EMS Core Measures Project

Reporting Capability of EMSA and LEMSA Data Systems

and

Results from Performance Measures

Data Year 2014

With Comparison to Years 2012 and 2013

October 2015

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EMS Core Measures Project, Reported 2014:
Reporting Capability of EMSA and LEMSA Data Systems and Results from Clinical Measure Reports

Introduction

Emergency medical services (EMS) provide timely and appropriate emergency medical care and transportation of the ill and injured, thereby reducing morbidity and mortality. EMS is an integral part of every community's emergency health care delivery system, and quality improvement (QI) practices must become an essential part of EMS systems. Evaluation of standard clinical and response performance indicators is a crucial component of a quality improvement program to ensure that EMS services operate safely and effectively and follow evidence based clinical practices to maximize outcomes.

Robust data systems, with the ability to report clinical indicators and performance measures, are a key tool to accomplish QI activities. The continuum of care from dispatch to pre-hospital to hospital disposition must be connected in order to optimally evaluate patient outcomes.

Background and Authority

California is a large, diverse state with a two-tier regulatory system consisting of State Emergency Medical Services Authority (EMSA) and 33 local EMS agencies (LEMSA). California statute (Health and Safety Code 1797.103) maintains that one of the required elements of an EMS system is data collection and evaluation, and mandates the establishment and development of quality improvement guidelines. Local EMS agencies are required to plan, implement, and evaluate an EMS system (CCR Title 22 Division 9 Chapter 12). As such, they are charged with the responsibility for establishing a data collection system and setting data and QI standards at the local level. Additionally, the EMS system QI regulations define the requirements for LEMSAs, EMS service providers, and base hospitals. These requirements include, but are not limited to, the implementation of an EMSA approved EMS Quality Improvement Program (requiring data reporting) and the use of defined indicators to assess the local EMS system as defined in CCR, Title 22, Division 9, Chapter 4, Section 100147, 100169, 100170.

Methodology

A task force consisting of key data and quality leaders from local EMS agencies, medical directors, hospitals, and pre-hospital EMS providers assisted in the development of these core measures (17 clinical and 3 related to response and transport). The measures are based on evidence-based processes and treatments for a condition or illness. Core measures are intended to help EMS systems improve the quality of patient care by focusing measurement specifications on key processes and results of care. The California EMS System Core Quality Measures, EMSA 166, Appendix E defines the specific data elements and instructions for reporting each measure. The measures are refined each year to improve results. For example, changes were made to the both of the trauma measures (TRA-1 and TRA-2) to be more consistent with the CDC Trauma Triage Criteria.

LEMSA participation in the statewide EMS data system, California Emergency Medical Services Information System (CEMSIS), is required consistent with HSC 1797.102 in providing the EMS Authority with information necessary to access the effectiveness of emergency medical services in each EMS area or the system's service area. The EMS Authority tasked the LEMSAs with the extraction and submission of core measure reports based on their local databases. Each of the 33 LEMSAs maintains their databases independent of one another, resulting in variability in their ability to report core measures and some intrinsic variation in validity. While sampling is an approved mechanism for the LEMSAs to calculate core measure values and has been done in the past, no LEMSAs reported sampling this year.

Limitations and Challenges

Core measure reporting is a recent project that depends on the development of compatible data systems at several levels of the EMS system and will take several more years to achieve the level of confidence of other healthcare sector quality assessment reporting. EMSA plans to continue to work on these measures to improve the validation, data collection, and reporting processes and to connect them to "best practices". The LEMSAs encounter challenges in reporting the core measures to EMSA, which are enumerated below. Of the 33 LEMSAs, 31 were able to report at least one clinical measure for 2014 data. A national initiative began in 2015 to develop performance measures with several California representatives on various committees. With the upcoming transition to NEMSIS 3, EMSA expects an increase in the quality of data collected and improvements to reported values for the performance measures.

Data Collection and Reporting Limitations

New data systems - Some of the LEMSAs recently migrated to new data systems and the prior data were no longer available or the LEMSA was unable to incur the costs of retrieving the data. This problem was noted in the first year of the project, and has continued to be a barrier in the second and third years as others transition.

Variability in data collection methodology – In a 2013 Health Information Exchange Readiness Survey conducted by Lumetra, ten of 32 EMS systems reported use of paper-based pre-hospital care reports (PCR) by at least one provider in their region. Abstracting information from paper forms is difficult, time-consuming, and not necessarily accurate. This has been a significant barrier in the first three years and will continue to be a problem until all providers and LEMSAs are using

electronic patient care record (ePCR) with software that has a high degree of technological sophistication, including rules that forces users to complete forms before closing the record.

Hospital Outcome Data – One of the clear challenges identified this year, as in the first two years, was the difficulty in obtaining hospital outcome data on every ambulance transport. Several measures rely on the hospital to report survival to emergency department discharge and survival to hospital discharge. While the response rate increased for specific cardiac arrest outcome measures (CAR- 3 and CAR-4), EMSA and the LEMSAs must continue efforts to acquire this information.

Transition from NEMSIS 2 to 3

This transition is a lengthy and costly process that directly impacts specific data definition. Most importantly, it will hinder the ability to conduct comparative analysis due to the variance in how quickly each LEMSA moves to NEMSIS 3.

Project Design Limitations

Aggregate data - The data provided are aggregated summary data reported by each LEMSA, which limits the types of analyses that can be done. More in-depth statistical analyses could be performed if patient-level data were collected and analyzed by EMSA.

Data quality and reliability -There are many differences in data collection and reporting practices across LEMSAs. This lack of data standardization and consistency further limits reliability and comparability of the measures reported by each LEMSA. Though all LEMSAs were given the same specifications to calculate the measures, not all are able to adhere to these due to constraints and inconsistencies in data collection and measure calculation methods. Greater data standardization will lead to results with greater validity and comparability. Unless data quality checks or audits are performed by LEMSAs before measures were calculated and submitted, the accuracy of the data cannot be ascertained. This is compounded where there is manual data entry.

Documentation by Non-Trained Providers - EMS field personnel did not receive core measures specific training prior to data entry. Consequently, responders likely did not consistently record all the data elements required for core measures. Additional education and training will reduce this problem. EMSA will work with the LEMSAs to alert providers of the specific elements in core measures data to ensure that those fields are properly populated. New ePCR software has rules that can mandate and can limit values for key fields. This can be integrated into quality improvement plans to help with quality assurance in the future. Optimally these will be standardized statewide.

Patient Records in Tiered EMS systems - One of the significant challenges of reporting EMS information is related to the dual EMS response system in most geographic areas. Two records are often initiated for each patient: one by EMS first responders and a second by ambulance transport units that arrive later. LEMSAs have not established a mechanism—either manually or technologically—to create an integrated record that captures the full treatment provided to a single patient. This inability to aggregate first responder data with transport provider data could lead to a conclusion that care was not provided, when in fact, it may have been provided to the patient by a different provider. This is a critical procedural issue and highlights the need for a "one patient, one

record" system to allow for a complete picture of patient care. EMSA, LEMSAs, and providers continue to explore potential solutions to this challenge.

Partial System Representation – Only a portion of the actual EMS business conducted in California is represented in this report. Since not all providers are using electronic data collection (some providers are still using paper patient records), the values reported by the LEMSAs are not representative of 100% of the providers in the state. EMSA is working with the LEMSAs to assist the providers in shifting from paper patient care records to ePCR systems. One way this is being done is through local assistance grant opportunities.

In future years, system improvements that will facilitate data collection and more accurate reporting include:

1. Additional LEMSAs successfully exporting data to CEMSIS
2. CEMSIS accumulating sufficient records to generate reports on core measures
3. Transition from NEMSIS Version 2 to NEMSIS Version 3, an updated national data dictionary.

Improvements
While the number of LEMSAs who submitted core measure values to EMSA was the same as the prior year (31/33 submitting at least one clinical measure), the number of measures that each LEMSA reported increased dramatically (see Chart 2 "Histogram"). Each core measure, excluding CAR-3, saw an increase in the number of LEMSAs able to report that measure.

The following 8 (eight) measures experienced an increase in their median reported value from the previous year:
- ACS-2
- ACS-3
- ACS-5
- STR-2
- STR-5
- RES-2
- PAI-1
- SKL-2

Tables, Charts and Graphs Generated from LEMSA Reporting of Core Measures

LEMSAs Reporting Data for Any Core Measures (Table 1):
Table 1 shows which LEMSAs submitted any core measures for data years 2009-2014. If a LEMSA was able to submit a value for any of the 17 clinical measures or the 3 (three) Response and Transport measures found in California EMS System Core Quality Measures, EMSA 166, Appendix E, the cell associated with that data year will be populated with an "X" and will be filled green. For LEMSAs that did not submit any core measure information to EMSA, their cell for that corresponding year appears white. As with 2013 data, 32/33 LEMSAs reported at least one measure.

Clinical Measures Response Count, Denominator Total, Submission Rate, Average, and Median as Reported by LEMSA (Table 2):
This table features the number of LEMSAs who reported a value for the specific clinical measure, the denominator total (number of patient records) of all responses, Submission Rate, Average Reported Value, and Median Value for all responses. This table includes 2012, 2013 and 2014 information.

Frequency Histogram of LEMSA Number of Responses to Clinical Measures (n=17) for 2012-2014 (Chart 1) and **LEMSA Response Count to 17 Clinical Measure for 2014 Data (Chart 2)**
The histogram shows the LEMSAs ability to report the 17 clinical measures. It features the number of LEMSAs able to respond to the clinical measures grouped ranges as follows: 17-15, 14-12, 11-9, 8-6, 5-3, 2-0. Each of the 33 LEMSAs is tallied in one of these groups based on how many clinical measures they were able to report. Chart 2 illustrates the number of clinical measures each of the LEMSAs were able to report and is organized alphabetically.

Clinical Measure Results:
This report includes the LEMSA responses to the clinical measures as they were reported to EMSA. Each measure includes a graph (based on the reported value provided by each LEMSA and the median value for all submissions ("Part 1 of 2"). On the following page ("Part 2 of 2") the report features a table of the reported values for the clinical measure as well as the denominator population considered for this measure. The table is populated directly from the values provided to EMSA by the LEMSAs. If a LEMSA was unable to report a measurement or denominator value, the cell in that row will be contain no value and is shaded grey. In addition, "Part 2 of 2" features the LEMSA response count, Denominator Total, Submission Rate, Average Reported Value, and Median Value for all responses. The median values for the prior year's reporting are found in the top right corner of the page, and a yellow box features some commentary on the measure and responses.

LEMSAs Reporting Data for Any Core Measure (Table 1)
Core Measure Reporting by LEMSA

	2009	2010	2011	2012	2013	2014
Alameda County EMS		X	X	X	X	X
Central California EMS	X	X	X	X	X	X
Coastal Valleys EMS				X	X	X
Contra Costa County EMS		X	X	X	X	X
El Dorado County EMS				X	X	X
Imperial County EMS						
Inland Counties EMS	X	X	X	X	X	X
Kern County EMS		X	X		X	X
Los Angeles County EMS	X	X	X	X	X	X
Marin County EMS		X	X		X	X
Merced County EMS	X	X	X	X	X	X
Monterey County EMS		X	X	X	X	X
Mountain Valley EMS		X	X	X	X	X
Napa County EMS					X	X
North Coast EMS		X	X	X	X	X
Northern California EMS	X	X	X	X	X	X
Orange County EMS					X	X
Riverside County EMS		X	X	X	X	X
Sacramento County EMS		X	X	X	X	X
San Benito County EMS					X	X
San Diego County EMS		X	X	X	X	X
San Francisco EMS	X	X	X	X	X	X
San Joaquin County EMS				X	X	X
San Luis Obispo County EMS		X	X		X	X
San Mateo County EMS		X	X	X	X	X
Santa Barbara County EMS	X	X	X		X	X
Santa Clara County EMS	X	X	X	X	X	X
Santa Cruz County EMS	X	X	X		X	X
Sierra-Sacramento Valley EMS	X	X	X	X	X	X
Solano County EMS				X	X	X
Tuolumne County EMS		X	X	X	X	X
Ventura County EMS		X	X	X	X	X
Yolo County EMS					X	X
Total Measure Responses (includes both clinical and response and transport measures)	10	24	24	23	32	32

Reported At Least 1 Measure
No Measures Submitted

Clinical Measures Response Count*, Denominator Total, Submission Rate, Average, and Median as Reported by LEMSA (Table 2)

Measure Response Count, Submission Rate, Average, and Median

2012

Measure ID	TRA-1	TRA-2	ACS-1	ACS-2	ACS-3	ACS-5	CAR-2	CAR-3	CAR-4	STR-2	STR-3	STR-5	RES-2	PED-1	PAI-1	SKL-1	SKL-2
Response Count	17	17	22	22	20	21	21	11	10	22	20	16	21	20	16	21	20
Denominator Total	14918	12185	90238	75642	11523	11598	10023	7991	7446	33872	34197	20822	52807	2829	135417	9130	6100
Submission Rate (n=32)	51.52%	51.52%	66.67%	66.67%	60.61%	63.64%	63.64%	33.33%	30.30%	66.67%	60.61%	48.48%	63.64%	60.61%	48.48%	63.64%	60.61%
Average	0:22:40	68.91%	60.36%	71.21%	0:23:00	79.56%	23.56%	24.01%	10.87%	66.02%	0:21:49	55.39%	56.28%	60.98%	53.44%	79.23%	72.51%
Median	0:21:48	70.30%	57.23%	78.80%	0:23:36	92.00%	25.00%	24.00%	10.62%	76.12%	0:22:24	72.67%	64.00%	68.80%	36.70%	80.45%	85.32%

25 Total Submissions considered in this table

2013

Measure ID	TRA-1	TRA-2	ACS-1	ACS-2	ACS-3	ACS-5	CAR-2	CAR-3	CAR-4	STR-2	STR-3	STR-5	RES-2	PED-1	PAI-1	SKL-1	SKL-2
Response Count	23	25	27	28	28	27	27	12	11	27	26	20	27	27	19	25	22
Denominator Total	16382	9481	108544	118811	13587	11316	16825	14242	14026	34364	31196	23389	62830	5254	131130	11930	10032
Submission Rate (n=33)	69.70%	75.76%	81.82%	84.85%	84.85%	81.82%	81.82%	36.36%	33.33%	81.82%	78.79%	60.61%	81.82%	81.82%	57.58%	75.76%	66.67%
Average	0:22:20	70.01%	65.51%	75.90%	0:22:36	75.56%	28.90%	28.82%	10.82%	81.88%	0:21:03	69.80%	58.48%	56.96%	45.18%	74.61%	71.34%
Median	0:22:00	82.00%	67.34%	80.80%	0:22:44	91.53%	25.25%	30.12%	11.53%	87.00%	0:20:10	86.00%	61.59%	64.18%	33.23%	75.57%	78.86%

31 Total Submissions considered in this table

2014

Measure ID	TRA-1	TRA-2	ACS-1	ACS-2	ACS-3	ACS-5	CAR-2	CAR-3	CAR-4	STR-2	STR-3	STR-5	RES-2	PED-1	PAI-1	SKL-1	SKL-2
Response Count	28	27	31	31	29	28	30	12	12	31	30	21	29	29	22	30	29
Denominator Total	59496	108682	111161	109520	9396	7826	16759	8773	9637	32810	31483	25478	79440	5453	117381	9898	7605
Submission Rate (n=33)	84.85%	81.82%	93.94%	93.94%	87.88%	84.85%	90.91%	36.36%	36.36%	93.94%	90.91%	63.64%	87.88%	87.88%	66.67%	90.91%	87.88%
Average	0:24:21	61.90%	66.55%	81.48%	0:21:22	87.82%	27.68%	27.00%	9.26%	80.09%	0:21:20	74.55%	60.47%	54.34%	41.65%	71.68%	74.60%
Median	0:24:30	81.02%	63.00%	87.86%	0:21:37	96.86%	24.54%	23.50%	8.51%	89.80%	0:20:43	93.00%	67.69%	60.62%	39.00%	72.87%	91.00%

31 Total Submissions considered in this table

*Response Count is defined as the number of LEMSAs who submitted a reported value for the specific measure

Thirteen of the seventeen measures had a 75% response rate or greater. The following measures were reported by at least 25 of 33 LEMSAs (75%):

1. TRA-1 Scene time for trauma patients
2. TRA-2 Direct transport to designated trauma center for trauma patients meeting criteria
3. ACS-1 Aspirin administration for chest pain/discomfort rate
4. ACS-2 12 lead ECG performance
5. ACS-3 Scene time for suspected heart attack patients
6. ACS-5 Direct transport to designated STEMI receiving center for suspected patients meeting criteria
7. CAR-2 Out-of-hospital cardiac arrests return of spontaneous circulation
8. STR-2 Glucose testing for suspected acute stroke patients
9. STR-3 Scene time for suspected acute stroke patients
10. RES-2 Beta2 agonist administration for adult patients
11. PED-1 Pediatric patients with wheezing receiving bronchodilators
12. SKL-1 Endotracheal intubation success rate
13. SKL-2 End-tidal CO_2 performed on any successful endotracheal intubation

Measures with the lowest response rate include:

14. CAR-3 Out of hospital Cardiac Arrest Survival to Emergency Department Discharge
15. CAR-4 Out of hospital Cardiac Arrest Survival to Hospital Discharge
16. PAI-1 Pain intervention
17. STR-5 Direct transport to stroke center for suspected acute stroke patients meeting criteria

Additional, non-clinical measures absent from this report include:

18. RST-1 Ambulance response time by ambulance zone (emergency)
19. RST-2 Ambulance response time by ambulance zone (non-emergency)
20. RST-3 Transport of patients to hospital

LEMSA Responses to Clinical Measures

Of interest is how many clinical measures could be evaluated by the LEMSAs. Out of the seventeen clinical measures, 31 of 33 LEMSAs (93%) were able to report at least nine, based on their 2014 data.

The ability to report these measures is not indicative of a LEMSAs commitment to data collection or quality improvement. Rather, it is an indicator of the ability of the LEMSA data system to report retrospective clinical data, with the limitations previously mentioned.

Frequency Histogram of LEMSA Number of Responses to Clincal Measures (n=17) for 2012-2014 (Chart 1)
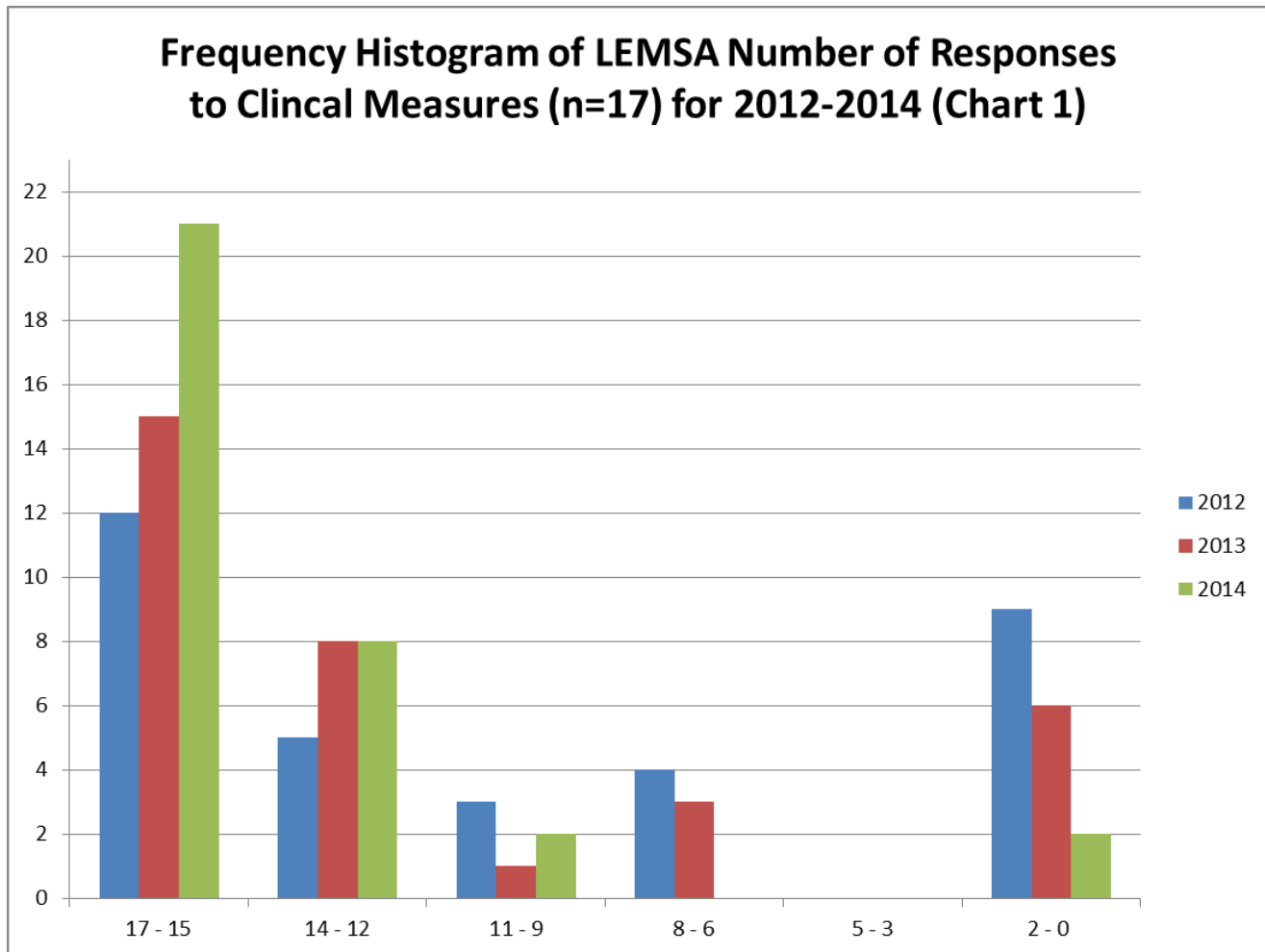
Count of LEMSA reporting a value noted in the calendar year

Bin	2012	2013	2014
17 - 15	12	15	21
14 - 12	5	8	8
11 - 9	3	1	2
8 - 6	4	3	0
5 - 3	0	0	0
2 - 0	8	6	2

LEMSA Response Count to 17 Clinical Measures for 2014 Data (Chart 2)
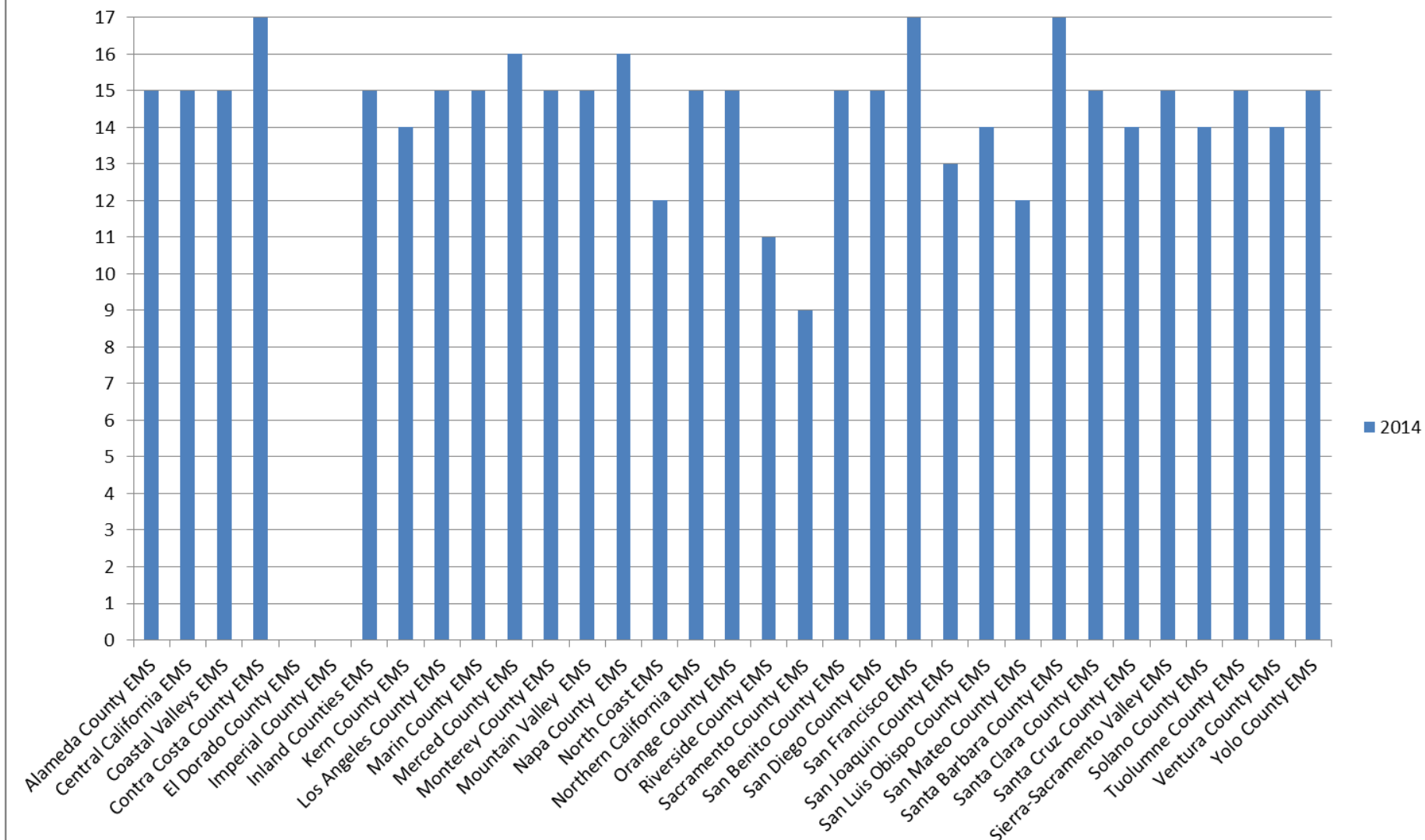
Note: This chart only displays the number of clinical measures each LEMSA was able to report and does not include the three (3) response and transport measures

Clinical Measure Responses

TRA-1: Scene Time for Trauma Patients – Part 1 of 2

Multiple factors impact the validity and analysis of these retrospective data, including but not limited to incomplete documentation, documentation not reflective of services provided prior to ambulance arrival, inconsistent data dictionary definitions between local jurisdictions, geographic resource disparities, and inability to collect hospital outcome data. This retrospective data have not been validated. These limitations caution against comparison between jurisdictions and limit the reliance of the aggregate values.

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	2014 Value	2014 Denom.
Sierra-Sacramento Valley	0:13:45	393
Los Angeles County	0:13:45	
Riverside County	0:18:41	57
Santa Clara County	0:20:00	5397
Tuolumne County	0:20:00	47
Marin County	0:20:30	
Orange County	0:20:48	174
San Joaquin County	0:21:34	1362
Solano County	0:21:38	3706
Ventura County	0:21:46	310
Contra Costa County	0:21:59	241
San Diego County	0:22:00	4780
Yolo County	0:23:26	17
Coastal Valleys	0:24:00	5942
North Coast	0:24:00	
Mountain Valley	0:24:59	10141
Santa Barbara County	0:25:00	746
Alameda County	0:25:15	
Merced County	0:25:24	719
San Luis Obispo County	0:25:37	51
Central California	0:26:03	10860
Napa County	0:26:06	2746
Inland Counties	0:26:16	1024
San Francisco	0:27:35	2273
Monterey County	0:28:13	5197
Santa Cruz County	0:28:15	
San Benito County	0:30:18	767
Northern California	0:31:00	1775
Kern County	0:37:37	771
Sacramento County		
San Mateo County		
El Dorado County		
Imperial County		

Empty grey cells indicate no value reported

Measure ID	TRA-1
Response Count	28
Denominator Total	59496
Submission Rate (n=33)	84.85%
Average	0:24:21
Median	0:24:30

Median Values
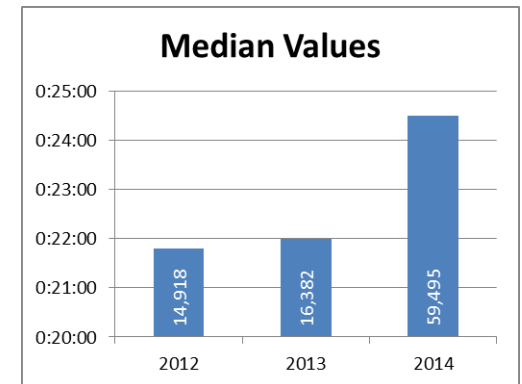
Of the 28 LEMSAs reporting these data for 2014, the median scene time was 24 minutes, 30 seconds. Adjustments were made for 2014 to the Trauma measures to analyze a larger population of trauma patients. Changes to the trauma measures include the removal of the revised trauma score to shift from examining those severely injured trauma patients, to all trauma patients meeting the CDC Trauma Triage Criteria. This likely accounts for the increase in median time.

The common expectation is for short scene times, targeted at 15 minutes, with rapid transport to remain within a "golden hour" for care in a hospital with surgical capability. Reported scene times may be influenced by extrication. Moreover, the Golden Hour concept and trauma response time have both been challenged in the literature.

TRA-2: Direct Transport to Designated Trauma Center for Trauma Patients Meeting Criteria – Part 1 of 2

Multiple factors impact the validity and analysis of these retrospective data, including but not limited to incomplete documentation, documentation not reflective of services provided prior to ambulance arrival, inconsistent data dictionary definitions between local jurisdictions, geographic resource disparities, and inability to collect hospital outcome data. This retrospective data have not been validated. These limitations caution against comparison between jurisdictions and limit the reliance of the aggregate values.

	2014 Value	2014 Denom.
San Joaquin County	99.85%	1362
Marin County	99.00%	78
Los Angeles County	97.53%	39330
Sierra-Sacramento Valley	97.00%	393
San Luis Obispo County	96.00%	51
Alameda County	94.00%	117
San Diego County	93.76%	7014
Ventura County	93.00%	310
Kern County	89.36%	4062
Orange County	84.00%	164
Contra Costa County	83.50%	241
Yolo County	82.40%	17
Santa Barbara County	82.00%	746
Santa Clara County	81.02%	8558
Napa County	74.29%	2746
Tuolumne County	58.00%	47
Coastal Valleys	55.00%	5942
Inland Counties	50.00%	1024
Solano County	48.92%	3706
Central California	42.61%	10860
Northern California	27.00%	1775
San Benito County	11.08%	767
San Francisco	10.00%	2273
Santa Cruz County	10.00%	1042
Monterey County	4.66%	5197
Merced County	4.45%	719
Mountain Valley	2.90%	10141
El Dorado County		
North Coast		
Riverside County		
Sacramento County		
San Mateo County		
Imperial County		

Measure ID	TRA-2
Response Count	27
Denominator Total	108682
Submission Rate (n=33)	81.82%
Average	61.90%
Median	81.02%

Median Values
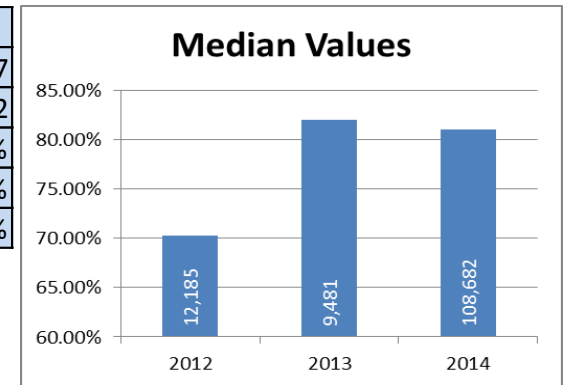
Of the 27 LEMSAs reporting these data for 2014, the median of patients transported directly to a trauma center was 81%. Adjustments were made to the Trauma measures to analyze a larger population of trauma patients. Changes to the measures from the prior years include the removal of the revised trauma score to shift from examining severely injured trauma patients to all trauma patients meeting the Center for Disease Control Trauma Triage Criteria.

Low values would be expected in some rural areas with prolonged transport times to a trauma center. The measure does not distinguish among level of trauma center.

Empty grey cells indicate no value reported

ACS-1: Aspirin Administration for Chest Pain/Discomfort Rate – Part 1 of 2


Multiple factors impact the validity and analysis of these retrospective data, including but not limited to incomplete documentation, documentation not reflective of services provided prior to ambulance arrival, inconsistent data dictionary definitions between local jurisdictions, geographic resource disparities, and inability to collect hospital outcome data. This retrospective data have not been validated. These limitations caution against comparison between jurisdictions and limit the reliance of the aggregate values.

	2014 Value	2014 Denom.
Marin County	98.00%	917
San Luis Obispo County	97.00%	617
Tuolumne County	95.00%	257
Orange County	94.00%	1488
Sierra-Sacramento Valley	94.00%	4082
Alameda County	91.00%	2321
Solano County	87.76%	1176
San Diego County	83.09%	10926
San Mateo County	76.00%	1105
Central California	75.76%	5527
San Francisco	74.00%	1498
San Benito County	71.21%	66
Los Angeles County	68.09%	26687
Ventura County	68.00%	2238
Sacramento County	64.00%	3451
Mountain Valley	63.00%	1942
Napa County	62.02%	603
North Coast	60.80%	1035
Northern California	58.00%	472
Yolo County	57.60%	963
Coastal Valleys	57.00%	1028
Riverside County	52.32%	11074
Santa Barbara County	52.00%	583
Santa Clara County	51.48%	4466
Monterey County	50.87%	808
Merced County	50.00%	1510
Contra Costa County	47.80%	4391
Inland Counties	46.00%	10842
Santa Cruz County	42.00%	775
San Joaquin County	39.14%	4251
Kern County	36.00%	4062
El Dorado County		
Imperial County		

Empty grey cells indicate no value reported

Measure ID	ACS-1
Response Count	31
Denominator Total	111161
Submission Rate (n=33)	93.94%
Average	66.55%
Median	63.00%
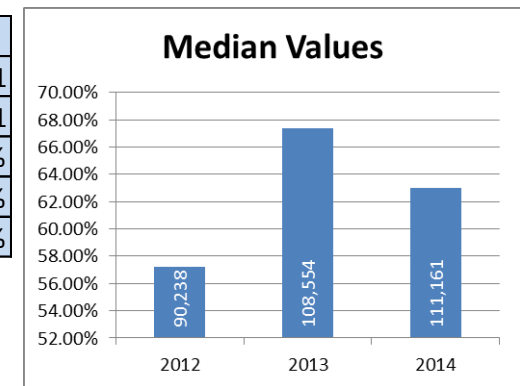
Median Values

Of the 31 LEMSAs reporting these data for 2014, the median percentage of patients receiving aspirin in the field for complaints of chest pain or discomfort suggestive of cardiac origin was 63%.

Factors for a low reported value include lack of documentation, or aspirin administered by the patient/family or first responder paramedics but not reflected in the patient care record by the ambulance transport service. Variation is also introduced by which chest pain patients are identified in the data search. The number of LEMSAs reporting this measure increased from 27 to 31, leading to an increase in number of records analyzed; however, the median value decreased from 67% to 63%. This is likely due to methodological refinements and new LEMSAs reporting. The wide variation should not be attributed to performance at this time, but should prompt evaluation of protocols and discussion with field providers.

Aspirin administration is the expected "standard of care" for chest pain and chest discomfort of cardiac origin. All 33 LEMSAs have aspirin administration in their protocol for management of suspected ACS patients.

ACS-2: 12 Lead ECG Performance – Part 1 of 2

Multiple factors impact the validity and analysis of these retrospective data, including but not limited to incomplete documentation, documentation not reflective of services provided prior to ambulance arrival, inconsistent data dictionary definitions between local jurisdictions, geographic resource disparities, and inability to collect hospital outcome data. This retrospective data have not been validated. These limitations caution against comparison between jurisdictions and limit the reliance of the aggregate values.

	2014 Value	2014 Denom.
Coastal Valleys	100.00%	1028
Mountain Valley	100.00%	1942
Napa County	100.00%	603
San Mateo County	100.00%	1105
Solano County	99.32%	1176
Alameda County	98.00%	2321
San Luis Obispo County	98.00%	617
Monterey County	96.78%	808
Sierra-Sacramento Valley	95.00%	4082
Tuolumne County	95.00%	257
Merced County	94.00%	1510
Inland Counties	91.00%	11921
Marin County	91.00%	619
Ventura County	90.00%	2238
San Francisco	89.00%	1498
Riverside County	87.86%	11074
San Diego County	85.29%	10926
Contra Costa County	84.10%	4391
Yolo County	84.00%	963
Santa Barbara County	83.00%	583
Orange County	80.00%	1763
Santa Cruz County	80.00%	775
Kern County	79.00%	3923
Los Angeles County	78.09%	26687
Central California	72.86%	5527
San Joaquin County	69.37%	4251
Santa Clara County	68.61%	4466
Northern California	53.00%	472
San Benito County	40.91%	66
Sacramento County	28.00%	893
North Coast	14.80%	1035
El Dorado County		
Imperial County		

Empty grey cells indicate no value reported

Measure ID	ACS-2
Response Count	31
Denominator Total	109520
Submission Rate (n=33)	93.94%
Average	81.48%
Median	87.86%

Median Values
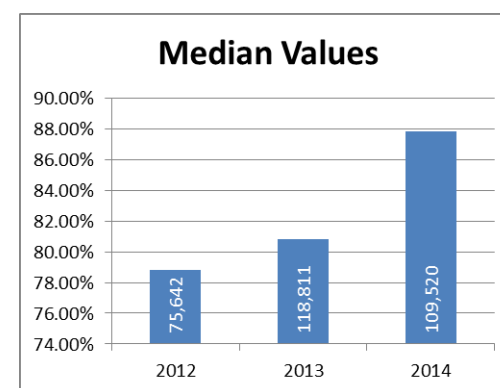
Of the 31 LEMSAs reporting these data for 2014, the median number of patients receiving 12-Lead ECG in the field for complaints of chest pain or discomfort suggestive of cardiac origin was 87.9%.

There was a marked increase in number of records analyzed and additional LEMSAs reporting. The median has increased significantly over the past 3 years. Additionally, there was moderate consistency in this measure, with most LEMSAs reporting 70-100% compliance. Low values more likely represent data and methodological issues rather than actual performance. This measure is of particular importance with the widespread development of STEMI centers. LEMSAs with a STEMI system in place are more likely to use 12 lead for identifying STEMI patients, a nationally recommended procedure by the American Heart Association. The draft STEMI regulations define "STEMI Patient" as one with characteristic symptoms of myocardial ischemia in association with persistent ST-Segment Elevation in ECG and that "The STEMI system policies shall address … identification of STEMI patients through the use of pre-hospital 12-lead ECG…" The American Heart Association has stated that the national goal is for an "in the field ECG." Thirty-one of 33 LEMSAs have developed STEMI systems and currently include field ECG in their management protocol.
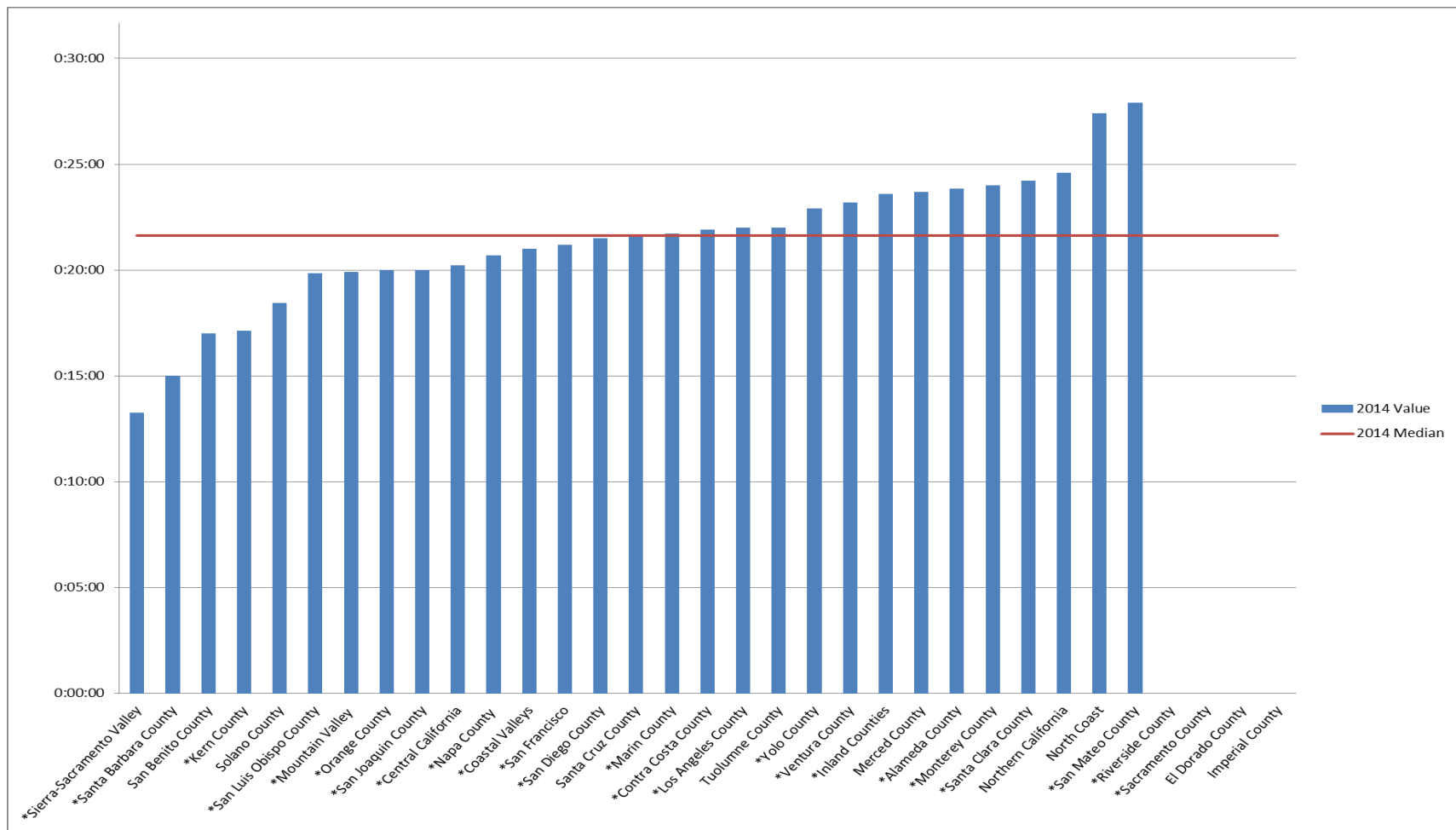
ACS-3: Scene Time for Suspected Heart Attack Patients – Part 1 of 2

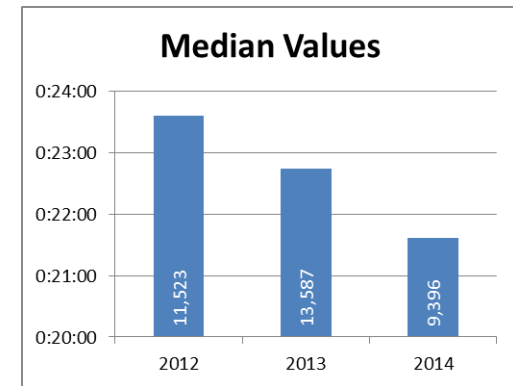An (*) denotes the 24 LEMSAs with a STEMI Receiving Center

Multiple factors impact the validity and analysis of these retrospective data, including but not limited to incomplete documentation, documentation not reflective of services provided prior to ambulance arrival, inconsistent data dictionary definitions between local jurisdictions, geographic resource disparities, and inability to collect hospital outcome data. This retrospective data have not been validated. These limitations caution against comparison between jurisdictions and limit the reliance of the aggregate values.

	2014 Value	2014 Denom.
*Sierra-Sacramento Valley	0:13:15	336
*Santa Barbara County	0:15:00	78
San Benito County	0:17:00	1
*Kern County	0:17:08	
Solano County	0:18:27	1277
*San Luis Obispo County	0:19:51	62
*Mountain Valley	0:19:54	107
*Orange County	0:20:00	117
*San Joaquin County	0:20:00	126
*Central California	0:20:14	172
*Napa County	0:20:42	43
*Coastal Valleys	0:21:00	101
*San Francisco	0:21:11	177
*San Diego County	0:21:30	1315
Santa Cruz County	0:21:37	
*Marin County	0:21:44	64
*Contra Costa County	0:21:54	329
*Los Angeles County	0:22:00	2073
Tuolumne County	0:22:00	14
*Yolo County	0:22:54	90
*Ventura County	0:23:12	160
*Inland Counties	0:23:36	540
Merced County	0:23:42	67
*Alameda County	0:23:51	437
*Monterey County	0:24:00	87
*Santa Clara County	0:24:14	349
Northern California	0:24:36	23
North Coast	0:27:24	
*San Mateo County	0:27:54	146
*Riverside County		1105
*Sacramento County		
El Dorado County		
Imperial County		

Empty grey cells indicate no value reported

Measure ID	ACS-3
Response Count	29
Denominator Total	9396
Submission Rate (n=33)	87.88%
Average	0:21:22
Median	0:21:37

Median Values

(Bar chart: 2012 ≈ 0:23:38 with 11,523; 2013 ≈ 0:22:45 with 13,587; 2014 ≈ 0:21:37 with 9,396)

Of the 29 LEMSAs reporting these data for 2014, the median scene time by ground ambulance for suspected heart attack patients with ST elevation on ECG was approximately 21 minutes and 37 seconds, decreased about 10% from prior year of reporting. Over the past 3 years, there has been a progressive decrease in the mean. There is limited variation with most agencies between 20-25 minutes.

Typically LEMSA protocols encourage paramedics to transport STEMI patients from the scene in 15 minutes or less since there is a time dependent goal to take the patient to the hospital catheterization suite to open blocked vessels. Further examination of this measure is warranted, including methodology, documentation, and validation. According to the American Heart Association, the national goal is for a scene time of 15 minutes, although given the evaluation and interventions needed for these patients, 15 minutes may be unrealistic.
http://www.heart.org/HEARTORG/HealthcareResearch/MissionLifelineHomePage/EMS/EMS-Strategies-to-Achieve-Ideal_UCM_312066_Article.jsp
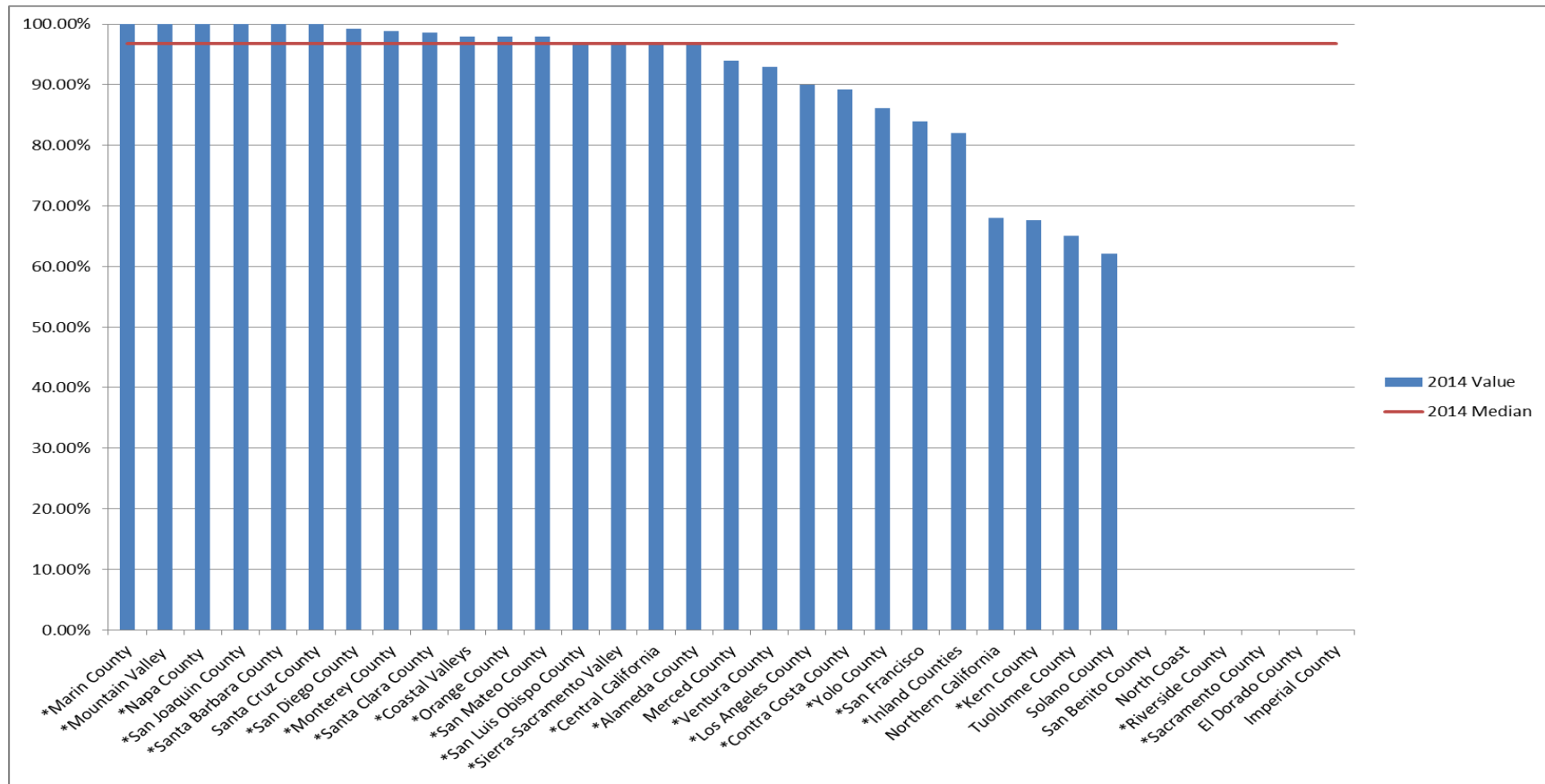
An (*) denotes the 24 LEMSAs with a STEMI Receiving Center

ACS-5: Direct Transport to Designated STEMI Receiving Center for Suspected Patients Meeting Criteria – Part 1 of 2

An (*) denotes the 24 LEMSAs with a STEMI Receiving Center

Multiple factors impact the validity and analysis of these retrospective data, including but not limited to incomplete documentation, documentation not reflective of services provided prior to ambulance arrival, inconsistent data dictionary definitions between local jurisdictions, geographic resource disparities, and inability to collect hospital outcome data. This retrospective data have not been validated. These limitations caution against comparison between jurisdictions and limit the reliance of the aggregate values.

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ACS-5: Direct Transport to Designated STEMI Receiving Center for Suspected Patients Meeting Criteria – Part 2 of 2

	2014 Value	2014 Denom.
*Marin County	100.00%	64
*Mountain Valley	100.00%	107
*Napa County	100.00%	43
*San Joaquin County	100.00%	126
*Santa Barbara County	100.00%	96
Santa Cruz County	100.00%	31
*San Diego County	99.19%	619
*Monterey County	98.86%	87
*Santa Clara County	98.65%	370
*Coastal Valleys	98.00%	101
*Orange County	98.00%	115
*San Mateo County	98.00%	146
*San Luis Obispo County	97.00%	62
*Sierra-Sacramento Valley	97.00%	336
*Central California	96.72%	183
*Alameda County	96.56%	437
Merced County	94.02%	67
*Ventura County	93.00%	160
*Los Angeles County	90.01%	2073
*Contra Costa County	89.20%	356
*Yolo County	86.17%	94
*San Francisco	84.00%	233
*Inland Counties	82.00%	566
Northern California	68.00%	25
*Kern County	67.57%	37
Tuolumne County	65.00%	14
Solano County	62.10%	1277
San Benito County	0.00%	1
North Coast		
*Riverside County		
*Sacramento County		
El Dorado County		
Imperial County		

Empty grey cells indicate no value reported

Measure ID	ACS-5
Response Count	28
Denominator Total	7826
Submission Rate (n=33)	84.85%
Average	87.82%
Median	96.86%

Median Values
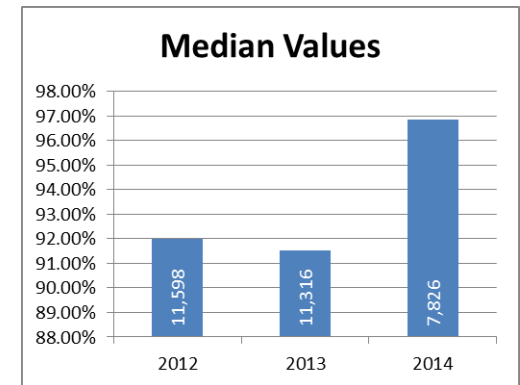
Of the 28 LEMSAs reporting these data, the median percentage of patients appropriately transported directly to a STEMI center was 96.9%, a significant increase from the prior year reporting.

Direct transport of patients to a STEMI centers with percutaneous coronary intervention (PCI) capability will vary by geography and availability of resources in a given area. Generally, LEMSAs with a higher level of direct transport are often urban areas with a STEMI system in their geographic area. Lower values would be expected in a rural area that may not have an established STEMI system or one that can be accessed rapidly in a neighboring LEMSA.

Several LEMSAs with measures below 90% may have STEMI systems, implying poor data quality or potential protocol violations.
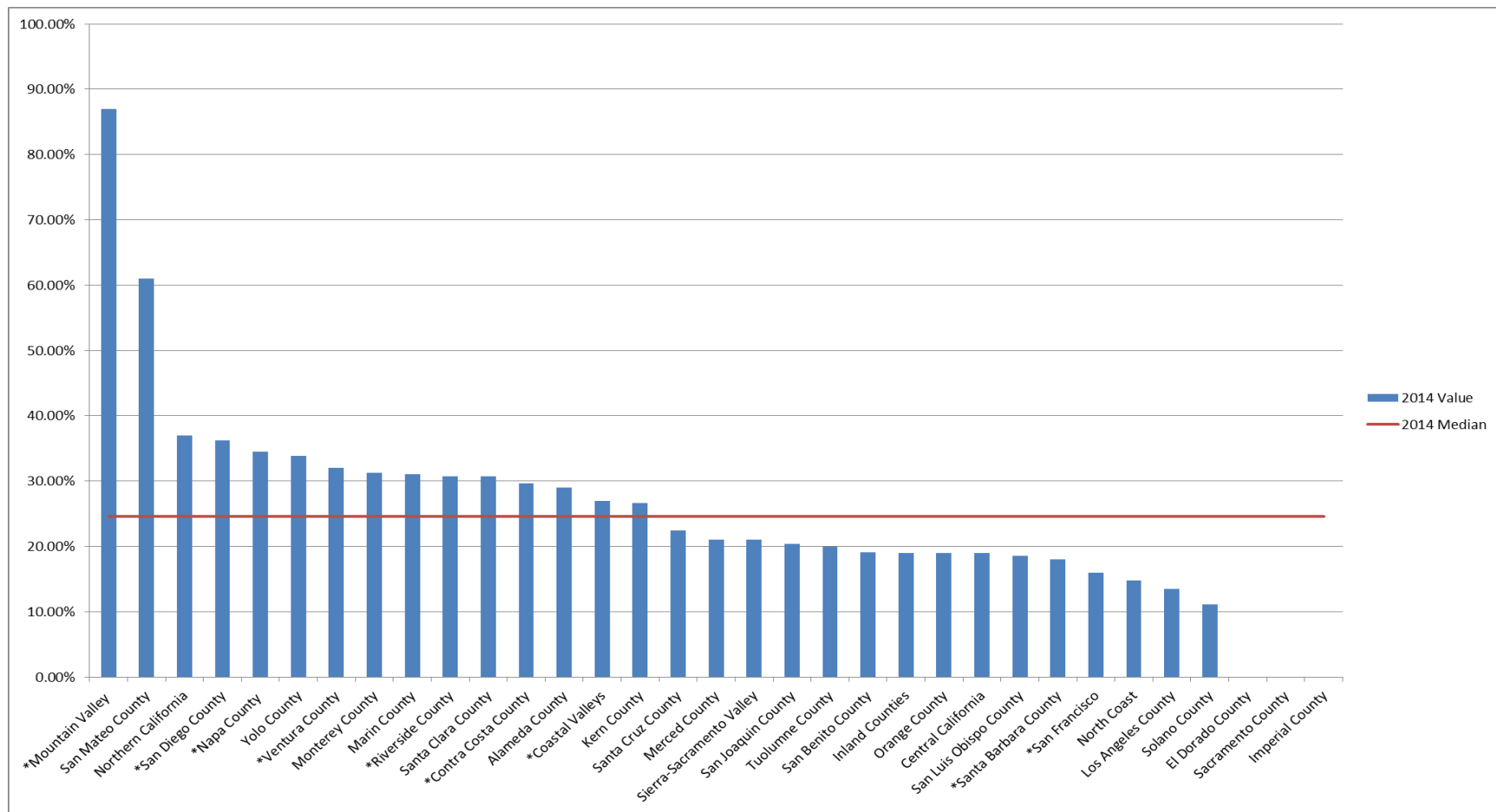
24 of 33 LEMSAs have STEMI Receiving Center.

CAR-2: Out-Of-Hospital Cardiac Arrest Return of Spontaneous Circulation – Part 1 of 2

An (*) denotes the nine (9) Cardiac Arrest Registry to Enhance Survival (CARES) participants

Multiple factors impact the validity and analysis of these retrospective data, including but not limited to incomplete documentation, documentation not reflective of services provided prior to ambulance arrival, inconsistent data dictionary definitions between local jurisdictions, geographic resource disparities, and inability to collect hospital outcome data. This retrospective data have not been validated. These limitations caution against comparison between jurisdictions and limit the reliance of the aggregate values.

	2014 Value	2014 Denom.
*Mountain Valley	87.00%	308
San Mateo County	61.00%	196
Northern California	37.00%	51
*San Diego County	36.19%	619
*Napa County	34.55%	55
Yolo County	33.90%	59
*Ventura County	32.00%	357
Monterey County	31.25%	112
Marin County	31.00%	90
*Riverside County	30.77%	936
Santa Clara County	30.73%	781
*Contra Costa County	29.60%	417
Alameda County	29.00%	1102
*Coastal Valleys	27.00%	136
Kern County	26.61%	109
Santa Cruz County	22.46%	138
Merced County	21.00%	239
Sierra-Sacramento Valley	21.00%	288
San Joaquin County	20.36%	717
Tuolumne County	20.00%	35
San Benito County	19.05%	21
Inland Counties	19.00%	1118
Orange County	19.00%	300
Central California	18.95%	802
San Luis Obispo County	18.60%	215
*Santa Barbara County	18.00%	221
*San Francisco	16.00%	378
North Coast	14.80%	238
Los Angeles County	13.51%	6387
Solano County	11.08%	334
El Dorado County		
Sacramento County		
Imperial County		

Empty grey cells indicate no value reported

Measure ID	CAR-2
Response Count	30
Denominator Total	16759
Submission Rate (n=33)	90.91%
Average	27.68%
Median	24.54%

Median Values
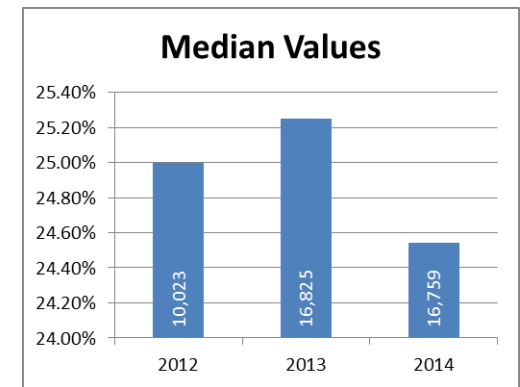
Of the 30 LEMSAs reporting these data for 2014, the median number of patients that had a return of spontaneous circulation in the field after a cardiac arrest from all causes was 24.5%, a decrease from the prior year reporting.

Nationally, this rate varies considerably by state and by local agency. Most jurisdictions reported rates from 10-40%, which is credible. In addition to methodological challenges (evidenced by one LEMSA reporting 100%), this outcome measure is dependent upon factors that vary considerably by community, including rapid public response, bystander CPR, community automated external defibrillation use, response times by first responders and ALS providers, and presenting cardiac rhythm. At this time, these results should not be considered accurate measures of performance. Values vary widely, depending on multiple factors. National rate for return to spontaneous circulation is 40%. Values for a particular system should be used to track improvements.

An (*) on the table to the left designates Cardiac Arrest Registry to Enhance Survival (CARES) participants; the values are probably most reliable for these participants.
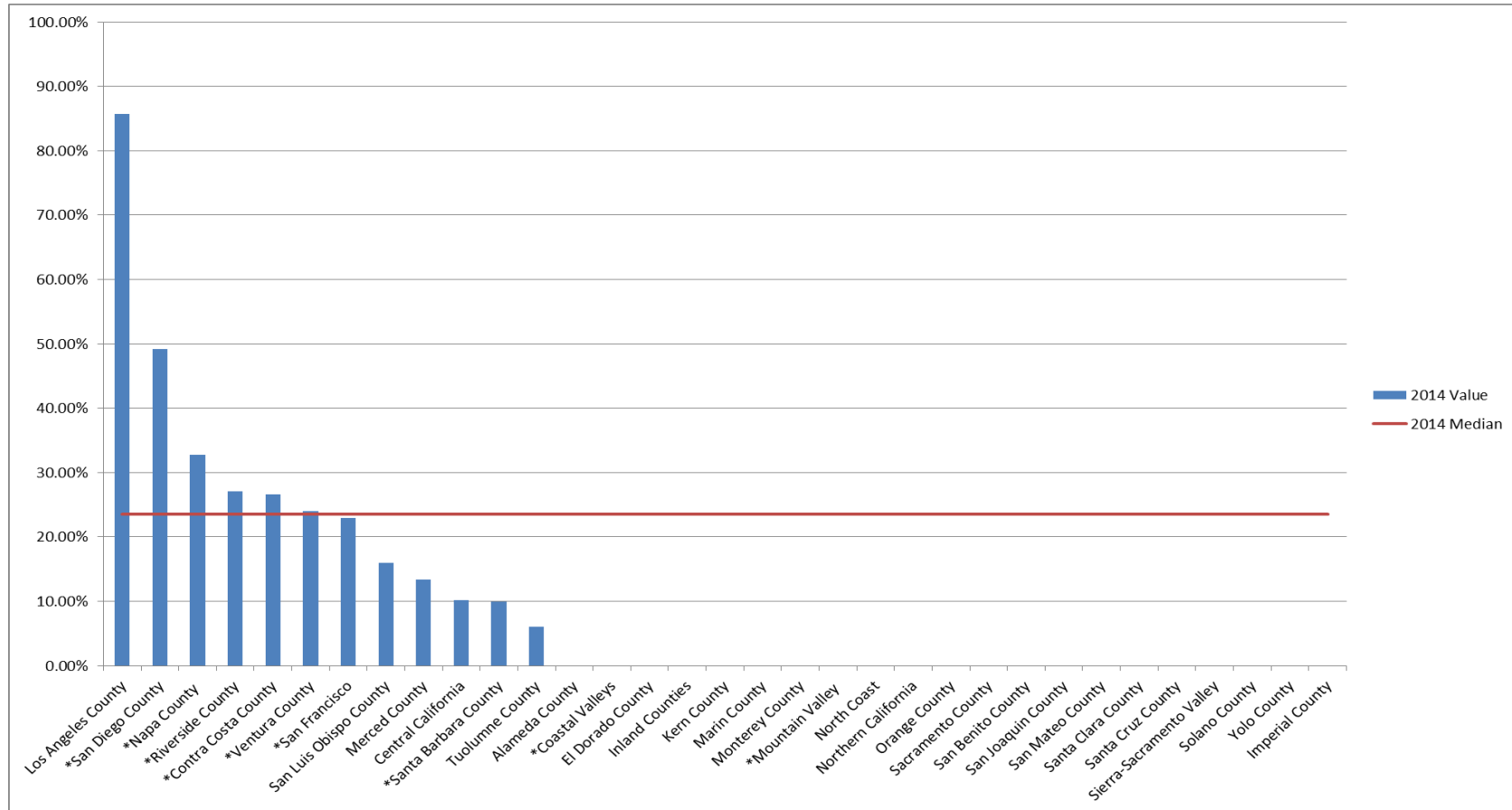
CAR-3: Out-Of-Hospital Cardiac Arrest Survival to Emergency Department Discharge – Part 1 of 2

An (*) denotes nine (9) Cardiac Arrest Registry to Enhance Survival (CARES) participants

Multiple factors impact the validity and analysis of these retrospective data, including but not limited to incomplete documentation, documentation not reflective of services provided prior to ambulance arrival, inconsistent data dictionary definitions between local jurisdictions, geographic resource disparities, and inability to collect hospital outcome data. This retrospective data have not been validated. These limitations caution against comparison between jurisdictions and limit the reliance of the aggregate values.

	2014 Value	2014 Denom.
Los Angeles County	85.70%	5215
*San Diego County	49.21%	317
*Napa County	32.73%	55
*Riverside County	27.12%	612
*Contra Costa County	26.60%	130
*Ventura County	24.00%	357
*San Francisco	23.00%	378
San Luis Obispo County	16.00%	215
Merced County	13.39%	239
Central California	10.22%	802
*Santa Barbara County	10.00%	221
Tuolumne County	6.00%	35
Alameda County		
*Coastal Valleys		
El Dorado County		
Inland Counties		
Kern County		
Marin County		
Monterey County		
*Mountain Valley		
North Coast		
Northern California		51
Orange County		
Sacramento County		
San Benito County		
San Joaquin County		146
San Mateo County		
Santa Clara County		
Santa Cruz County		
Sierra-Sacramento Valley		
Solano County		
Yolo County		
Imperial County		

Empty grey cells indicate no value reported

Measure ID	CAR-3
Response Count	12
Denominator Total	8773
Submission Rate (n=33)	36.36%
Average	27.00%
Median	23.50%
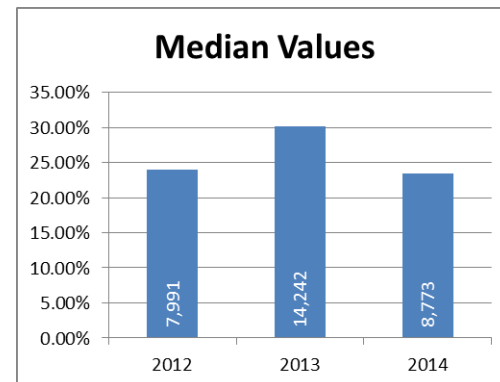
Median Values

Of the 12 LEMSAs reporting these data for 2014, the median number of patients that had survived a return hospital cardiac arrest to be admitted to the hospital was 23.50%. This measure included an increase of one LEMSA response from the prior year of reporting. Obtaining hospital outcome data continues to be a challenge faced by many LEMSAs. Accurate measure of this outcome is an important future quality improvement goal and supports the need to develop exchange of health information with hospitals. Marked variation is expected, but generally, this number is significantly less than the ROSC in the prior measure. Values vary widely, depending on multiple factors. Values for a particular system should be used to track improvements.

An (*) on the table to the left designates Cardiac Arrest Registry to Enhance Survival (CARES) participants; the values are probably most reliable for these participants.
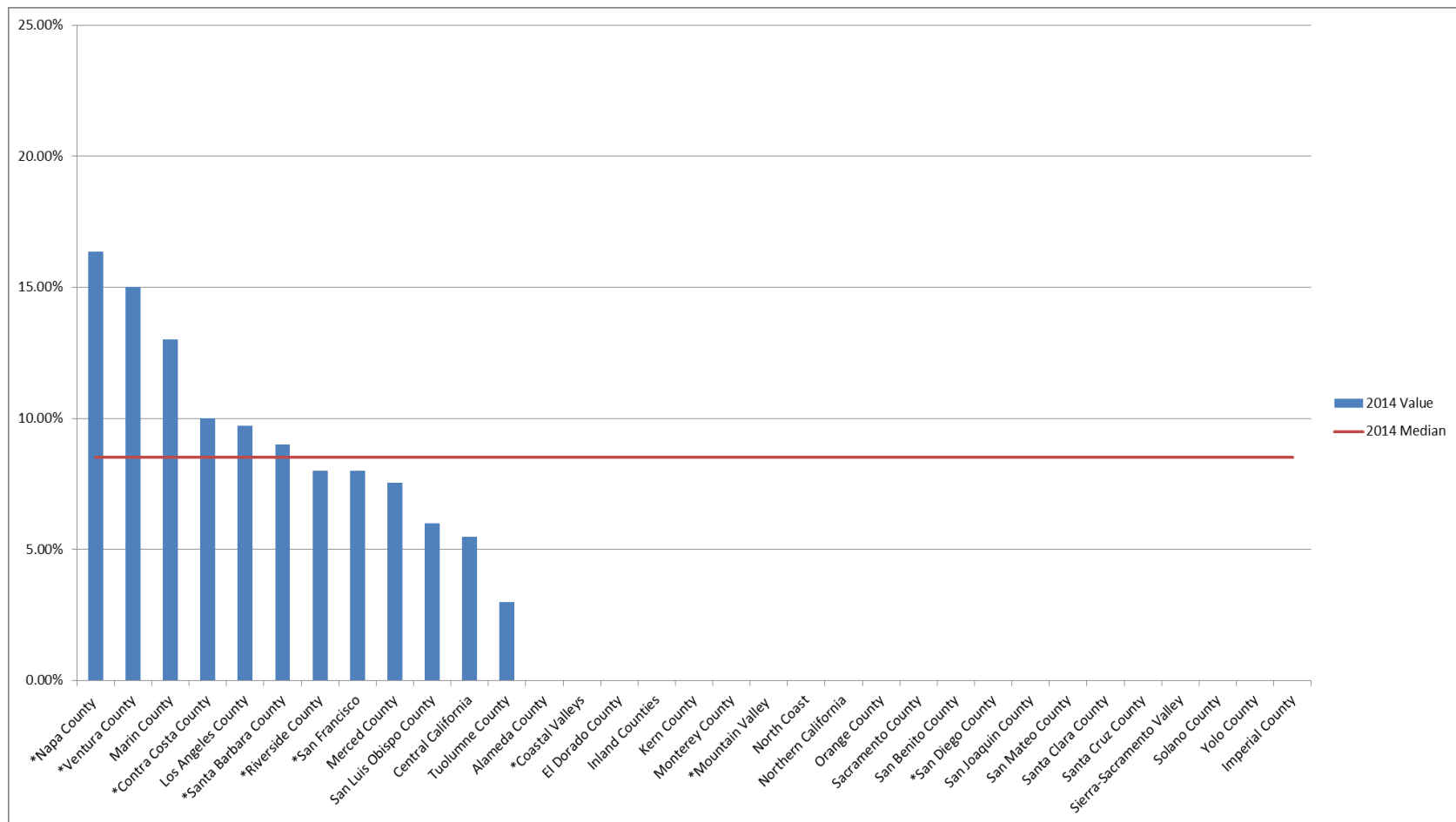
CAR-4: Out-Of-Hospital Cardiac Arrest Survival to Hospital Discharge – Part 1 of 2

An (*) denotes nine (9) Cardiac Arrest Registry to Enhance Survival (CARES) participants

Multiple factors impact the validity and analysis of these retrospective data, including but not limited to incomplete documentation, documentation not reflective of services provided prior to ambulance arrival, inconsistent data dictionary definitions between local jurisdictions, geographic resource disparities, and inability to collect hospital outcome data. This retrospective data have not been validated. These limitations caution against comparison between jurisdictions and limit the reliance of the aggregate values.

	2014 Value	2014 Denom.
*Napa County	16.36%	55
*Ventura County	15.00%	357
Marin County	13.00%	90
*Contra Costa County	10.00%	49
Los Angeles County	9.71%	6387
*Santa Barbara County	9.00%	221
*Riverside County	8.01%	612
*San Francisco	8.00%	378
Merced County	7.53%	239
San Luis Obispo County	6.00%	215
Central California	5.49%	802
Tuolumne County	3.00%	35
Alameda County		
*Coastal Valleys		
El Dorado County		
Inland Counties		
Kern County		
Monterey County		
*Mountain Valley		
North Coast		
Northern California		51
Orange County		
Sacramento County		
San Benito County		
*San Diego County		
San Joaquin County		146
San Mateo County		
Santa Clara County		
Santa Cruz County		
Sierra-Sacramento Valley		
Solano County		
Yolo County		
Imperial County		

Empty grey cells indicate no value reported

Measure ID	CAR-4
Response Count	12
Denominator Total	9637
Submission Rate (n=33)	36.36%
Average	9.26%
Median	8.51%

Median Values
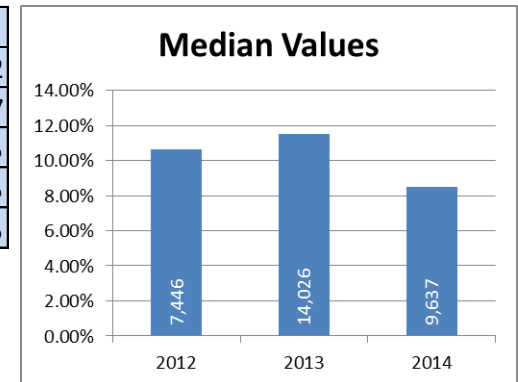
Of the 12 LEMSAs reporting these data for 2014, the median percentage of patients that had survived an out of hospital cardiac arrest and were discharged from the hospital was 8.5%. This measure yielded the lowest number of responses from LEMSAs because of the difficulties in obtaining hospital outcome data. Accurate measure of this outcome is an important future quality improvement goal and supports the need to develop exchange of health information with hospitals. An important refinement to this measure is the functional status on discharge. Values vary widely, depending on multiple factors. National rate for return to spontaneous circulation is 40% and survival to hospital discharge is 10%. Values for a particular system should be used to track improvements.

An (*) on the table to the left designates Cardiac Arrest Registry to Enhance Survival (CARES) participants; the values are probably most reliable for these participants.
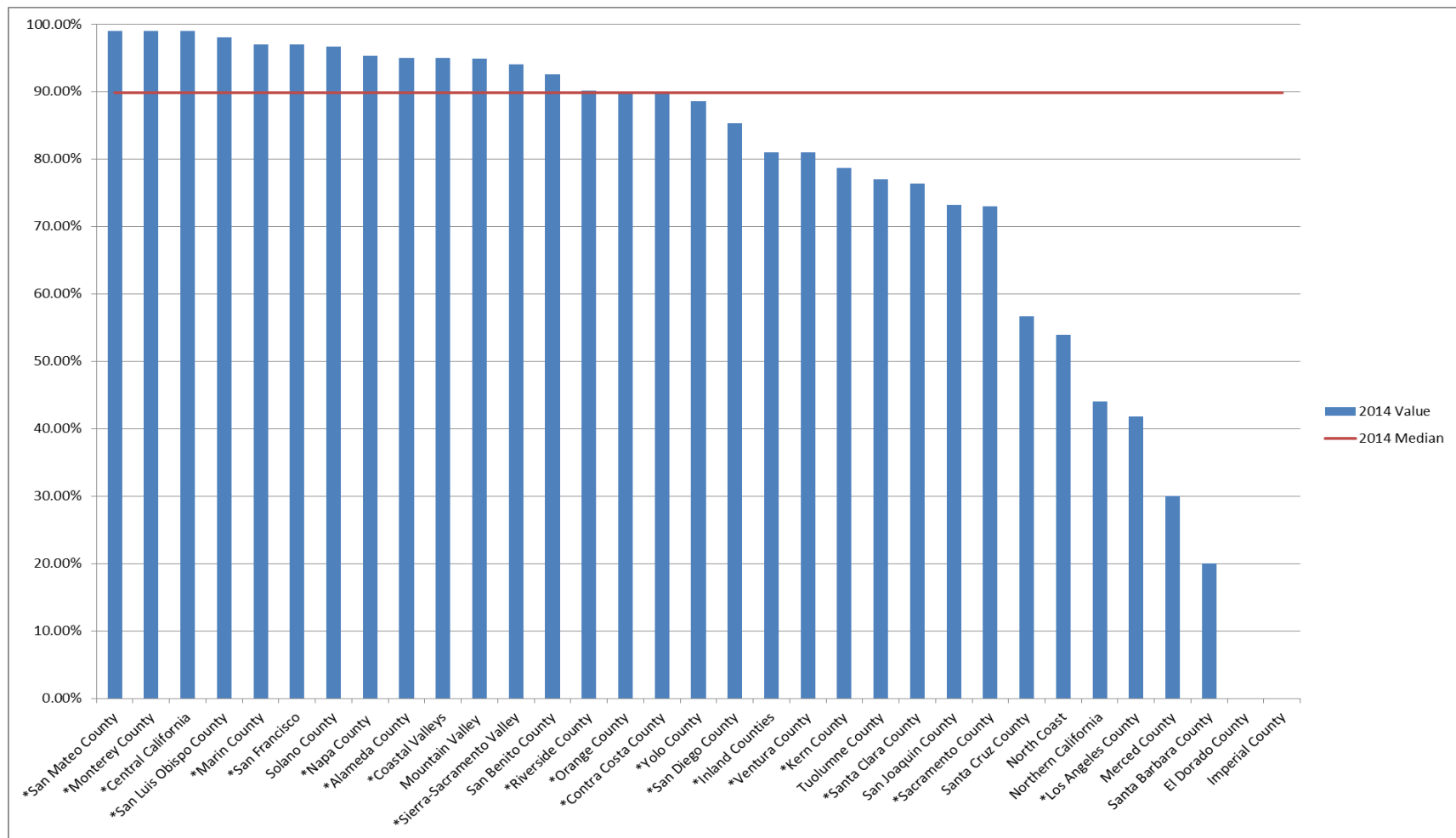
STR-2: Glucose Testing for Suspected Acute Stroke Patients – Part 1 of 2

An (*) denotes the 22 LEMSAs identified as developing/implementing an approach to Stroke Care

Multiple factors impact the validity and analysis of these retrospective data, including but not limited to incomplete documentation, documentation not reflective of services provided prior to ambulance arrival, inconsistent data dictionary definitions between local jurisdictions, geographic resource disparities, and inability to collect hospital outcome data. This retrospective data have not been validated. These limitations caution against comparison between jurisdictions and limit the reliance of the aggregate values.

	2014 Value	2014 Denom.
*San Mateo County	99.00%	507
*Monterey County	98.98%	394
*Central California	98.97%	2918
*San Luis Obispo County	98.00%	122
*Marin County	97.00%	324
*San Francisco	97.00%	794
Solano County	96.67%	420
*Napa County	95.29%	170
*Alameda County	95.00%	1972
*Coastal Valleys	95.00%	369
Mountain Valley	94.90%	528
*Sierra-Sacramento Valley	94.00%	1520
San Benito County	92.59%	27
*Riverside County	90.10%	2465
*Orange County	90.00%	669
*Contra Costa County	89.80%	1348
*Yolo County	88.58%	289
*San Diego County	85.30%	3871
*Inland Counties	81.00%	1810
*Ventura County	81.00%	770
*Kern County	78.69%	873
Tuolumne County	77.00%	99
*Santa Clara County	76.29%	1818
San Joaquin County	73.20%	942
*Sacramento County	73.00%	15
Santa Cruz County	56.68%	247
North Coast	53.90%	188
Northern California	44.00%	122
*Los Angeles County	41.79%	6611
Merced County	30.02%	403
Santa Barbara County	20.00%	205
El Dorado County		
Imperial County		

Empty grey cells indicate no value reported

Measure ID	STR-2
Response Count	31
Denominator Total	32810
Submission Rate (n=33)	93.94%
Average	80.09%
Median	89.80%
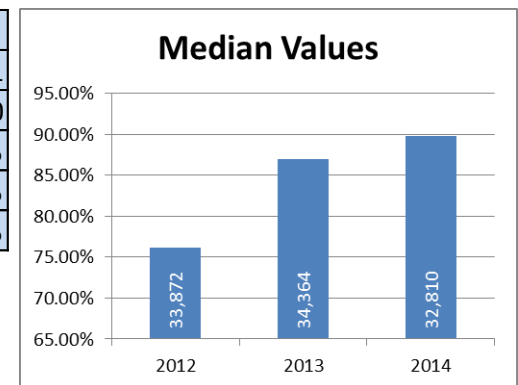
Median Values

Of the 31 LEMSAs reporting these data for 2014, the median percentage of patients receiving glucose testing in the field for a possible stroke was 89%. This has increased steadily over the three years of reporting. Inconsistent low values likely reflect data issues but should be evaluated for adherence to protocol. Diabetic causes of neurologic symptoms are important to exclude prior to transporting to a stroke center and are part of stroke protocols. 32/33 LEMSAs have protocols that advise routine evaluation of blood sugar in suspected stroke patients.

An (*) indicates 22 LEMSAs that have developed a stroke system with a designated primary stroke receiving center. There are currently draft stroke regulations being finalized. In future reports, EMSA will be able to clearly identify the stroke systems statewide.
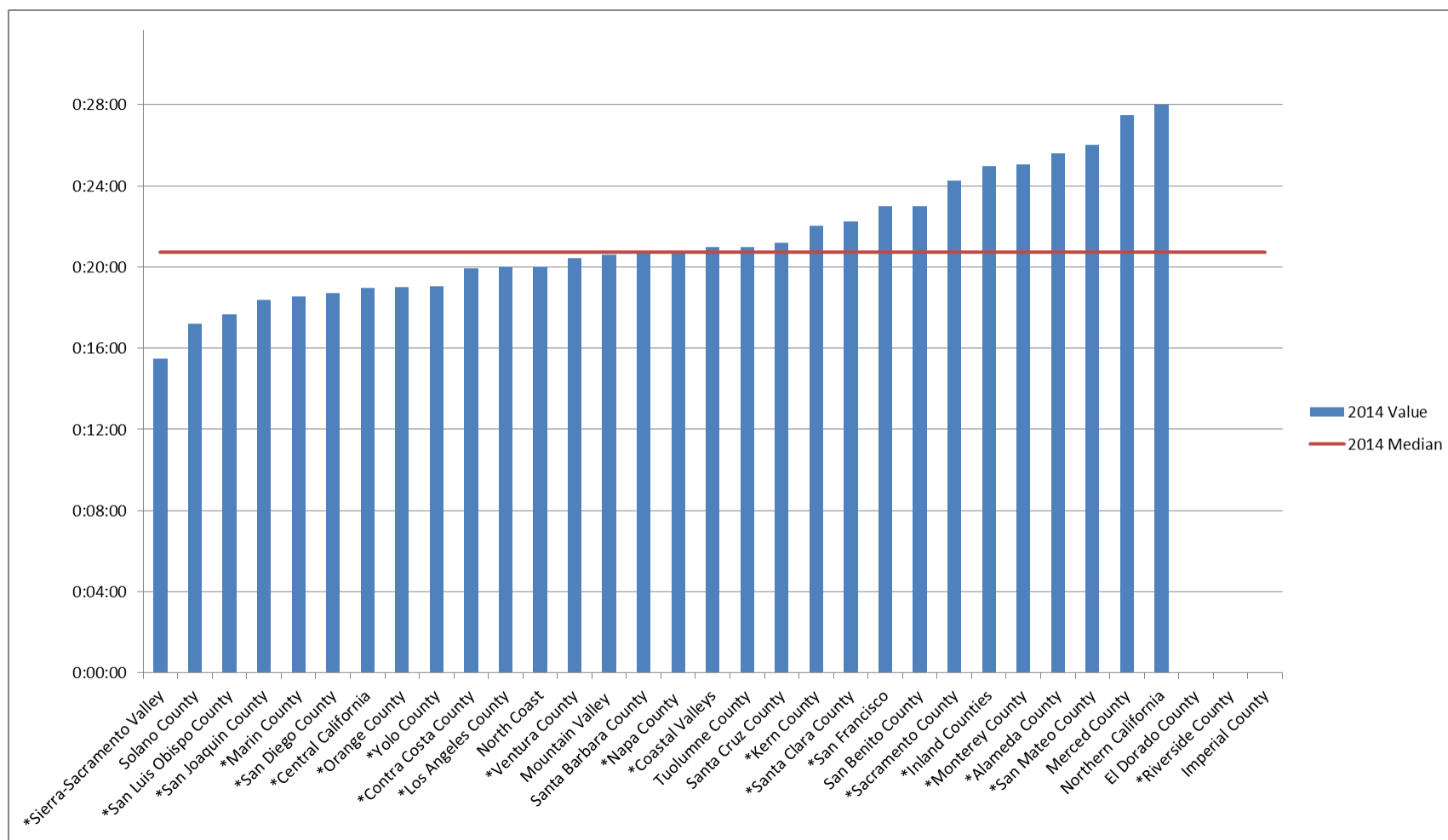
STR-3: Scene Time for Suspected Acute Stroke Patients – Part 1 of 2

An (*) denotes 22 LEMSAs identified as developing/implementing an approach to Stroke Care

Multiple factors impact the validity and analysis of these retrospective data, including but not limited to incomplete documentation, documentation not reflective of services provided prior to ambulance arrival, inconsistent data dictionary definitions between local jurisdictions, geographic resource disparities, and inability to collect hospital outcome data. This retrospective data have not been validated. These limitations caution against comparison between jurisdictions and limit the reliance of the aggregate values.

STR-3: Scene Time for Suspected Acute Stroke Patients – Part 2 of 2

	2014 Value	2014 Denom.
*Sierra-Sacramento Valley	0:15:29	1520
Solano County	0:17:11	495
*San Luis Obispo County	0:17:40	122
*San Joaquin County	0:18:23	915
*Marin County	0:18:34	
*San Diego County	0:18:43	5350
*Central California	0:18:59	2614
*Orange County	0:19:00	633
*Yolo County	0:19:03	283
*Contra Costa County	0:19:55	1262
*Los Angeles County	0:20:00	6611
North Coast	0:20:00	
*Ventura County	0:20:26	650
Mountain Valley	0:20:35	523
Santa Barbara County	0:20:43	197
*Napa County	0:20:44	167
*Coastal Valleys	0:20:58	369
Tuolumne County	0:21:00	99
Santa Cruz County	0:21:12	
*Kern County	0:22:01	
*Santa Clara County	0:22:14	1548
*San Francisco	0:22:59	791
San Benito County	0:23:00	25
*Sacramento County	0:24:15	22
*Inland Counties	0:24:57	1523
*Monterey County	0:25:04	381
*Alameda County	0:25:36	1972
*San Mateo County	0:26:00	506
Merced County	0:27:30	403
Northern California	0:28:00	104
El Dorado County		
*Riverside County		2398
Imperial County		

Empty grey cells indicate no value reported

Measure ID	STR-3
Response Count	30
Denominator Total	31483
Submission Rate (n=33)	90.91%
Average	0:21:20
Median	0:20:43

Median Values

Bars: 2012 = 34,197; 2013 = 31,196; 2014 = 31,483
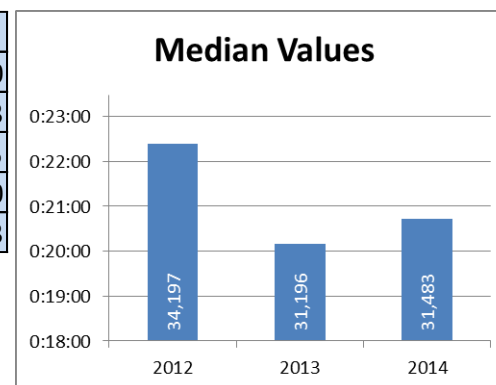
Of the 30 LEMSAs reporting these data for 2014, the median scene time by an ambulance for suspected stroke patients was approximately 20 minutes and 43 seconds, not significantly different from last year.

Times from all local jurisdictions reporting ranged between 15 and 28 minutes. 19/33 (58%) of LEMSAs have protocols that direct EMS to limit time on scene. Time targets may not be realistic for many patients who require more time for history, examination, and extraction from their residence. Stroke evaluation and treatment is a time sensitive measure, so extra minutes in the field add up with additional delays within the healthcare system. Further examination of this measure is warranted, including methodology, documentation, and validation.

An (*) represents the 22 LEMSAs that have a designated primary stroke receiving center. Currently, draft stroke regulations are being finalized.

An (*) indicates 22 LEMSAs that have developed a stroke system with a designated primary stroke receiving center. There are currently draft stroke regulations being finalized. In future reports, EMSA will be able to clearly identify the stroke systems statewide.
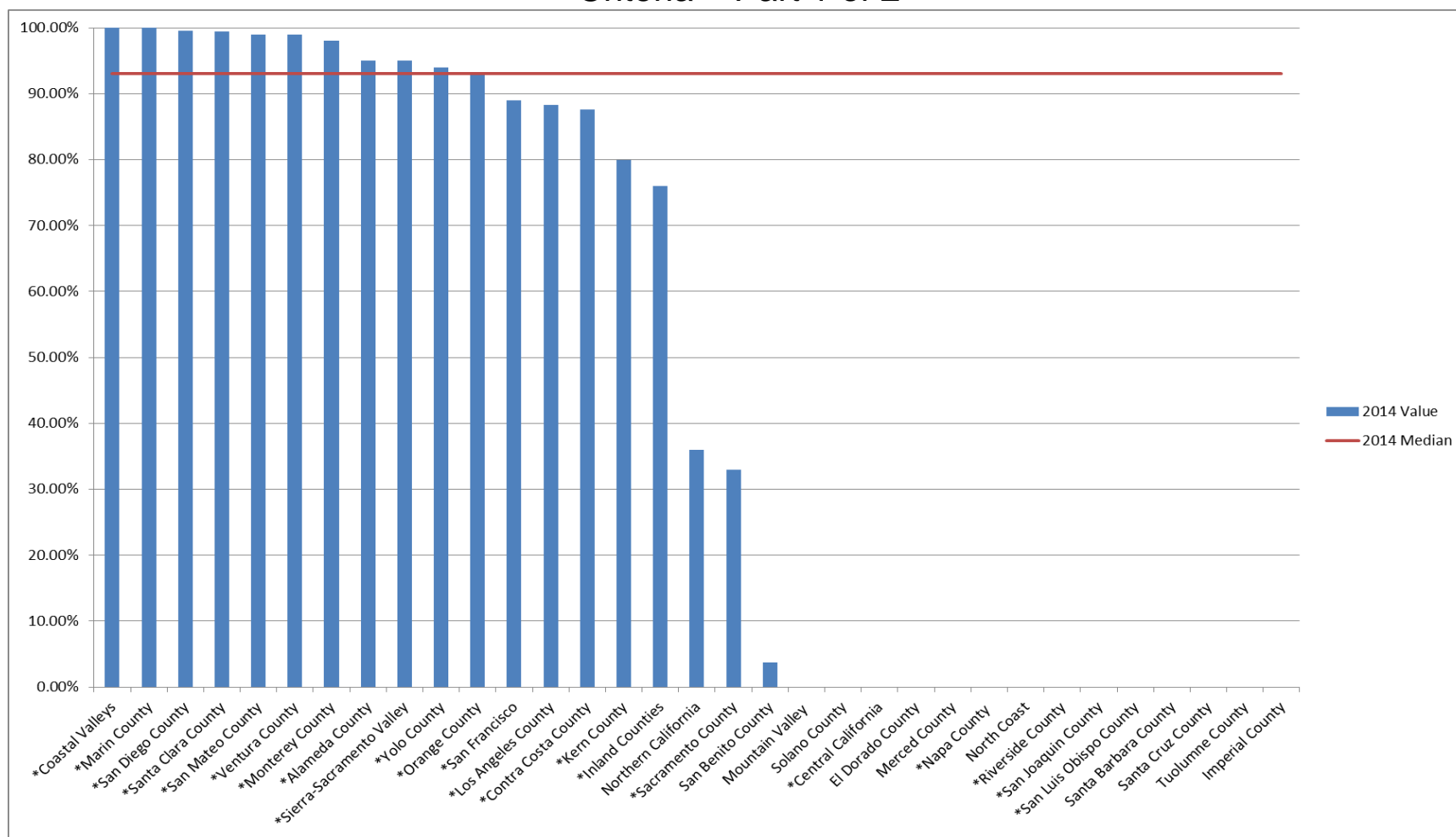
STR-5: Direct Transport to Stroke Center for Suspected Acute Stroke Patients Meeting Criteria – Part 1 of 2

An (*) denotes 22 LEMSAs identified as developing/implementing an approach to Stroke Care

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STR-5: Direct Transport to Stroke Center for Suspected Acute Stroke Patients Meeting Criteria – Part 2 of 2

	2014 Value	2014 Denom.
*Coastal Valleys	100.00%	369
*Marin County	100.00%	326
*San Diego County	99.55%	3805
*Santa Clara County	99.48%	1549
*San Mateo County	99.00%	507
*Ventura County	99.00%	650
*Monterey County	98.00%	394
*Alameda County	95.00%	1972
*Sierra-Sacramento Valley	95.00%	1520
*Yolo County	94.00%	294
*Orange County	93.00%	669
*San Francisco	89.00%	813
*Los Angeles County	88.29%	6611
*Contra Costa County	87.60%	1348
*Kern County	80.00%	873
*Inland Counties	76.00%	1546
Northern California	36.00%	112
*Sacramento County	33.00%	15
San Benito County	3.70%	27
Mountain Valley	0.00%	528
Solano County	0.00%	495
*Central California		
El Dorado County		
Merced County		
*Napa County		
North Coast		
*Riverside County		
*San Joaquin County		1055
*San Luis Obispo County		
Santa Barbara County		
Santa Cruz County		
Tuolumne County		
Imperial County		

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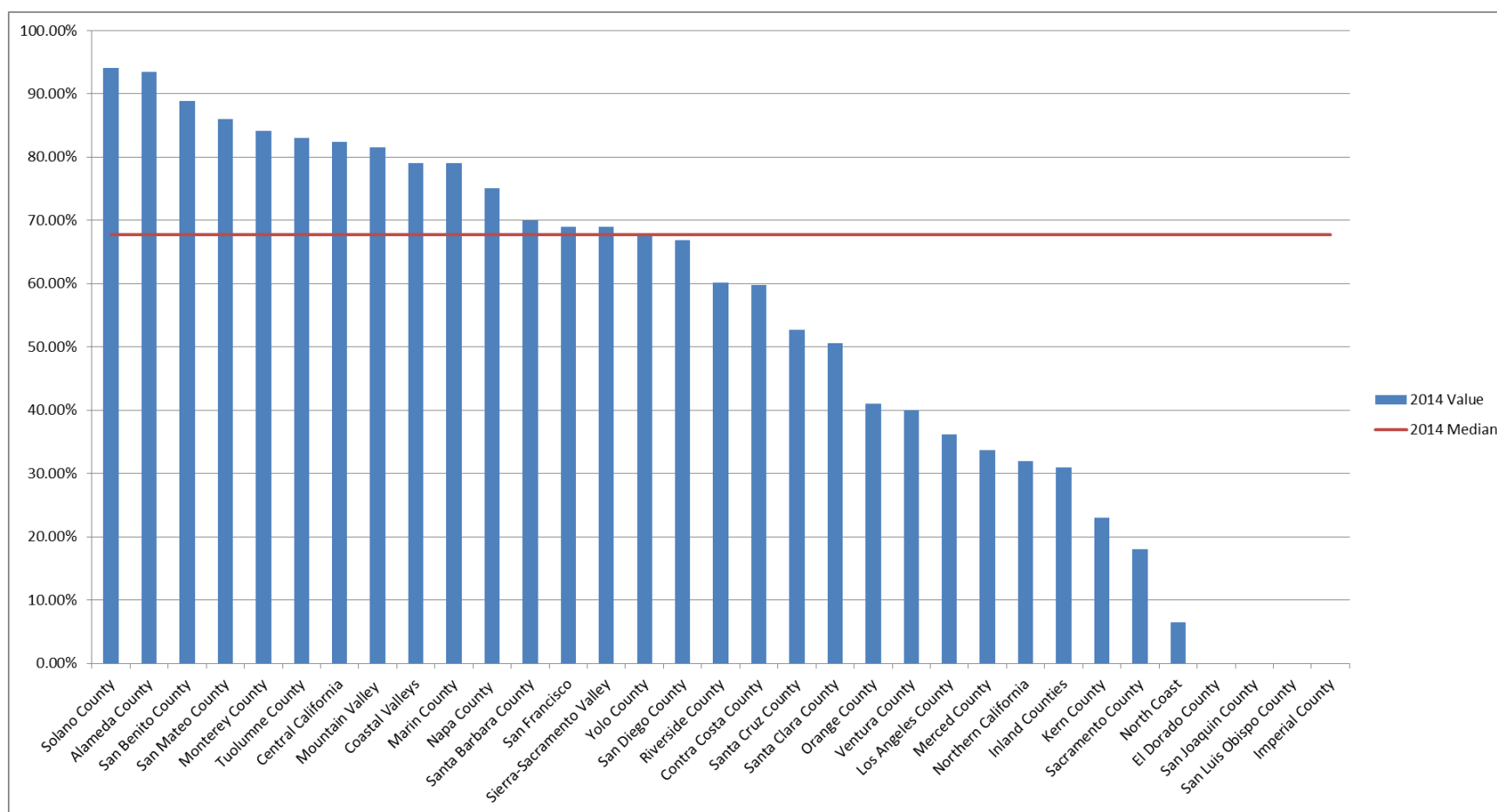| Measure ID	STR-5
Response Count	21
Denominator Total	25478
Submission Rate (n=33)	63.64%
Average	74.55%
Median	93.00%

Median Values
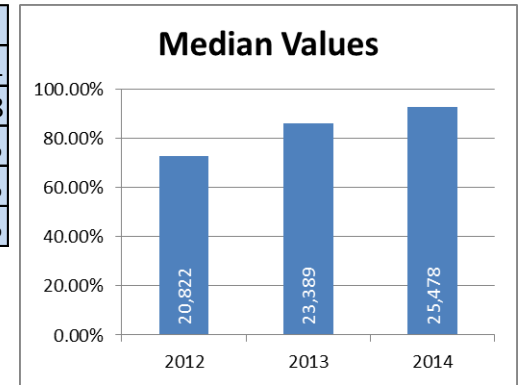
Of the 21 LEMSAs reporting these data for 2014, the median number of patients transported directly to a Stroke center by ground ambulance was 93%, with a steady and significant increase over the past three years.

Direct transport of patients to a Stroke center will vary by geography and availability of resources in a given area. Lower values are expected in rural areas or jurisdictions that do not have an established system with designated specialty care hospitals or rapid access to a center in a neighboring jurisdiction.

An (*) represents the 22 LEMSAs that have a designated primary stroke receiving center. There are currently draft stroke regulations in the process of being finalized. The goal in a stroke system is to transport 100% of stroke patients to a designated stroke center.

RES-2: Beta2 Agonist Administration for Adult Patients – Part 1 of 2


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	2014 Value	2014 Denom.
Solano County	94.06%	657
Alameda County	93.40%	2719
San Benito County	88.89%	9
San Mateo County	86.00%	149
Monterey County	84.14%	145
Tuolumne County	83.00%	127
Central California	82.40%	4920
Mountain Valley	81.50%	233
Coastal Valleys	79.00%	92
Marin County	79.00%	238
Napa County	75.00%	36
Santa Barbara County	70.00%	93
San Francisco	69.00%	1919
Sierra-Sacramento Valley	69.00%	1812
Yolo County	67.69%	294
San Diego County	66.86%	5272
Riverside County	60.10%	4387
Contra Costa County	59.80%	1489
Santa Cruz County	52.70%	148
Santa Clara County	50.55%	3557
Orange County	41.00%	1883
Ventura County	40.00%	198
Los Angeles County	36.20%	30561
Merced County	33.73%	2511
Northern California	32.00%	760
Inland Counties	31.00%	13967
Kern County	22.97%	727
Sacramento County	18.00%	107
North Coast	6.50%	363
El Dorado County		
San Joaquin County		67
San Luis Obispo County		
Imperial County		

Measure ID	RES-2
Response Count	29
Denominator Total	79440
Submission Rate (n=33)	87.88%
Average	60.47%
Median	67.69%
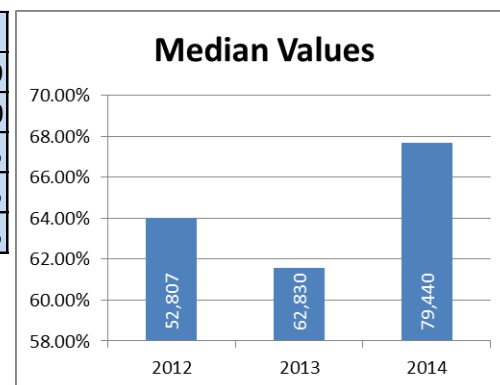
Median Values

Of the 29 LEMSAs reporting these data for 2014, the median percentage of patients receiving a Beta-2 Agonist/bronchodilator for bronchospasm in adults (age 14 or older) was 67%, an increase from 61.5% last year.

The marked variability for this measure suggests challenges identifying the appropriate denominator of patients for whom a bronchodilator is indicated.

Treatment protocols for which adult patients should receive Beta2 agonists may vary and clinical differentiation is difficult.
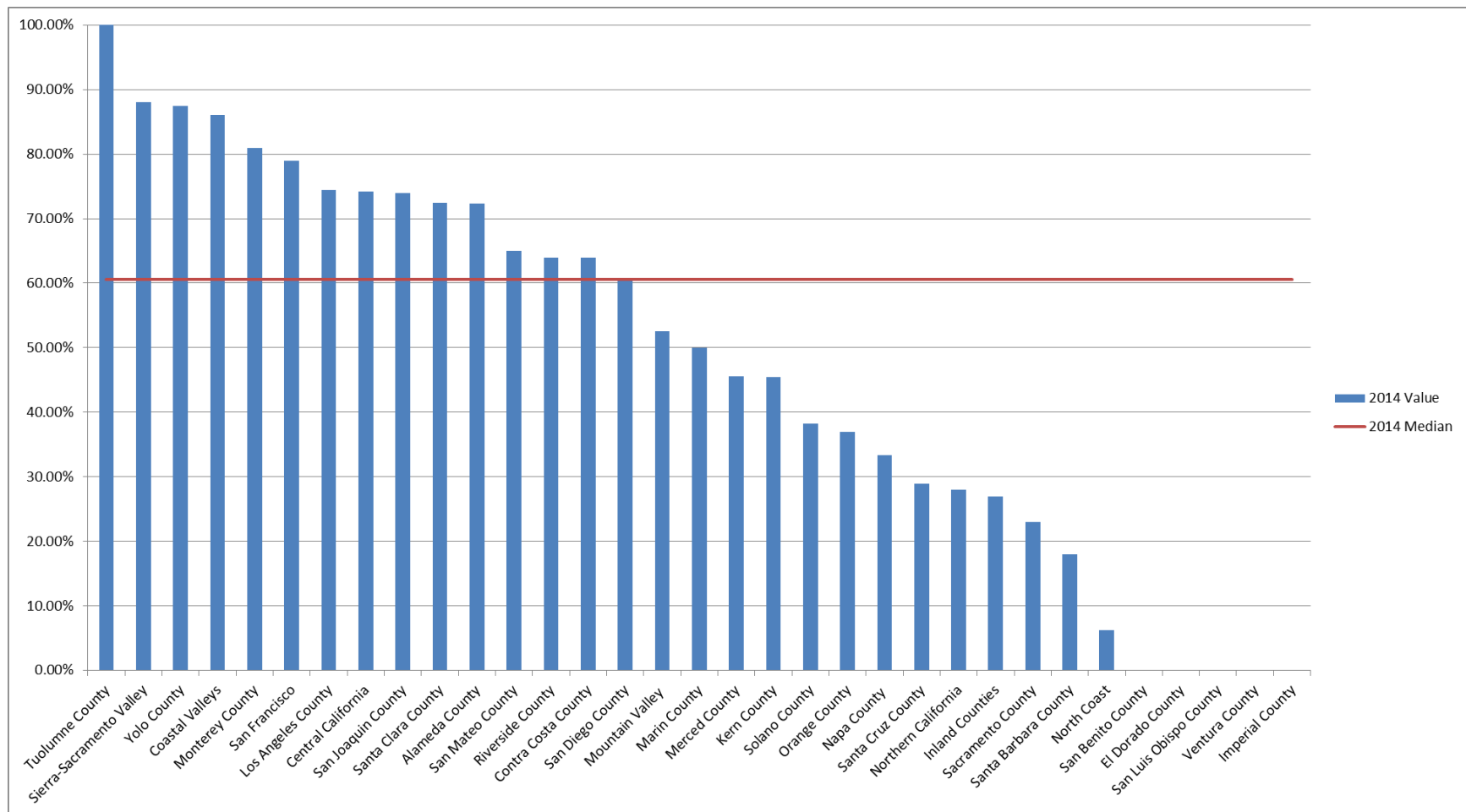
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PED-1: Pediatric Patients With Wheezing Receiving Bronchodilators – Part 1 of 2

Multiple factors impact the validity and analysis of these retrospective data, including but not limited to incomplete documentation, documentation not reflective of services provided prior to ambulance arrival, inconsistent data dictionary definitions between local jurisdictions, geographic resource disparities, and inability to collect hospital outcome data. This retrospective data have not been validated. These limitations caution against comparison between jurisdictions and limit the reliance of the aggregate values.

	2014 Value	2014 Denom.
Tuolumne County	100.00%	2
Sierra-Sacramento Valley	88.00%	92
Yolo County	87.50%	8
Coastal Valleys	86.00%	7
Monterey County	80.95%	21
San Francisco	79.00%	33
Los Angeles County	74.48%	960
Central California	74.24%	264
San Joaquin County	74.00%	77
Santa Clara County	72.41%	145
Alameda County	72.34%	235
San Mateo County	65.00%	26
Riverside County	63.96%	283
Contra Costa County	63.90%	65
San Diego County	60.62%	325
Mountain Valley	52.60%	38
Marin County	50.00%	10
Merced County	45.54%	191
Kern County	45.48%	376
Solano County	38.30%	141
Orange County	37.00%	167
Napa County	33.33%	3
Santa Cruz County	28.93%	591
Northern California	28.00%	36
Inland Counties	27.00%	1253
Sacramento County	23.00%	13
Santa Barbara County	18.00%	39
North Coast	6.20%	51
San Benito County	0.00%	1
El Dorado County		
San Luis Obispo County		
Ventura County		
Imperial County		

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Measure ID	PED-1
Response Count	29
Denominator Total	5453
Submission Rate (n=33)	87.88%
Average	54.34%
Median	60.62%

Median Values
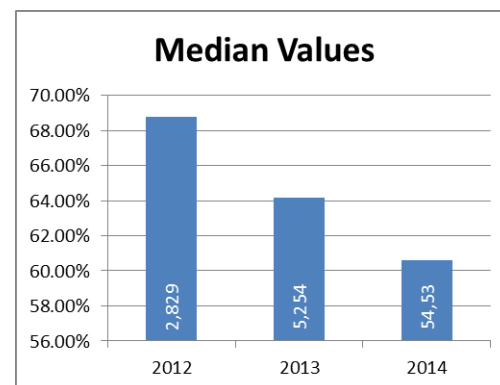
Of the 29 LEMSAs reporting these data for 2014, the median number of pediatric patients receiving bronchodilators for asthma was 60.6%. The decrease over the last 3 years suggests methodological issues rather than performance. The pediatric measure should have more validity than the adult, since shortness of breath with wheezing in children is more likely due to asthma than adult symptoms that may be due to cardiac etiology. It is not clear why the spectrum of results would be so variable. One reason may be multiple doses administered at the home prior to arrival of EMS or dose administered by first responders. Examination of this measure is recommended to ensure proper patient inclusion and documentation.
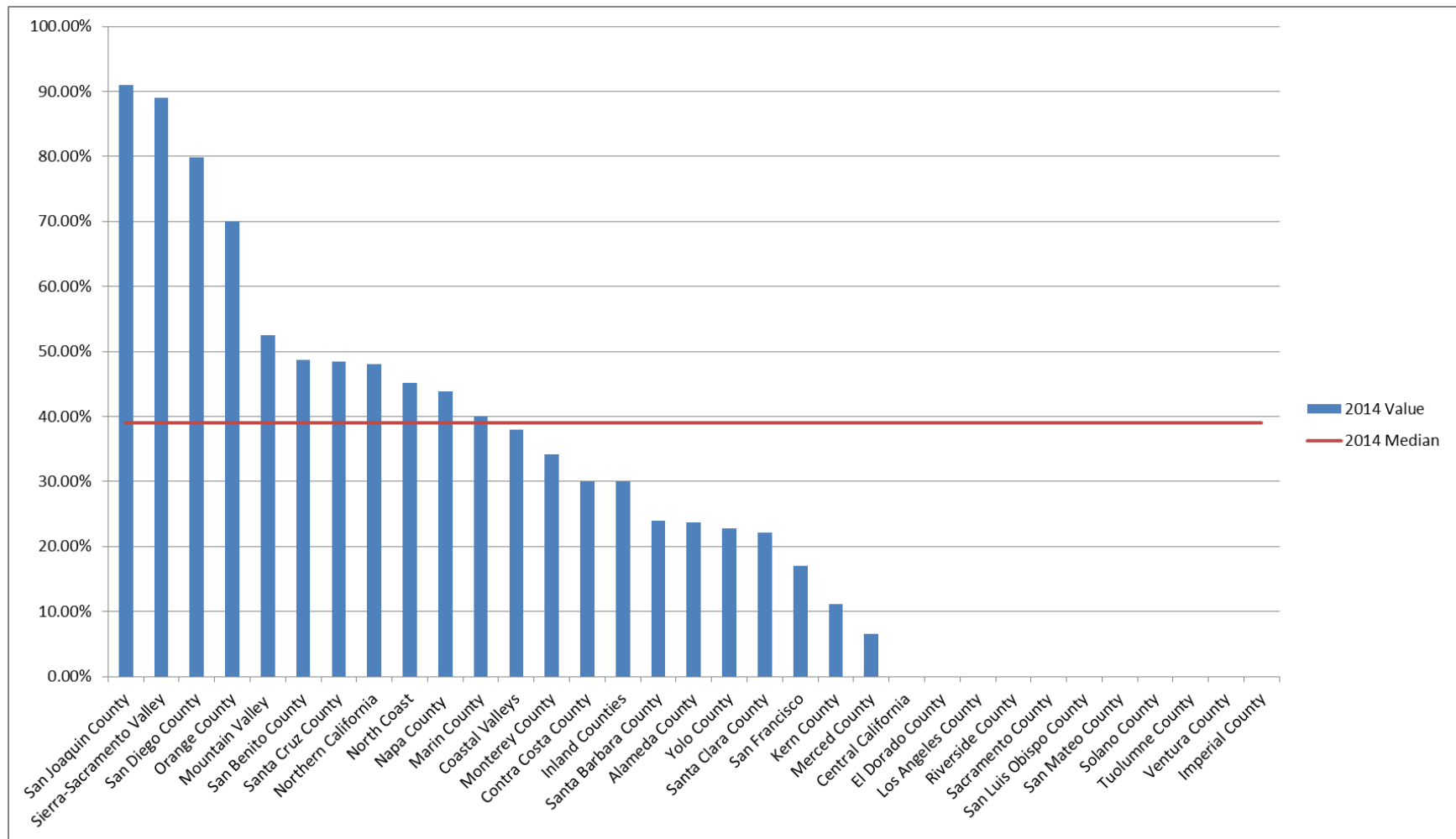
Contact Information:
Adam.davis@emsa.ca.gov
(916) 322-4336 ext. 409
http://www.emsa.ca.gov/ems_core_quality_measures_project

Multiple factors impact the validity and analysis of these retrospective data, including but not limited to incomplete documentation, documentation not reflective of services provided prior to ambulance arrival, inconsistent data dictionary definitions between local jurisdictions, geographic resource disparities, and inability to collect hospital outcome data. This retrospective data have not been validated. These limitations caution against comparison between jurisdictions and limit the reliance of the aggregate values.

PAI-1: Pain Intervention – Part 2 of 2

	2014 Value	2014 Denom.
San Joaquin County	91.00%	316
Sierra-Sacramento Valley	89.00%	5915
San Diego County	79.81%	1847
Orange County	70.00%	50
Mountain Valley	52.50%	5061
San Benito County	48.74%	369
Santa Cruz County	48.43%	733
Northern California	48.00%	1205
North Coast	45.20%	1320
Napa County	43.91%	1799
Marin County	40.00%	1331
Coastal Valleys	38.00%	4463
Monterey County	34.19%	4343
Contra Costa County	30.00%	13700
Inland Counties	30.00%	18243
Santa Barbara County	24.00%	1200
Alameda County	23.68%	32243
Yolo County	22.79%	3049
Santa Clara County	22.15%	6542
San Francisco	17.00%	1850
Kern County	11.19%	8886
Merced County	6.61%	2916
Central California		
El Dorado County		
Los Angeles County		
Riverside County		
Sacramento County		
San Luis Obispo County		
San Mateo County		
Solano County		
Tuolumne County		
Ventura County		
Imperial County		

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Measure ID	PAI-1
Response Count	22
Denominator Total	117381
Submission Rate (n=33)	66.67%
Average	41.65%
Median	39.00%

Median Values
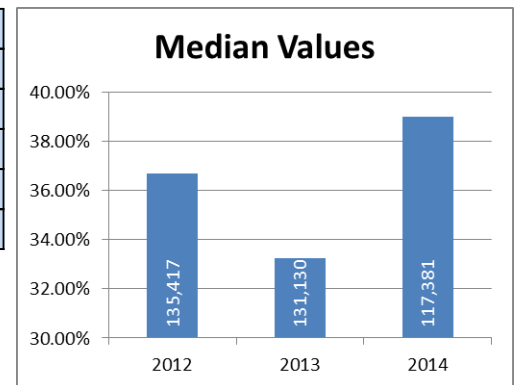
Of the 22 LEMSAs reporting these data for 2014, the median percentage of patients receiving intervention for any pain reported as 7 or greater on a 10-point pain scale was 39%. Pain intervention was defined as any analgesic medication or accepted procedure to reduce pain.

All paramedics have access to narcotics; however protocols for use may vary significantly. Some may have received pain medication from first responders. The wide variation deserves closer investigation.
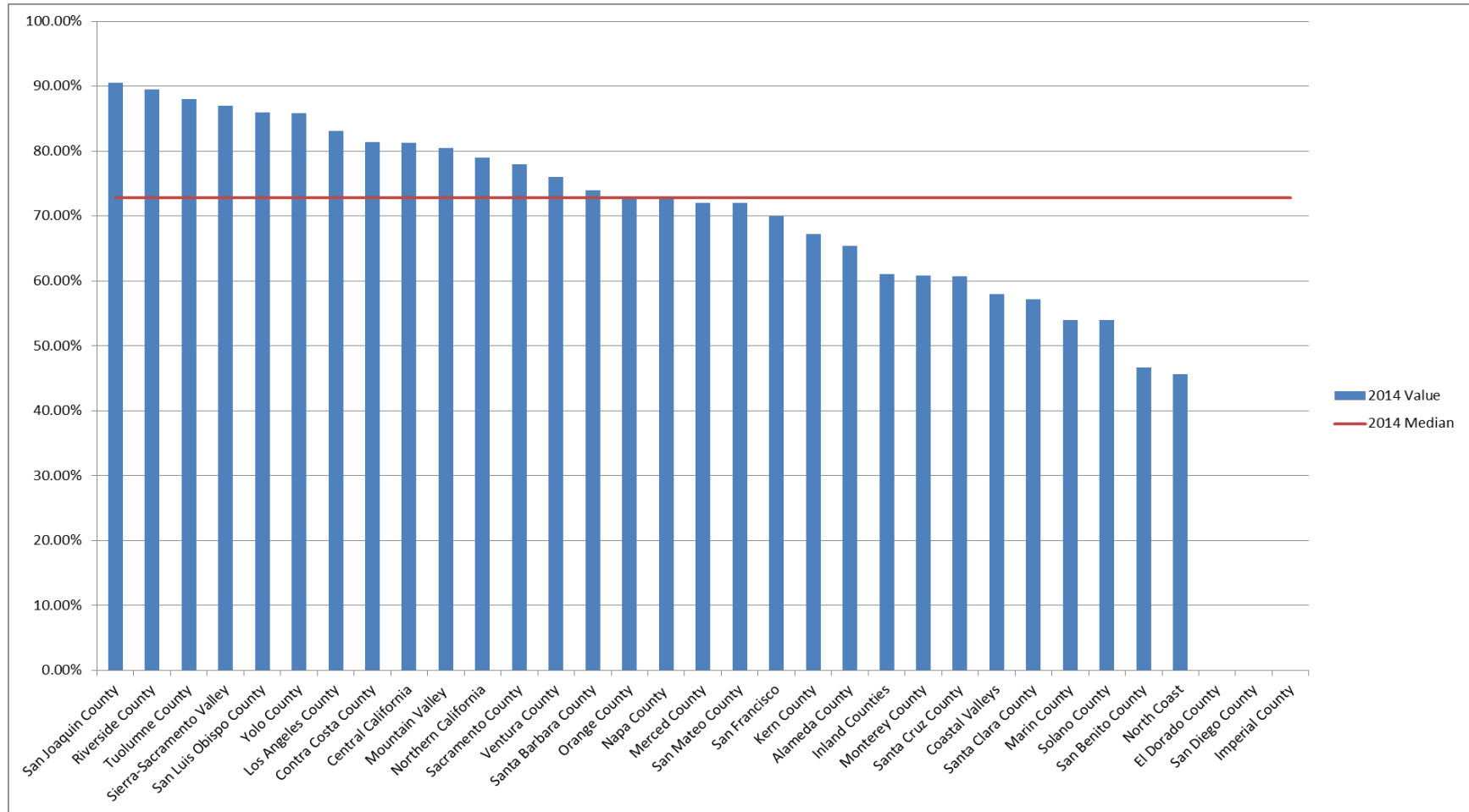
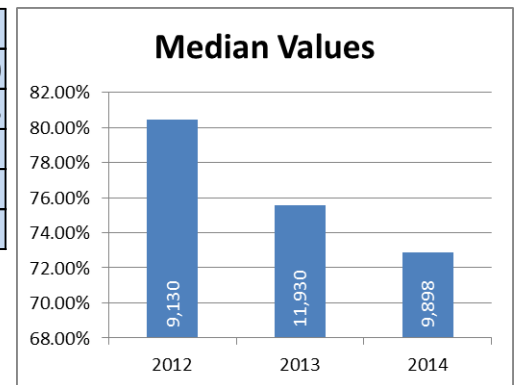# SKL-1: Endotracheal Intubation Success Rate – Part 1 of 2

Multiple factors impact the validity and analysis of these retrospective data, including but not limited to incomplete documentation, documentation not reflective of services provided prior to ambulance arrival, inconsistent data dictionary definitions between local jurisdictions, geographic resource disparities, and inability to collect hospital outcome data. This retrospective data have not been validated. These limitations caution against comparison between jurisdictions and limit the reliance of the aggregate values.

	2014 Value	2014 Denom.
San Joaquin County	90.50%	316
Riverside County	89.53%	1347
Tuolumne County	88.00%	17
Sierra-Sacramento Valley	87.00%	459
San Luis Obispo County	86.00%	118
Yolo County	85.89%	78
Los Angeles County	83.12%	2085
Contra Costa County	81.40%	322
Central California	81.23%	538
Mountain Valley	80.50%	123
Northern California	79.00%	52
Sacramento County	78.00%	18
Ventura County	76.00%	76
Santa Barbara County	74.00%	69
Orange County	73.00%	250
Napa County	72.73%	11
Merced County	72.00%	167
San Mateo County	72.00%	236
San Francisco	70.00%	206
Kern County	67.18%	582
Alameda County	65.38%	777
Inland Counties	61.00%	1050
Monterey County	60.77%	130
Santa Cruz County	60.76%	79
Coastal Valleys	58.00%	64
Santa Clara County	57.19%	320
Marin County	54.00%	68
Solano County	53.94%	165
San Benito County	46.67%	15
North Coast	45.60%	160
El Dorado County		
San Diego County		
Imperial County		

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Measure ID	SKL-1
Response Count	30
Denominator Total	9898
Submission Rate (n=33)	90.91%
Average	71.68%
Median	72.87%

Median Values

Of the 30 LEMSAs reporting these data for 2014, the median percentage of successful endotracheal intubations (within 2 attempts) was 72.9%. Endotracheal intubation success rate by paramedics in the field vary widely from 60-90% with an average of 72%, depending on methods, population and protocol.

It is unclear why this value has decreased over the past 3 years. Other methods of airway management have recently been shown to be as effective as intubation. It is important to monitor this measure to verify skill maintenance.
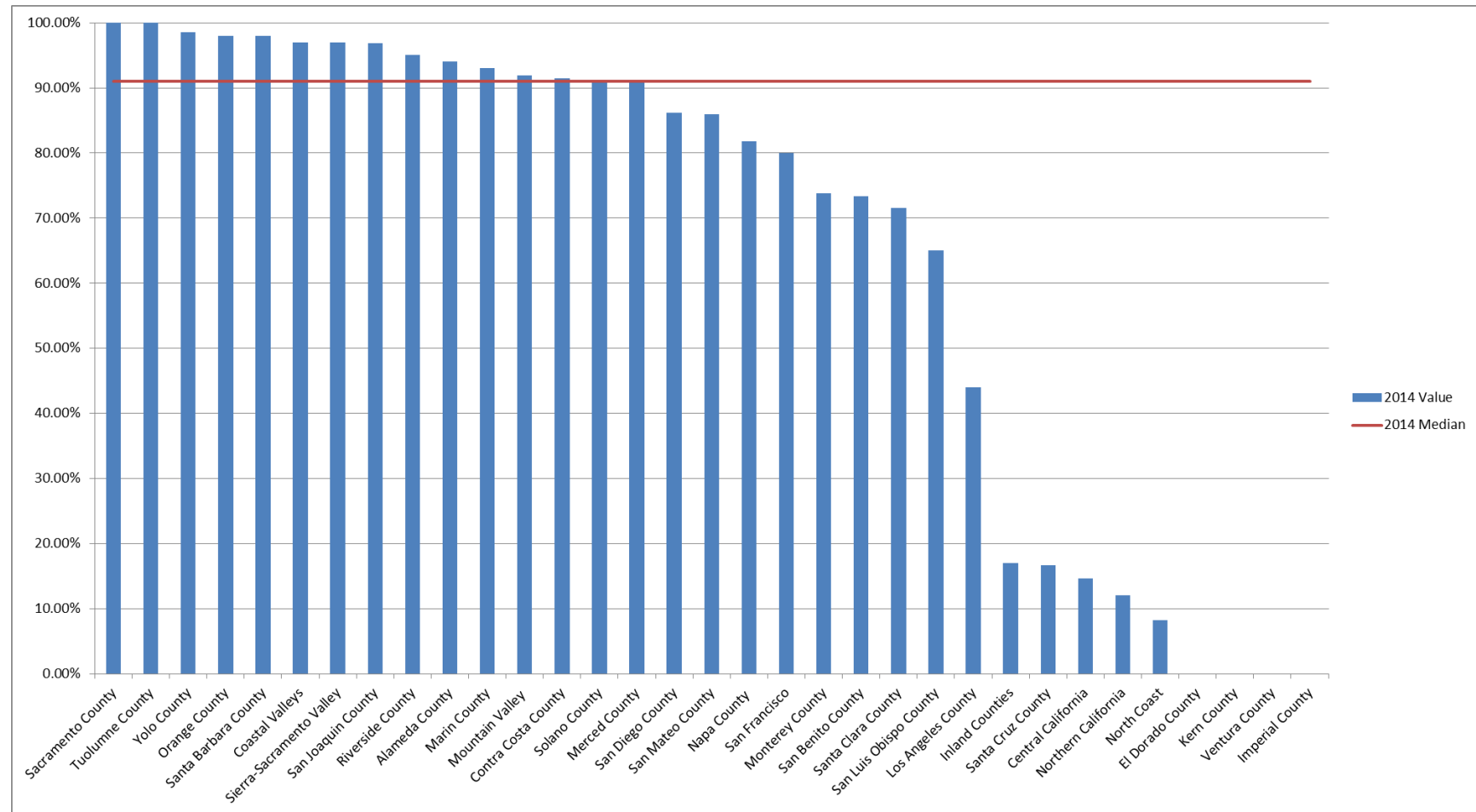
SKL-2: End-tidal CO2 Performed on any Successful Endotracheal Intubation – Part 1 of 2


Multiple factors impact the validity and analysis of these retrospective data, including but not limited to incomplete documentation, documentation not reflective of services provided prior to ambulance arrival, inconsistent data dictionary definitions between local jurisdictions, geographic resource disparities, and inability to collect hospital outcome data. This retrospective data have not been validated. These limitations caution against comparison between jurisdictions and limit the reliance of the aggregate values.

	2014 Value	2014 Denom.
Sacramento County	100.00%	14
Tuolumne County	100.00%	15
Yolo County	98.51%	67
Orange County	98.00%	50
Santa Barbara County	98.00%	51
Coastal Valleys	97.00%	37
Sierra-Sacramento Valley	97.00%	398
San Joaquin County	96.83%	316
Riverside County	95.06%	1215
Alameda County	94.09%	508
Marin County	93.00%	87
Mountain Valley	91.90%	123
Contra Costa County	91.50%	267
Solano County	91.20%	125
Merced County	91.00%	120
San Diego County	86.17%	253
San Mateo County	86.00%	171
Napa County	81.82%	11
San Francisco	80.00%	199
Monterey County	73.85%	130
San Benito County	73.33%	15
Santa Clara County	71.58%	183
San Luis Obispo County	65.00%	108
Los Angeles County	44.00%	1911
Inland Counties	17.00%	638
Santa Cruz County	16.67%	42
Central California	14.65%	437
Northern California	12.00%	41
North Coast	8.20%	73
El Dorado County		
Kern County		
Ventura County		
Imperial County		

Empty grey cells indicate no value reported

Measure ID	SKL-2
Response Count	29
Denominator Total	7605
Submission Rate (n=33)	87.88%
Average	74.60%
Median	91.00%
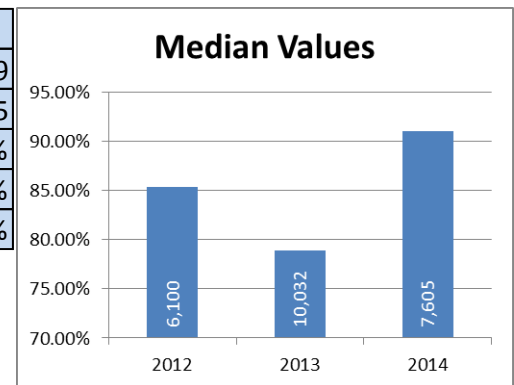
Median Values

Of the 29 LEMSAs reporting these data for 2014, the median percentage of End-Tidal CO2 monitoring with waveform capnography after any successful endotracheal intubations was 91%. The value significantly increased from last year, but has been variable over the three years of measurement. Following clinical best practices, this indicator should be 100%, so it is important for local jurisdictions to evaluate whether this is documentation, a practice issue, or protocol deficiency.