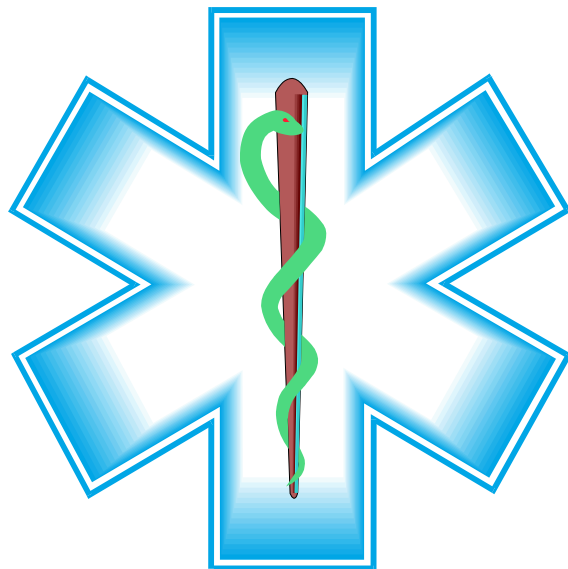

Tuolumne County
Emergency Medical Services Agency

2016 Annual Statistical Report



February 22, 2017

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INTRODUCTION

The 2016 Annual Statistical Report compiles and condenses an entire year's worth of data about the Tuolumne County EMS system. The data included in this report is derived from pre-hospital patient care records (PCRs) completed by Tuolumne County Ambulance Service (TCAS) personnel, unless otherwise noted.

Since July 1, 1993, TCAS has collected PCR data using the software program EMS DataPro (EMSDP) provided for their use by the Tuolumne County EMS Agency (TCEMSA). Once entered in EMSDP, the data is submitted in an electronic format to the TCEMSA, where the data is imported into a central version of EMS DataPro. The TCEMSA then validates the data.

In September 2000, TCAS, with the assistance of the EMS agency, initiated a program for completing PCRs using EMS Outfielder (EMSOF). EMSOF provides immediate data availability for daily quality assurance/quality improvement reviews and imports patient billing information directly into the billing system used by TCAS.

The Tuolumne County Emergency Medical Services System is comprised of four 9-1-1 answering points including Tuolumne County Sheriff's Dispatch, City of Sonora Police Department Dispatch, CHP Dispatch (located in Merced County) and Mariposa County Sheriff's Dispatch.

- Ambulance dispatching is provided by the Tuolumne County Sheriff's Dispatch Center.
- BLS first response services are provided by Tuolumne County Fire Dept., Tuolumne City Fire Dist., Columbia College Fire Dept., Twain Harte Fire Dist., Columbia Fire Dist., Sonora City Fire Dept., Miwuk-Sugarpine Fire Dist., and the Groveland Fire Dist.
- U.S. Forest Service, Tuolumne County Sheriff's Search and Rescue, Don Pedro Recreation Agency, Dodge Ridge Ski Patrol provides specialized BLS response services.
- Tuolumne County Ambulance Service provides ALS service. Mercy Medical Transport from Mariposa County provides the Lake Don Pedro area ALS Ambulance service.
- PHI provides air ambulance services with day-to-day mutual aid from the California Highway Patrol (CHP) Air Operations Division, Mercy Air, CALSTAR and R.E.A.C.H. Air Ambulances.

In June 2003, grant funds were made available to TCEMSA for the purpose of purchasing and installing EMSsystem communication software and related computer hardware for the emergency departments of Tuolumne General Hospital and Sonora Regional Medical Center (SRMC) and the EMS agency office. In early 2004, EMSsystem linked Tuolumne County's EMS system with the other ten (10) counties of OES Region IV, enabling Tuolumne General Hospital (TGH), as the county's Disaster Control Facility, to view real-time emergency department availability when determining patient disbursement during a multi-casualty incident (MCI).

In 2004, The Tuolumne County Emergency Medical Services System developed and

implemented a Trauma Plan, in conjunction with Memorial Medical Center, Doctors Medical Center of Modesto, Mountain Valley, El Dorado County, Central California, Northern California, Sacramento County, and Santa Barbara County EMS Agencies. The Trauma Plan provides a framework that assures that the citizens and visitors of Tuolumne County receive comprehensive prehospital and hospital trauma care. Tuolumne County relies on Trauma Centers throughout Northern California for in-hospital trauma care. Air Ambulances are used as the primary means of transportation for patients meeting Tuolumne County's major trauma patient criteria.

In July 2007, TGH closed leaving only one acute care hospital in Tuolumne County. SRMC assumed the duties of the county's Disaster Control Facility and Mountain Counties South Control Facility.

In 2008, EMSsystem was expanded to include data elements for the Department of Health and Human Services HAvBED (Hospital Available Beds for Emergencies & Disasters). This capability allows for accurate and consistent polling of hospital resources nationwide.

In June of 2009, TCEMSA was instrumental in the development of the Central Regional Trauma Coordinating Committee (CRTCC), a twelve county regional committee. The purpose of the committee is to standardize and improve the provision of trauma care within the region. The CRTCC, working in coordination with four other CRTCCs throughout the State and the State EMS Authority to build a strong, cohesive statewide trauma system.

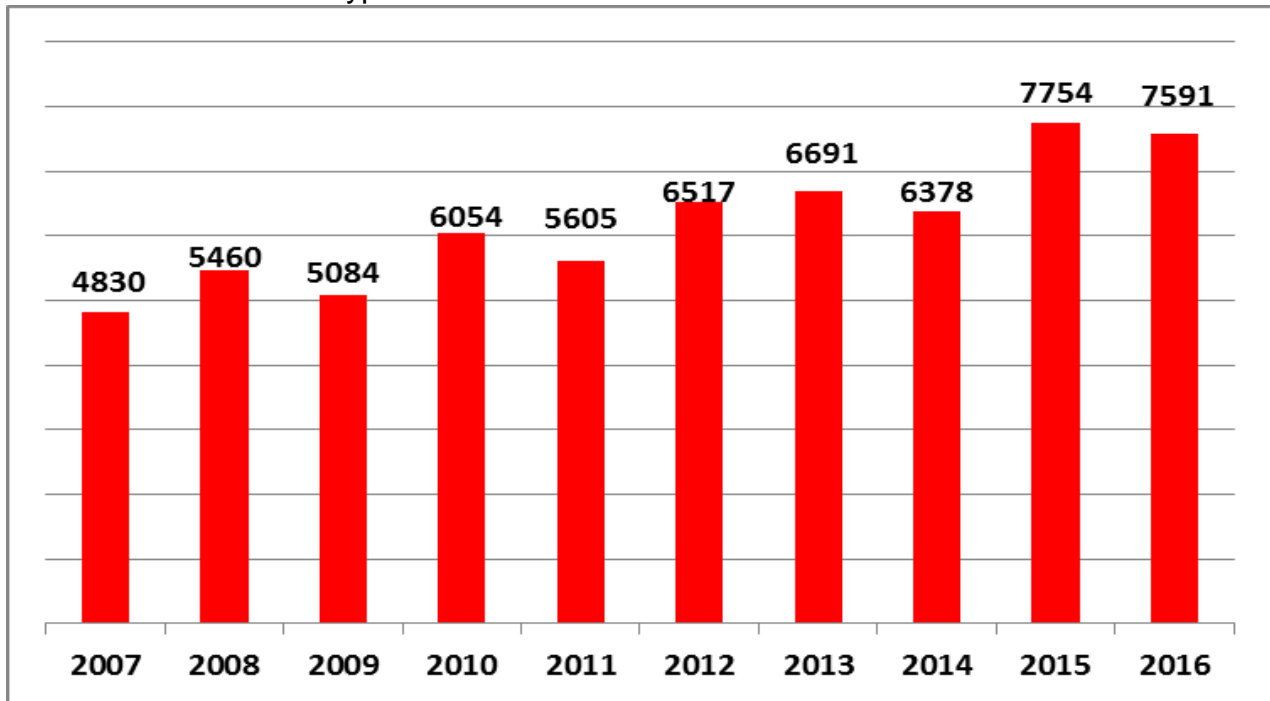
In 2010, Tuolumne County EMS implemented an S-T Elevation Myocardial Infarction (STEMI) triage policy. This allows Paramedics in the field to transport, usually by air ambulance, a patient experiencing a serious cardiac event to be transported directly to a hospital capable of Percutaneous Coronary Intervention (PCI). Decreasing the time from the recognition of a STEMI to PCI greatly decreases the injury to the cardiac muscle and increases the survival rate of these patients.

In September of 2011, Tuolumne County adopted the CRTCC Trauma Triage Criteria. This criteria is based on the Centers for Disease Control (CDC) trauma triage guidelines.

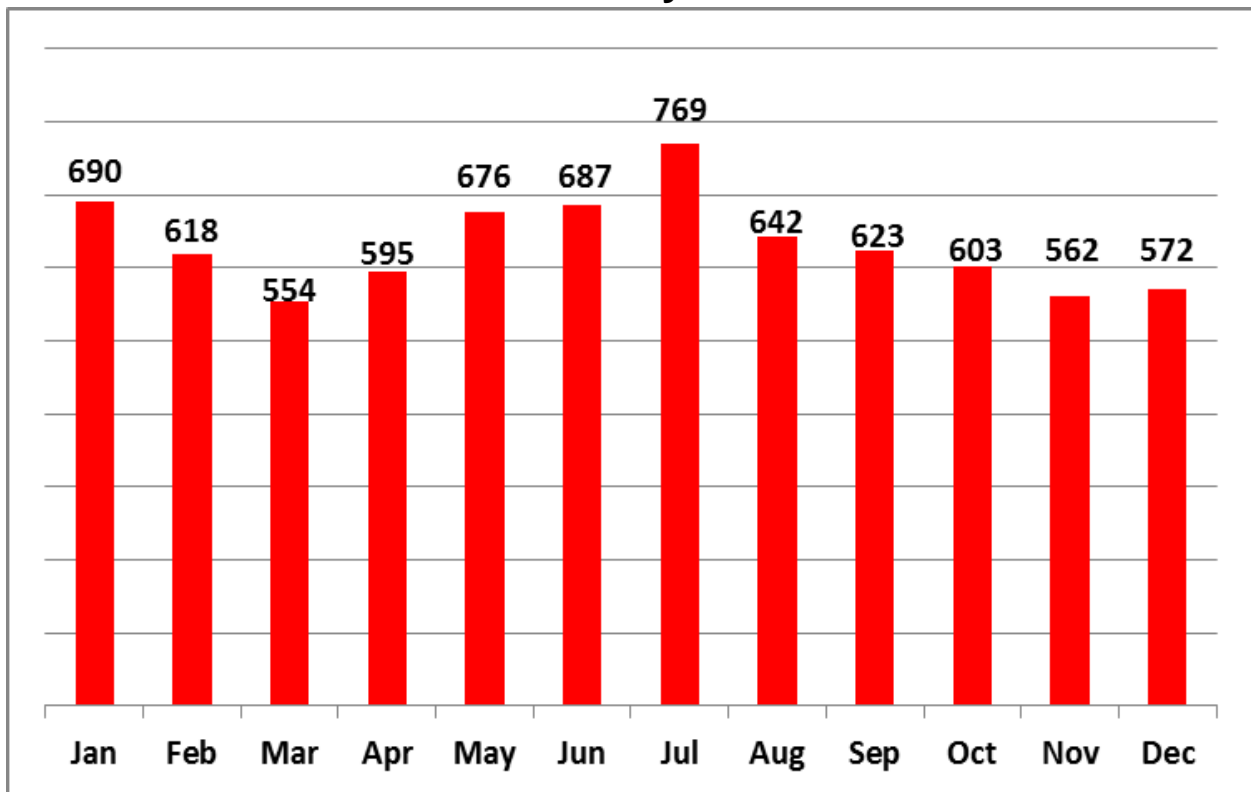
In February 2015, Dr. Todd Stolp retired, leaving both the Public Health Officer and EMS Medical Director positions vacant. Due to the increasing complexities of Public Health and EMS Systems it was decided that the bifurcation Public Health Officer and EMS Medical Director duties would best serve the County of Tuolumne. Dr. Liza Ortiz was hired as the Public Health Officer and Dr. Kimberly Freeman contracted with the County of Tuolumne as the EMS Medical Director.

OVERVIEW OF CALL VOLUME

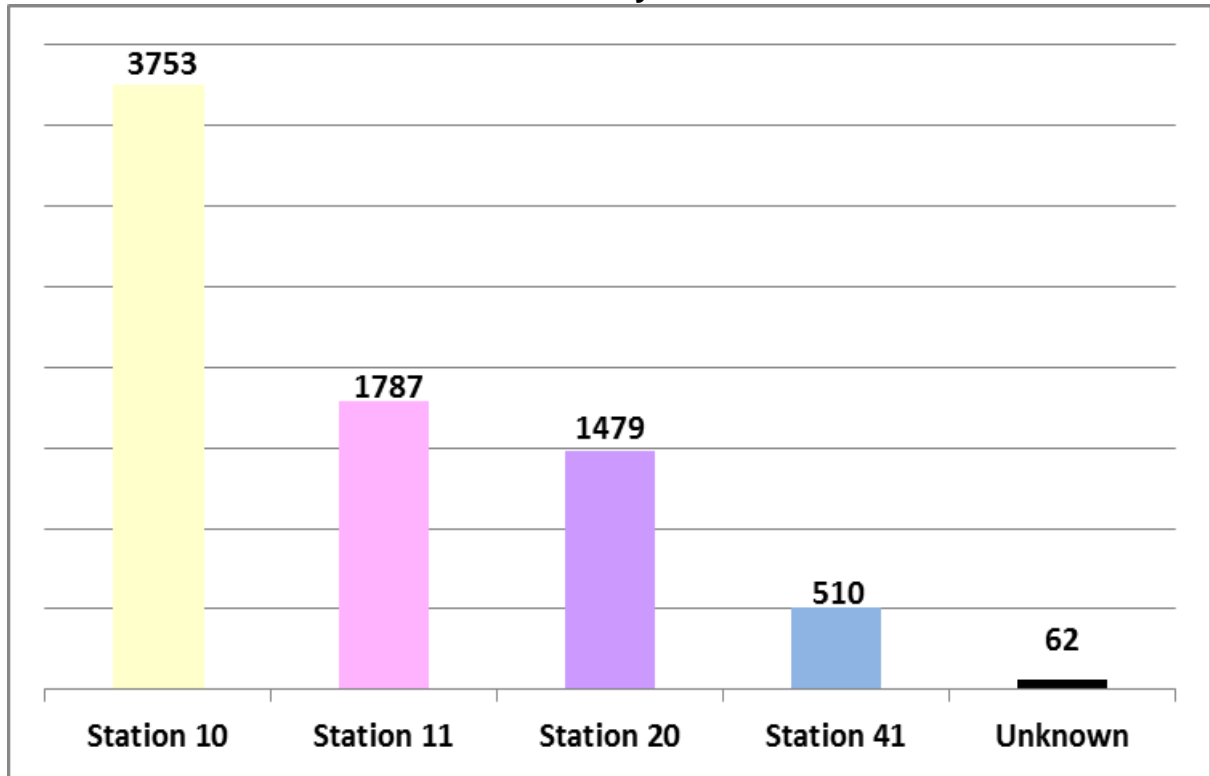
As illustrated in the graphs below, unless otherwise specified EMS requests include both scene and transfer call types.



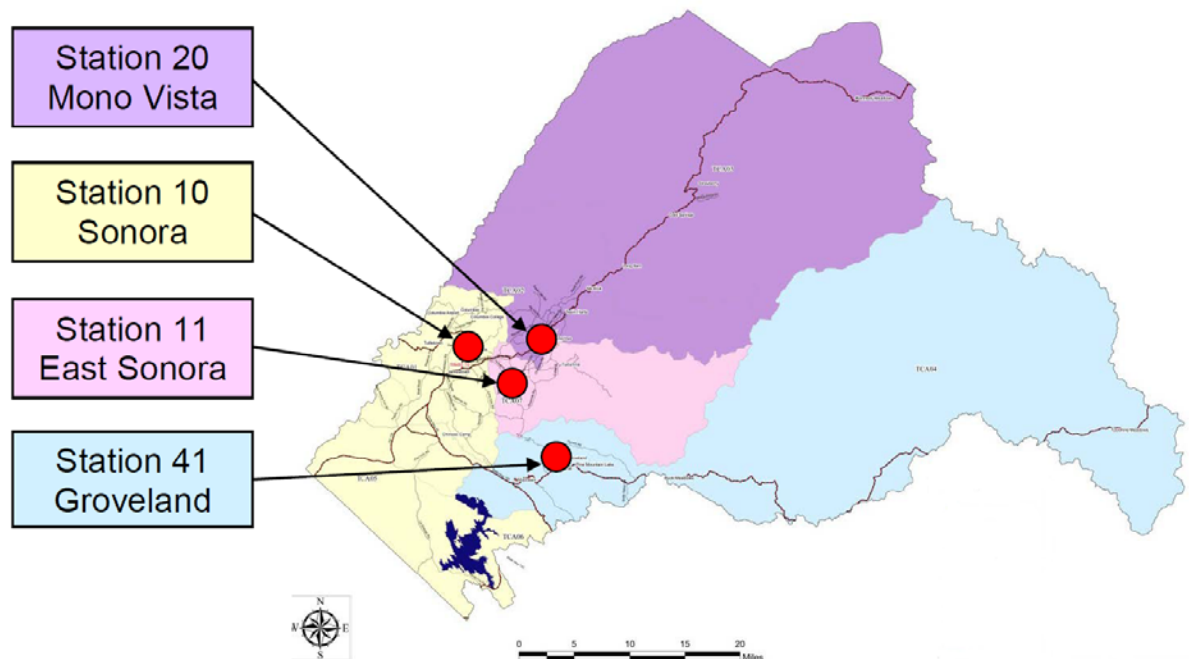
2016 Calls by Month



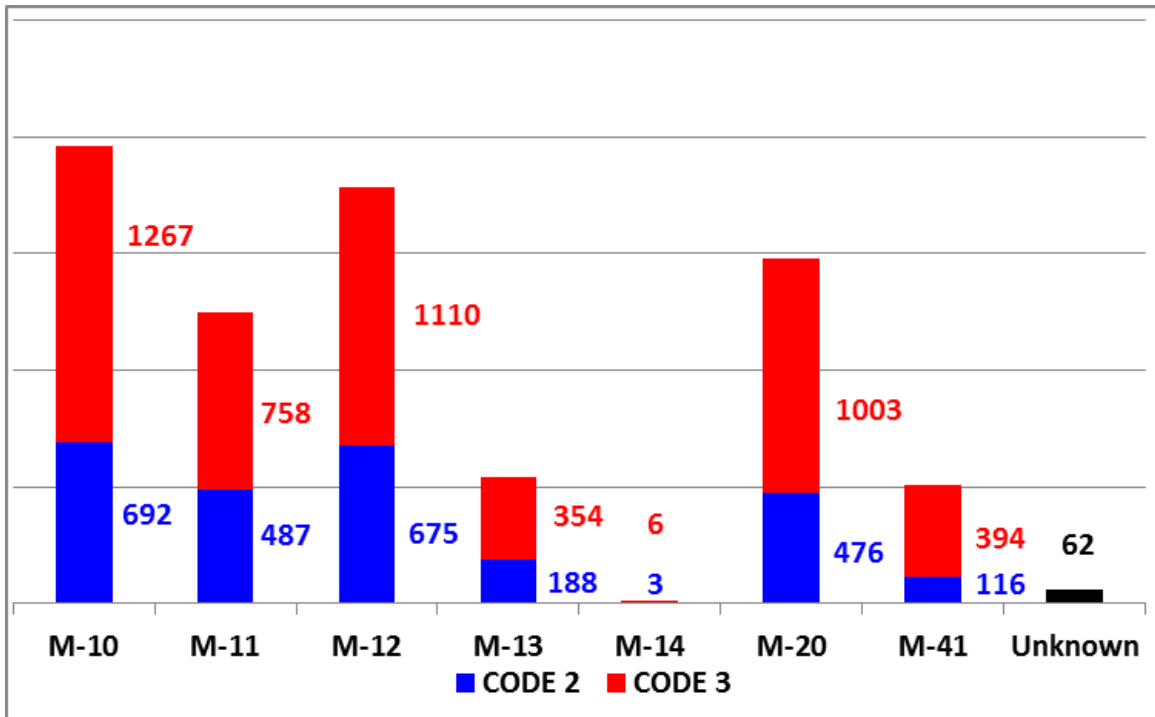
2016 Calls by Station



As illustrated above, Station 10 responded to the majority of all EMS requests.

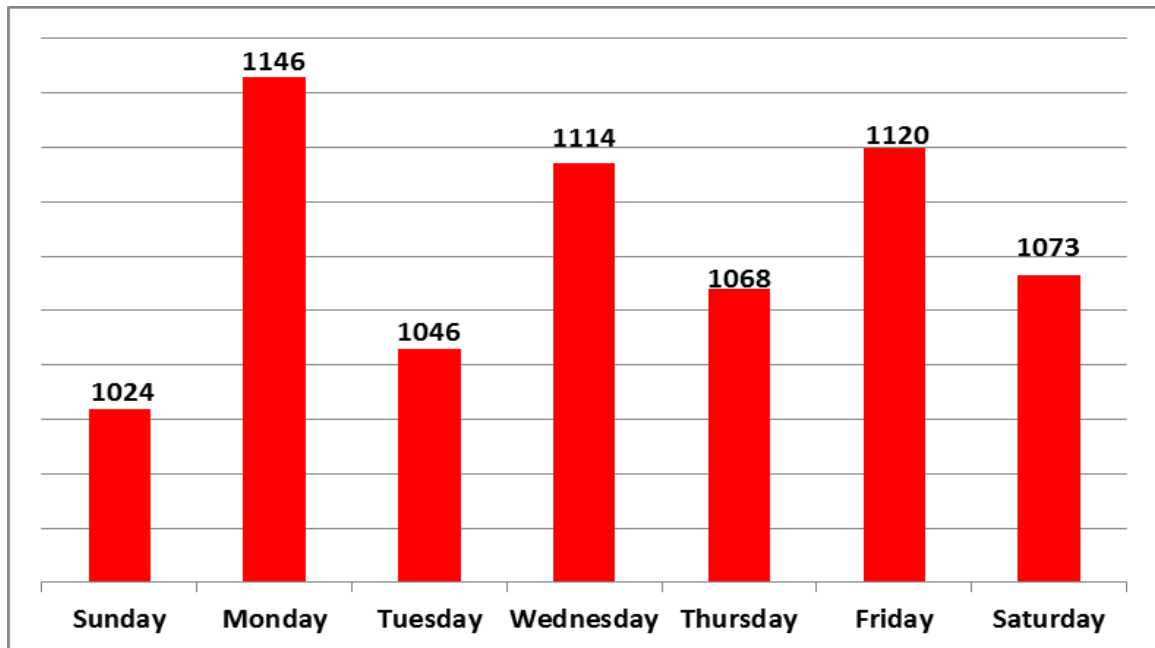


2016 Calls by Unit and Code of Response

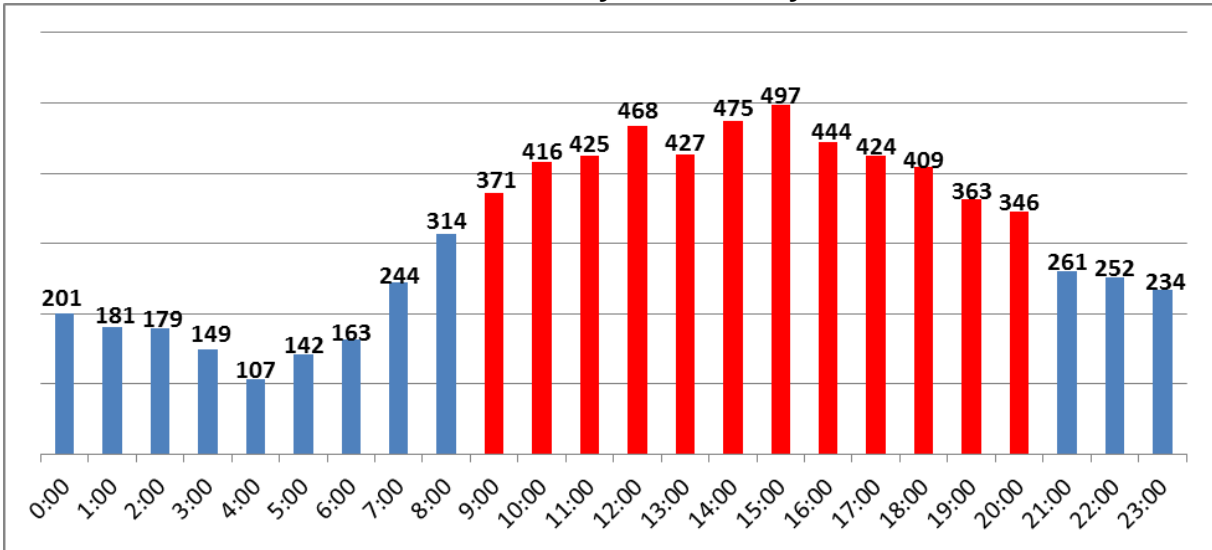


A breakdown of requests by day and time of day shows that call volumes may vary widely during the week, with the highest volumes on Mondays, Wednesdays and Fridays.

2016 Calls by Days of the Week



2016 Calls by Time of Day



Response Times

The California Emergency Medical Services Authority (EMSA) has established recommended guidelines for Code 3 response time standards to EMS requests, based on population density. Although the validity of these response time guidelines has been called into question, the EMSA recommends that EMS responses meet these response time guidelines at least 90% of the time.

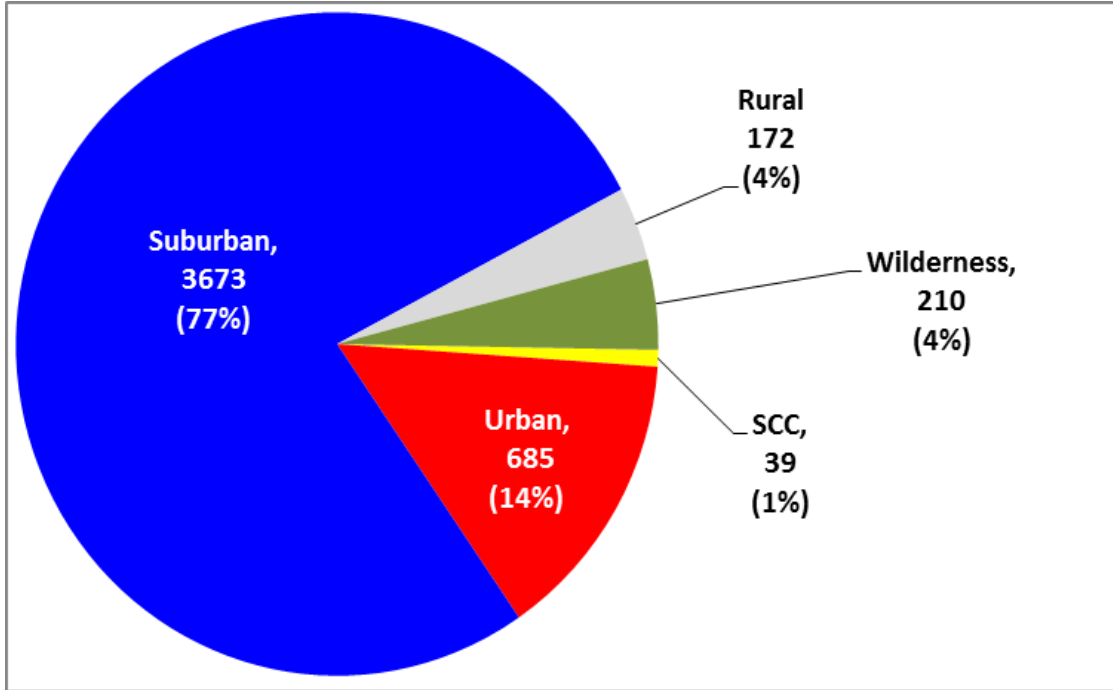
	BLS 1 st Response	ALS Ambulance
Urban	5 minutes	8 minutes
Suburban	15 minutes	20 minutes
Rural	15 minutes	20 minutes
Wilderness	ASAP	ASAP

Urban = 101 to 500 people per mile **Suburban** = 51 to 100 people per mile
Rural = 7 to 50 people per mile **Wilderness** = less than 7 people per mile
SCC = Sierra Conservation Center (secured facilities may be exempted from response time requirements)

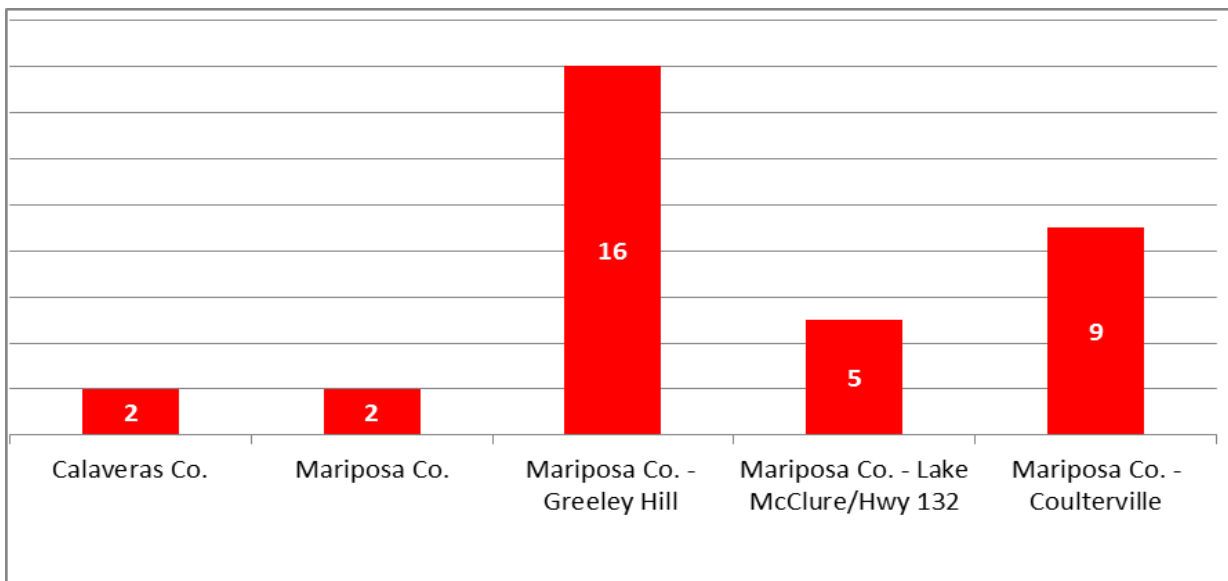
	Urban	Suburban	Rural	SCC	Wilderness
Minimum:	0 min	0 min	0 min	4 min	1 min
Maximum:	53 min	81 min	48 min	33 min	72 min
Average:	6.46 min	10.54 min	18.65 min	19.08 min	27.66 min
90 %ile:	11 min	17 min	34 min	25 min	45 min

CALL LOCATION

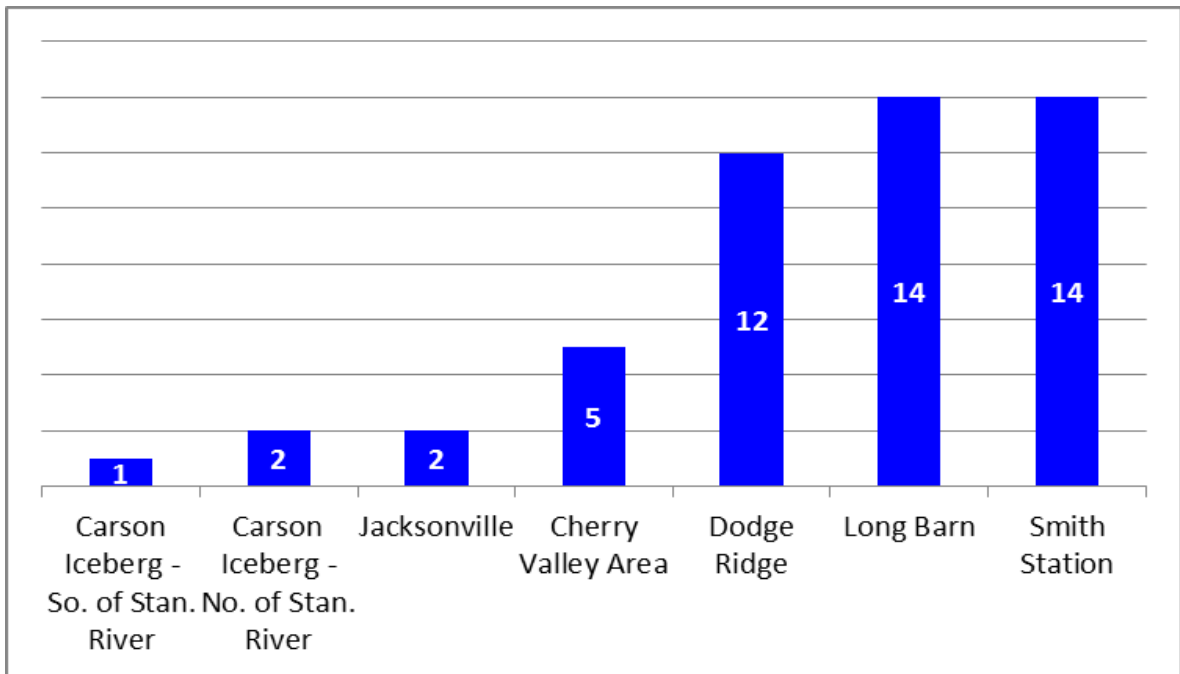
The breakdown of EMS requests by location reveals that the majority (77%) of requests occur in the suburban areas of Tuolumne County, where the majority of Tuolumne County residents live.



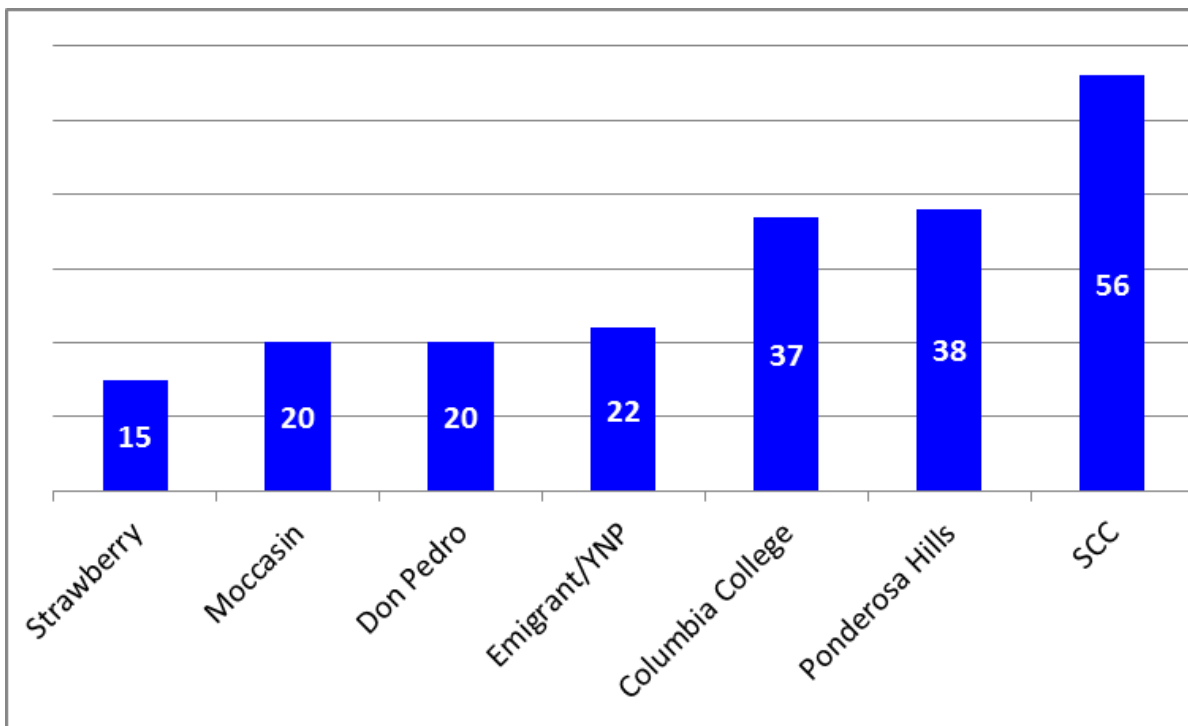
2016 Mutual Aid Responses by Tuolumne County Ambulance



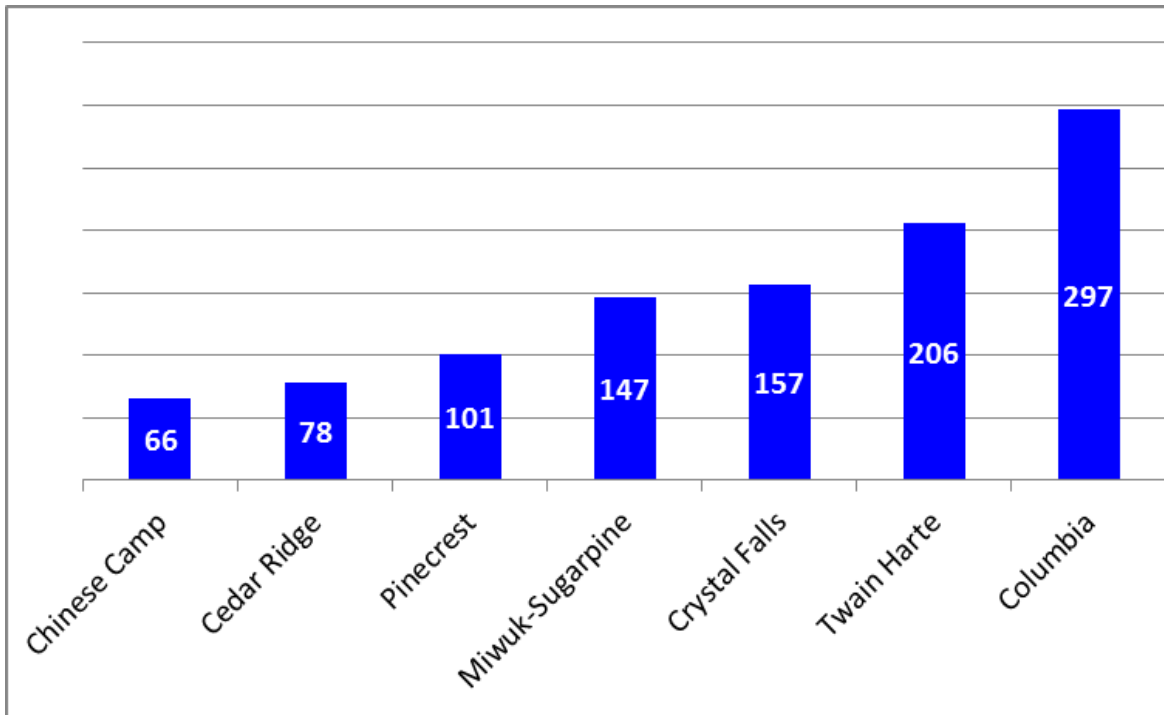
2016 Calls by Map Zone Chart #1



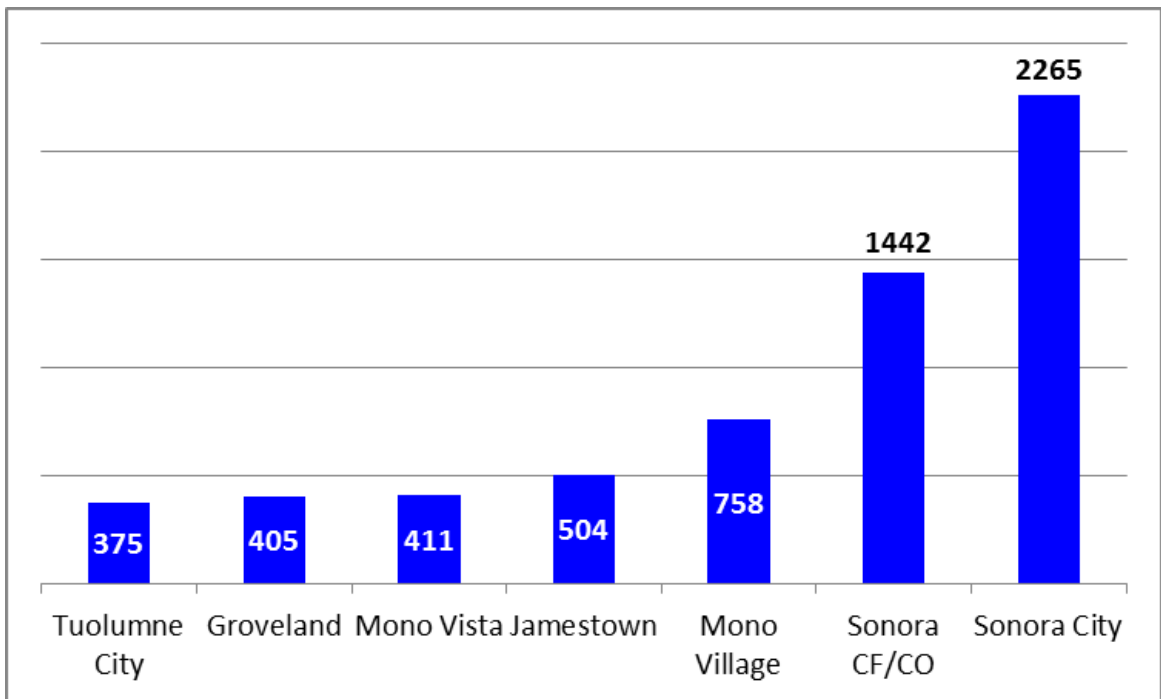
2016 Calls by Map Zone Chart #2



2016 Calls by Map Zone Chart #3



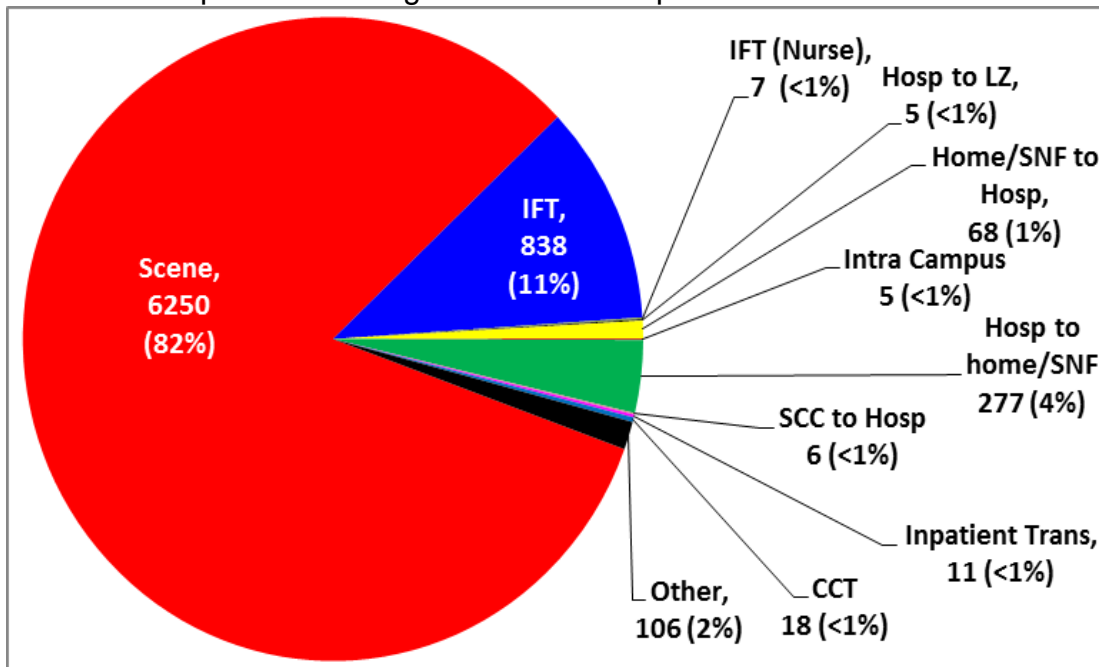
2016 Calls by Map Zone Chart #4



2016 Calls by Scene Description			
Greenley Primary Care	1	School	47
Snow-Play Area	1	Hotel/Motel	59
Swimming pool	2	Sierra Conservation Center	60
Ranch/Agricultural	3	Government Building	62
EMS Rendezvous/LZ	3	Indian Rock Prompt Care	70
Tuolumne Clinic	4	Other SNF not listed	85
Sonora Imaging	4	Bar/Restaurant	87
Other hospital not listed	5	Other Clinic/Doctor's Office	93
Industrial/Manufacturing	7	Casa Viejo	107
Lake Don Pedro	9	Black Oak Casino	113
Groveland Clinic	9	Oak Terrance Memory Care	143
Tuolumne County Jail	13	Skyline Place	146
National Forest	15	City Street	147
Church	17	Other	147
Group Camp/Outdoor Facility	19	Avalon Health Care	192
Dodge Ridge	21	Office Business	253
Board and Care Facility	25	Highway (108, 132, 120, 49)	316
Park/Ball Field	26	County Road	321
Other Waterway	27	SRMC	1341
Campground	33	Residence	3439
Chicken Ranch Bingo	36		

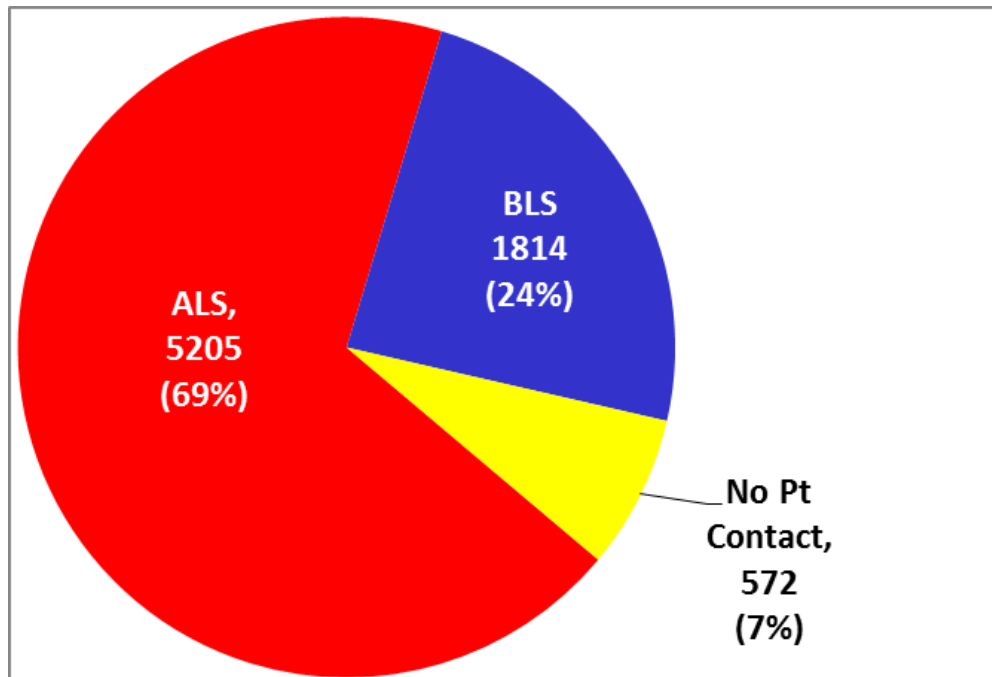
Calls by Type

In 2016, scene emergencies accounted for 82% of the total EMS requests for service. Transfers make up the remaining 18% of EMS requests for services.



Level of Care

69% of all requests for service resulted in the delivery of advanced life support (ALS) procedures and/or medications administered to the patient. No Patient Contact includes calls that were cancelled enroute and "Other".



2016 Calls by Call Disposition

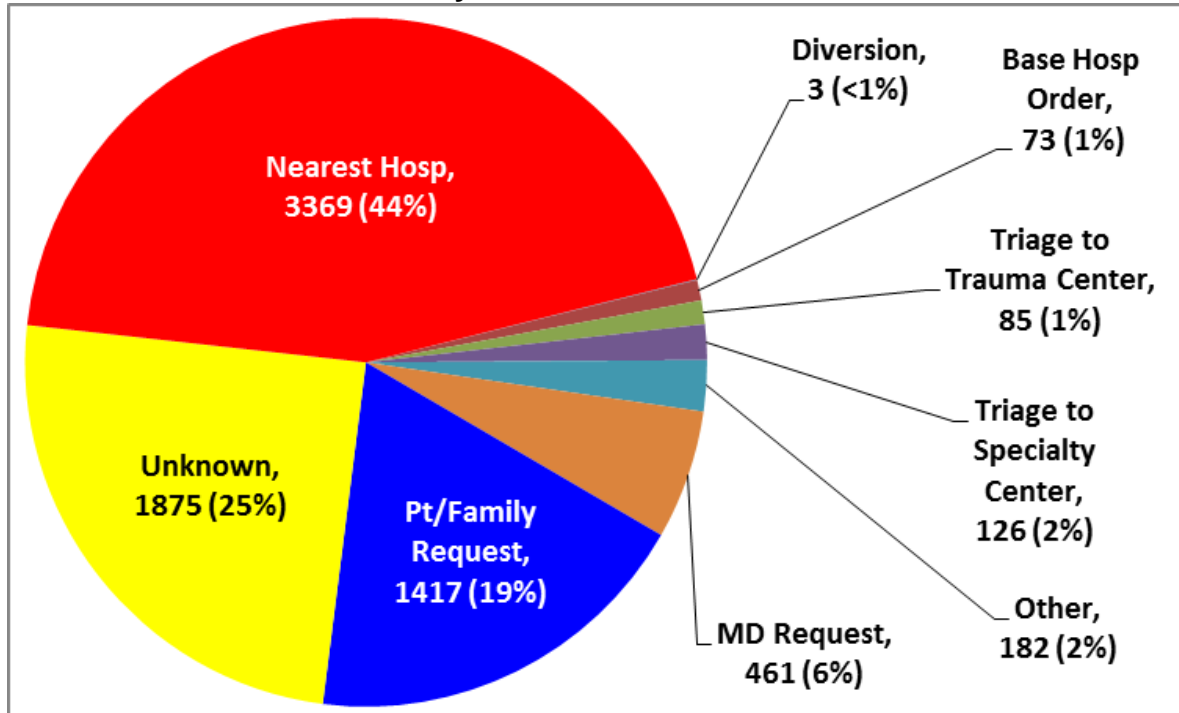
Transport by another Amb	5 (<1%)	Pt Released from Scene	162 (2%)
Transport to Other Location	16 (<1%)	No Pt Contact Made	166 (2%)
Transport to Non-Hosp Med Facility	27 (<1%)	Call Cancelled Enroute	249 (3%)
Unknown	31 (<1%)	Transport to a SNF	255 (3%)
Transport to Rendezvous Point	93 (1%)	Transport to Hosp (non-ED)	277 (4%)
Transport Residence	98 (1%)	Refused AMA	577 (8%)
Dead On Scene	104 (1%)	Transport to ED	5383 (71%)
Other	148 (2%)		

PATIENT DISTRIBUTION

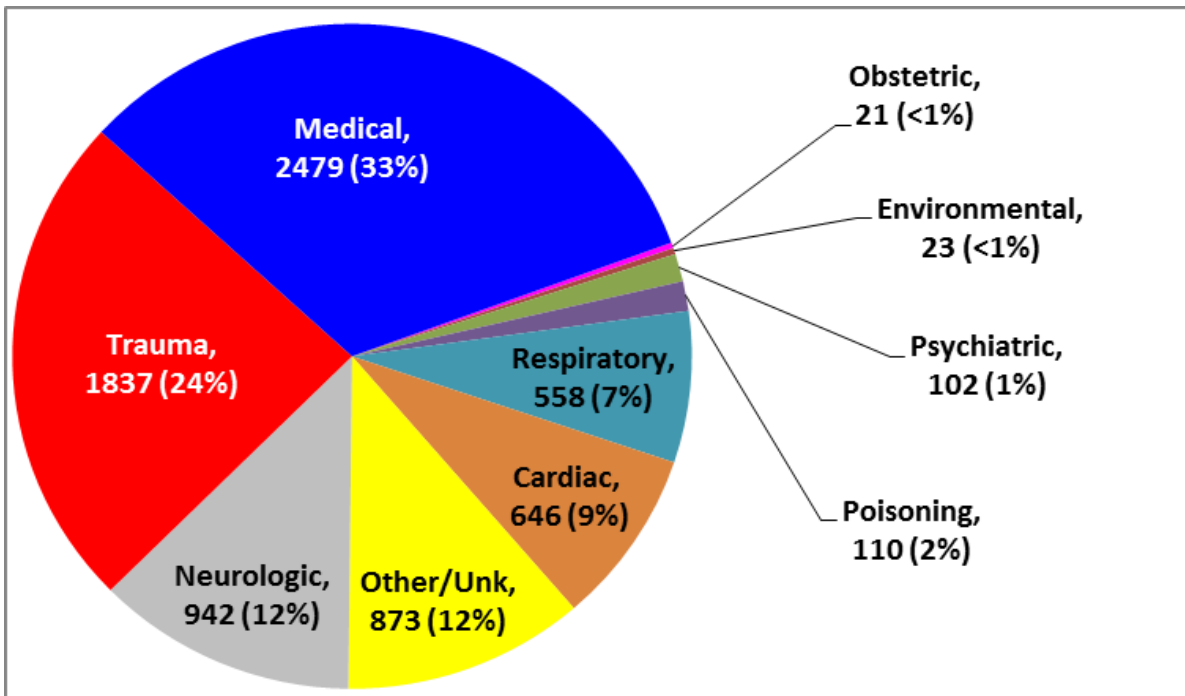
The chart below shows the patient distribution by receiving facilities,
including transfers.

Central California Children's Hosp	1	Mercy General Hosp	3
Clovis Community Hosp	1	Other San Francisco Co. Hosp	3
Dameron Hosp	1	St Joseph's Medical Center	3
Kaiser Hosp, Sacramento	1	Valley Children's Hosp	3
Kaiser Hosp, South Sacramento	1	Kaiser Hosp of Manteca	6
Kaiser Santa Clara	1	Mt Diablo Hosp	6
Mercy Hosp, Merced	1	VA Medical Center Palo Alto	7
Other Alameda Co. Hosp	1	Other Fresno Co. Hosp	9
Other Contra Costa Co. Hosp	1	San Joaquin General Hosp	10
Other Napa Co. Hosp	1	Oak Valley Hosp	11
Other Sacramento Co. Hosp	1	California Pacific Medical Center	17
Other San Mateo Co. Hosp	1	Stanford University Hosp	20
San Jose Medical Center	1	U.C.S.F. Medical Center	26
Shriner's Hosp Sacramento	1	Oakland Children's Hosp	34
St Joseph's Behavioral Health	1	U.C. Davis Medical Center	49
Sutter Roseville Medical Center	1	Modesto Rehabilitation Hosp	72
Mark Twain-St. Joseph's	2	Other Hosp Not Listed	87
Mercy San Juan Hosp	2	Memorial Medical Center	164
Other Santa Clara Co. Hosp	2	Doctors Medical Center	507
Sequoia Hosp	2	SRMC	4653
Lucile Packard Children's Hosp	3		

2016 Calls by Destination Decision Reason



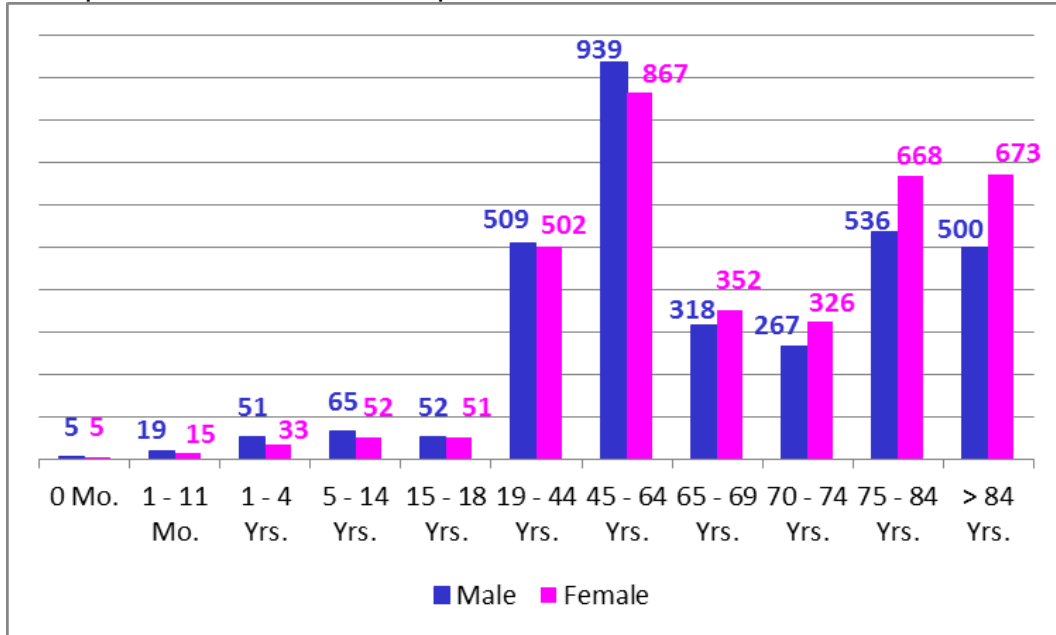
2016 Calls by Patients Primary Illness/Injury Type



Poisoning category does not differentiate between accidental and intentional ingestion or overdose. Nor does it differentiate between prescription and illicit drugs. Medication reactions and anaphylaxis are included in the Medical category.

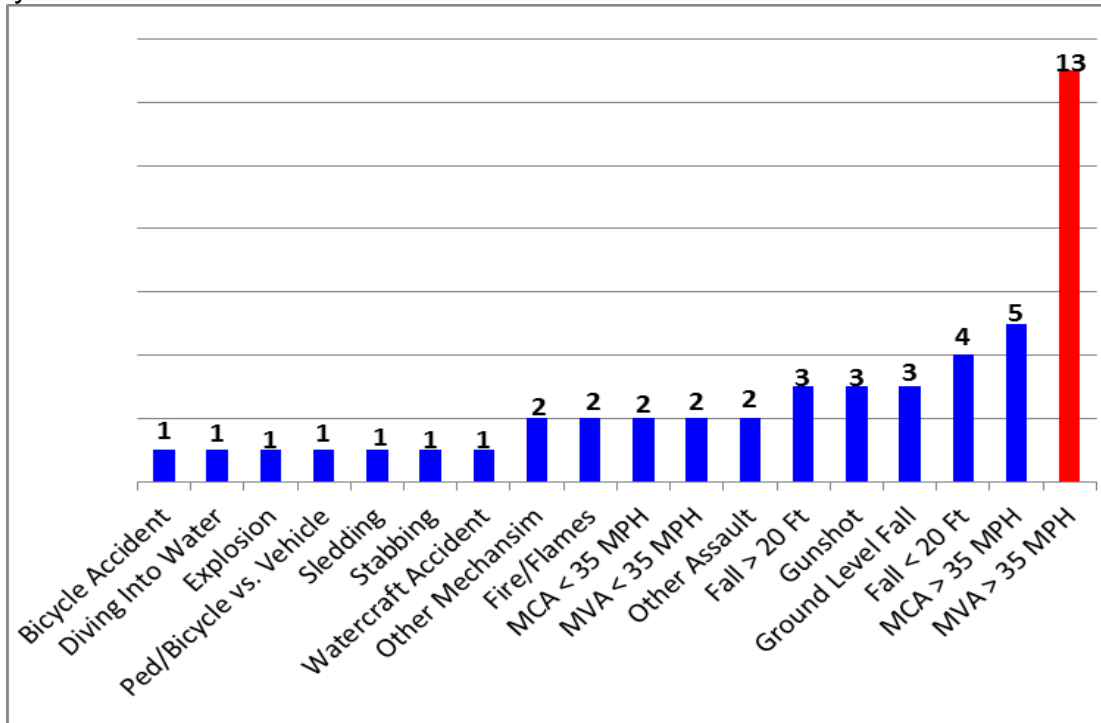
2016 EMS Demographics

The average age of EMS patients is 61 for males, 64 for females and 62.5 overall. Males comprise 48% of ambulance patients and 52% are females.

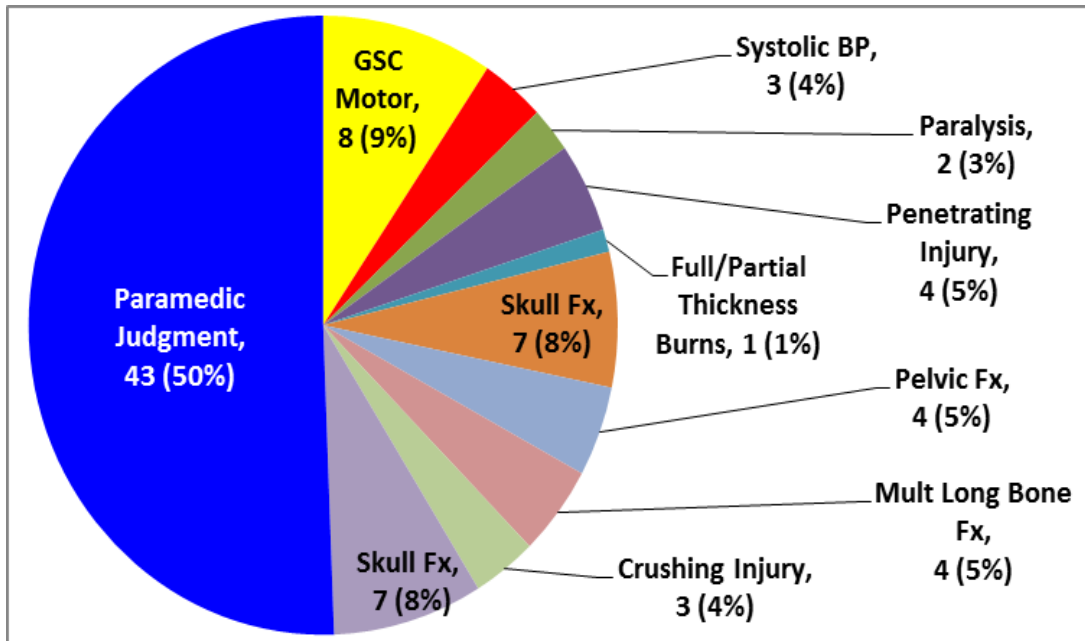


TRAUMA SYSTEM

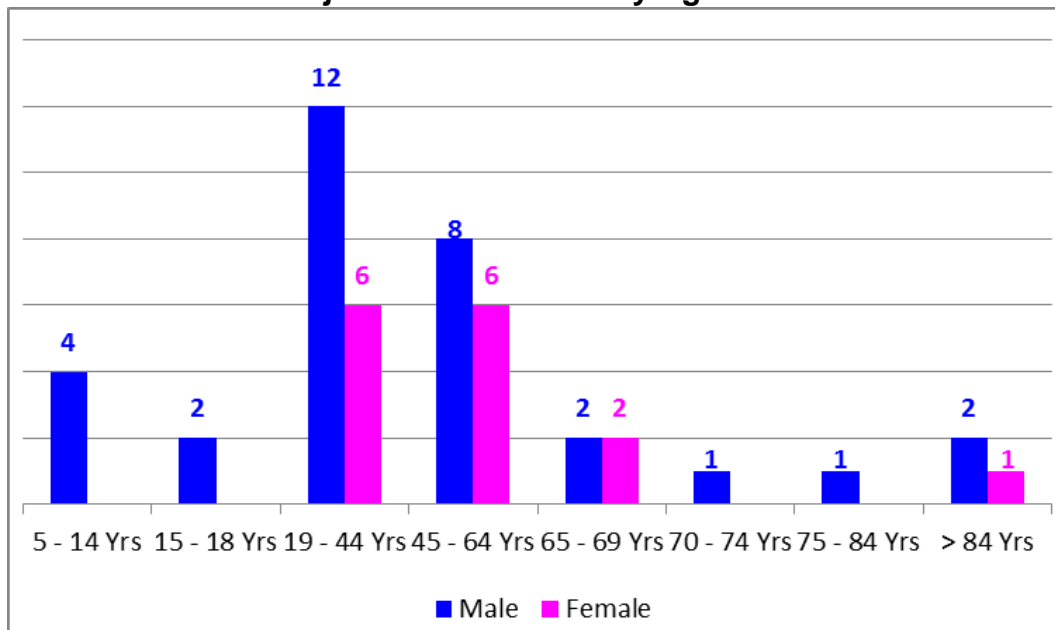
The chart below shows the mechanism of injury for major trauma victims in Tuolumne County in 2016.



The Tuolumne County Trauma Plan has defined ten separate trauma triage criteria. The criteria are designed to categorize those trauma patients with an increased risk of mortality and morbidity due to their injuries. Paramedic judgment was the criteria used 50% of the time.

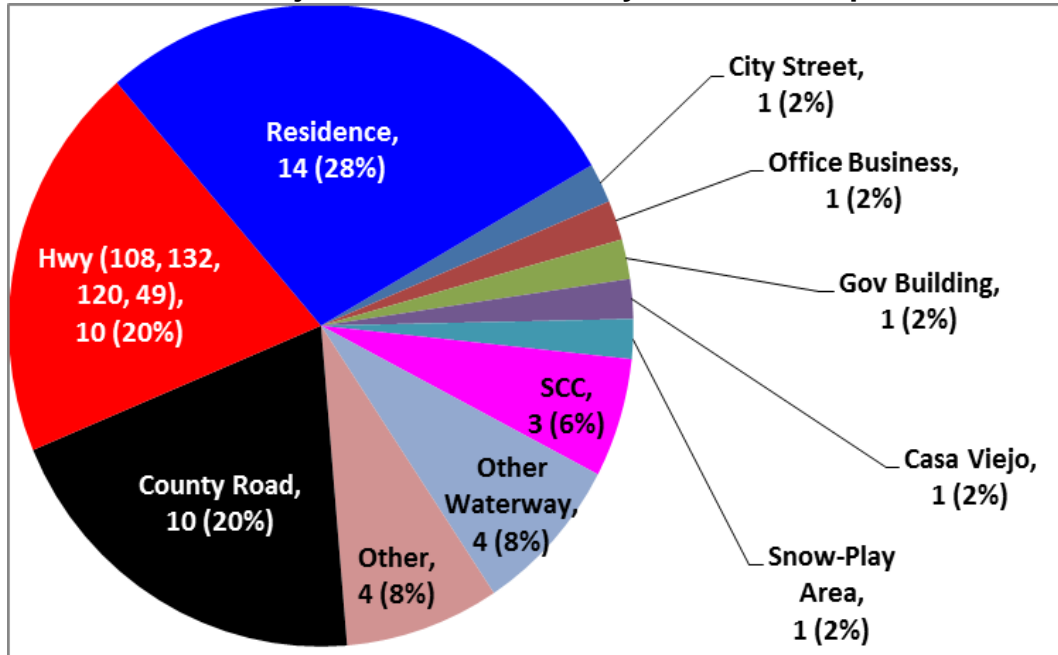


2016 Major Trauma Patient by Age & Gender

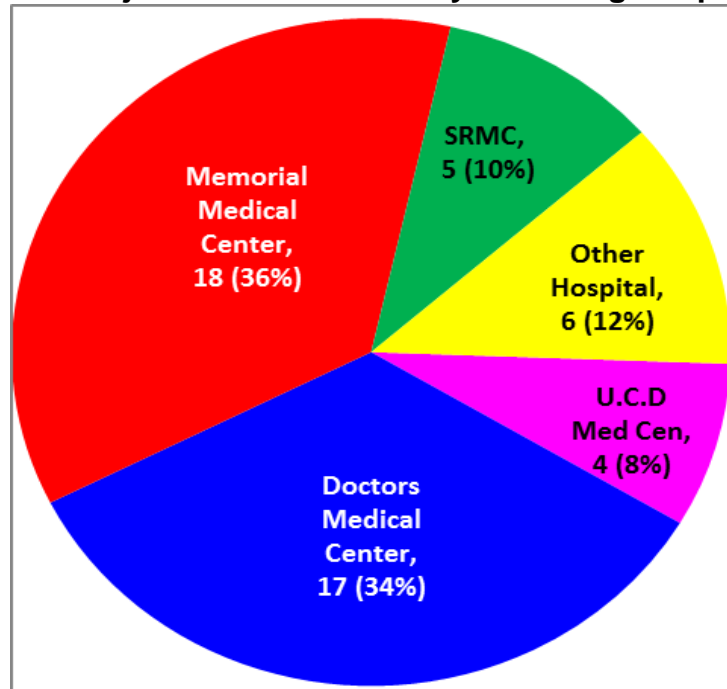


The average age of the Major Trauma patients is 43 for males, 50 for females and 45 overall. Males comprise 68% of ambulance patients and 32% are females.

2016 Major Trauma Patients by Scene Description



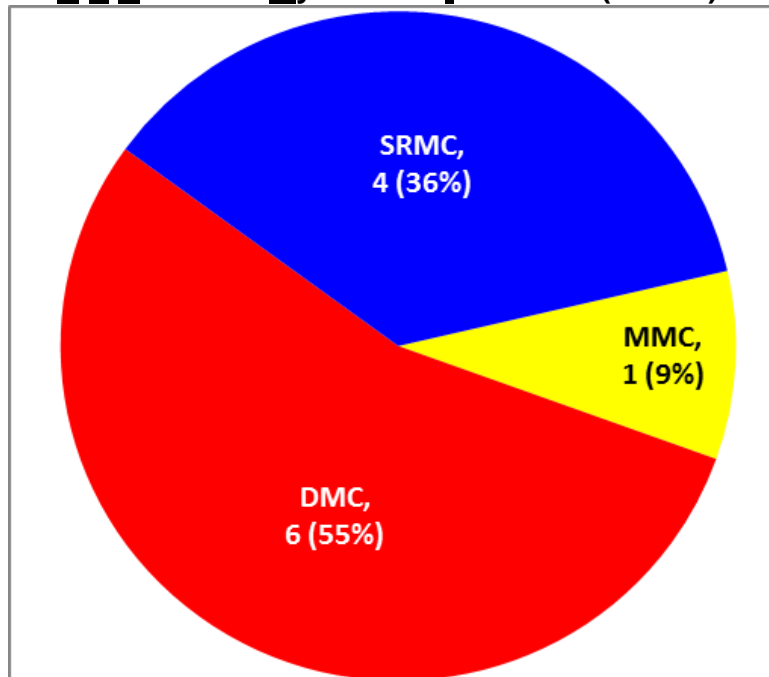
2016 Major Trauma Patients by Receiving Hospital



The Tuolumne County Trauma Plan has identified three major trauma patient destinations.

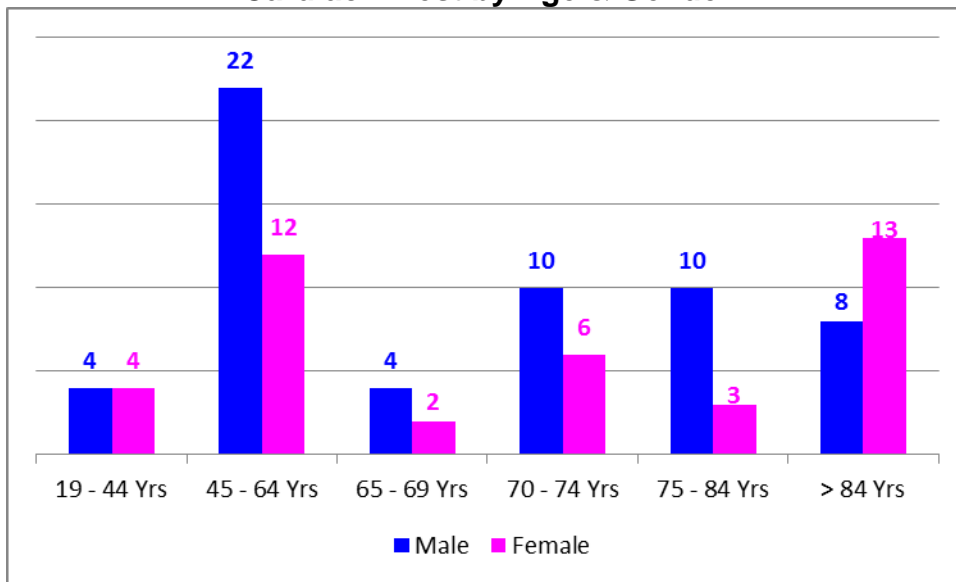
1. Doctors Medical Center (adult)
2. Memorial Medical Center (adult)
3. U.C. Davis Medical Center (adult & pediatric)

S-T Elevation Myocardial Infarction (STEMI)



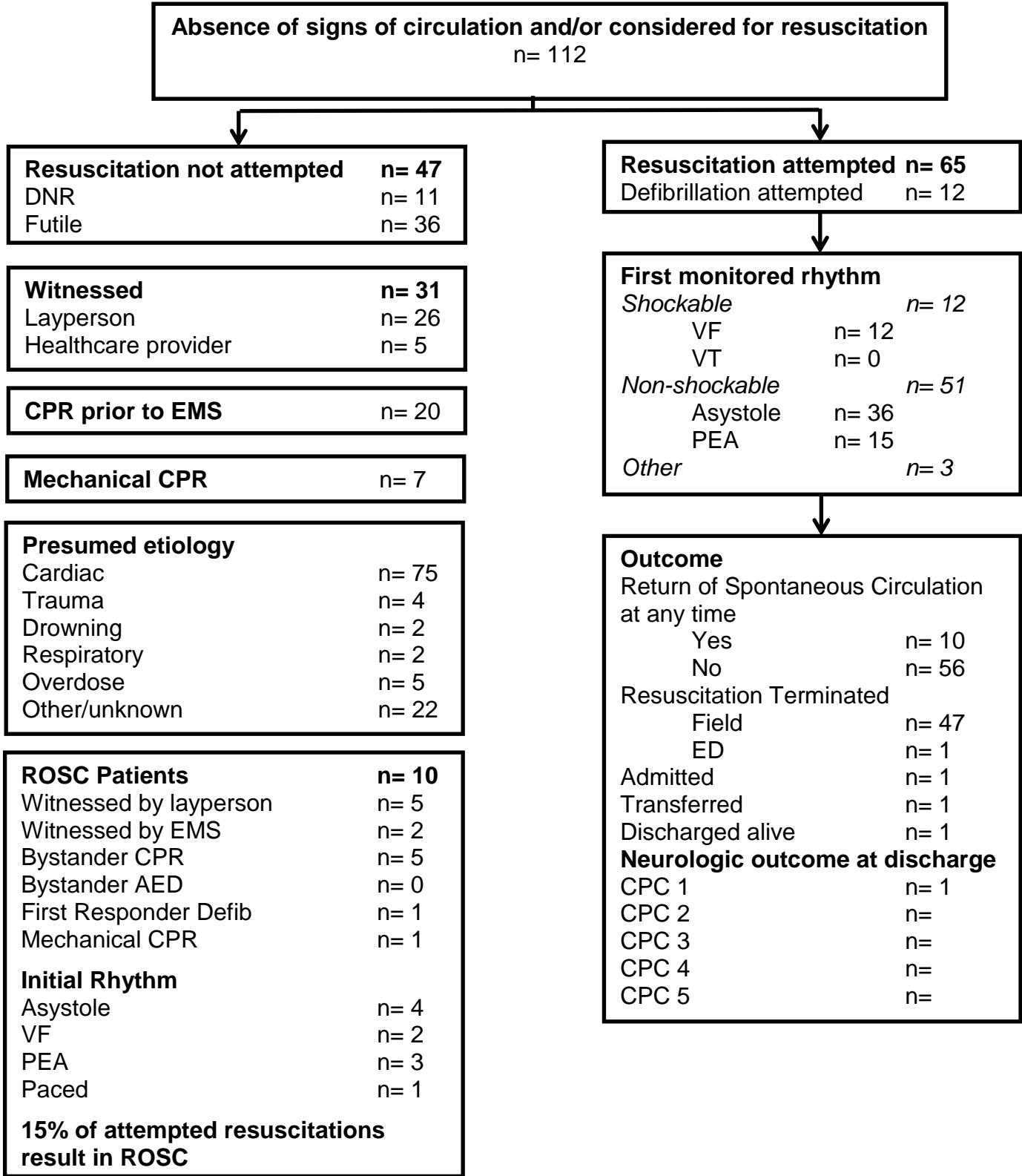
In 2016, 11 patients met the STEMI triage criteria; 4 of them were transported to SRMC by ground ambulance, 6 were transported to Doctors Medical Center and 1 was transported to Memorial Medical Center. Males comprised 82% of STEMI patients, 18% female. The average age of STEMI patients was 67 years old.

CARDIAC ARRESTS **Cardiac Arrest by Age & Gender**



In 2016, males comprise 60% of cardiac arrest victims. The average age was 64 years for males, 70 years for females, 66 years overall.

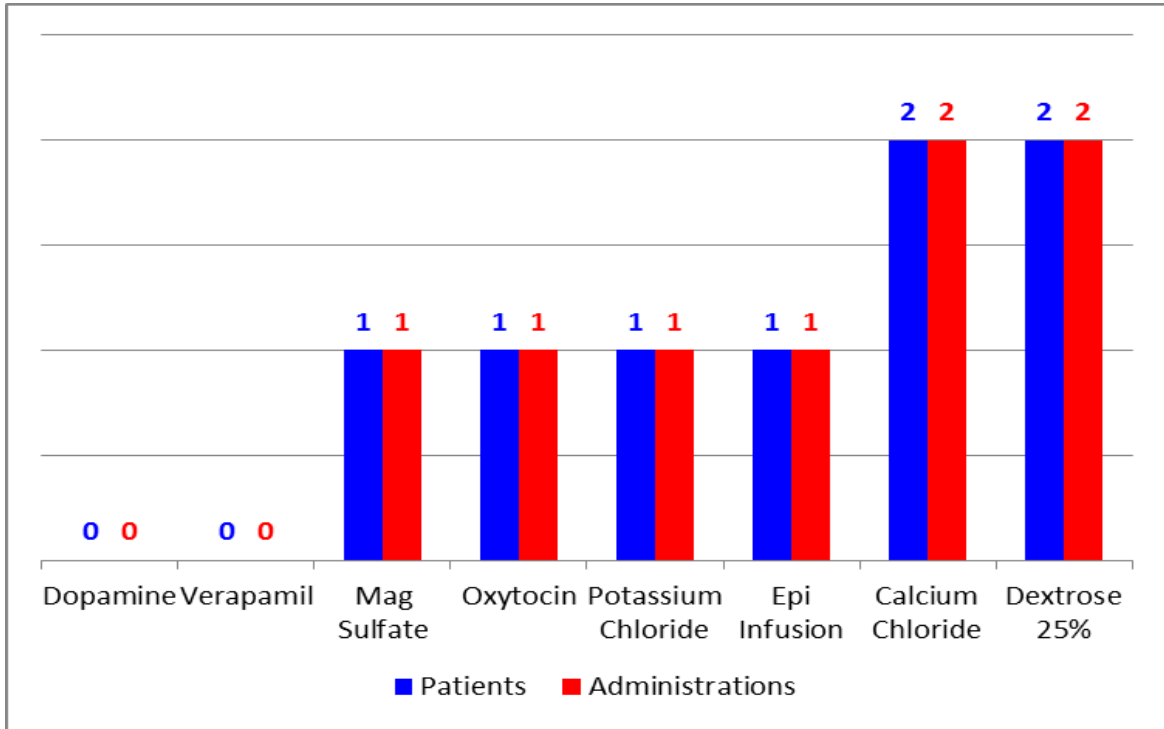
**2016 Cardiac arrest Outcomes
(Utstein Reporting Method)**



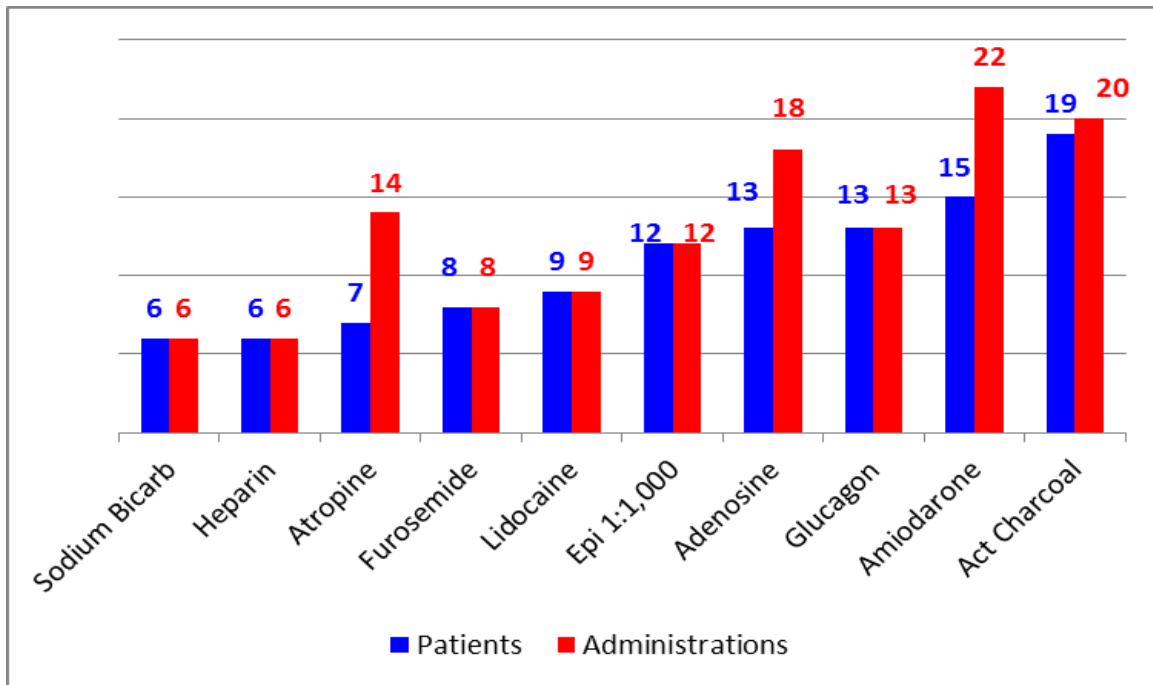
ALS MEDICATIONS

The charts below represent the number of times a medication was administered and how many patients received the medication.

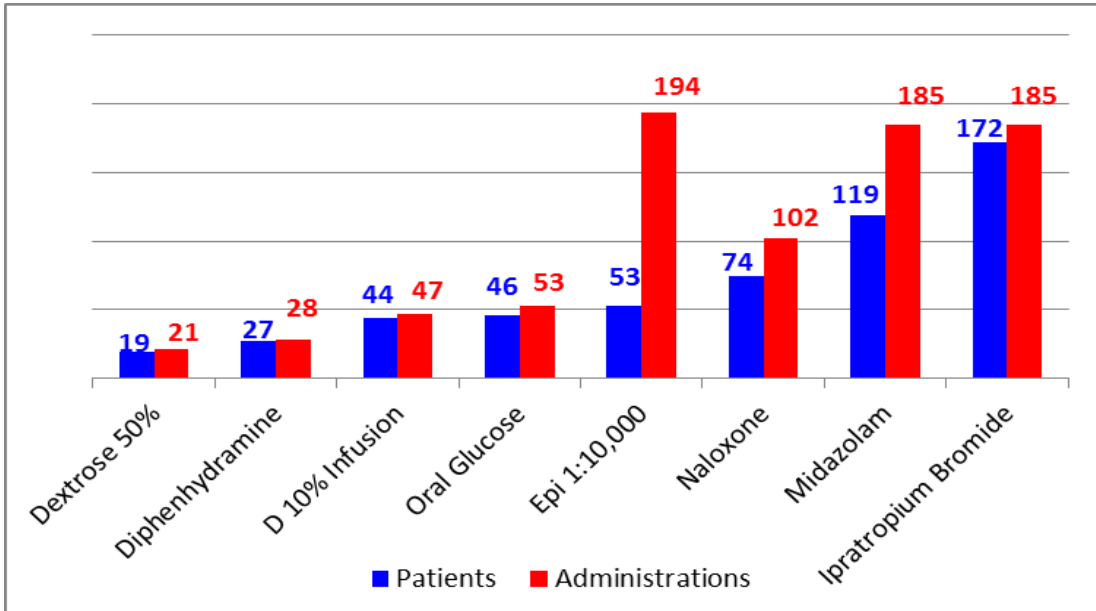
2016 Medications by Patients & Administrations Chart #1



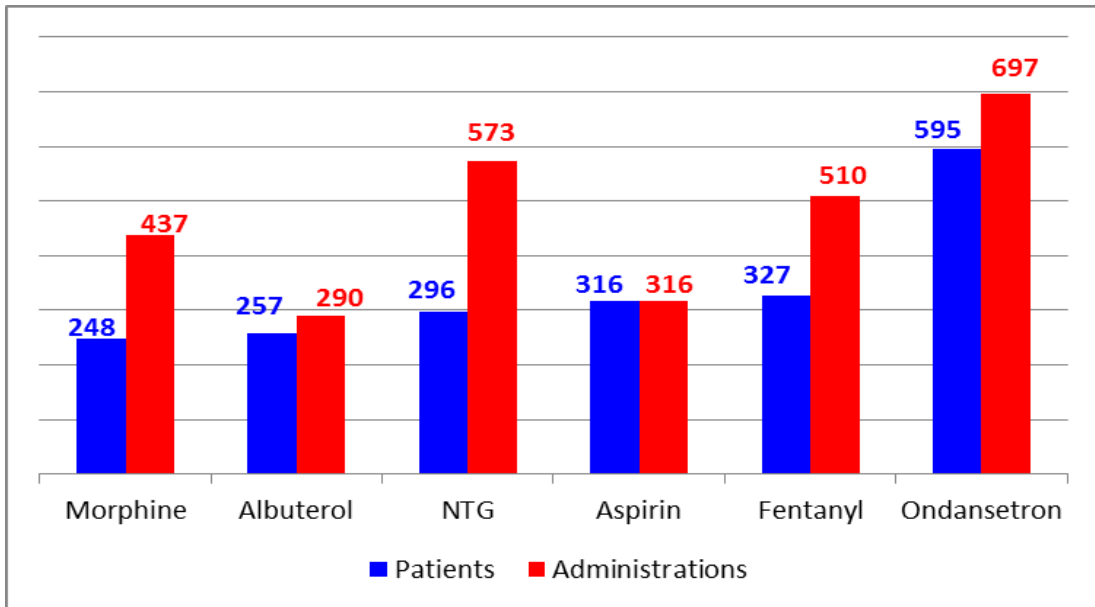
2016 Medications by Patients & Administrations Chart #2



2016 Medications by Patients & Administrations Chart #3



2016 Medications by Patients & Administrations Chart #4



SUMMARY

I would like to thank Tuolumne County Ambulance Service for providing the data that made this report possible. I would also like to thank all of the First Response Agencies, and PHI Air Medical for the excellent service they provide to the County of Tuolumne.

The Tuolumne County EMS System remains a strong asset to the County, its citizens and visitors. The eleven-year trend shows a general increase in calls for EMS service, particularly along the Highway 108 corridor.