

COUNTY OF SAN MATEO
HEALTH SYSTEM

System Overview Report

SAN MATEO COUNTY
EMERGENCY MEDICAL SERVICES



FY 2016-2017

Introduction

We are pleased to present the 2016-2017 Emergency Medical Services (EMS) System Overview Report, a recap of our systems organization, accomplishments, response times, specialty care and health emergency preparedness programs. The EMS System depends on many different elements working seamlessly, from an informed public able to recognize medical emergencies to a network of public safety communication centers, fire departments, ambulance providers, and hospitals providing specialized care to sick or injured people. What you will see in this report is the result of hard work and collaboration between those different areas.

This collaborative system would not be possible without the strong partnership between local fire departments, collectively called the San Mateo County Pre-Hospital Emergency Medical Services Group (EMS-Fire JPA); South San Francisco Fire Department; American Medical Response (AMR), the County's 911 ambulance provider; Public Safety Communications; our hospitals; and San Mateo Emergency Medical Services (EMS). Our extremely cohesive system helps us deliver our goal of delivering the best life-saving care.

We are able to track patients using various data systems from the moment they call 9-1-1, through the prehospital setting, to their discharge from our established specialty care centers and analyze system performance, identify training needs, and institute appropriate system changes. In 2018 and beyond, we look forward to building upon this data to run more detailed and timely reports for our providers and the public to answer system questions and make policy decisions. San Mateo County is truly a leader in prehospital care in California, and we aim to keep it that way.

ACCOMPLISHMENTS

- Launched ReddiNet® System
- Established new compliance monitoring processes- ambulance patient offload time and compliance for clinical protocols- now in the process of validating data
- Collecting data for stroke through Get With the Guidelines platform
- Updated Emergency/Disaster Department Operations Center
- Re-Designation of STEMI centers
- Stream lined and updated our STEMI system data collection process
- Participated in and received a Silver award for Mission Lifeline STEMI
- Expanded San Mateo County Healthcare Coalition
- Completed Medical Health Operations Area Coordinator (MHOAC) manual and training for all California MHOAC Programs

PRIORITY FOCUS IN 2018

- Conduct an RFP for Ambulance Services and negotiate/complete the contract with the provider.
- Review the Fee Structure with the goal of stabilizing the financial structure
- Create databases for specialty care programs in order to use the data to implement the most effective evidence-based practices
- Reengineer patient care protocols in order to enhance and facilitate high quality patient care
- Redesign the key elements of the Department Operations Center, including the team structure and the training provided to DOC personnel, to improve our disaster response in the event of an emergency.
- Create a plan that addresses the medical needs of the sheltered population in the event of an emergency to bridge the gap for this vulnerable population.

System Overview Report

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Overview

MISSION

To ensure the highest quality emergency medical care to the people of San Mateo County through an integrated and coordinated system of services, and to foster the medical and health resiliency of our community during disasters and emergencies.

EMS SYSTEM

Our system is designed to get the right patients, to the right place (hospital), in the right amount of time to take care of their special medical needs. The system is activated with a 9-1-1 call to a single dispatch center, Public Safety Communications (PSC) in Redwood City, which performs all dispatch services for fire departments within the County as well as for the emergency ambulances. The system dispatches the closest fire engine, regardless of local fire department boundaries, and a paramedic-staffed ambulance to every medical incident. Emergency care begins with Emergency Medical Dispatchers (EMD) gathering information and providing pre-approved instruction through the Medical Priority Dispatch Systems (MPDS) protocol, prior to EMS arrival. Paramedics working with all our hospital emergency departments make destination decision to ensure patients are transported to the most appropriate facility.

HEALTH EMERGENCY PREPAREDENESS (HEP)

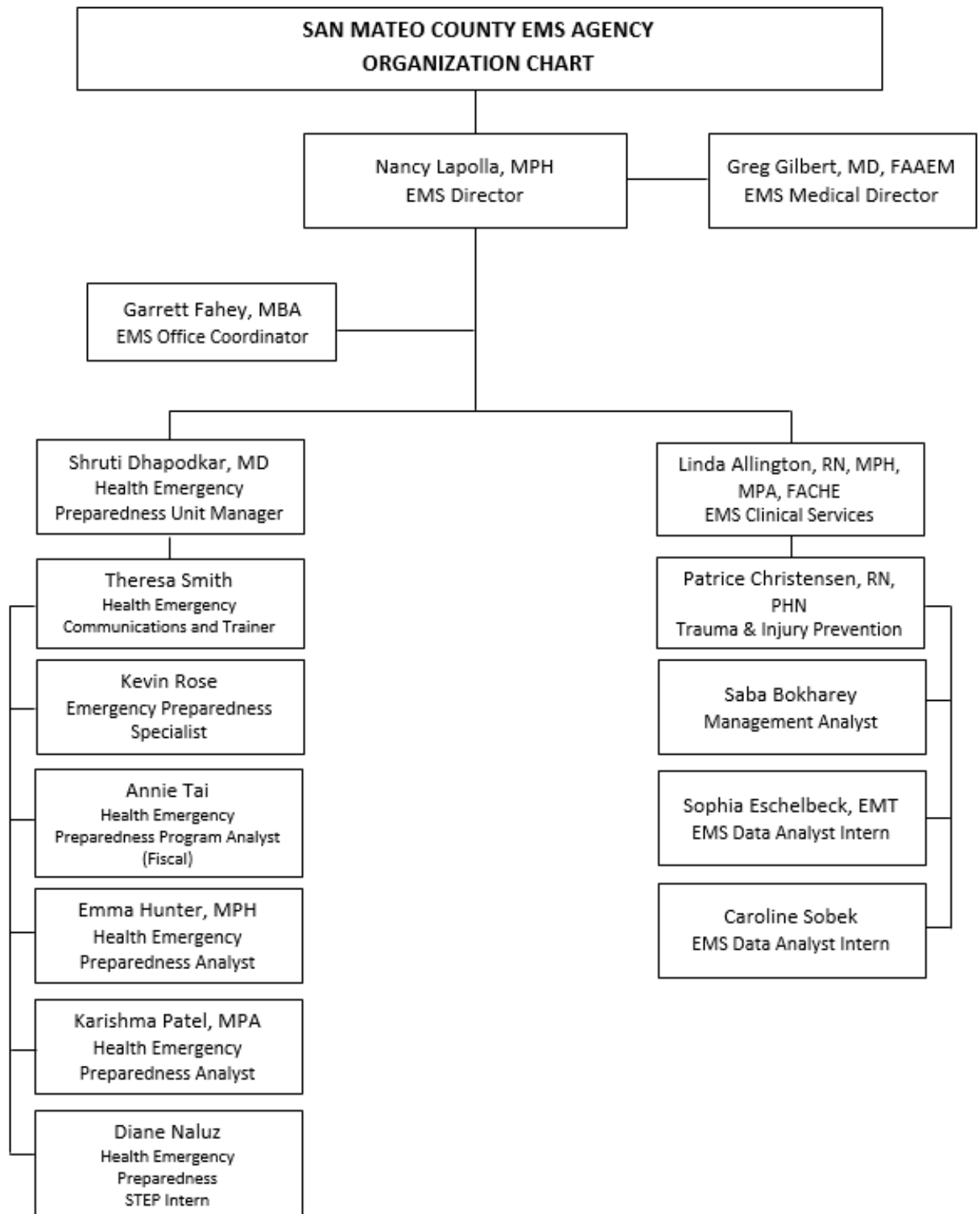
The HEP team works with many system stakeholders to ensure plans, policies, and procedures are in place during a disaster situation. They also conduct many trainings, drills and exercises to prepare staff and system partners to respond to any medical and health emergency/ disaster. Updating our emergency communication capacity was a major initiative in 2017.

REDDINET®

As of June 2017, San Mateo County Emergency Medical Services Agency has been using an emergency communications system known as ReddiNet county-wide. ReddiNet provides San Mateo County with a large variety of resources bettering the existing emergency communication plans. The implementation of ReddiNet has afforded the County capabilities mentioned below, all of which we have been incorporating into existing communication plans and procedures.

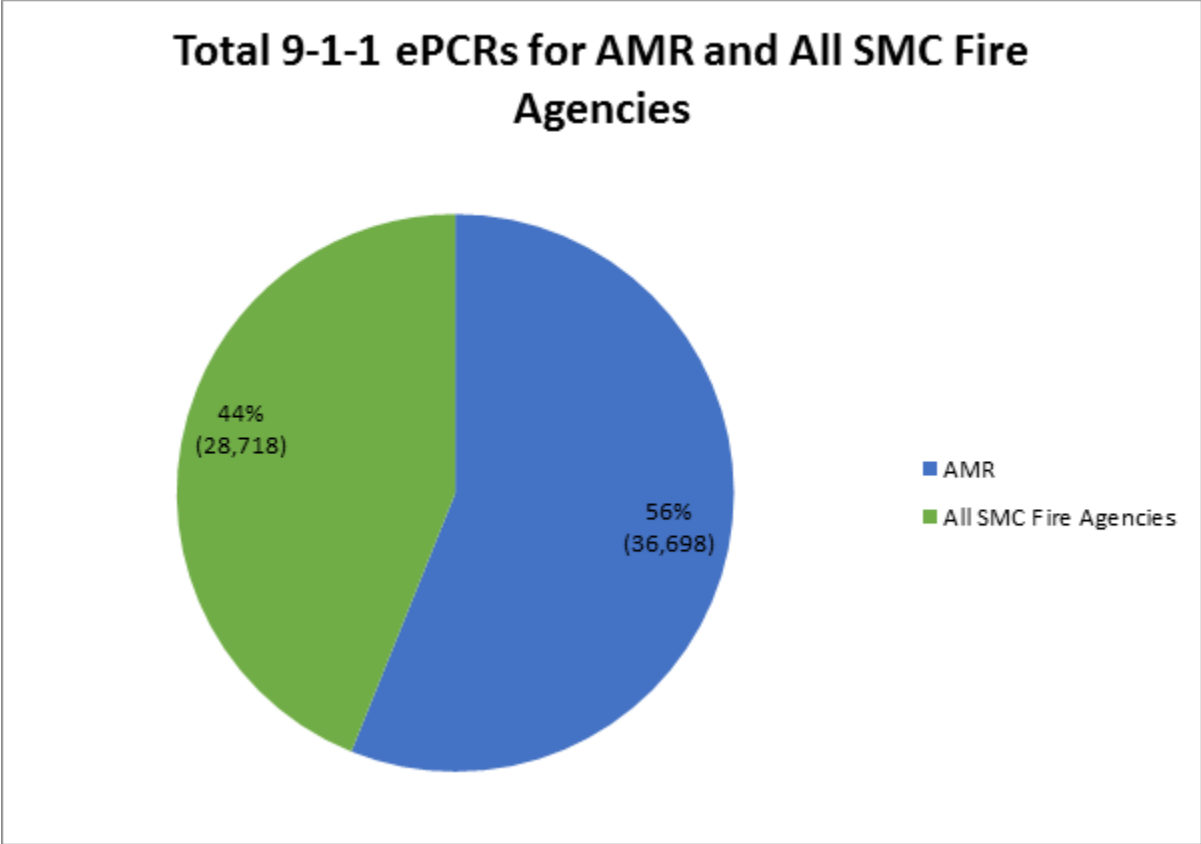
- Track hospital status, mass casualty incidents, hospital bed count/availability, facility assessments, and secure messaging
- Mobile application access for employees
- Locate family members through access to the Family Reunification Center
- Include clinics, surgery centers, and long-term care facilities in order to better capture county-wide availability/facility data using the assessment module
- Access the status and reports of surrounding counties which are also on ReddiNet (i.e. Alameda County, Contra Costa County, Marin County, San Francisco County, and Solano County) providing easy tools for mutual aid resources and tracking

Organizational Chart



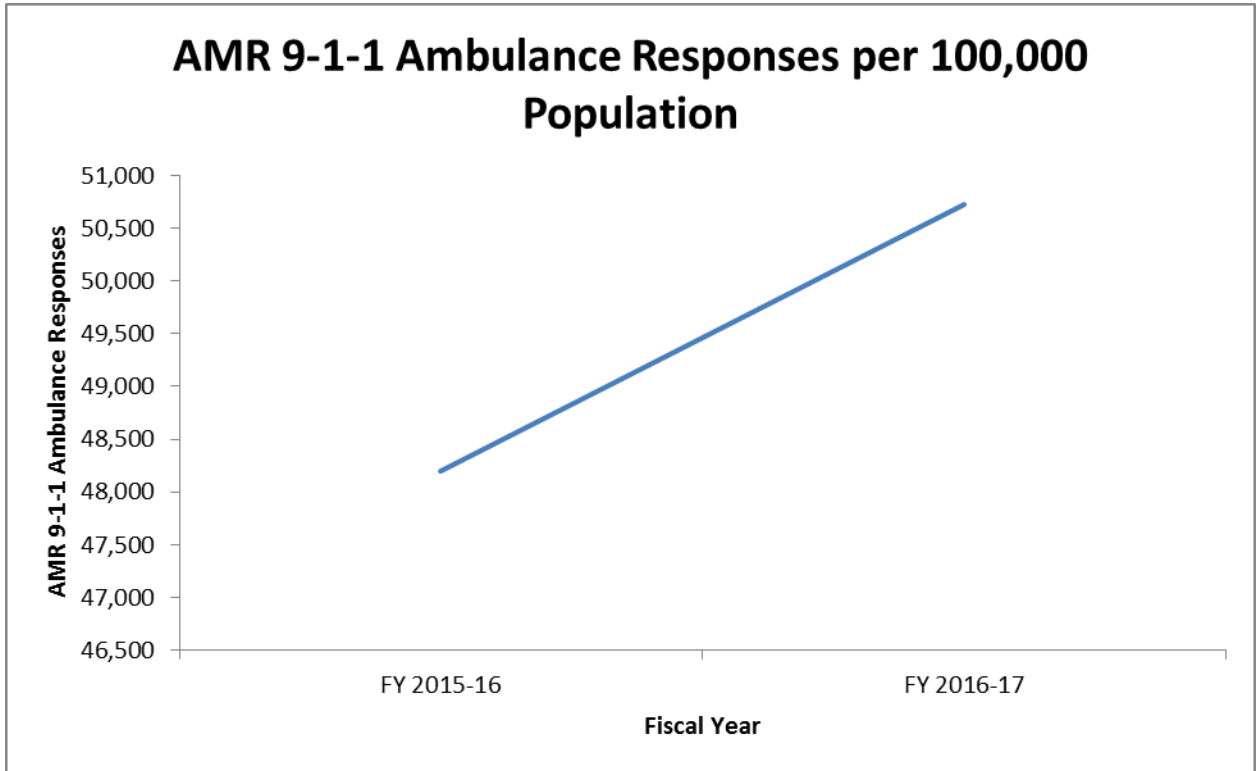
Pre-Hospital Service

TOTAL 911 CONTACTS



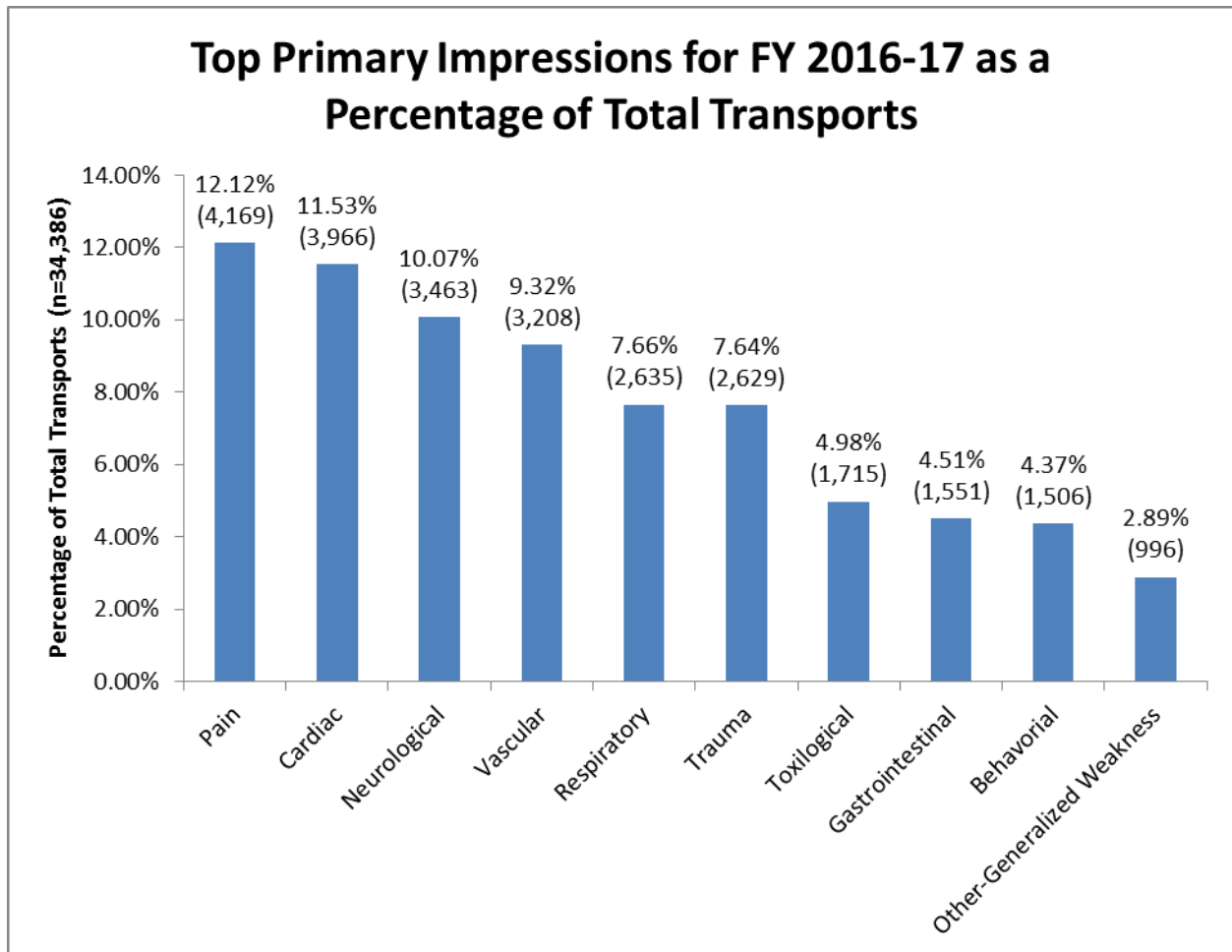
Our ambulance transport provider, AMR, has responded to over 36,000 calls in the past fiscal year. The first responders, from fire departments, have responded to over 28,000 calls for service, adding up to a total of 65,416 responses total.

AMR AMBULANCE RESPONSES PER 100,000 POPULATION



The number of ambulance responses, adjusted for population, has been increasing with a 3.6% increase in the past year.

TOP 10 PRIMARY IMPRESSIONS



A primary impression is the reason an individual calls 9-1-1. Pain, cardiac, and neurological issues are the most common reasons ambulances transport and make up over a third of all transports.

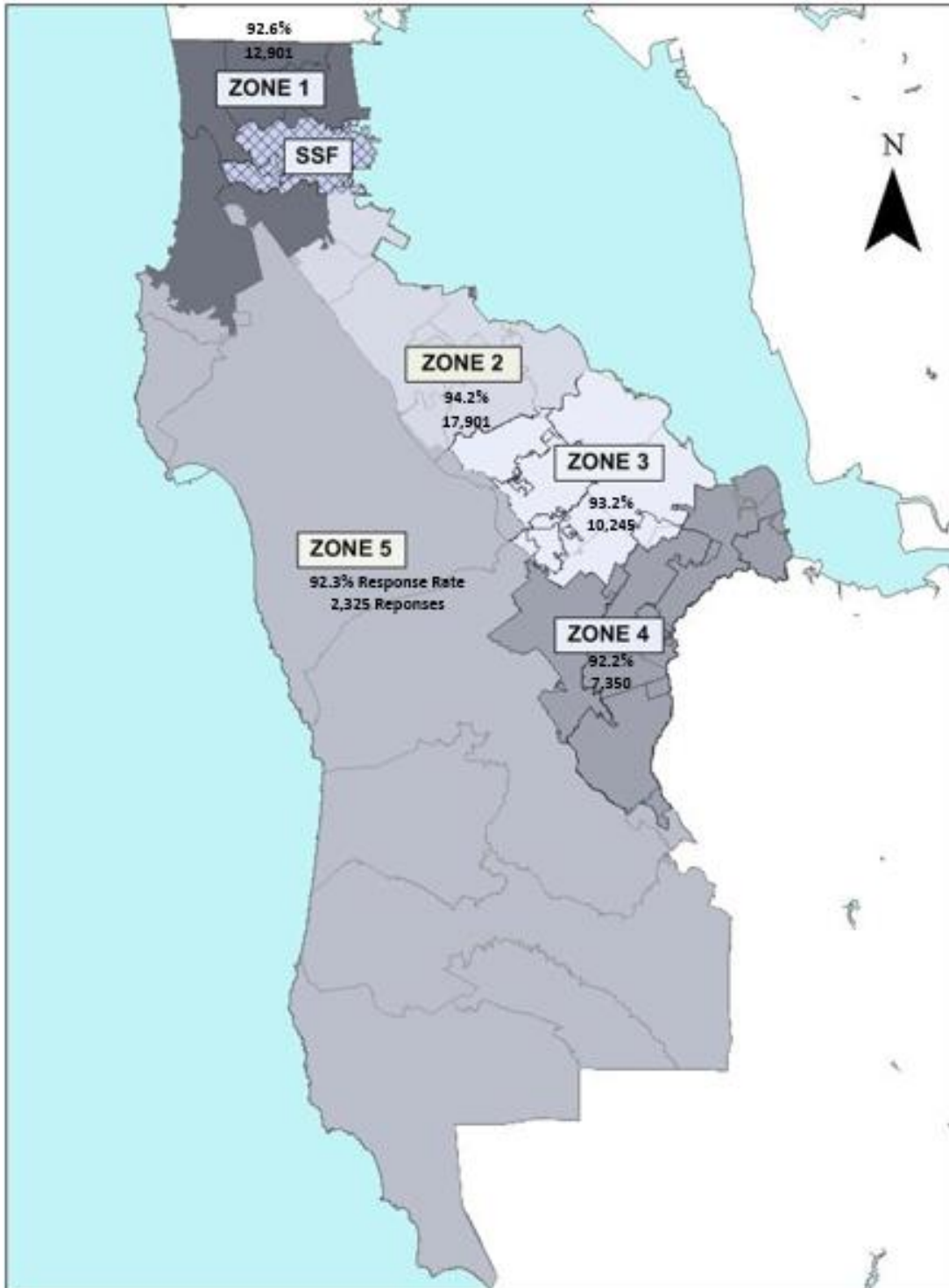
Response Volume and Speed

REQUIRED RESPONSE TIMES

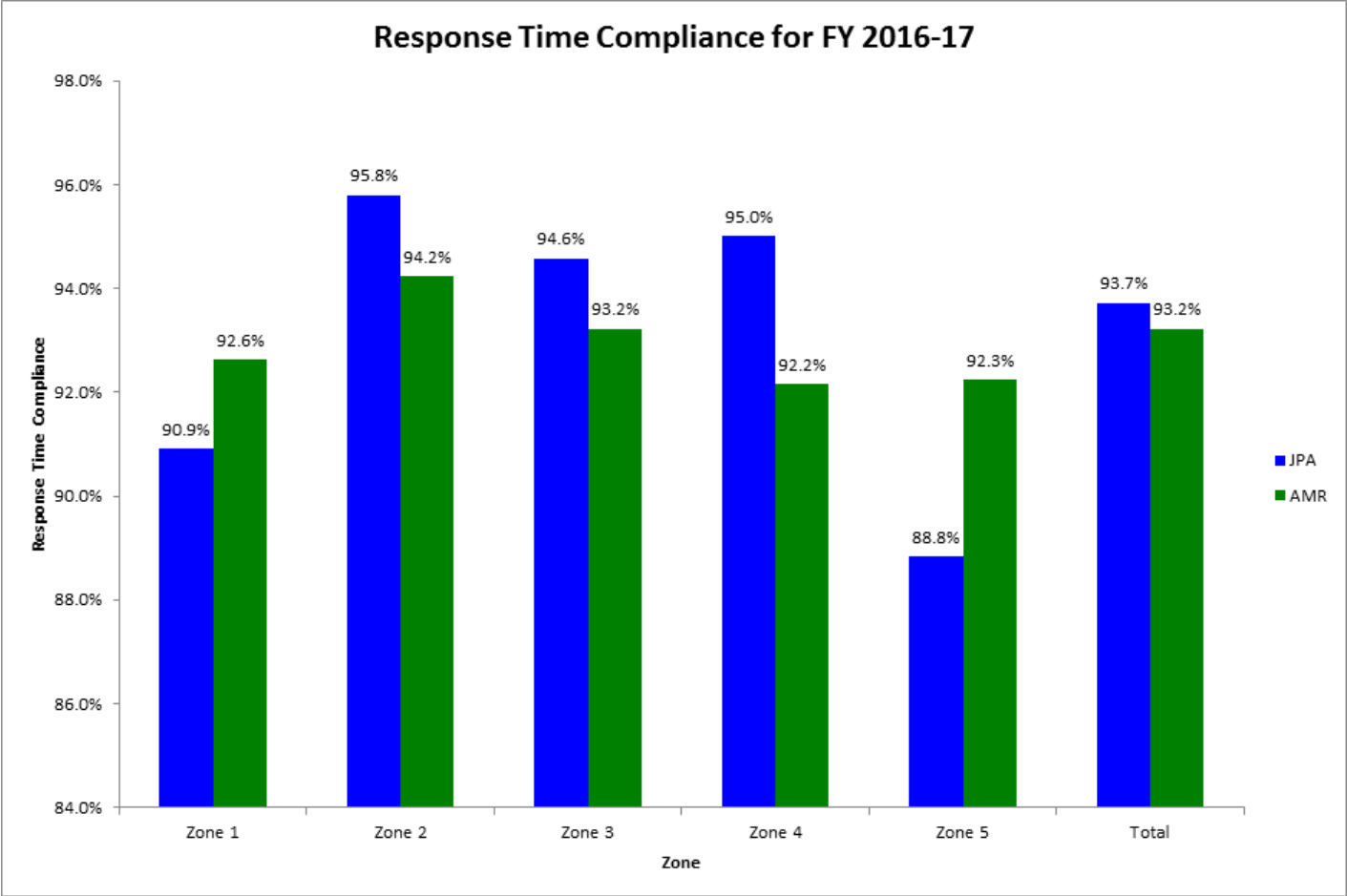
Priority of Response	Area Type	Paramedic Fire Responder, Non-transport	Emergency Ambulance
1	Urban/Suburban	06:59 Minutes	12:59 Minutes
1	Rural	11:59 Minutes	19:59 Minutes
1	Remote	21:59 Minutes	29:59 Minutes
2	Urban/Suburban	14:59 Minutes	22:59 Minutes
2	Rural	24:59 Minutes	59:59 Minutes
2	Remote	29:59 Minutes	59:59 Minutes

The table above outlines the response times that our emergency medical responders are required to comply with at least 90% of the time. These times depend on the urgency of the case (priority of the response), the region of the county (area type), and whether or not they are ALS fire responders or ambulance.

ZONE MAP



The map above demarcates the 5 zones of San Mateo County, excluding South San Francisco with has separate fire first responders and ambulance.



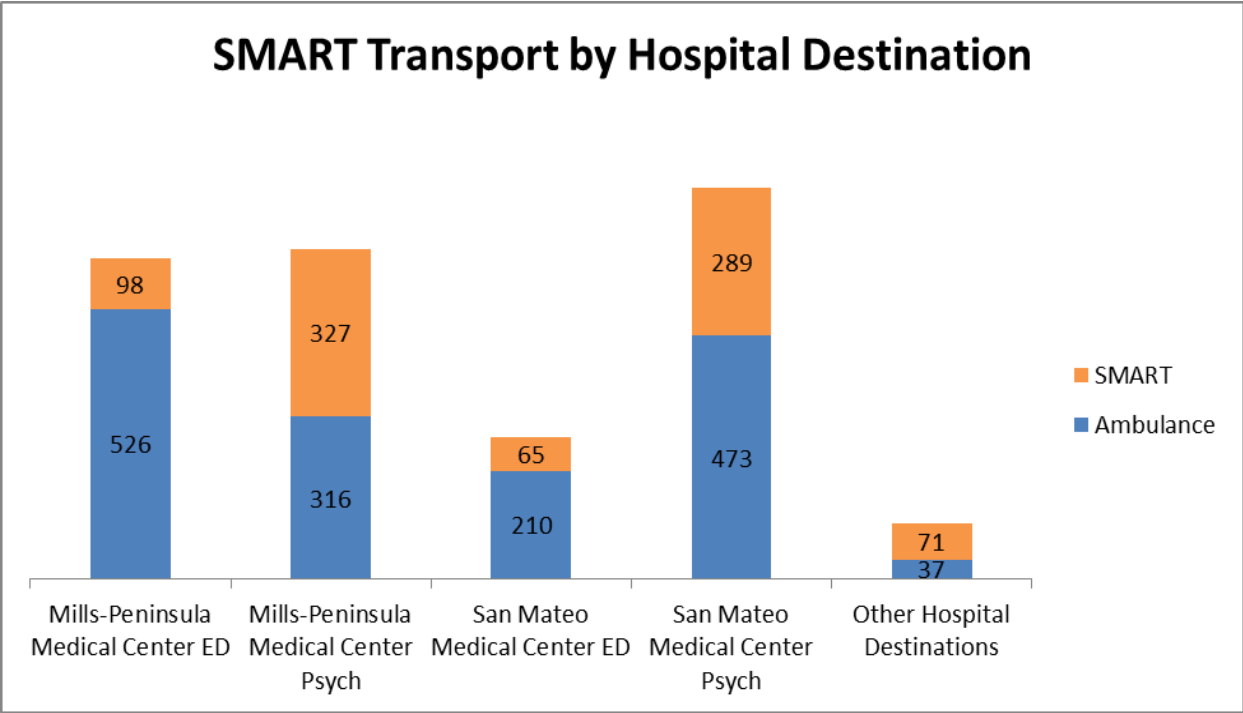
This table outlines the percent compliance, based on priority, that each zone had for both fire first responders and ambulance. The majority of San Mateo County's 5 zones exceeded the nationally established benchmark of 90%.

Specialty Care – Behavioral Health

SMART TRANSPORT BY HOSPITAL DESTINATION

The San Mateo County Mental Health Assessment and Referral Team (SMART) program, funded in part by Measure K, dispatches specially trained paramedics to respond to people having behavioral health crises. This SMART paramedic performs a mental health assessment and transports the patient to psychiatric emergency services or, in consultation with County behavioral health services staff, arranges for other services to meet the patients’ needs.

The system includes two SMART vehicles staffed 12 hours a day, 7 days a week during peak hours with SMART paramedics who have successfully completed a special training program. If the patient has additional medical needs they are transported instead by the ambulance. Both the SMART van and ambulance may transport directly to the psychiatric center or the emergency department (ED) in case prior medical clearance is required.

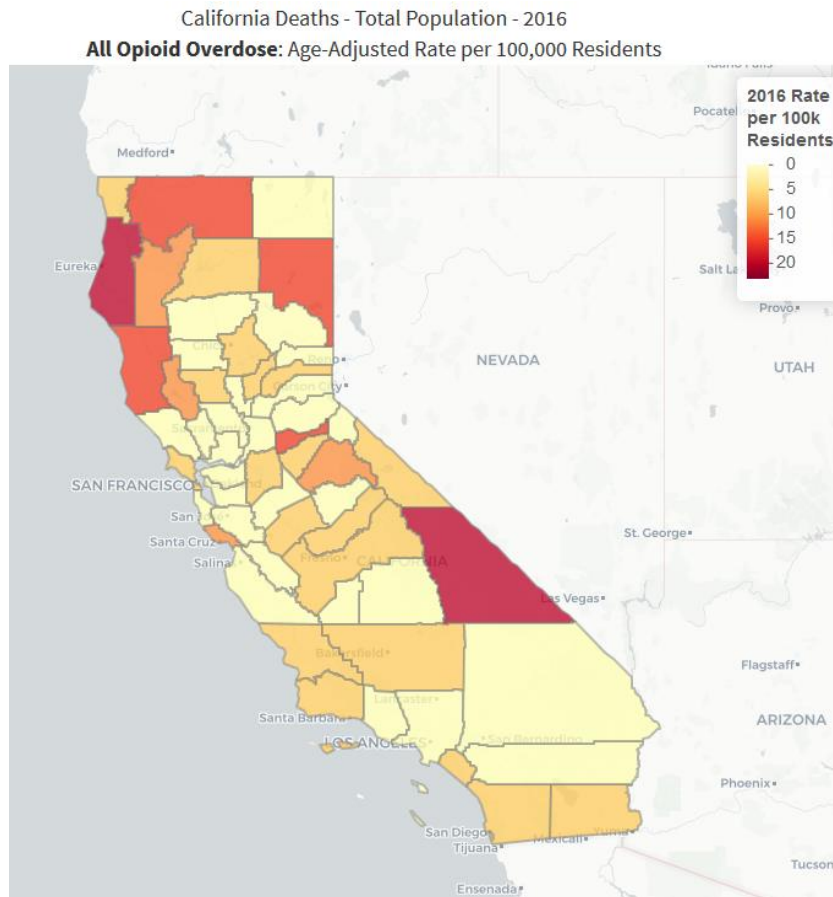


San Mateo County’s SMART patients are transported to either the ED or psychiatry center at one of the two hospitals that offers psychiatric emergency services: Mills-Peninsula Medical Center or San Mateo Medical Center.

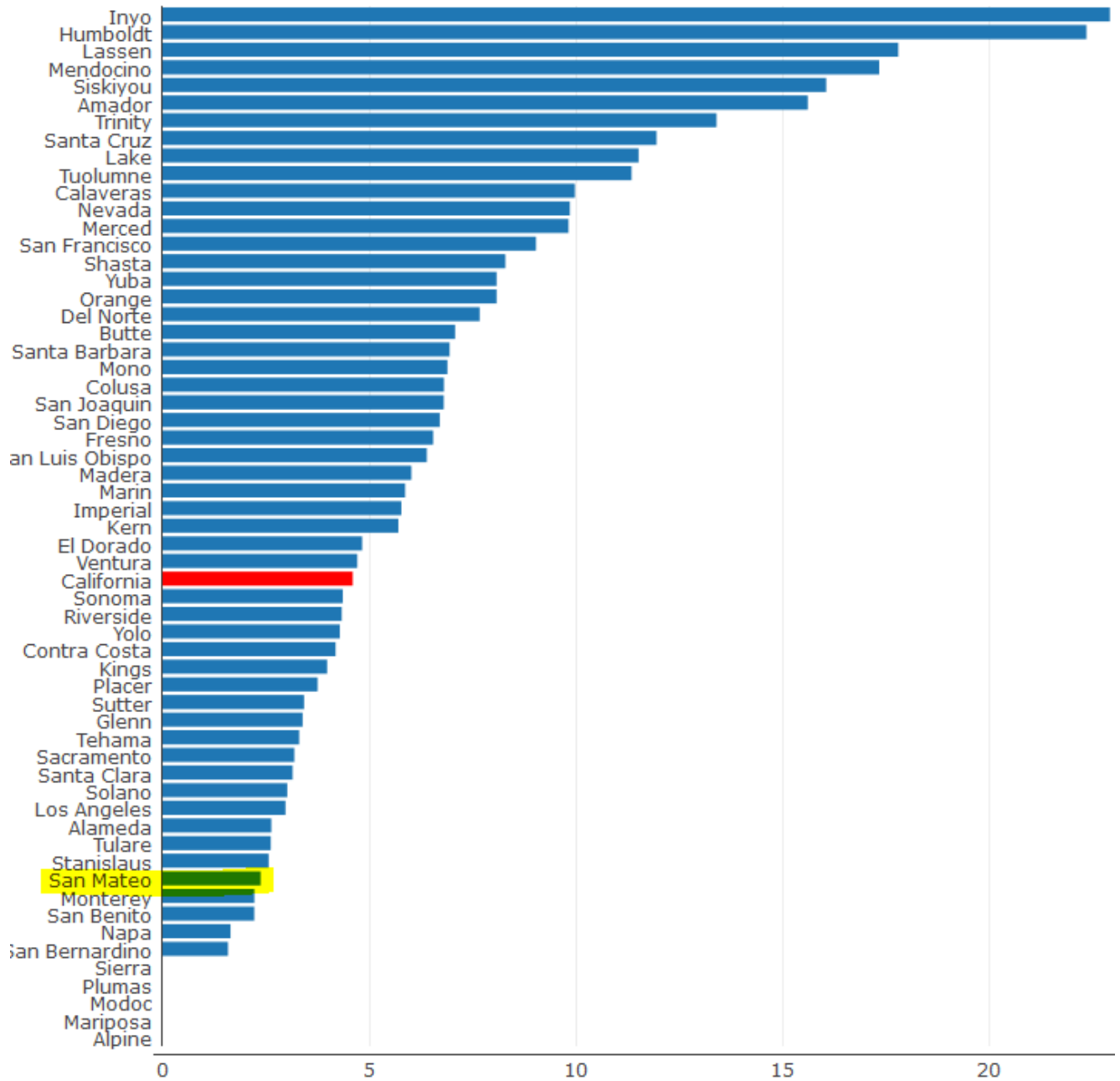
OPIATE CRISIS

The misuse and abuse of opioid pain medication is a national public health problem and the majority of drug overdose deaths are from an opioid pain medication. To place the problem in perspective, more people died of opioid overdoses than in motor vehicle crashes in 2015 in the U.S. The Center for Disease Control (CDC) reports 91 Americans die every day because of an opioid overdose.

San Mateo County is actively monitoring the morbidity and mortality from the misuse of opioids via our electronic patient care records. In addition, the county epidemiologists review emergency department data, medical examiner data, and data from multiple other sources. This information is shared amongst our system stakeholders to assess, monitor, and look at solutions to this public health issue. Although opioid overdose is a national issue, within the state of California our County has one of the lowest total deaths and age-adjusted rates of death.



California Deaths - Total Population - 2016
All Opioid Overdose: Age-Adjusted Rate per 100,000 Residents



Age adjusted rate per 100,000 residents: In 2016 California had 1,925 deaths with an age adjusted rate of 4.6. In comparison, San Mateo County had 19 deaths with an age adjusted rate of 2.3.

Specialty Care – Cardiac Patients

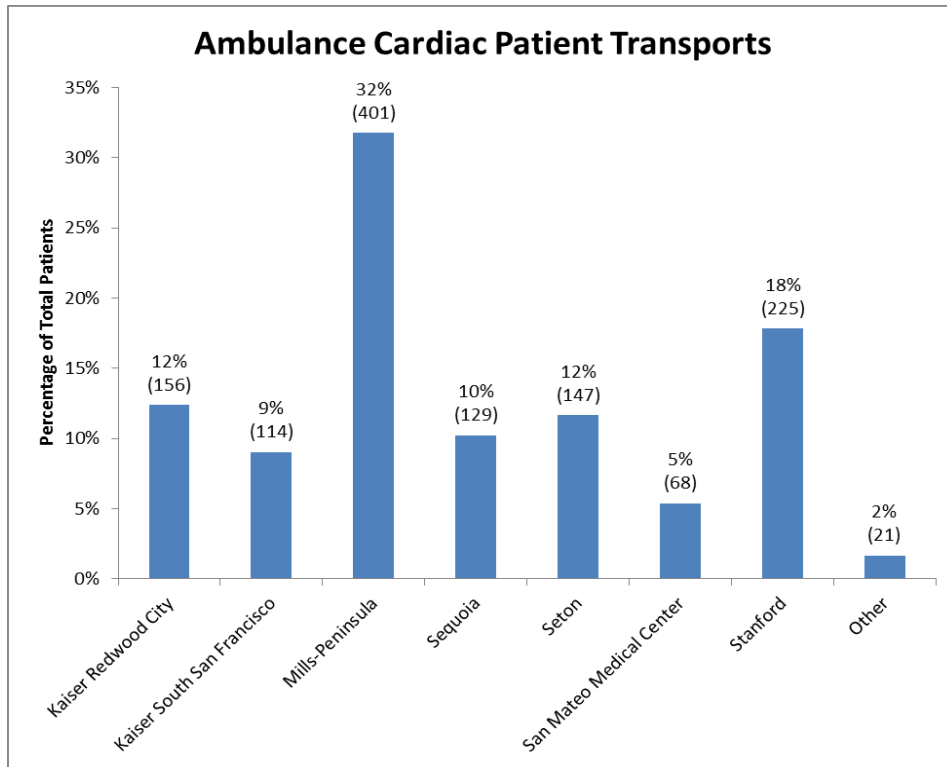
San Mateo County participates in the Cardiac Arrest Registry to Enhance Survival (CARES) program. CARES is a collaborative effort between the Centers for Disease Control and Prevention (CDC), the American Heart Association, and Emory University. After a cardiac arrest patient is transported to a local hospital, the EMS provider and hospital input the answers to a few simple questions into the registry. The reporting process is HIPAA compliant and gives us an opportunity to compare local patient outcomes against national outcomes. The goal of CARES is to improve survival from sudden cardiac death for out-of-hospital cardiac arrest. In addition, as part of the EMS Continual Quality Improvement (CQI) Committee, key stakeholders review each week every cardiac arrest occurring in San Mateo County.

CARDIAC ARREST- CARES

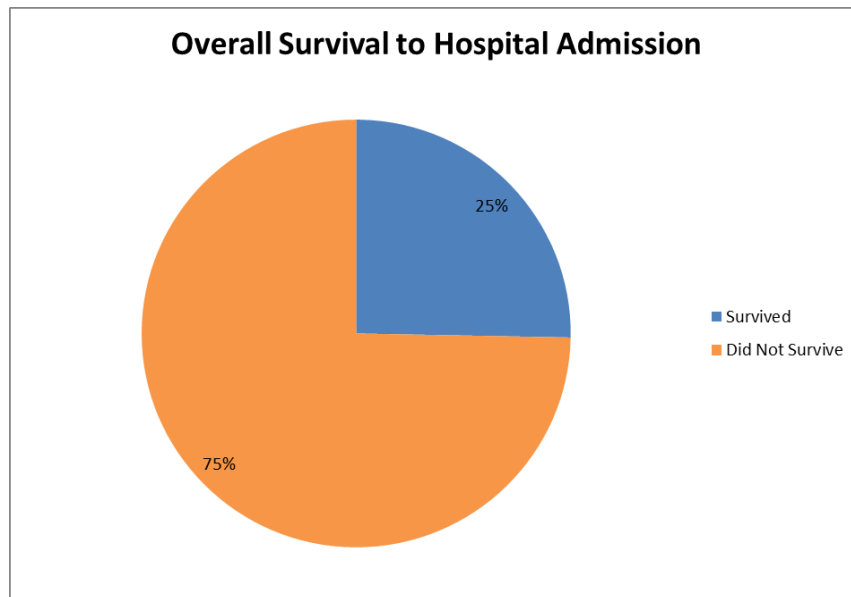
2016 CARDIAC ARREST FACTS
443 cases
67.5% MALE
32.5% FEMALE
MEAN AGE OF 68.1
58.2% OF THE TIME, AN AED WAS APPLIED PRIOR TO EMS ARRIVAL
43.8% OF THE TIME, A BYSTANDER INITIATED CPR

The table above summarizes the cardiac arrest activity in San Mateo County in year 2016. The majority of patients were male, and the average patient age was around 68 years old. Over 58% use of an automated external defibrillator (AED) indicates the importance of readily available AED's in public facilities. Educating the public on cardiopulmonary resuscitation (CPR) continues to increase bystander initiated CPR, leading us to over 43% of the time currently. We continue to enhance that number through further education.

AMBULANCE CARDIAC PATIENT TRANSPORTS



Over seven San Mateo County facilities received and treated total of 1,261 cardiac patients with the majority being at Mills-Peninsula Medical Center followed by Stanford University Hospital, Seton Medical Center, and Kaiser Redwood City Hospital.

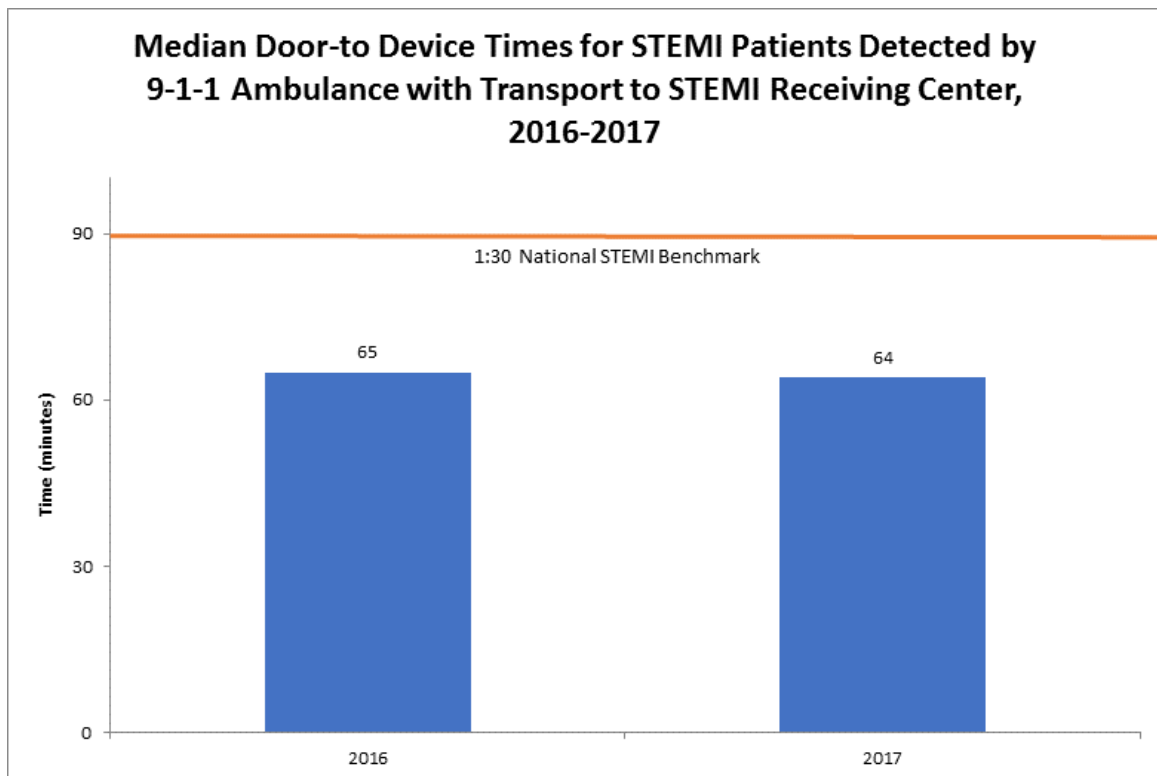


The weekly EMS CQI Committee reviews have led to many system enhancements and processes to improve cardiac arrest survival in San Mateo County.

Specialty Care – STEMI

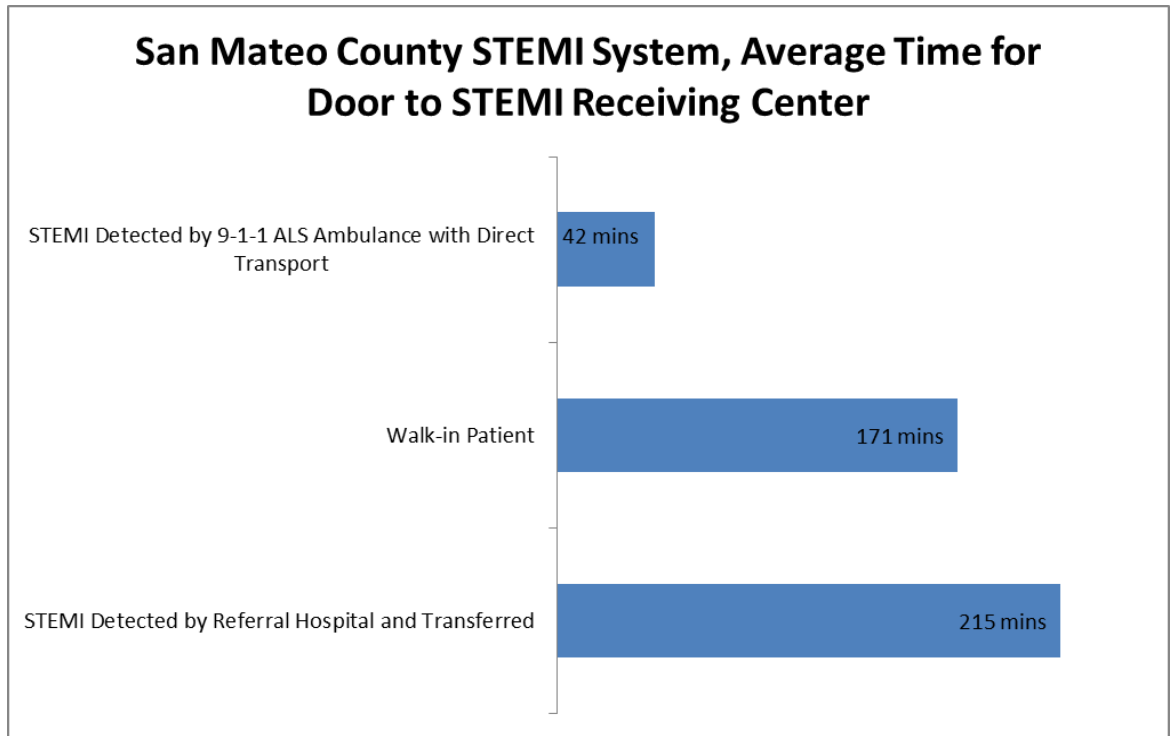
An ST segment elevated myocardial infarction (STEMI) is the most serious form of a heart attack during which one of the heart's major arteries that supplies oxygen to the heart muscle is blocked. It requires immediate, specialized treatment in a STEMI designated hospital. A STEMI patient's best chance of survival is when symptoms are recognized early and treated. Therefore, our ambulance personnel are equipped and trained to detect a STEMI with a 12 lead electrocardiogram (ECG) and notify a STEMI facility of transport via a "STEMI alert." San Mateo County has 5 hospitals that are STEMI certified, called STEMI Receiving Centers (SRC's).

STEMI MEDIAN DOOR TO DEVICE TIME



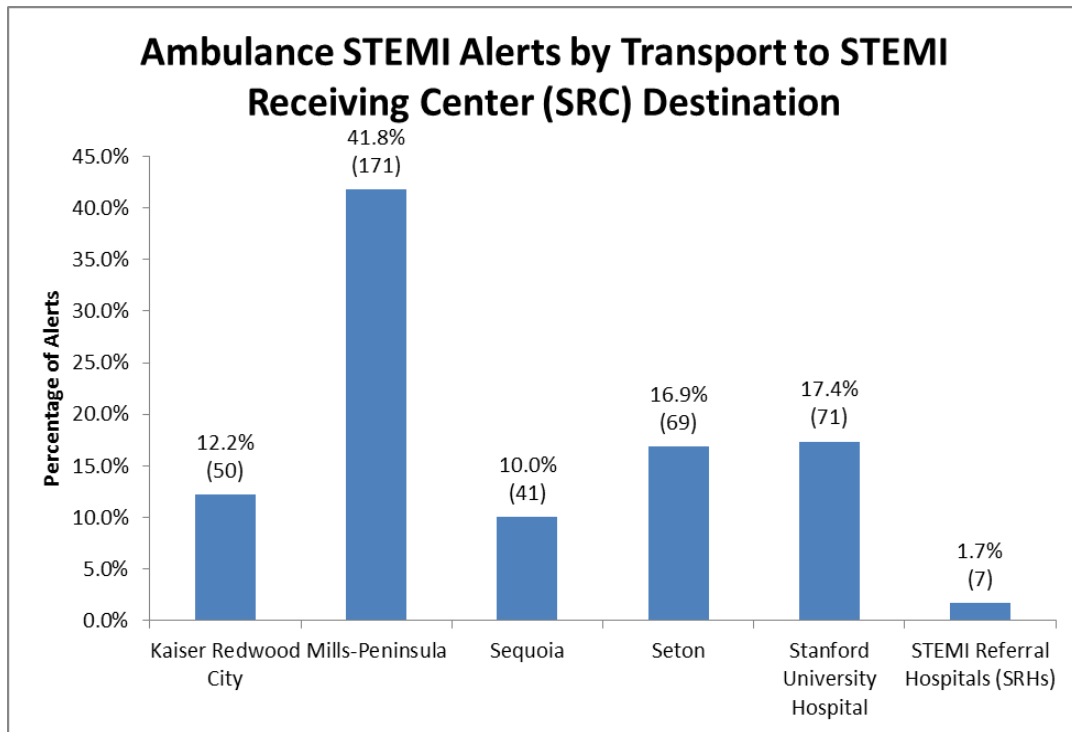
The graph above describes the median time it takes for a STEMI patient to be treated with a “device” once they enter the hospital emergency department. In the County, the median door-to-device time lies steadily around 65 minutes, which is 25 minutes less than the 90-minute national STEMI benchmark.

STEMI AVERAGE DOOR TO SRC TIME



The graph above describes the amount of time it takes for a patient with a STEMI to get to an SRC, depending on their mode of transport. Those who are transported by ambulance arrived at the SRC significantly faster than those who transport themselves or were referred by and transferred from a different medical center. This highlights the importance of calling 9-1-1 when having heart attack like symptoms to have the quickest time to treatment.

AMBULANCE STEMI ALERTS BY SRC DESTINATION



Patients transported and identified as having a STEMI by EMS were most often transported to Mills-Peninsula Medical Center followed by Stanford University Hospital and Seton Medical Center.

Specialty Care – Stroke

San Mateo County has a well-established, evidence-based stroke triage and patient destination system designed to deliver patients quickly to the most appropriate hospital for definitive care. Ambulance paramedics have the ability to identify patients as having a stroke and alert the hospitals of their arrival via a “stroke alert.” Four hospitals serve San Mateo County patients as primary stroke centers and two are designated as comprehensive centers. The tiered system allows patients to receive assessment and treatment at either a primary or a comprehensive center, depending on the time of symptom onset and the type of stroke.

AMBULANCE STROKE ALERTS BY TRANSPORT DESTINATION

Ambulance Transport with Stroke Alerts to either Primary or Comprehensive Stroke Center		
Facility	Total	Percentage
Kaiser Redwood City	123	23.0%
Kaiser South San Francisco	31	5.8%
Palo Alto Veterans Hospital	1	0.2%
Mills-Peninsula	171	32.0%
Sequoia	47	8.8%
Seton	82	15.3%
San Francisco General	1	0.2%
Stanford University Hospital	79	14.8%
Total	535	

The table above illustrates the total number of EMS identified “Stroke alerts” by Stroke Center.

Specialty Care – Trauma

San Mateo County has two designated trauma specialty care centers: Zuckerberg San Francisco General Hospital and Stanford Health Care. Both are level 1 trauma centers where patients with severe or potentially life threatening injuries are cared for. Not all injured patients require transport to a trauma center; patients with minor and less severe injuries, as determined by San Mateo County EMS providers, are transported to one of our local emergency departments.

LEADING MECHANISM OF INJURY BY AGE & DESTINATION

Total Volume at Trauma Centers			
	Pediatrics	Adult	Total
Zuckerberg SF General	39	501	540
Stanford Health Care	146	1134	1280

The majority of trauma patients in San Mateo County are adults and Stanford Health Care receives the highest volume.

Leading Mechanisms of Injury by Age				
	Children (<17)	Adult (18-65)	Older Adult (>65)	Total
Fall	96	145	255	496
Motor Vehicle Collision	34	283	46	363
Pedestrian Accident	15	48	16	79

This chart shows the most common mechanisms of injury as a function of age. The leading mechanism of injury for children (<17) and older adults (>65) is falls. For adults (18-65) motor vehicle collision remains the main cause of injury.

Health Emergency Preparedness

ACTIVITIES & EVENTS

The goal of the health emergency preparedness unit (HEP) is to strengthen the community's ability to respond to all types of public health and medical incidents. The HEP team continually collaborates with community stakeholders and organizations to mitigate response and recovery for public health and medical emergencies as well as prepare for them through exercises that engage the community and responders.

Statewide Medical & Health Exercise

- Staffing the Med/Health and MHOAC branches in the Department Operations Center
- Exercise situational awareness, resource requesting, HAVBED polling, and medical surge

Silver Dragon

- Silver Dragon is a full scale exercise including a total of 21 participating agencies
- San Mateo County Health tested its Medical Countermeasures Plan (MCM) with its annual delivery of simulated prophylaxis to over 8,000 homes within the County
- Community Emergency Response Teams (CERT) delivered information packets
- San Mateo County Health assisted the San Mateo County Mosquito and Vector Control District in activating its own Department Operations Center in preparation for the ZIKA virus
- CERT teams canvassed and investigated certain hot spots for mosquito breeding

Community Shield

- Full scale exercise that simulated a terrorism event including
 - Nerve agent on a bus at a bus station
 - Terrorism Counter Assault Team removed the extremist threat and secured the scene
 - Victims removed from the hot zone
 - Hazardous Material Team decontaminated the victims
 - Injured persons transferred to a casualty collection point
 - American Medical Response provided patient triage and treatment

Skilled Nursing Facilities (SNF) Ready

- Create a forum for SNFs to work collaboratively towards disaster preparedness, response, planning, and recovery
- Work on SNF's gaining membership into existing Health Care Coalition
- SNF's were trained on ReddiNet® which was used during the North Bay fires

Medical Health Operational Area Coordinator (MHOAC) Guide

- Completed its first draft which was approved by Emergency Medical Services Administrators' Association of California and California Conference of Local Health Officers
- Presented the MHOAC Guide to all six regions as well as State entities

State Patient Movement Plan

- Staff participated in the development of the Statewide patient movement plan which will serve as a model for the state
- Draft plan was tested during an exercise in early 2017
- Most current draft plan is being revised at the State level

Bay Area Urban Area Security Initiative (BAUASI) Care and Shelter Planning

- Two-year initiative to improve the operational area and regional planning for mass care and shelter
- In 2018, this initiative will expand to include a medical shelter

County Disaster Service Worker Day

- Better inform County employees on their role as a disaster service worker through informational booths, PR awareness, simulated fire extinguisher, activating San Mateo County accounts

Disaster Preparedness Day

- Inform residents of San Mateo County on the disaster preparedness through presentations, information booths, first responder apparatus displays, and CPR awareness courses
- Give the public insight on the personnel and equipment as well as train first responders