

SAN JOAQUIN

— COUNTY —

Emergency Medical Services Agency

Annual Report 2020



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Executive Summary

The San Joaquin County EMS Agency is responsible to “plan, implement, and evaluate” the emergency medical services system pursuant to Division 2.5 of the California Health and Safety Code. A large part of fulfilling this role consists of collecting and evaluating data. The data presented in this report provides a general picture of the volume and types of prehospital medical emergencies during 2020 and performance trends from previous years.

2020 was an especially difficult year because of the effects of the COVID-19 pandemic on the local EMS system. As might be expected, some of the data and trends in 2020 are not typical compared to previous years. Even though the San Joaquin County EMS system was strenuously tested, it adapted to these challenging conditions. The San Joaquin County EMS Agency wishes to acknowledge the efforts and dedication of all EMS system participants in 2020 and we look forward to a prosperous recovery to normal operations in 2021.

Message from the Medical Director

As the Medical Director for the San Joaquin County EMS Agency and the EMS system, 2020 proved to be a challenging year for us all and it was dominated by the COVID-19 pandemic response. The EMS agency took on constantly evolving guidelines related to PPE, infection control, and responder procedures related to the COVID-19 virus response. The EMS agency also took quick action to engage and coordinate the centralized reporting of local hospital admissions, ICU status, and oxygen and ventilator availability to assess our local health care and EMS system capacity to surge. In the end, through hard work and cooperation, the professionals in the San Joaquin County EMS system expanded services and capacity to respond to the unprecedented needs generated by the pandemic, all while maintaining vital EMS agency services to the public.



Katherine Shafer, MD
Medical Director

Emergency Medical Services (EMS) System Overview

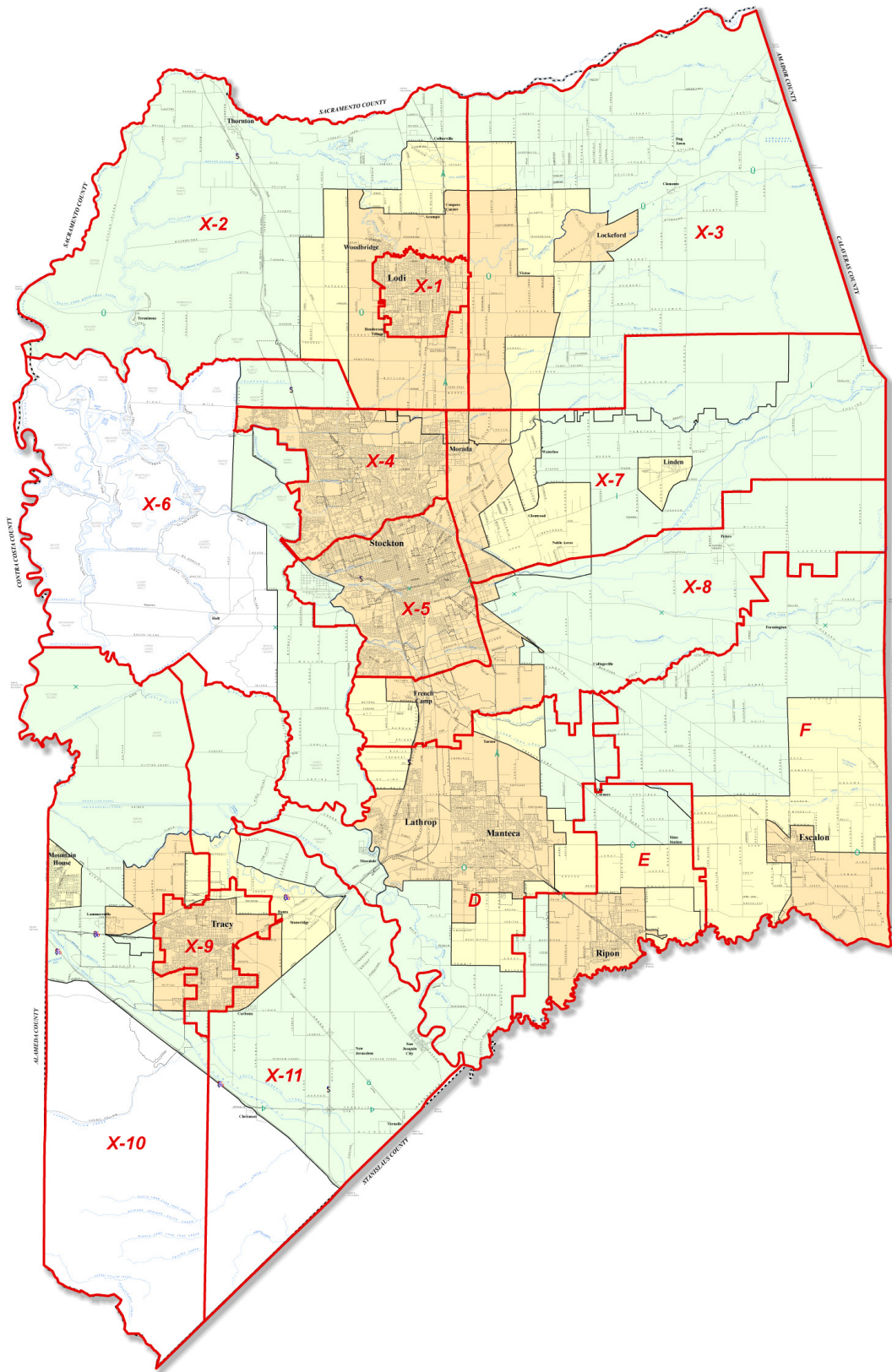
The San Joaquin County EMS system is comprised of multiple organizations that fulfill different but essential roles from the time a 9-1-1 call is made to when a patient receives definitive medical care at an acute care facility. These organizations include the primary 9-1-1 call centers (that determine whether the call is for law, fire, or EMS services); the secondary 9-1-1 call centers (that further question the caller to determine and dispatch appropriate EMS resources and provide pre-arrival instructions); the city and district fire agencies that respond to provide either basic life support or advanced life support care; the ambulance providers that deliver advanced life support and transport to an emergency department, and; the acute care facilities that provide definitive medical care.

The County encompasses nearly 920,000 acres (or about 1,440 square miles), with a population of approximately 773,632 (1/1/2020, California Department of Finance). While 80% of the population is concentrated in the seven (7) cities in San Joaquin County, the importance of the more rural 156,208 residents is a key consideration during EMS system planning and policy development.

Advanced Life Support (ALS) First Response services are provided by Ripon Consolidated Fire District, the South San Joaquin County Fire Authority, and the Stockton Fire Department. Basic Life Sup-

port (BLS) services are provided by Clements Fire District, Colledgeville Fire District, Escalon Fire District, Farmington Fire District, French Camp-McKinley Fire District, Lathrop-Manteca Fire District, Liberty Fire District, Linden Peters Fire District, Lodi Fire Department, Manteca Fire Department, Mokelumne Fire District, Montezuma Fire District, Mountain House Fire Department, Thornton Fire District, Waterloo Morada Fire District, and Woodbridge Fire District.

The colors in the following map (from white to dark beige) represent the areas of less to greater population density (less than seven (7) per square mile to greater than 100 per square mile) are used as a basis for response time requirements for the four (4) ambulance providers that provide Advanced Life Support response and transport EMS services as part of the 9-1-1 system. Each ambulance provider operates primarily in their respective compliance zones as follows: American Medical Response in Areas X-1 thru X-11; Manteca District Ambulance in Area D; Ripon Consolidated Fire District in Area E, and; Escalon Community Ambulance in Area F. Although they are responsible for their own respective areas, they provide reciprocal zone assist for each other in times of need. For response time compliance information, refer to the Ambulance Contract Compliance Reports at www.sjgov.org.



Ambulance Compliance Zones

Data Collection and System Evaluation

Evaluation of the EMS system relies upon the collection of data from multiple sources including the computer aided dispatch system (CAD) from the EMS designated dispatch center, patient care report data (ePCR) from the electronic health record systems that meet the requirements of the California Emergency Medical Services Information System (CEMSIS) and the National Emergency Medical Services Information System (NEMSIS), and data provided by hospitals for trauma, STEMI, and Stroke specialty care services. Data provided from these sources is included throughout this document.

Data collection and analysis provides a basic understanding of the EMS system and allows EMS system participants and SJCEMSA staff to identify opportunities for improvement. An example of an issue identified by local EMS agencies throughout California led to the development of California Health and Safety Code, section 1797.120 (effective January 1, 2016) to address ambulance patient offload delays. This statute required the State EMS Authority to “adopt a statewide standard methodology for the calculation and reporting by a local EMS agency of ambulance patient offload time” as a means of addressing the statewide patient offload delay problem. This resulted in the development of a measurement called the Ambulance Patient Offload Time (APOT) and the adoption of the standard for hospitals to accept the transfer of patient care

and move the patient to either a gurney or wheelchair no later than 20 minutes from the arrival of the ambulance patient in the emergency department.

As is illustrated in the table and chart on the following page, hospitals may not always succeed in moving patients from ambulance gurneys to hospital beds in less than 20-minutes. For example, while the goal is for 100% of patients to be offloaded within 20-minutes, the table shows that in 2020, the percentage from the best to the worst performing hospital was 81% to 45%. A similar pattern is shown for each year and can be explained in part as due to the normal ebb and flow in the volume of requests for emergency ambulance services. Those hospitals that have the highest ambulance patient volume face additional internal logistical challenges when there are surges in the arrival of ambulance patients during any single hour.

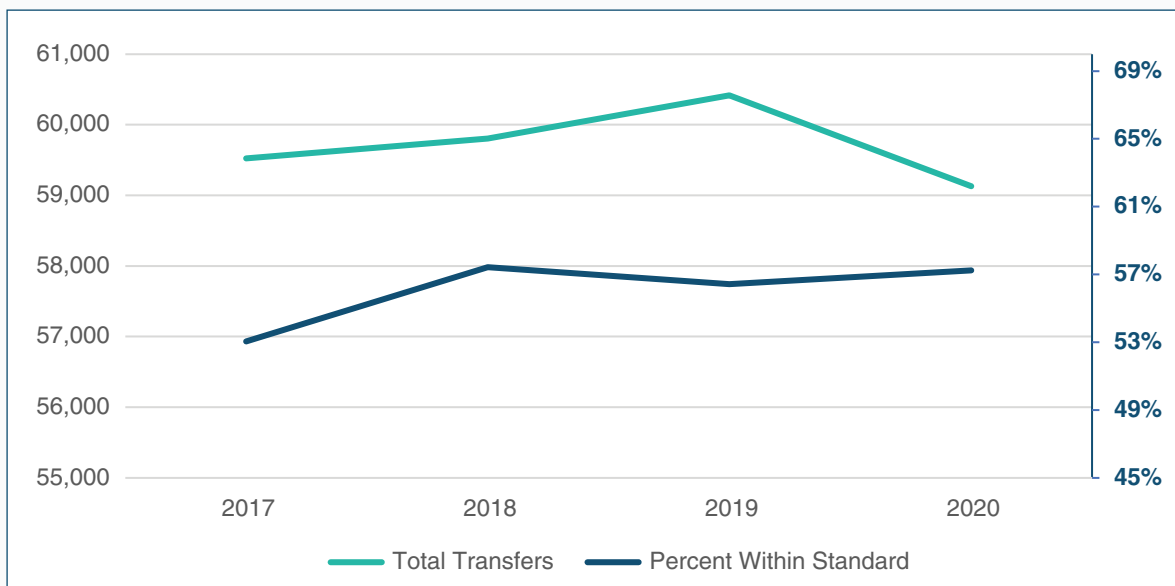


The APOT goal is for 100% of patients to be offloaded within 20-minutes.

Percent of APOTs within 20-Minutes by Hospital from 2017 to 2020

Hospital	2017	2018	2019	2020
Adventist Health Lodi Memorial Hospital	72%	76%	73%	71%
Dameron Hospital Association	61%	69%	71%	69%
Doctors Hospital of Manteca	77%	77%	77%	81%
Kaiser Foundation Hospital Manteca	67%	73%	74%	64%
San Joaquin General Hospital	57%	61%	54%	57%
St. Joseph’s Medical Center	35%	40%	42%	45%
Sutter Tracy Community Hospital	66%	69%	63%	63%

Combined Hospital APOT Performance within 20-Minutes from 2017 to 2020



The Combined Hospital APOT Performance chart shows a welcome improvement in the percentage of APOTs within 20-Minutes from 2017 to 2020. The general trend of an increase in the volume of ambulance patient volume was interrupted by the effects of COVID-19 in 2020.

Firstwatch

On July 1, 2020, SJCEMSA migrated ambulance response time compliance reporting and analytics to Firstwatch, a single third-party data management and analytics platform. The Firstwatch platform is used in EMS systems throughout the state and nation to monitor ambulance service provider and EMS system performance. SJCEMSA vetted the platform during the migration process to ensure the highest level of data integrity and continuity.

Staffing and Training

Staffing

Emergency medical service care is delivered by EMS personnel from different staffing categories that work within distinct domains:

1 Emergency Medical Dispatchers

Emergency Medical Dispatchers (EMDs) work in teams as call takers and dispatchers to interrogate each caller to determine the nature and severity of the medical emergency, to provide pre-arrival instructions to the caller, and to quickly dispatch appropriate EMS resources.

2 EMTs and Paramedics

Emergency Medical Technicians (EMTs) and Paramedics respond as directed by dispatch as members of either a fire agency or ambulance provider to provide care and transport patients to local hospitals.

3 Mobile Intensive Care Nurses

Mobile Intensive Care Nurses (MICNs) assist base hospital physicians to provide on-line medical control to Paramedics by responding to radio or phone call-ins from Paramedics and to direct patient care as described in San Joaquin County EMS Policies and Procedures.

Total EMS Certified Personnel		
in 2020		increase since 2016
86	EMDs	0%
836	EMTs	9.0%
368	Paramedics	8.9%
54	MICNs	18.6%

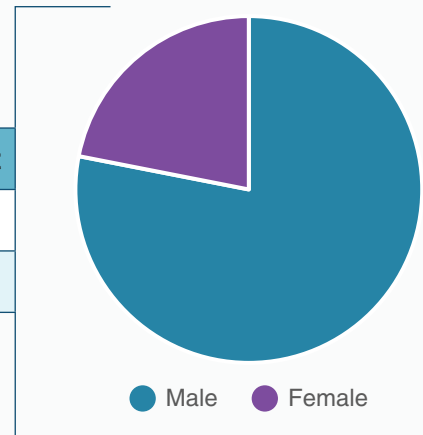
Authorization of EMS Personnel Working in San Joaquin County

EMS personnel are authorized to provide EMS services through EMT certification and paramedic accreditation processes administered by the SJCEMSA and the State of California.

New or Renewal EMT Certification Applications in 2020

EMT Application Outcome	Count
Denied	2
Approved	433
Approved with Restrictions	3
Total	438

Gender	Count	Percent
Male	342	78.08%
Female	96	21.92%



Personnel Investigations

The SJCEMSA conducts investigations to determine whether EMS personnel meet standards to ensure the health and safety of the public. The number of potential personnel actions during the

previous five (5) years were (on-average each year) 15 investigations of EMTs and two (2) investigations of EMDs. Paramedic licensure investigations are referred to and conducted by the state.

Training & Continuing Education Programs

Per requirements in Division 2.5, H.S.C.§ 1797.220, the SJCEMSA defines the standards for EMS Continuing Education delivery formats and limitations, record keeping, and CE provider program approval. There are currently 12 CE providers approved in San Joaquin County.

EMT-II, and EMT-P training programs based in San Joaquin County. There is currently one (1) EMT-I training program located in San Joaquin County.

Per Division 2.5, HSC § 1797.208, the SJCEMSA determines compliance and approval of EMT-I,

Additional training is routinely provided to prehospital personnel by SJCEMSA staff and emergency ambulance providers and emergency medical responder agencies as defined in SJCEMSA policies and written agreements.

Paramedic Accreditation

The paramedic accreditation process in San Joaquin County requires that paramedics meet initial and ongoing requirements designed to ensure they have and maintain knowledge of San Joaquin County EMS policies and procedures. Paramedics that seek employment with an authorized ALS provider in San Joaquin County must first pass a field evaluation, submit the Paramedic Competency Form, and complete and successfully pass a Para-

medic Accreditation Orientation course conducted by SJCEMSA staff. Currently accredited paramedics must complete the paramedic reaccreditation process every two (2) years that includes completion and passing a Policy Skills Review course conducted by SJCEMSA staff, and completion of any mandatory training sessions related to new or changing local EMS policies and procedures or other pertinent topics.



Communications

9-1-1 call-takers from seven (7) primary public safety answering points in San Joaquin County determine whether a 9-1-1 caller’s request requires law, fire, or EMS services. 9-1-1 calls for EMS are transferred to the Designated EMS Dispatch Center (Valley Regional Emergency Communications Center or VRECC) that performs highly specialized dispatch prioritization and computerized data collection activities referred to as the Medical Priority

Dispatch System (MPDS). In 2020, VRECC handled 83,974 9-1-1 requests for services of which 61,730 required caller interrogation and pre-arrival instructions.

As a result of caller interrogation, calls are classified by 34 Protocol types, of which the top ten (10) protocols comprise 82.4% of all protocol types as shown in the table below:

MPDS Determinant Protocol Types

Type	Count	Percentage
Sick Person (26)	10,948	17.7%
Breathing Problems (6)	8,844	14.3%
Transfer/Interfacility/Palliative Care (33)	6,873	11.1%
Falls (17)	6,010	9.7%
Chest Pain (Non-Traumatic) (10)	4,673	7.6%
Unconscious/Fainting (31)	4,060	6.6%
Convulsions/Seizures (12)	2,699	4.4%
Abdominal Pain/Problems (1)	2,662	4.3%
Hemorrhage/Lacerations (21)	2,322	3.8%
Stroke (CVA) (28)	1,772	2.9%
Top 10 Total	50,863	82.4%
Grand Total	61,730	100.0%

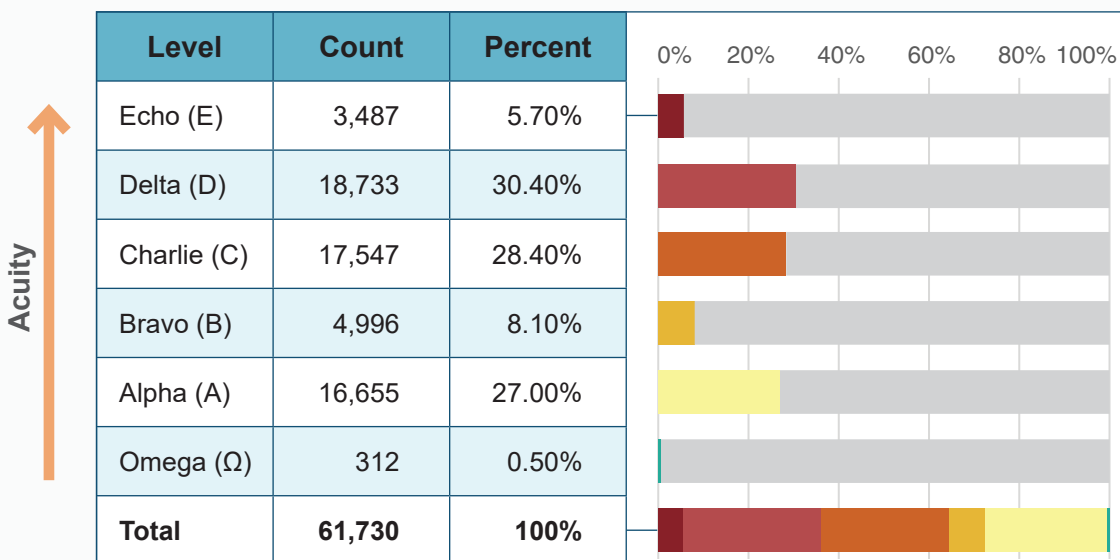
As the most often used MPDS Protocol Type (17.7% of all calls), the Sick Person (Protocol 26) protocol merits further discussion. The Sick Person protocol serves the important function as a “safety net” when the caller interrogation does not elicit a clearly defined illness or injury and fit in one (1) of the other 33 protocol types. When this occurs, Emergency Medical Dispatchers are trained to quickly identify this scenario and select Sick Person protocol to avoid any delay in the dispatch of EMS resources.

Caller interrogation through the MPDS consists of a scripted set of questions based on the type of medical emergency that are designed to quickly determine the type and severity of each medical emergency. With this information, the type of EMS resources needed (ambulance, fire, law, etc.) and the level of response (with red lights and sirens (RLS) or with no red lights and sirens (NRLS) is determined. Each call is processed into one (1) of six (6) Levels of medical acuity (or determinant level)

from most to least serious (E-D-C-B-A-Ω). The most serious calls (such as respiratory or cardiac arrest) designated as Echo (E) and Delta (D) are usually assigned both ambulance and fire resources with red lights and sirens. Alpha (A) and Omega (Ω) calls are designations for the least urgent requests. Alpha (A) level calls receive (at a minimum) an ambulance response without red lights and sirens. The Omega (Ω) level is a category that recognizes that some calls are best handled without sending an ambulance and may result in a referral to provide the needed services. Dispatchers select the correct response level and resource response type based upon SJCEMSA policies that provide direction for each of the five (5) determinant levels within each of the 34 protocol types.

The table below shows the number and percentage of calls in each determinant level in 2020.

MPDS Determinant Severity Levels



Response and Transport

While EMTs and Paramedics are trained to provide essential life-saving medical care, the core function of EMS is to ensure rapid response and transport for patients with medical emergencies to hospitals for definitive medical care. To support this core function, Emergency Medical Responder (EMR) fire

departments and fire districts provide emergency medical care, manpower, and rapid EMS response. The chart below provides a snapshot into the volume of responses for each fire department and district during 2020.

EMR Response in 2020

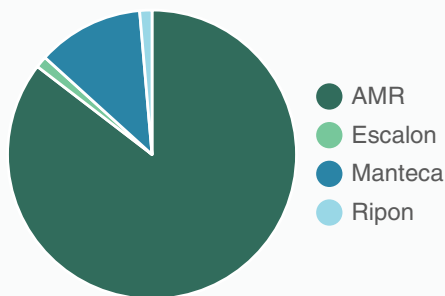
Fire Department / District	Total Arrived On-Scene
Clements Fire District	158
Collegeville Fire District	65
Escalon Fire District	715
Farmington Fire District	127
French Camp-McKinley Fire District	571
Lathrop-Manteca Fire District	2,137
Liberty Fire District	163
Linden Peters Fire District	372
Lodi Fire Department	3,573
Manteca Fire Department	5,700
Mokelumne Fire District	435
Montezuma Fire District	407
Mountain House Fire Department	460
Ripon Consolidated Fire District	965
Stockton Fire Department	21,542
Thornton Fire District	158
Waterloo Morada Fire District	1,169
Woodbridge Fire District	914

The data in the charts below provides a snapshot into the volume of responses and transports conducted by each of the four (4) 9-1-1 ambulance service providers in San Joaquin County.

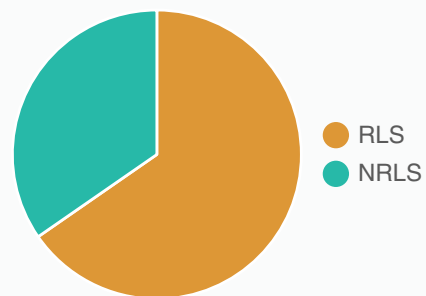
9-1-1 Ambulance Responses (Arrived On-Scene) in 2020

NRLS and RLS	AMR	Escalon	Manteca	Ripon	Total
NRLS and RLS Responses	69,595	1,059	9,705	1,119	81,478
Percent with RLS Response	64.77%	65.72%	69.82%	62.91%	65.36%
Percent with NRLS Response	35.23%	34.28%	30.18%	37.09%	34.64%

Ambulance Provider Volume



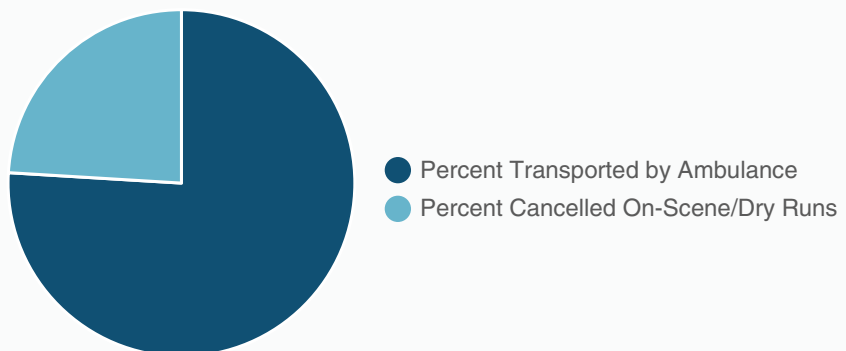
NRLS and RLS



Ambulance Transports Derived from 9-1-1 Responses in 2020

Transports	AMR	Escalon	Manteca	Ripon	Total
Total Number of Transports	53,161	757	7,206	766	61,890
Percent Transported by Ambulance	76.39%	71.48%	74.25%	68.45%	75.96%
Percent Cancelled On-Scene/Dry Runs	23.61%	28.52%	25.75%	31.55%	24.04%

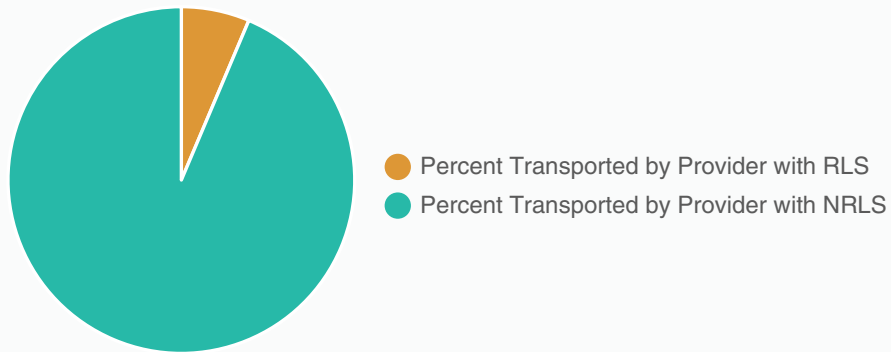
Total Transported vs. Cancelled / Dry Runs



Code of Ambulance Transport from 9-1-1 Responses in 2020

Code	AMR	Escalon	Manteca	Ripon	Total
Number of RLS Transports	3,423	40	415	63	3,941
Percent Transported by Provider with RLS	6.44%	5.28%	5.76%	8.22%	6.37%
Percent Transported by Provider with NRLS	93.56%	94.72%	94.24%	91.78%	93.63%

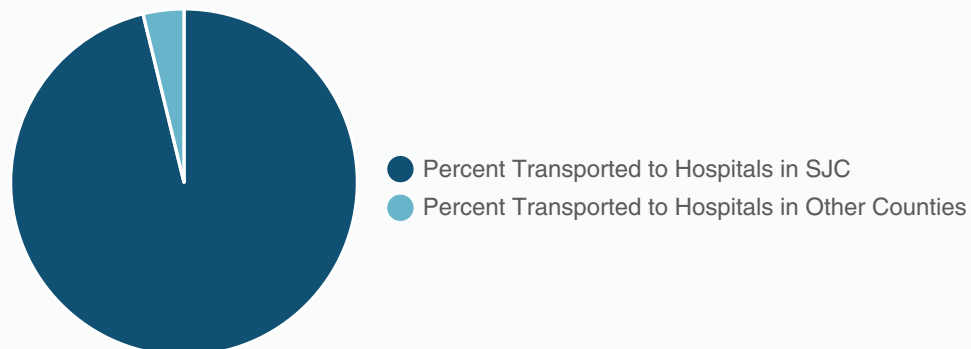
Total Transported by Provider with RLS vs. NRLS



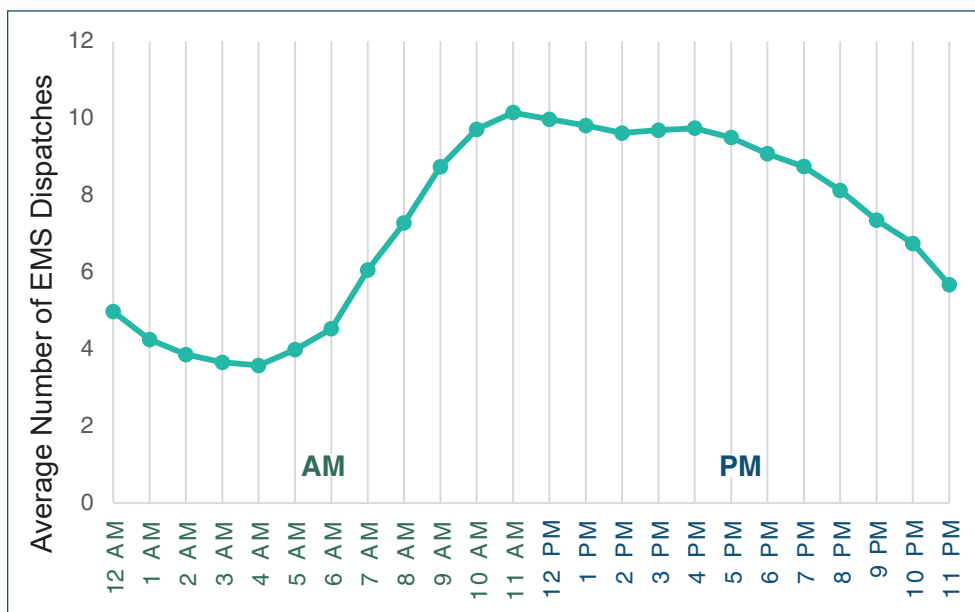
Ambulance Transports to Hospitals Within & Outside SJC in 2020

In SJC or Other Counties	AMR	Escalon	Manteca	Ripon	Total
Number Transported to Hospitals in SJC	52,139	185	6,884	325	59,533
Percent Transported to Hospitals in SJC	98.09%	24.44%	95.52%	42.43%	96.20%
Percent Transported to Hospitals in Other Counties	1.91%	75.56%	4.48%	57.57%	3.80%

Total Transported Within & Outside SJC

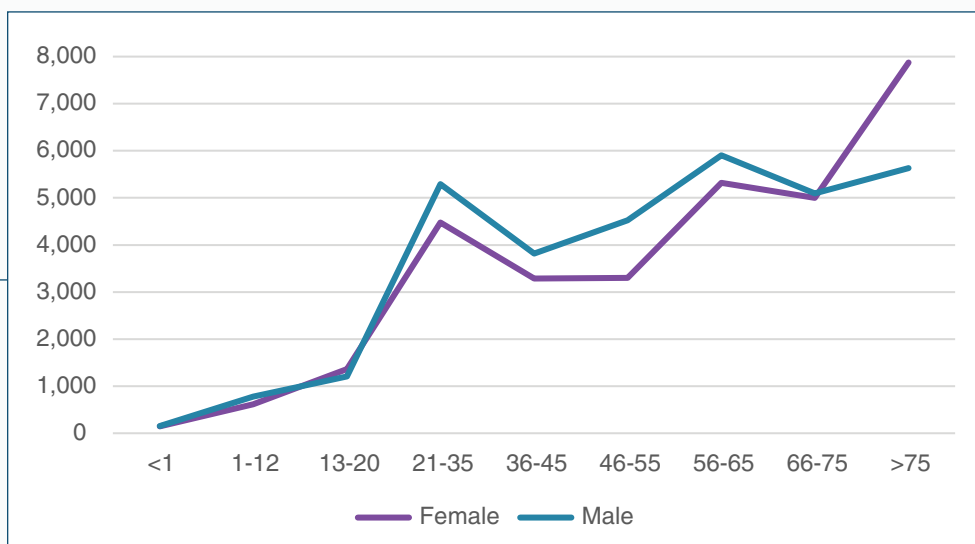


Average Volume of EMS Dispatch of Ambulances that Result in Transport to a Hospital by Time of Day in 2020



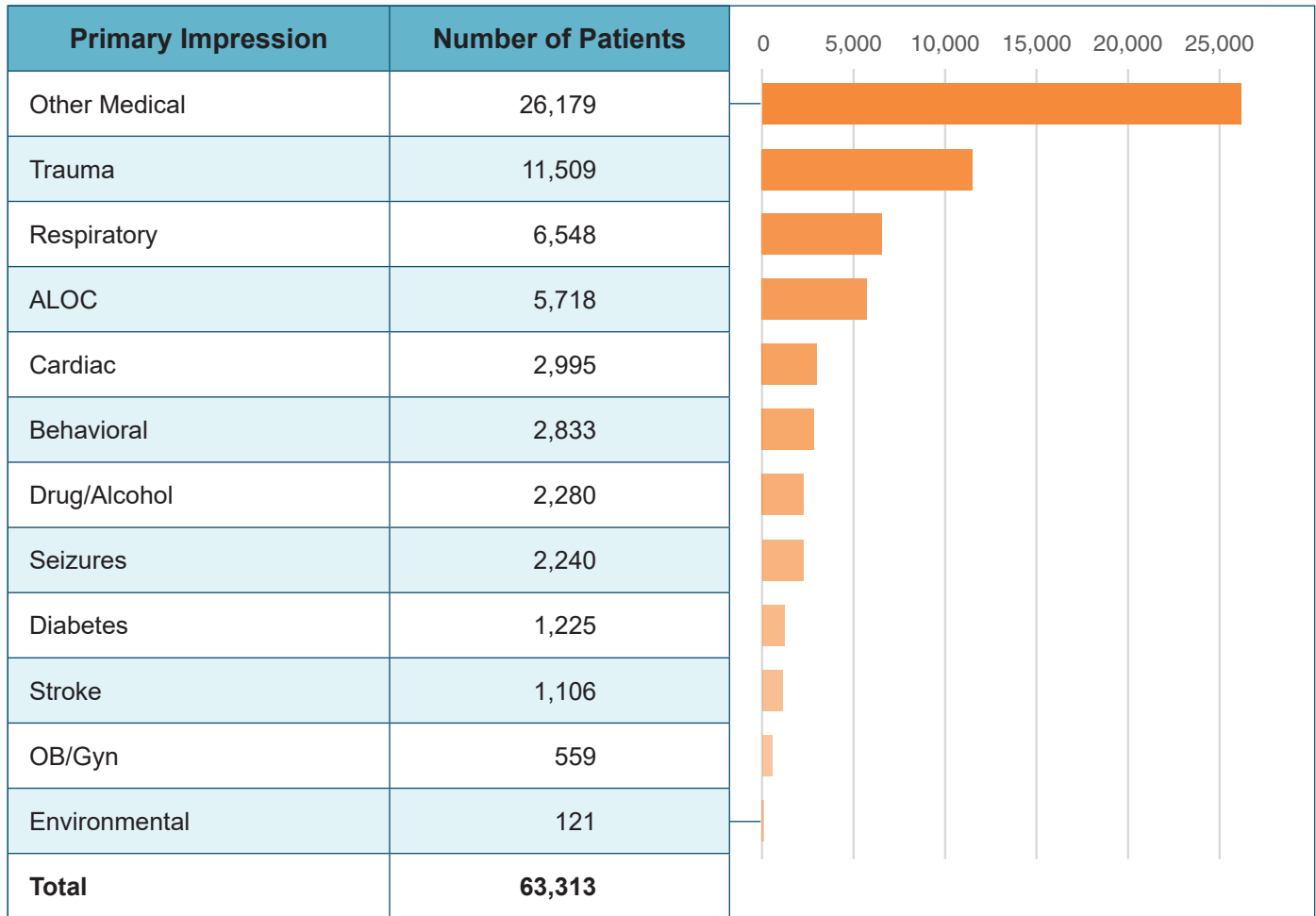
During 2020 there were 63,801 patients transported by ambulance to hospitals through the 9-1-1 system. The breakdown by age and gender is shown below:

Gender	<1	1 to 12	13-20	21-35	36-45	46-55	56-65	66-75	>75	Total	Unk
Female	144	613	1,367	4,479	3,287	3,302	5,318	5,001	7,875	31,386	14
Male	157	781	1,207	5,290	3,814	4,521	5,906	5,096	5,629	32,401	0

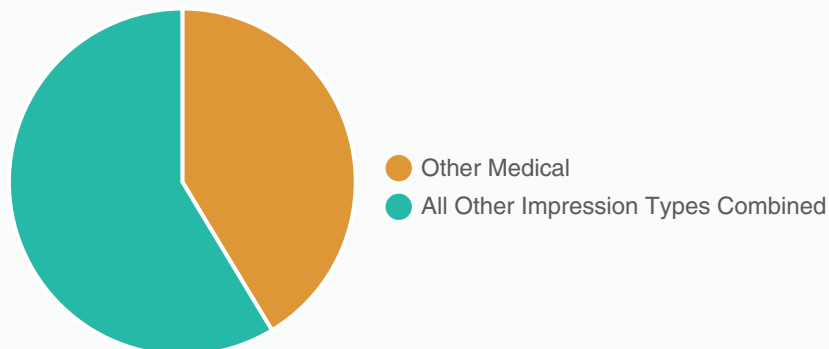


The following shows the breakdown of ambulance transports from 9-1-1 based upon the primary impression type as determined by prehospital personnel in San Joaquin County during 2020. The list of specific primary impression categories shown is limited to the most common categories. The complete list of primary impression types that comprise the “Other Medical” category are too numerous to list.

Primary Impression Type per EMS Personnel in 2020



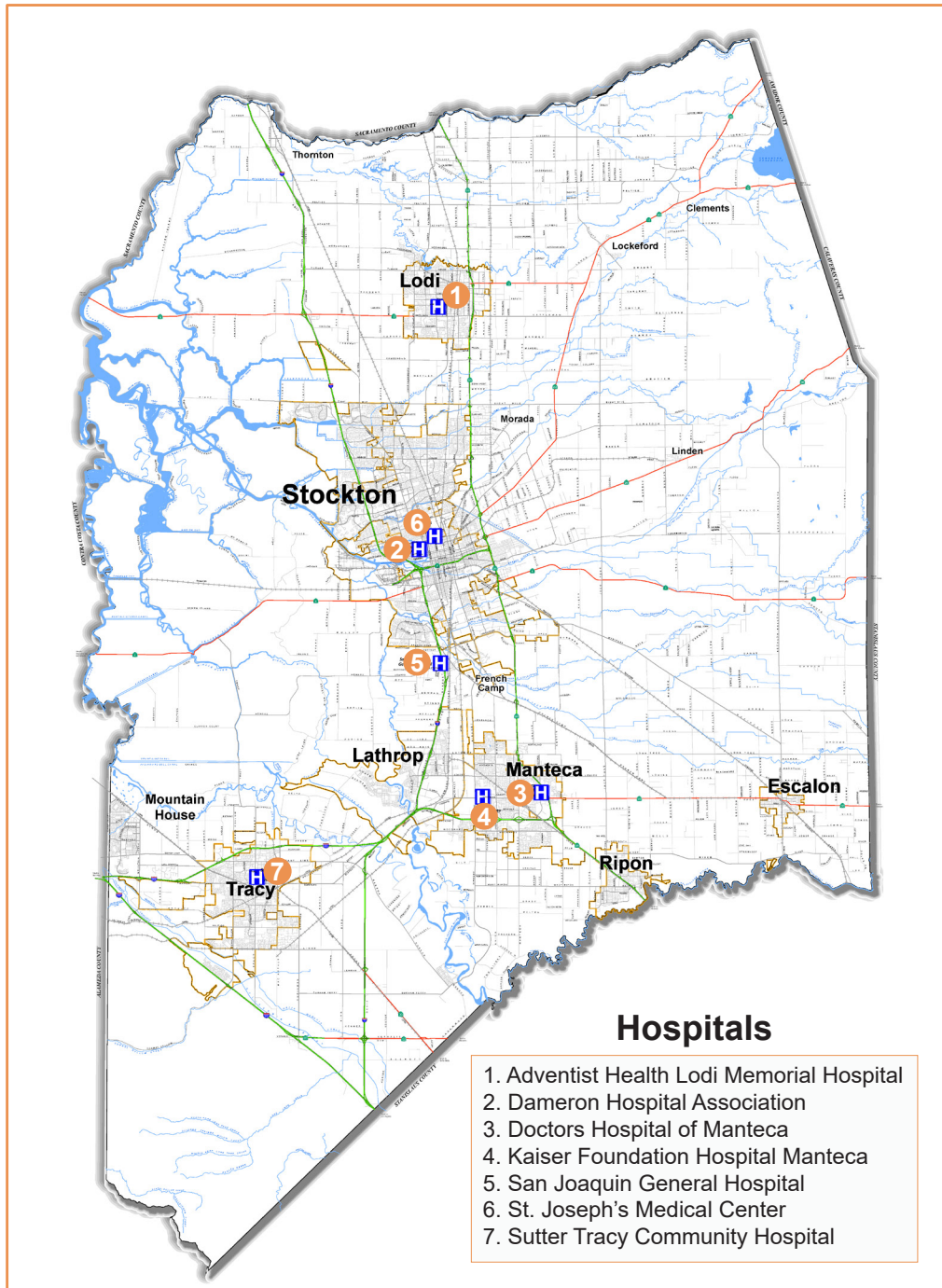
Other Medical Compared to All Other Impression Types



Facilities and Critical Care

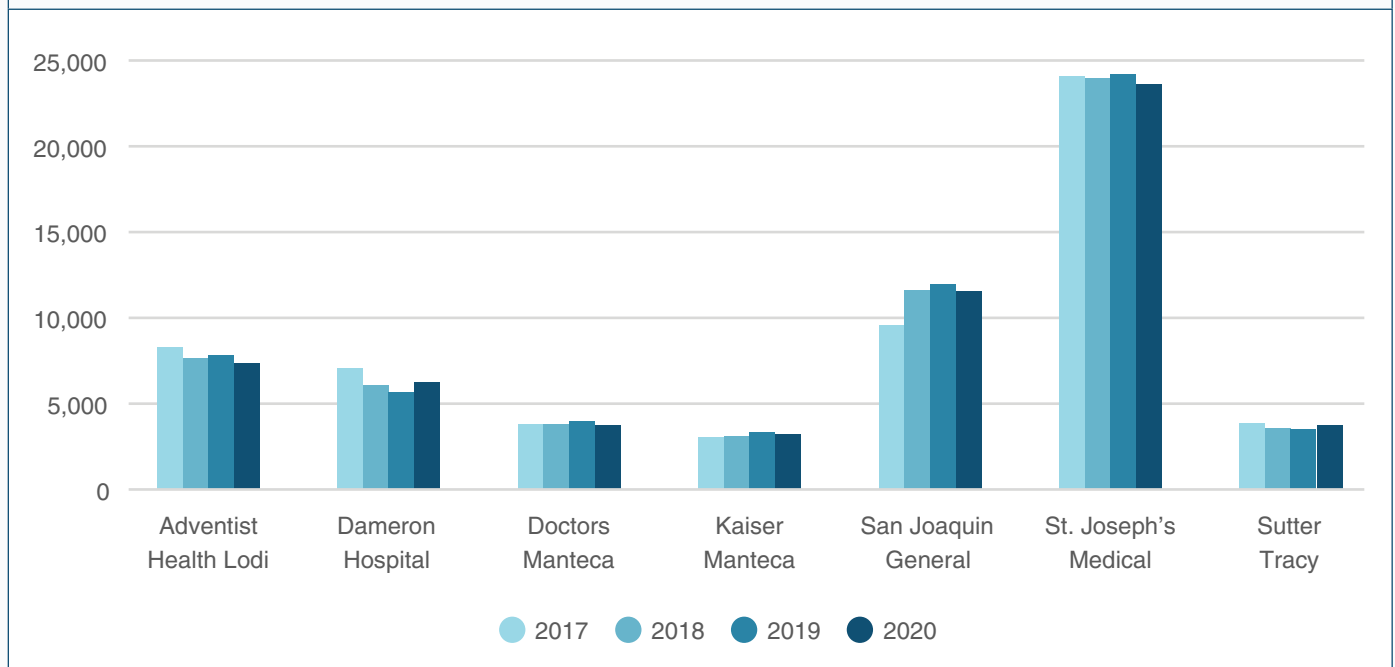
Except for specific conditions (e.g., multi-casualty incidents, major trauma, cardiac arrest, etc.) San Joaquin County EMS Agency policy allows patients transported by ambulance to select their destination hospital within the counties of San Joaquin, Stani-

slaus, and Sacramento. In 2020, 96% of patients transported by ambulance in San Joaquin County were transported to the following in-county hospitals shown in the map below.



Hospital Volume of Ambulance Transports from 9-1-1 System

Hospital	2017	2018	2019	2020
Adventist Health Lodi Memorial Hospital	8,316	7,641	7,830	7,327
Dameron Hospital Association	7,092	6,076	5,669	6,277
Doctors Hospital of Manteca	3,803	3,836	3,989	3,752
Kaiser Foundation Hospital Manteca	3,036	3,112	3,347	3,254
San Joaquin General Hospital	9,569	11,619	11,996	11,572
St. Joseph's Medical Center	24,099	23,977	24,223	23,615
Sutter Tracy Community Hospital	3,847	3,598	3,527	3,736
TOTAL	59,762	59,859	60,581	59,533



Hospital Specialty Care Designations

Hospital	Receiving Center	Disaster Control Facility	Base Hospital	Trauma Center	Stroke Center	STEMI Center	Neo-Natal
Adventist Health Lodi Memorial Hospital	X				X		
Dameron Hospital Association	X				X	X	
Doctors Hospital of Manteca	X				X		
Kaiser Foundation Hospital Manteca	X				X		
San Joaquin General Hospital	X	X	X	X	X		X
St. Joseph's Medical Center	X				X	X	X
Sutter Tracy Community Hospital	X				X		

Major Trauma

Major trauma is any injury that has the potential to cause prolonged disability or death. According to the California State EMS Authority, traumatic injury is the primary cause of death for people ages 1 to 44, regardless of gender, race, or economic status. Injuries, both unintentional and those caused by acts of violence, are among the top ten (10) killers for Americans of all ages. Trauma results from motor vehicle collisions, falls, burns, stabbing and gunshot wounds, or other blunt or penetrating forces. The SJCEMSA is responsible for assessing, directing, developing, and implementing the county's trauma plan based on local topography, demographics, population density, available healthcare resources, and funding. San Joaquin General Hospital is the trauma center designated by the SJCEMSA for San Joaquin County.

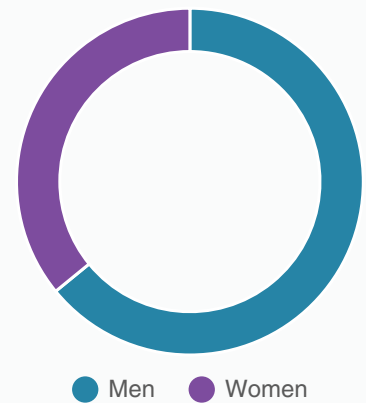
The data collected in this program is derived from

a hospital-based trauma registry purchased by the SJCEMSA and developed from the idea that aggregating data from similar cases may reveal variations in care and ultimately result in a better understanding of the underlying injury and its treatment. Patients identified in the prehospital setting as major trauma patients and transported by ambulance meet major trauma triage criteria established in SJCEMSA policies. These triage criteria are designed to capture all potential cases of major trauma by purposely using overly broad criteria and assessment parameters that can be quickly accomplished to be consistent with meeting the goal of spending no more than ten (10) minutes from patient contact to time transporting the patient to the Trauma Center (on-scene time). During 2020, the average on-scene time for patients that met prehospital trauma triage criteria was 12 minutes.

The graphs below are examples of the kind of data that provide valuable information from which the SJCEM-SA and San Joaquin General Hospital (designated Trauma Center) can assess the effectiveness of the EMS system and make necessary modifications to prehospital and in-hospital policies and procedures.

Major Trauma by Gender in 2020

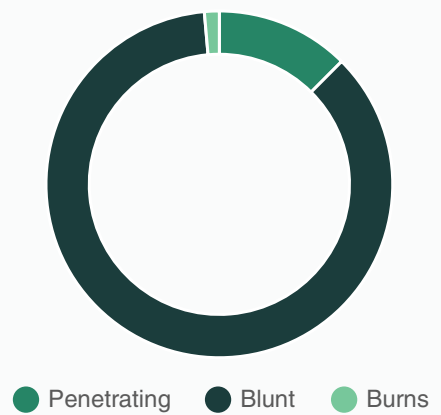
Gender	Count	Percent
Men	2,037	64.10%
Women	1,141	35.90%
Total	3,178	100.00%



The data below shows the breakdown of injuries by type in 2020:

Major Trauma by Type of Injury in 2020

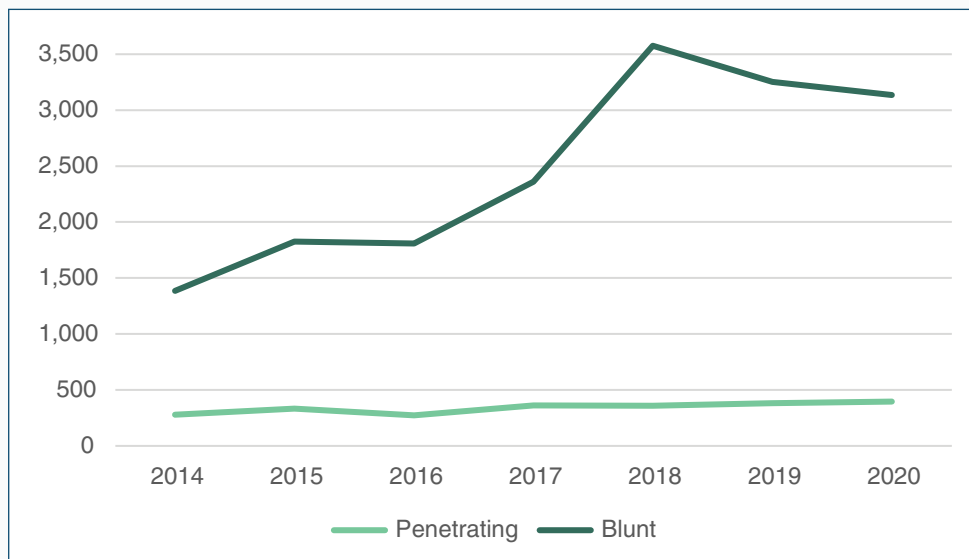
Type of Injury	Count	Percent
Penetrating	396	12.46%
Blunt	2,738	86.15%
Burns	44	1.38%
Total	3,178	100.00%



The chart below shows the increase of both blunt and penetrating trauma transported by ambulance to the trauma center in San Joaquin County since 2014. The spiked increase in blunt trauma cases beginning in 2018 was in part due to the change in trauma triage criteria used by prehospital person-

nel that was modified to ensure that elderly patients that were injured due to falls that had a life-threatening injury would receive appropriate care. This resulted in an unacceptable level of over triage and the policy modification was subsequently modified.

Major Trauma Counts by Blunt and Penetrating



When an ambulance patient that meets prehospital major trauma triage criteria arrives at the trauma center, the trauma team assesses the patient and assigns an Injury Severity Score (ISS)* that is used

to quickly determine how quickly and with what resources trauma center staff respond to care for each patient.

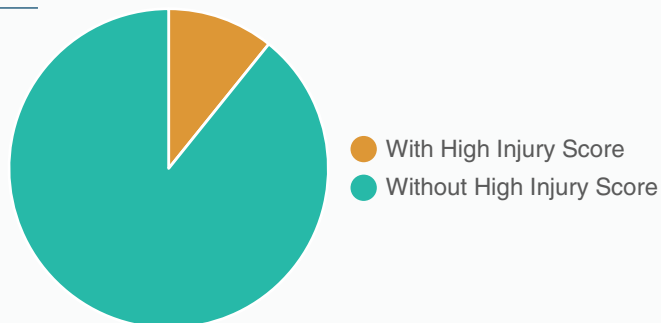
* The Injury Severity Score (ISS) is an established medical score to assess trauma severity. It correlates with mortality and morbidity and hospitalization time following trauma. It is used to help define the term major trauma. A major trauma is defined as the ISS being greater than 15.

The table and charts below show that from 2014 through 2020, 10.79% of major trauma cases were serious enough to receive a high injury score. This breakdown is consistent regardless of whether the patient suffered from blunt trauma (10.60% with

high ISS) or penetrating trauma (11.54% with high ISS). However, as shown in the chart “Type of Penetrating Injury with High Injury Score” there are significantly more high injury scores with gunshots (17.28%) compared to stabbings (5.62%).

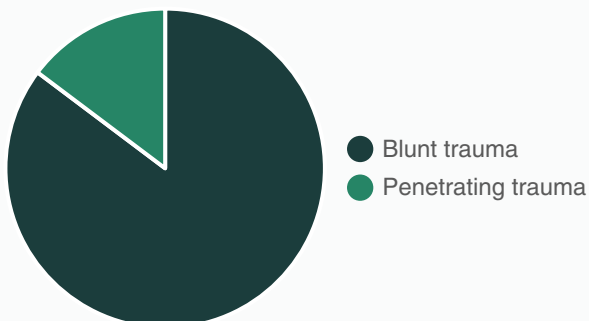
All Major Trauma with High Injury Score for 2014-2020

Type	Total
With High Injury Score	1,893
All	17,546
Percent with High Injury Score	10.79%



Major Trauma by Type with High Injury Score for 2014-2020

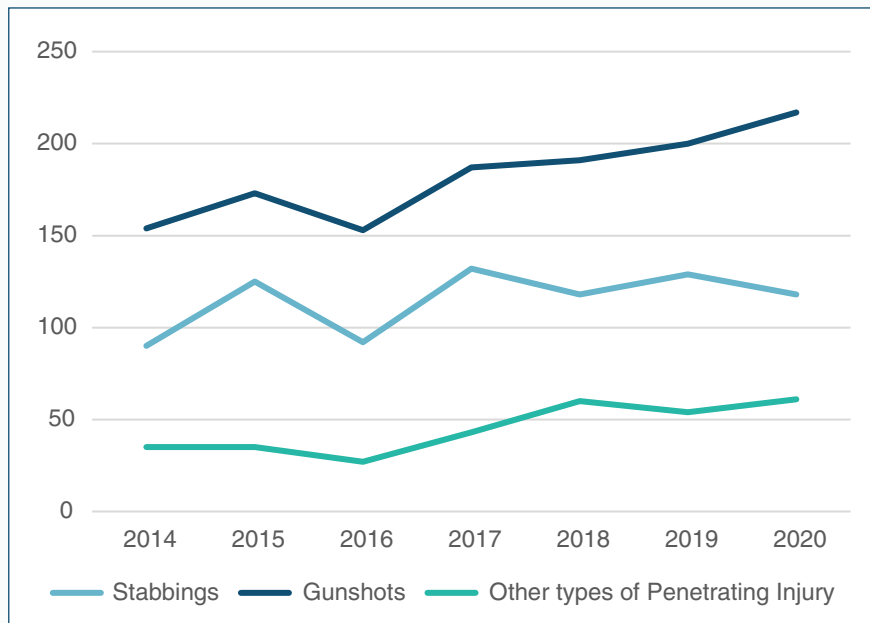
Type	With High Injury Score	All	Percent with High Injury Score
Blunt Trauma	1,585	14,956	10.60%
Penetrating Trauma	274	2,375	11.54%



Type of Penetrating Injury with High Injury Score for 2014-2020

Stabbings	Gunshots	Other types of Penetrating Trauma
5.62%	17.28%	3.9%

Types of Penetrating Trauma Counts by Year



Stroke

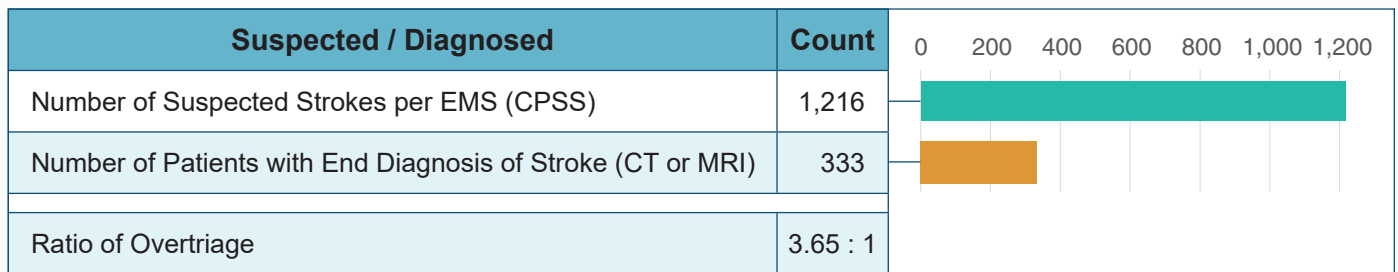
Stroke Diagnosis & Total Counts in 2020

The less time from the onset of an acute stroke to the time a patient receives definitive care in the hospital setting, the better the patient outcome. For this reason, prehospital personnel are trained to rapidly identify and transport suspected stroke patients and to pre-alert the closest stroke center of their impending arrival. This pre-alert or stroke alert saves precious minutes by alerting key hospital staff and ensuring the availability of diagnostic tools (CT or MRI).

The tool used by paramedics to rapidly identify suspected stroke patients is a nationally recognized method called the Cincinnati Prehospital Stroke Scale (CPSS). However, because so many illnesses mimic a stroke (e.g., all causes of altered level of consciousness), such prehospital stroke scales capture many non-stroke patients in the “suspected stroke” net. As found in most EMS systems, this purposeful “over-triage” of suspected stroke cases resulted in a nearly 4:1 ratio of prehospital patients suspected of having stroke compared to those that were diagnosed as having stroke following an in-hospital CT scan or MRI.

- In 2020, there were 533 patients transported by ambulance to hospitals in San Joaquin County that received a final diagnosis of stroke.
- The average age of these patients was 69; the youngest patient was 21 and the oldest patients was 98 years old.
- 53 (10%) of these patients were between the ages of 21 and 49.

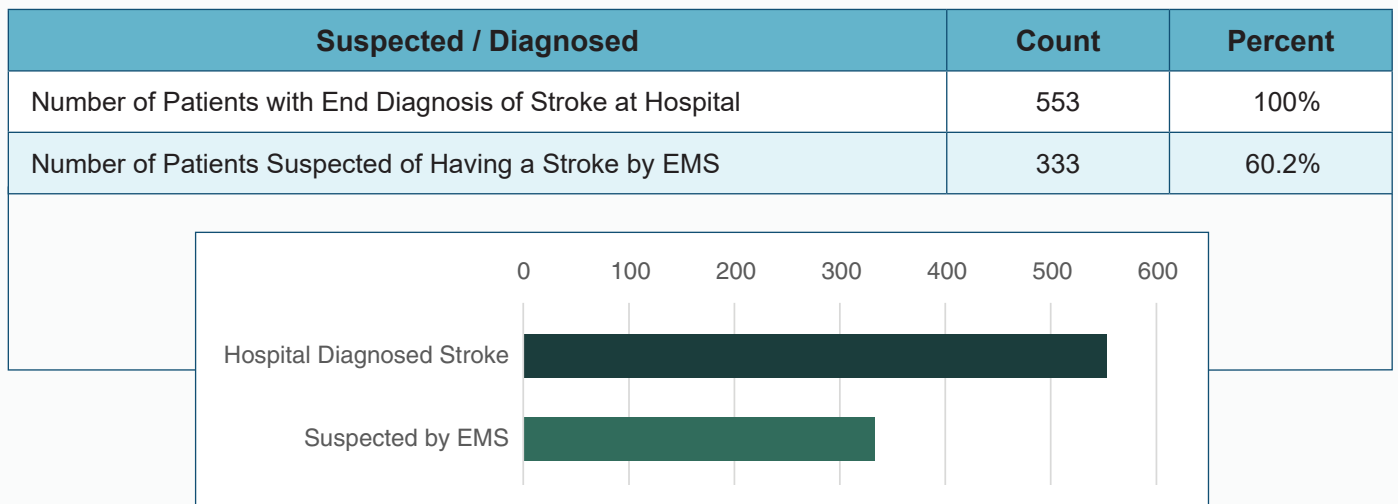
Patients with End Diagnosis of Stroke in 2020



Despite the use of comprehensive stroke criteria to identify stroke patients, the confounding nature of stroke symptoms and the fact that prehospital stroke scales rely heavily upon a patient’s ability to respond to direct questions, many cases of stroke are missed by prehospital personnel. In 2020, 60% of patients transported to stroke centers by ambulance were identified as suspected stroke patients

and subsequently hospitals did not receive a stroke alert for 40% of stroke patients prior to arrival. Such a pattern is typical nation-wide and is unlikely to change in the absence of new technology that provides prehospital personnel with diagnostic abilities as effective as in-hospital based CT scans.

Patients Transported by Ambulance with Stroke Diagnosis in 2020

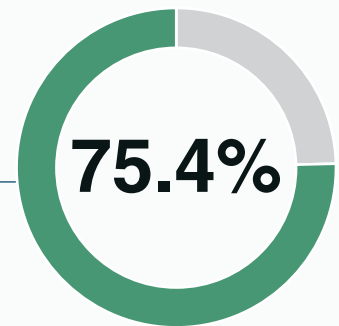


The American Heart Association recommends that EMS systems adopt the goal of having prehospital personnel provide hospitals with pre-alert of suspected stroke patients at least 75% of the time. Stroke systems of care also emphasize the importance of determining and documenting the time

that a patient was last known to be well (since the in-hospital treatment of strokes depend upon this information). As shown below, prehospital personnel provided pre-alert 75.4% of the time and documented Last Known Well Time (LKWT) 85% of the time during 2020.

Summary of Prehospital Stroke Identification Performance in 2020

Suspected / Pre-alert	Count	Percent
Number of Patients Suspected of Having a Stroke by EMS	333	100%
Patients for Whom EMS Provided Hospital Pre-alert	251	75.4%
Patients for Whom EMS Provided Documented Last Known Well Time (LKWT)	283	85%



As part of the Continuous Quality Improvement (CQI) process, SJCEMSA staff and the stroke coordinators from each Stroke Center routinely review data that measures the speed at which stroke pa-

tients receive prehospital and in-hospital medical care. The following table is a list of elapsed time stroke care metrics and their respective average elapsed times during 2020.

Stroke CQI Processes Measured in 2020	Average Elapsed Time
Elapsed Time from Ambulance Arrival at Patient to Time Patient Transported by Ambulance	0:10:19
Elapsed Time from Arrival at Hospital to Arrival at Radiology (CT Scan)	0:15:12
Elapsed Time from EMS Arrival at Patient to Arrival at Radiology (CT Scan)	0:42:43
Elapsed Time from Arrival at Hospital to Time Patient Receives Thrombolytic Medication	0:54:20
Elapsed Time from EMS Arrival at Patient to Time Patient Receives Thrombolytic Medication	1:18:03
Elapsed Time from Arrival at Hospital to Time Patient’s Case Includes Consultation with a Neurologist	0:54:11
Elapsed Time from EMS Arrival at Patient to Time Patient’s Case Includes Consultation with a Neurologist	1:17:21

STEMI

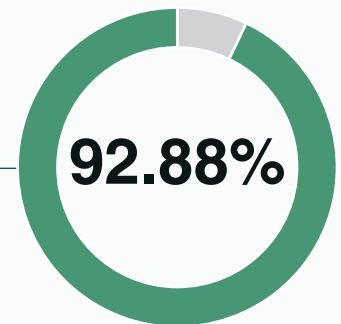
An ST-Elevation Myocardial Infarction (STEMI) is a very serious type of heart attack during which one (1) of the heart’s major arteries (that supplies oxygen and nutrient-rich blood to the heart muscle) is blocked. The two (2) hospitals designated by the SJCEMSA as STEMI receiving centers in San Joaquin County are Dameron Hospital Association and St. Joseph’s Medical Center. These hospitals submit data that allows the SJCEMSA to measure key metrics pertaining to successful performance in both prehospital and in-hospital setting. Because successful patient outcomes rely upon the skill of medical practitioners to rapidly and successfully provide a percutaneous intervention (PCI) to stop

the real time death of heart muscle, the measurement of outcomes and key elapsed time metrics are essential.

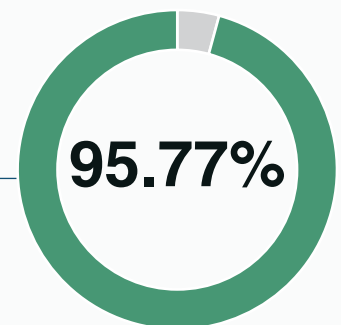
As shown below, Continuous Quality Improvement metrics related to elapsed time are routinely measured by SJCEMSA staff working with the STEMI Coordinators of the two (2) STEMI Receiving Centers in San Joaquin County. However, it is also important to emphasize the success in survival outcomes for patients that are identified as STEMI patients and transported by ambulance to either St. Joseph’s Medical Center or Dameron Hospital Association during 2020.

STEMI Patient Survival during 2020

Transported / Discharged Alive	Counts	Percent
Total # of STEMI Patients Transported by Ambulance to STEMI Receiving Centers in San Joaquin County	267	100%
Number of Patients Discharged Alive	248	92.88%



Transported / Discharged Alive	Counts	Percent
Total # of STEMI Patients Transported by Ambulance to STEMI Receiving Centers in San Joaquin County that Received Percutaneous Intervention (Balloon)	71	100%
Number of Patients Discharged Alive	68	95.77%

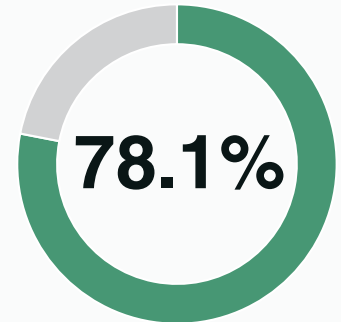


STEMI Continuous Quality Improvement Elapsed Time Metrics in 2020

Cases of Elapsed On-Scene Time < 15 Minutes

< 15 Minutes	Total	Percent < 15 Min
217	278	78.1%

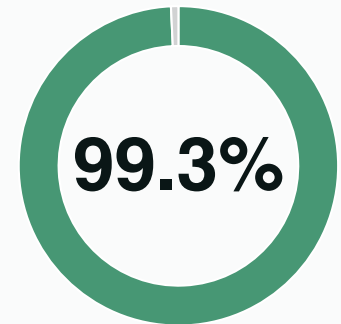
*AHA Goal > 75%



Successful Completion of EKGs in Prehospital Setting

Successful	Total	Percent Successful
265	267	99.25%

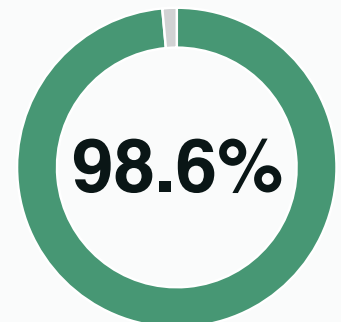
*AHA Goal > 75%



Percent of STEMI Cases with Elapsed Time of ≤ 90 Min from Arrival at Hospital (SRC) to receiving PCI (balloon device)

≤ 90 Min	Total	Percent
68	69	98.55%

*AHA Goal > 75%



Elapsed Time from EMS Arrival at Patient to Arrival at Hospital (SRC)

Count	Average	90th Percentile
267	0:27:14	0:39:38

Disaster Medical Response

2020 was a particularly challenging year that required the SJCEMSA to perform a wide range of disaster medical response activities (both COVID-19 related and non-COVID-19 related). As the designated Medical Health Operational Area Coordinator (MHOAC) program lead for San Joaquin County, the SJCEMSA provided non-COVID-19 related assistance to ensure transfer of patients via ambulance from St. Helena’s Hospital as a result of the wildfires; and provided COVID-19 related activities necessary to coordinate all medical and health mutual aid resource requests, and implement emergency operations to assist acute care hospitals, long term care facilities, clinics, surgery centers, home health, hospice, and emergency responders in San Joaquin County. SJCEMSA worked directly with the State of California EMS Authority, California Department of Public Health, and the Regional Disaster Medical

Health Mutual Aid System to process resource requests for additional staffing and PPE to maintain the ability of the EMS system and healthcare coalition partners to deliver medical care and treatment to patients. SJCEMSA also worked closely with the San Joaquin County Office of Emergency Services and the San Joaquin County Health Care Services Agency and other federal, state, and local partners to monitor and coordinate the local medical health response to the outbreak of COVID-19. SJCEMSA’s response included the forward deployment of portable medical beds to all Acute Care Facilities in San Joaquin County, and coordination with Hospital Command centers for all seven (7) hospitals, skilled nursing and long term care facilities in San Joaquin County in response to increased patient census and issues with staffing shortages.

The timeline below summarizes additional SJCEMSA’s COVID-19 response activities during 2020:

Disaster / COVID-19 Response Timeline

Jan.

EMS Policy 2020-02 Coronavirus Emerging Infectious Disease.

Feb.

1st COVID-19 related resource request received.

Mar.

Department Operations Center activated; EMS notification process established; EMS Policy 2020-06 Personnel Screening; EMS Policy 2020-08 Disinfection Recommendations; EMS Policy 2020-10 PPE; EMS Policy 2020-12 EMD Screening Process; EMS Policy 2020-13 Healthcare Surge Strategy Implementation; EMS Policy 2020-16 Aerosol Generating Procedures; EMS Policy 2020-17 (response time compliance penalties waived); EMS Policy 2020-18 ACF Bed Polling.

Apr.

Hydroxychloroquine made available for Acute Care Facility (ACF) use through MHOAC, EMS Policy 2020-20 Lab Testing for First Responders and Prehospital Personnel; EMS Policy 2020-23 (updated providers' secondary impressions list); EMS Policy 2020-22 Contact Notification Process for Law Enforcement; accepted delivery from Representative Josh Harder for PPE.

May.

EMS Policy 2020-26 LTICF Crisis Staffing; EMS Policy 2020-27 Distribution of Remdesivir.

Jun.

EMS Policy 2020-31 (provided guidance to prehospital personnel if a hospital denied entry into the Emergency Departments for transfer of patient care).

Jul.

Two (2) federal medical assistance teams deployed to Adventist Health Lodi Memorial Hospital and Dameron Hospital Assoc.; EMS Policy 2020-34 Hospital Staffing Resource Requests, Coordinated with CDCR regarding advanced planning.

Aug.

Coordinated the transfer of patients via ambulance from St. Helena's Hospital as a result of wildfires.

Oct.

BinaxNOW Antigen Test made available.

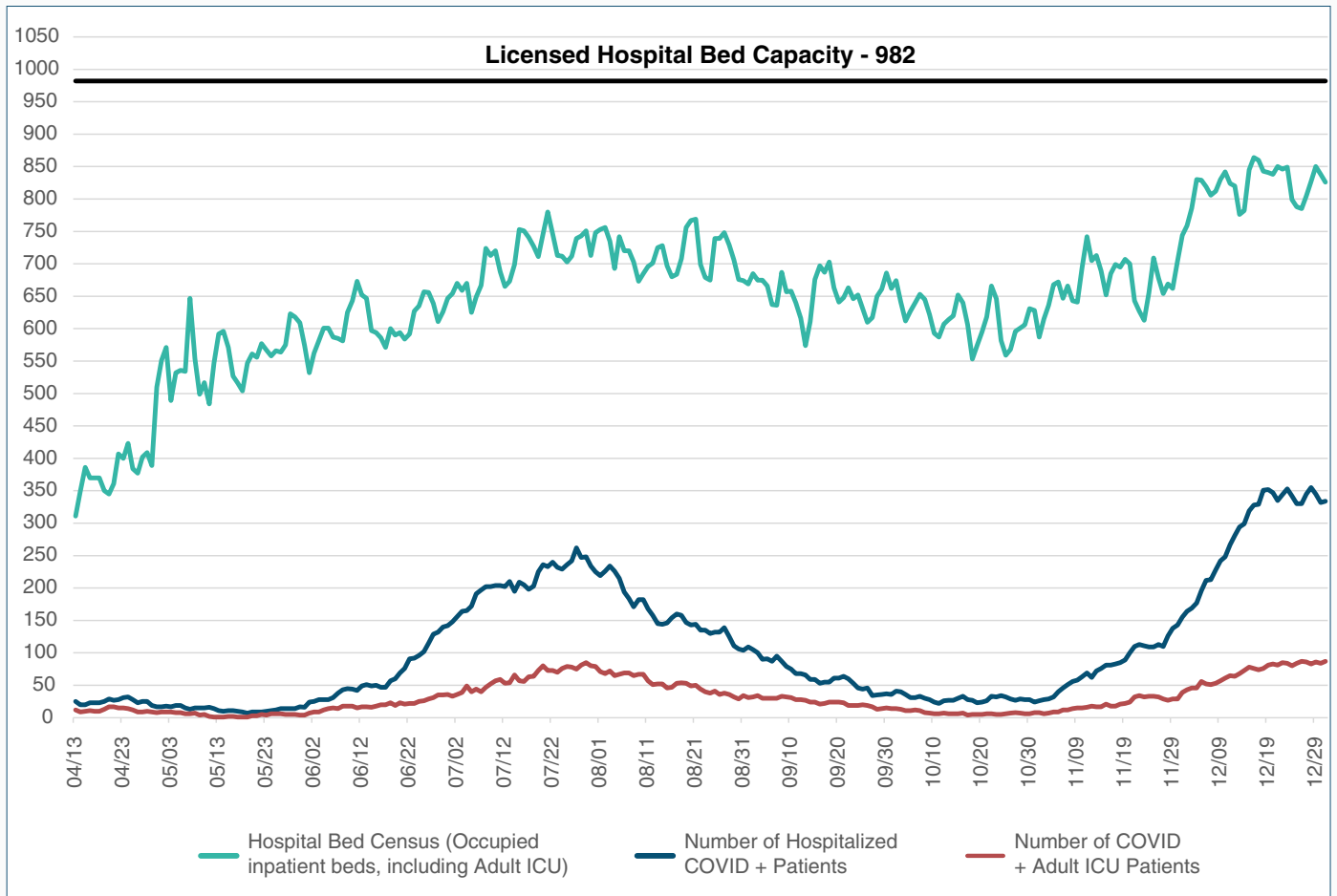
Dec.

Arranged for prehospital care personnel working in SJC to obtain COVID-19 vaccinations through San Joaquin County Clinics.

SJCEMSA coordinated the collection and submission of hospital COVID-19 related information received from each of the seven (7) Acute Care Facilities in San Joaquin County and compiled that information and issued daily reports that provided Acute Care Hospital (ACH) Chief Medical Officers,

Chief Executive Officers, Chief Nursing Officers and Emergency Preparedness Coordinators with situational awareness of COVID-19 laboratory positive patient hospitalizations, Intensive Care Unit hospitalizations and current bed capacity. A compilation of this information is shown below.

San Joaquin County EMS Agency 2020 Hospital Census & COVID-19 Hospitalization Tracking Report



In Conclusion

2020 was a unique and difficult year for EMS that relied upon the willingness of individuals to make personal sacrifices and for all EMS system participants and organizations to adapt to the many challenges created by the COVID-19 pandemic. The SJCEMSA would like to thank everyone in the EMS system for successfully meeting these challenges with competence, compassion, and commitment.