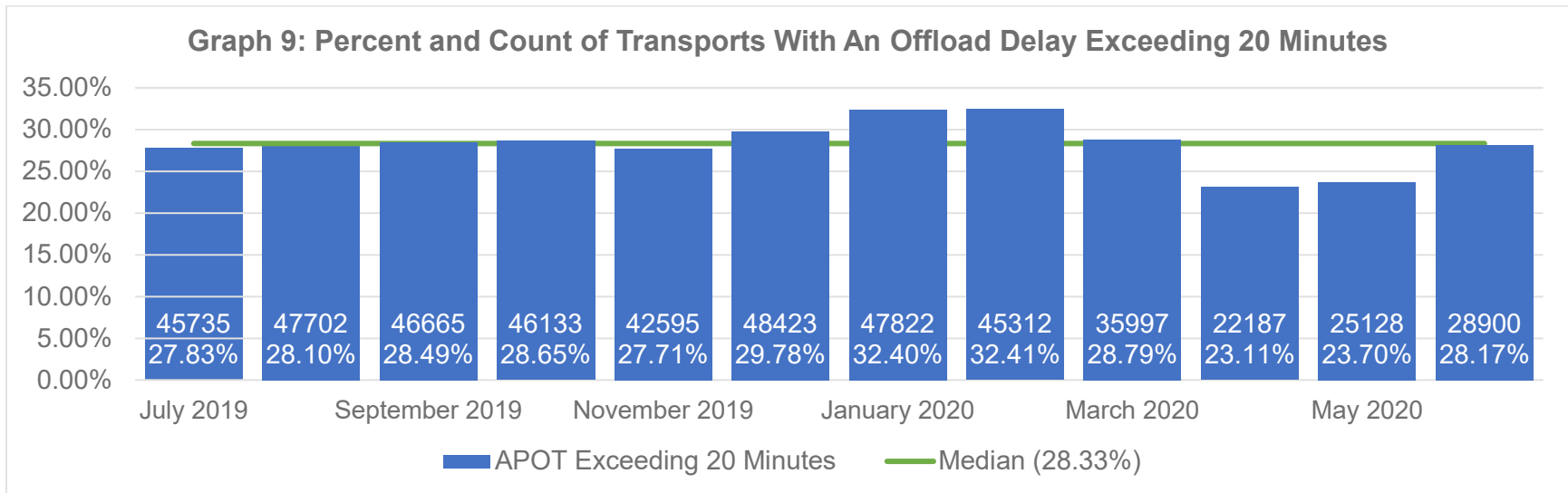
During the COVID-19 pandemic, almost all LEMSAs experienced less transport overall but saw an increase in APOT compared to the prior year. Hospitals saw an increased number of patients being admitted and this has resulted in an increase of patient offload time (see Graph 4).

Graph 8: Percent and Count of Transports With An Offload Delay Exceeding 60 Minutes



*Graph 8 shows the count of offload times that were more than 60 minutes as well as the percentage of all offload times that were more than 60 minutes. For example, in January 2020, 7763 transports, or 5.25% of all transports, had a delay exceed 60 minutes.

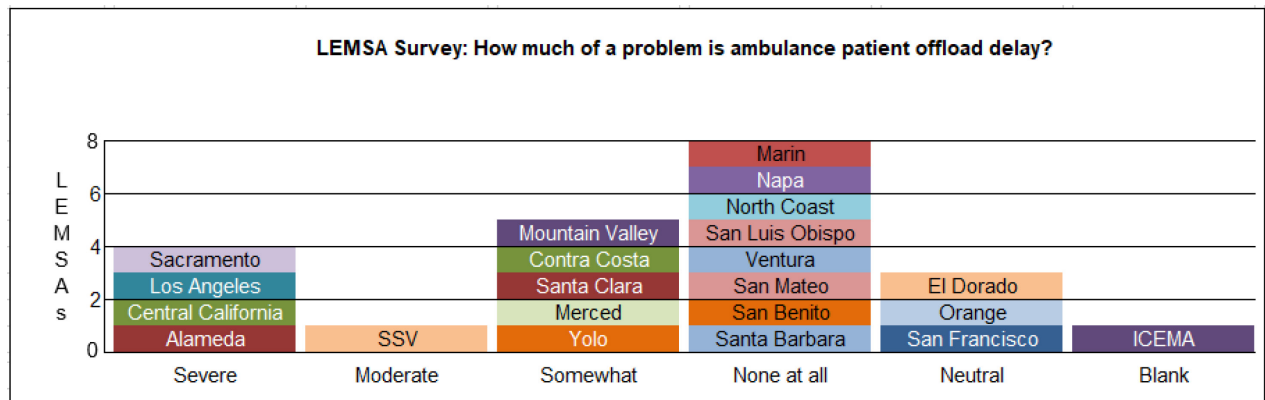
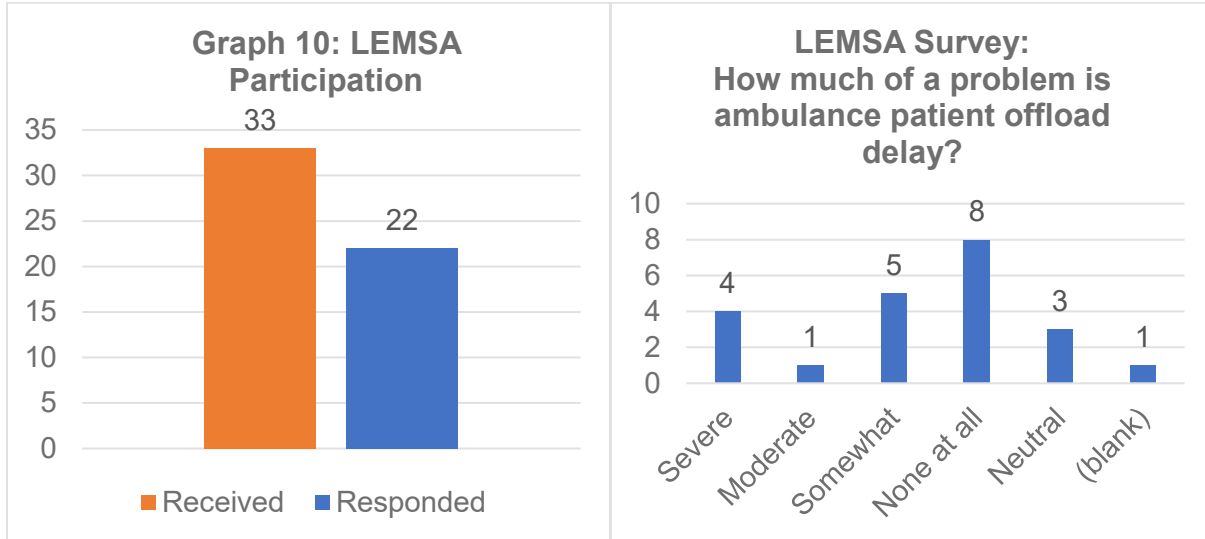
As noted previously, with stakeholder input, EMSA has targeted 20 minutes as a maximum APOT. EMSA estimates that 554,506 annual transports with an offload delay exceed 20 minutes. That represents an annual average of 28.26% of all APOTs; based on LEMSA submitted APOT data from months with the most statewide representation (June 2019 – December 2019).



*Graph 9 shows the count and percentages of all offload delays that exceeded 20 minutes. For example, in January 2020, 48,423 transports, or 32.4% of all transports, had an offload delay exceeding 20 minutes.

Survey Report Findings:

In November 2020, LEMSAs were sent a survey about APOT in their jurisdiction. Out of the 33 LEMSAs, EMSA received a response from 22.



Recommendations

With only two years of data derived from disparate sources, it is still premature to draw conclusions about what corrective measures are most practical and acceptable. Although a one-size-fits-all solution to APOD may not exist, at minimum, we must demand a demonstrable effort and sustained incremental improvement. All agree that extended waits cannot be allowed to be a feature of any emergency medical system.

Some jurisdictions have adopted innovative approaches to ensuring EMS provider agencies and their receiving hospitals agree about the times they are

measuring. This is an essential element in building effective partnerships. Unfortunately, these efforts require a high degree of system wide buy-in and the ability and willingness to invest in a long-term quality improvement process.

While the adoption of common APOT definitions has been an important step in understanding the issue, defining the rate of time considered a “delay” is still left up to local jurisdictions and there is currently no statewide standard.

Current data collection efforts need to be extended and reinforced. While virtually all of California's LEMSAs are now providing APOT data, the current data aggregation efforts take weeks or even months and are labor intensive.

The COVID-19 pandemic has pointed to the need for real-time EMS data collection by California's state and local authorities. Real-time data is needed for EMS because it can contribute to overall situational awareness in any disaster. Furthermore, retrospective data collected by EMSA reflected increasing APOT times at the peak of the COVID-19 response. Having this data minute by minute would have provided state decision makers with a particularly important data point in determining the optimal deployment of limited response resources.

Stakeholder cooperation and past legislation have done much to clear a path towards solving the problem of APOD. We remain hopeful that this information will provide additional information to inform this important issue.