



EMS Core Measures Project

**Reporting Capability of EMSA and LEMSA Data Systems
and Results from Performance Measures Data Year 2015
with Comparison to Years 2012, 2013 and 2014**

**Emergency Medical Services Authority
California Health and Human Services Agency**



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EMS Core Measures Project, Reported 2015: 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. EMSA aims to track the continuum of care from dispatch to pre-hospital to hospital disposition in order to optimally evaluate EMS system performance and patientcare.

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. As of January 1, 2016, Health and Safety Code 1797.227 became law and mandates that an emergency medical care provider shall use an electronic health record system that is compliant with the current version of the CEMIS and NEMIS standards and must collect and submit data to the local EMS agency in a format that can be integrated into the LEMSA's data system. The effect of this new mandate will begin to be seen in 2017 when 2016 data are reported to EMSA.

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, such as aspirin administration for chest pain of suspected cardiac origin, 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 data validity and consistency. For example, changes were made to calculation method for the trauma measures (TRA-1 and TRA-2) to be more consistent with the CDC Trauma Triage Criteria (<https://www.cdc.gov/mmwr/preview/mmwrhtml/rr6101a1.htm>).

LEMSA participation in the Core Measure project is consistent with HSC 1797.102 which requires the LEMSA to provide the EMS Authority with details necessary to access the effectiveness of emergency medical services in each EMS area or the system's service area. The EMS Authority tasks the LEMSAs with the extraction and submission of core measure reports based on their local databases. Each of the 33 LEMSAs maintains their database independently, resulting in variability in their ability to report core measures. 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.

In addition to reporting core measure information, EMSA requested that each of the LEMSAs provide the following information in order to gain insight into the process of collection and reporting of their data at both the LEMSA and provider levels.

Data flow description:

- *Paper Patient Care Records (PCRs)*
 - *How many providers are using paper PCRs;*
 - *How the data from the paper PCRs are being entered into the system from those providers;*
- *Electronic Paper Patient Care Records (ePCRs)*
 - *How many providers are using electronic PFCRs;*
 - *How the data form the ePCRs are being entered into the system;*
- *A general description of your data system to include:*
 - *A general description of the data flow from the providers to EMSA;*
 - *Who compiles the data for the Core Measures Reports (LEMSA staff, contractor, provider, etc.);*
 - *Who submits the Core Measures Reports to EMSA;*
 - *Who compiles the data for the Core Measures Reports (LEMSA staff, contractor, etc.); and*

- *Any other information that would help us better understand the Core Measures data submitted*

Limitations and Challenges

Core measure reporting is a project that depends on compatible data systems at several levels of the EMS system and access to hospital health information on patient outcomes to provide meaningful data. It will take several more years to achieve the level of confidence of other healthcare sector quality assessment reporting, such as hospitals. EMSA will continue to work on these measures to improve the validation, data collection, and reporting processes and to connect them to “best practices”. LEMSAs encounter significant challenges in reporting the core measures to EMSA, which are enumerated below. Not all LEMSAs can report on all the measures; of the 33 LEMSAs, 29 reported at least one clinical measure for 2015 data, but only 4 can report results for all 17 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 to new systems for NEMSIS 3.4.

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 force users to complete forms before closing the record. Providers are mandated by recent legislation to use ePCR and submit electronic data to the LEMSA by the end of 2016. (See below)

Hospital Outcome Data – One of the clear challenges identified each year is the difficulty in obtaining hospital outcome data on all ambulance transports. 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. Recent legislation may help by specifically allowing hospitals to share patient information with EMS providers and agencies. (See below)

Transition from NEMSIS 2 to 3 – Legislation calls for the process to be completed by January 1, 2017, but this transition is likely to extend into 2017. The Core Measures specifications will transition next year to NEMSIS 3.4 data definitions, but since some jurisdictions will receive and report data in both NEMSIS 2 and 3, the ability to conduct comparative analysis will be impacted.

Recent Data Legislation

- Recent state legislation is driving changes in EMS data systems related to data quality and data accuracy. Specifically, four bills were enacted in 2015 and became effective January 2016. These include: AB 1129 requires each provider to utilize electronic health record systems that are compliant with the "current version of NEMESIS" to collect EMS data;
- AB 503 authorizes a health facility to share patient-identifiable information with EMSA or other appropriate EMS entities for the purposes of addressing quality improvement;
- AB 1223 requires EMSA to adopt standards related to data collection for ambulance patient off-load time; and
- SB 19 requires EMSA to establish a pilot project to be known as the California POLST eRegistry for the purpose of collecting information received from a physician or their designee.

Because of the requirement to have electronic data collection, each of these new laws will likely have some impact on the Core Measures effort, particularly AB 1129 and AB 1223.

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 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, data dictionaries and electronic database products, and measureable 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 are calculated and submitted, the accuracy of the data cannot be evaluated. This is compounded where there is manual data entry.

Documentation by Non-Trained Providers - EMS field personnel do not receive specific core measures training for data entry. Consequently, responders likely do not consistently record all the data elements required for core measures. LEMSAs and Providers are tasked with monitoring documentation, skills maintenance/competency and clinical care and patient outcome through the quality improvement regulations found in CCR Title 22 Division 9 Chapter 12. Additional education and training would 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. Electronic Patient Care Record Software has the functionality to make elements, such as those utilized in the core measures, mandatory prior to the closing a record leading to more complete documentation.

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, which is an issue nationwide.

Provider Data Submission – Only a portion of the actual EMS business conducted in California is represented in this report. The values reported by the LEMSAs are not representative of 100% of the providers in the state. Since not all providers are currently using an ePCR, records may be open to transcription errors. EMSA is working with the LEMSAs to assist providers to shift from paper patient care records to electronic data 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 accurate reports on core measures
3. Transition from NEMSIS Version 2 to NEMSIS Version 3, an updated national data dictionary.
4. Aim to achieve 100% data submission by 100% of EMS providers statewide.

Improvements

The number of LEMSAs who submitted any core measure values to EMSA decreased from the prior year (from 31 to 29 of 33 submitting at least one clinical measure), but the number of measures that each LEMSA reported increased significantly (see Chart 2 “Histogram”).

The following 7 (seven) measures experienced an improvement in their median reported value from the previous year:

- TRA-1
- TRA-2
- ACS-1
- CAR-2
- CAR-4
- STR-2
- STR-3
- SKL-1

EMS Compass

A national initiative (<http://www.emscompass.org/>) began in 2015 to develop performance measures, which are similar to the California Core Measures. The primary difference is that the national effort has focused on fewer data elements than California’s effort. As the national efforts moves, forward, California will continue to work with the initiative and coordinate with the performance measurements as much as possible. Initially, EMS Compass will release five measures or groups of measures related to Hypoglycemia; Seizures; and Stroke. These were extensively researched and linked to NEMSIS 3.4 data definitions. EMSA intends to introduce the national measures into Core Measures, initially incorporating Compass methodology into our measures design, where the measures are aligned with current Core Measures.

Additional Data Flow Information

Overview

The Core Measures Project provides a unique opportunity to collect information about the local agency data collection processes at both the LEMSA and provider levels. Because only 21 of 33 LEMSAs currently submit some patient records to CEMSIS, core measures participation is the only mechanism that can gather these data and provide critical insight and context to the data submitted to CEMSIS.

Paper versus Electronic Data Submission

Use of paper PCRs increases the data error rate due to transcription errors. For 2015, ten (10) LEMSAs (out of 20 responding) reported at least one (1) provider is still using paper PCR—but only 20 LEMSAs provided this information. This number should soon decrease to zero, because of recent legislation that requires all data submission from providers to LEMSAs in an electronic format (see AB 1129, chapter 377, Section 1797.227 Health and Safety Code). EMSA has made it a priority to provide technical assistance to those LEMSAs who have identified providers utilizing paper records. The impact of AB 1129 will not be apparent until the 2016, or even more in the 2017 Core Measures Report, since the transition to full electronic patient data in NEMSIS 3.4 is not required until the end of 2016.

Data Flow Survey

Information on data flow improves EMSA's understanding of the LEMSAs' data processes and provides useful insight into the Core Measure data collected. Of the 29 LEMSAs submitting data, 21 provided supplementary information with their Core Measures Report submission and 20 LEMSAs provided a response to the questions regarding PCRs (*see a, b below*), while 9 of the 29 LEMSAs provided responses to the general description of the data flow (*see c below*).

The data flow information requested in the Core Measures Instructional Manual is:

- Paper Patient Care Records (PCRs) –
 - *Number of providers using paper PCRs;*
 - *How the data from the paper PCRs are being entered into the system from those providers;*
- Electronic Paper Patient Care Records (ePCRs)
 - *Number of providers using electronic PFCRs;*
 - *How the data form the ePCRs are being entered into the system;*
- A general description of your data system to include:
 - *A general idea of the data flow from the providers to EMSA;*
 - *Who compiles the data for the Core Measures Reports (LEMSA staff, contractor, provider, etc.);*
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Software Vendors

Providers or LEMSAs are using at least fourteen (14) different Software Vendors for their patient care data:

- SIMON
- AMR MEDS
- Zoll
- ESO Solutions
- ImageTrend
- Lancet
- First Watch
- PhysioControl
- Local Fire Solution (2)
- Sansio
- ePCR
- DataPro
- Digital Innovation

Providers

Two hundred ninety one (291) EMS provider agencies, operating in the 21 LEMSAs which responded to the supplemental information request, provided data for this report. 561 EMS providers work within those same responding LEMSAs boundaries, leaving 270 providers, who did not provide data for this report. EMSA expects to have additional information provided in future years to gain a better understanding of the percentage of providers and patient runs statewide that are represented in the report.

The supplementary information provided by the LEMSAs indicates that only about one-half of the EMS Providers are submitting data to their LEMSA for inclusion in this report.

Service Level: ALS, BLS, and Other

EMSA also requested information on the responding level of care, using categories ALS (Advanced Life Support), BLS (Basic Life Support), or Other (such as Air Ambulance). The LEMSAs provided these numbers to reflect activity from the providers who operate in their jurisdiction. The matrix on the next page displays this information more clearly.

Summary of Providers operating in LEMSA vs. Providers represented in this Core Measure Report

	ALS Providers in Region	ALS Providers in Report	Total BLS Providers in Region	BLS Providers in Report	Other Providers in Region	Other Providers in Report	Sum of Providers in Region	Sum of Providers in Report	Percent in Report
Central California	18	17	0	0	0	0	18	17	94.4%
Contra Costa	7	7	9	0	0	0	16	7	43.8%
ICEMA	48	48	16	3	0	0	64	51	79.7%
Kern	10	4	2	0	0	0	12	4	33.3%
LA	48	38	68	41	13	0	129	79	61.2%
Marin	6	6	0	0	0	0	6	6	100.0%
Merced	2	2	7	0	0	0	9	2	22.2%
Mountain Valley	8	1	0	0	0	0	8	1	12.5%
Napa	3	3	5	5	0	0	8	8	100.0%
Riverside	11	4	11	0	0	0	22	4	18.2%
San Benito	1	1	0	0	0	0	1	1	100.0%
San Diego	35	35	21	0	0	0	56	35	62.5%
San Francisco	3	2	4	0	0	0	7	2	28.6%
San Luis Obispo	8	2	10	0	2	2	20	4	20.0%
Santa Barbara	4	4	7	7	0	0	11	11	100.0%
Santa Clara	15	15	10	1	2	0	27	16	59.3%
Sierra-Sacramento	34	26	87	2	0	0	121	28	23.1%
Tuolumne	1	1	10	0	1	0	12	1	8.3%
Ventura	7	7	5	5	0	0	12	12	100.0%
Yolo	1	1	0	0	1	1	2	2	100.0%
TOTAL	270	224	272	64	19	3	561	291	51.9%

ALS Services have a much higher representation rate than BLS or “Other” services in this report. This may be due to a number of reasons such as:

- ALS services having a greater ability to report than BLS services; or
- LEMSAs with less than 50% of providers reporting are primarily rural regions.

Collection and Submission of Data

Data aggregation, running the core measure reports, and submitting the data are done most often by staff within the LEMSA, but in some cases, is managed by the provider. The following (11) LEMSAs indicated that LEMSA Staff (or contractor) handled the aggregation and submission of their core measures information:

- Alameda
- North Coast
- Contra Costa
- Marin
- Merced
- Nor-Cal
- San Luis Obispo
- San Joaquin
- Orange
- Mountain Valley
- San Diego

The following (3) LEMSAs indicated that their provider handled the aggregation and submission of their core measures information:

- Coastal Valley
- San Benito
- Santa Cruz

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

LEMAs Reporting Data for Any Core Measures (Table 1)

Table 1 shows which LEMAs submitted any core measures for data years 2009-2015. If a LEMSA was able to submit a value for any of the 17 clinical measures or the three (3) 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 marked with an "X" and colored green. For LEMAs that did not submit any core measure information to EMSA, their cell for that corresponding year appears white. 29/33 LEMAs reported at least one measure. Four LEMAs did not submit 2015 data for this report.

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

This table includes 2012, 2013, 2014 and 2015 information and displays the number of LEMAs who reported a value for the specific clinical measure, the denominator total (number of patient records) for each response, submission rate, average reported value, and median value for all responses.

Frequency Histogram of LEMSA Number of Responses to Clinical Measures (n=17) for 2012-2014 (Figure 1) and LEMSA Response Count to 17 Clinical Measure for 2015 Data (Figure 2)

The histogram shows the LEMAs' ability to report the 17 clinical measures. It shows the number of LEMAs 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 LEMAs 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 LEMAs was able to report and is organized alphabetically.

Of interest is how many clinical measures could be evaluated by the LEMAs. Out of the seventeen clinical measures, 29 of 33 LEMAs (93%) were able to report at least nine, based on their 2015 data.

The inability to report these measures is not indicative of a LEMAs 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.

Table 3 list measures reported by at least 75% of LEMAs and measures with the lowest response rate. The latter is primarily a reflection of the difficulty in obtaining hospital outcome data.

Table 1. LEMSAs Reporting Data for Any Core Measure

	2009	2010	2011	2012	2013	2014	2015
Alameda County EMS		X	X	X	X	X	X
Central California EMS	X	X	X	X	X	X	X
Coastal Valleys EMS				X	X	X	X
Contra Costa County EMS		X	X	X	X	X	X
El Dorado County EMS				X	X	X	
Imperial County EMS							
Inland Counties EMS	X	X	X	X	X	X	X
Kern County EMS		X	X		X	X	X
Los Angeles County EMS	X	X	X	X	X	X	X
Marin County EMS		X	X		X	X	X
Merced County EMS	X	X	X	X	X	X	X
Monterey County EMS		X	X	X	X	X	X
Mountain Valley EMS		X	X	X	X	X	X
Napa County EMS					X	X	X
North Coast EMS		X	X	X	X	X	X
Northern California EMS	X	X	X	X	X	X	X
Orange County EMS					X	X	X
Riverside County EMS		X	X	X	X	X	X
Sacramento County EMS		X	X	X	X	X	
San Benito County EMS					X	X	X
San Diego County EMS		X	X	X	X	X	X
San Francisco EMS	X	X	X	X	X	X	X
San Joaquin County EMS				X	X	X	X
San Luis Obispo County EMS		X	X	X	X	X	X
San Mateo County EMS		X	X	X	X	X	X
Santa Barbara County EMS	X	X	X		X	X	X
Santa Clara County EMS	X	X	X	X	X	X	X
Santa Cruz County EMS	X	X	X		X	X	X
Sierra-Sacramento Valley EMS	X	X	X	X	X	X	X
Solano County EMS				X	X	X	
Tuolumne County EMS		X	X	X	X	X	X
Ventura County EMS		X	X	X	X	X	X
Yolo County EMS					X	X	X
Total number of LEMSAs reporting (including Response and Transport Measures)	10	24	24	24	32	32	29
Indicates the LEMSA reported at least 1 measure							
Indicates the LEMSA reported no measures							

Table 2. Clinical Measures Response Count*, Denominator Total, Submission Rate, Average Measure Value, and Median Measures Value as Reported by LEMSA

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																	
2015																	
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	27	26	29	29	27	28	29	10	10	29	26	22	27	27	25	28	28
Denominator Total	14036	19456	98274	101450	18553	13703	16385	4820	4580	30254	25155	26212	116267	8614	251438	9629	7170
Submission Rate (n=33)	81.82%	78.79%	87.88%	87.88%	81.82%	84.85%	87.88%	30.30%	30.30%	87.88%	78.79%	66.67%	81.82%	81.82%	75.76%	84.85%	84.85%
Average	0:23:49	70.04%	66.28%	80.97%	0:22:27	81.83%	27.78%	26.10%	14.64%	84.91%	0:20:24	69.34%	45.88%	43.51%	39.51%	72.73%	75.79%
Median	0:23:44	83.37%	66.00%	85.81%	0:23:07	95.85%	27.49%	19.41%	10.75%	92.90%	0:20:29	88.70%	37.21%	29.00%	32.40%	73.37%	88.25%
29 Total Submissions considered in this table																	

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

Fifteen of the seventeen measures had a 75% response rate or greater. (Table 3)

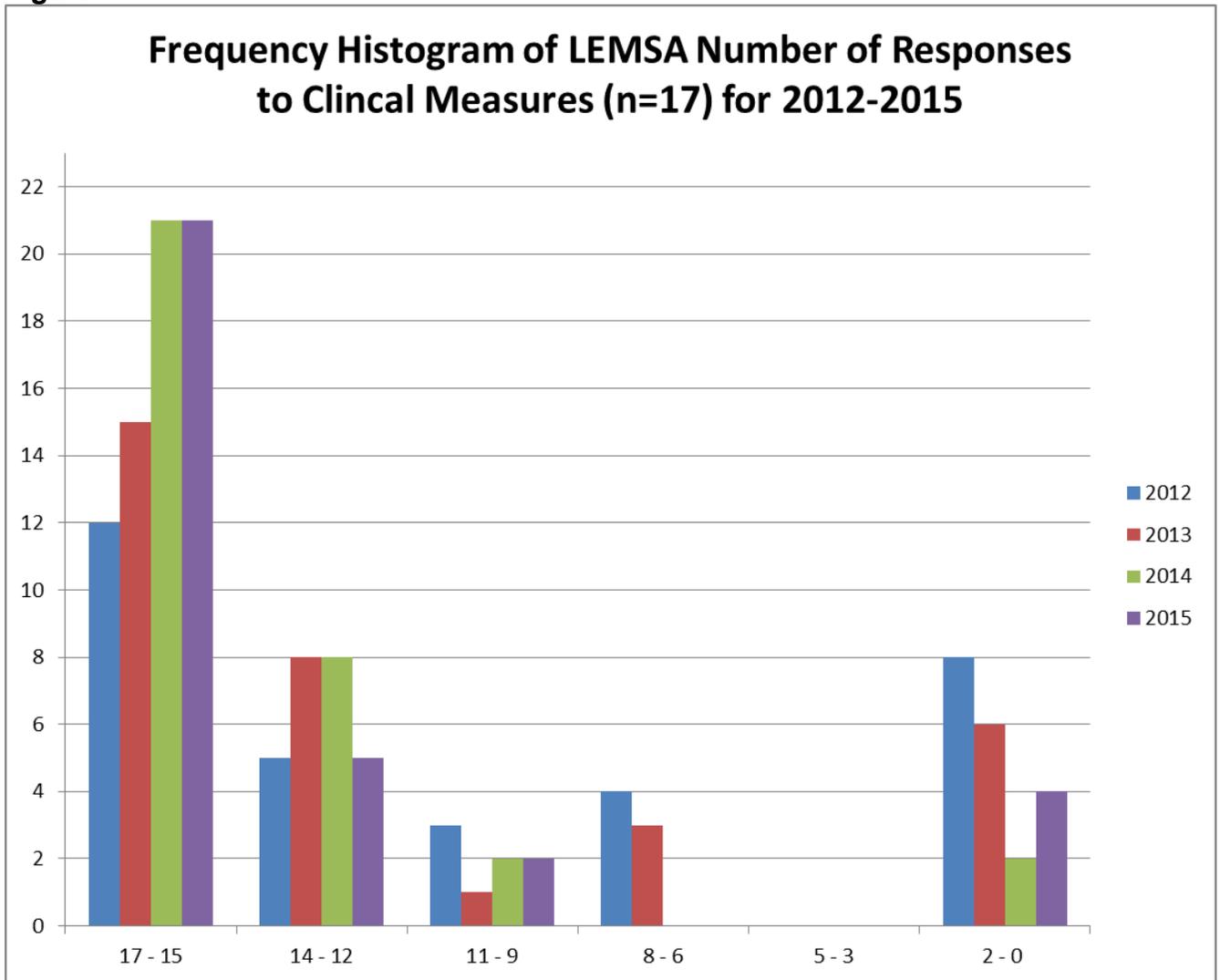
The following measures were reported by at least 25 of 33 LEMSAs (75%):

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. STR-5 Direct transport to stroke center for suspected acute stroke patients meeting criteria
11. RES-2 Beta2 agonist administration for adult patients
12. PED-1 Pediatric patients with wheezing receiving bronchodilators
13. PAI-1 Pain intervention
14. SKL-1 Endotracheal intubation success rate
15. SKL-2 End-tidal CO2 performed on any successful endotracheal intubation

Measures with the lowest response rate include:

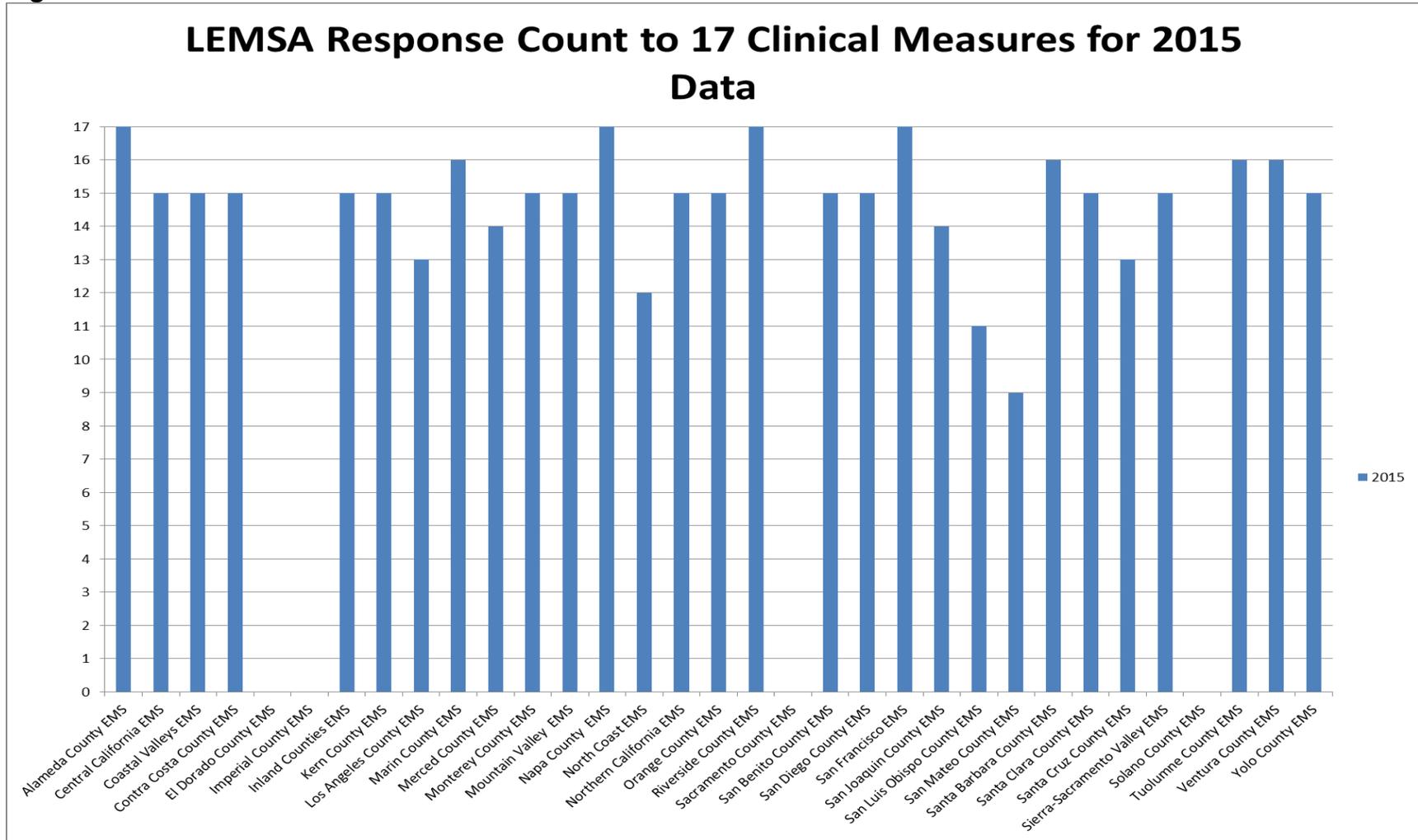
1. CAR-3 Out of hospital Cardiac Arrest Survival to Emergency Department Discharge
2. CAR-4 Out of hospital Cardiac Arrest Survival to Hospital Discharge

Figure 1



Number of Measures	2012	2013	2014	2015
17 - 15	12	15	21	21
14 - 12	5	8	8	5
11 - 9	3	1	2	2
8 - 6	4	3	0	0
5 - 3	0	0	0	0
2 - 0	8	6	2	4

Figure 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

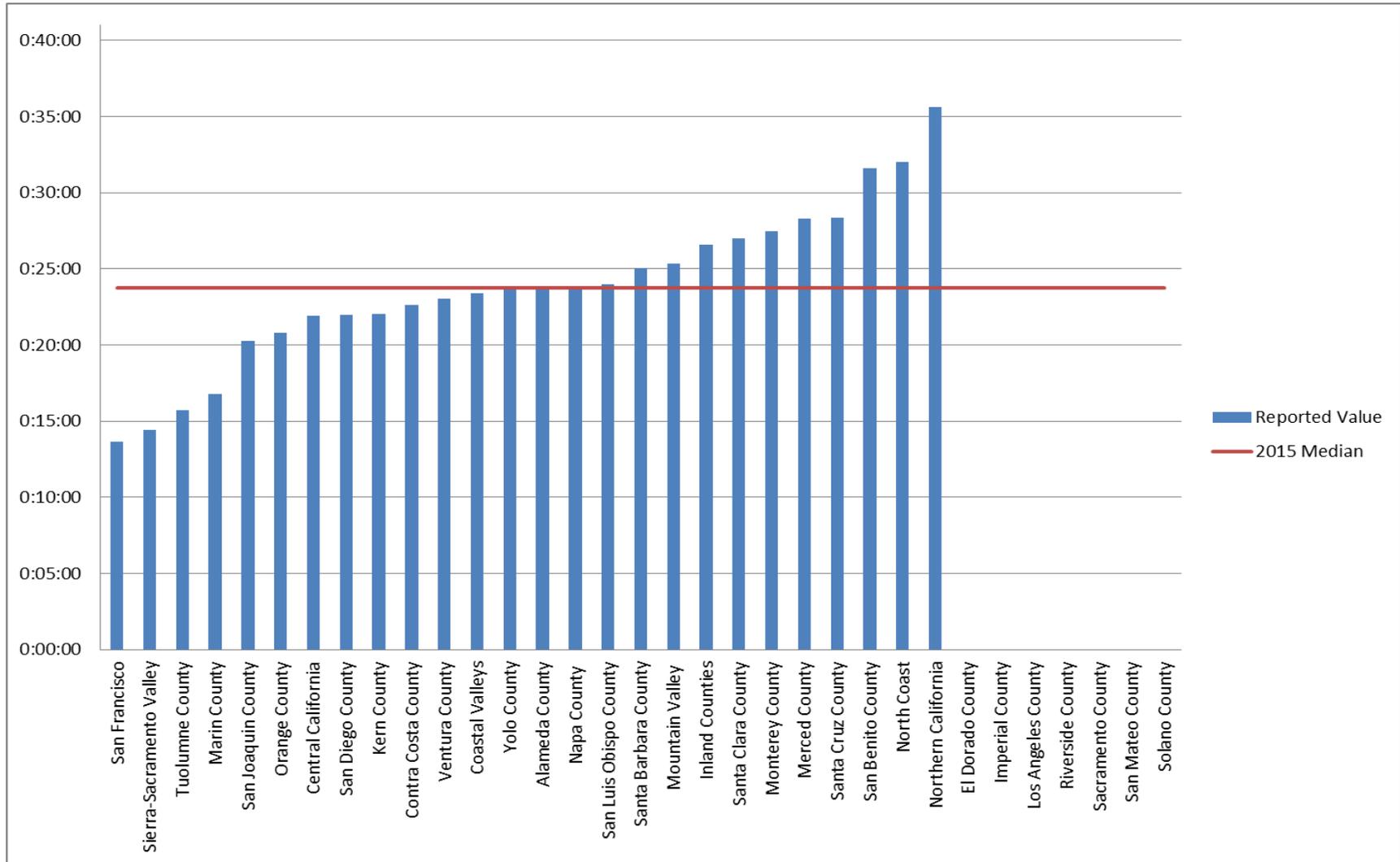
Clinical Measure Results

This report includes the LEMSA's 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 contain no value and is shaded grey. In addition, "Part 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.

The results of three non-clinical measures were omitted from this report due to difficulty in displaying the information by ambulance zone in a meaningful manner. (There are 336 ambulance zones in California.)

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

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

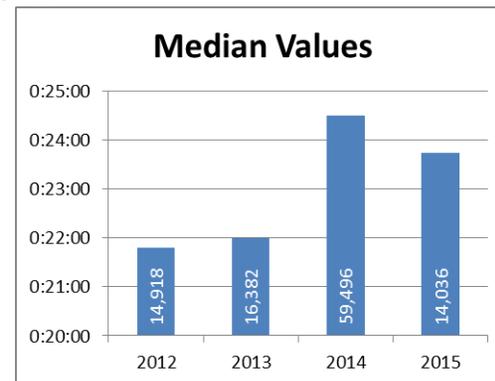


Multiple factors impact the validity and analysis of these retrospective data, including but not limited to incomplete documentation, documentation not reflective of services provided prior to ambulance arrival, inconsistent data dictionary definitions between local jurisdictions, geographic resource 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.

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

	2015 Value	2015 Denom.
San Francisco	0:13:39	483
Sierra-Sacramento Valley	0:14:25	406
Tuolumne County	0:15:42	11
Marin County	0:16:46	29
San Joaquin County	0:20:16	649
Orange County	0:20:48	205
Central California	0:21:55	1281
San Diego County	0:22:00	4336
Kern County	0:22:02	244
Contra Costa County	0:22:39	112
Ventura County	0:23:02	284
Coastal Valleys	0:23:24	306
Yolo County	0:23:36	176
Alameda County	0:23:52	201
Napa County	0:23:52	137
San Luis Obispo County	0:24:00	73
Santa Barbara County	0:25:01	511
Mountain Valley	0:25:19	467
Inland Counties	0:26:36	1109
Santa Clara County	0:26:59	772
Monterey County	0:27:28	490
Merced County	0:28:17	340
Santa Cruz County	0:28:20	843
San Benito County	0:31:36	58
North Coast	0:32:00	435
Northern California	0:35:36	78
El Dorado County		
Imperial County		
Los Angeles County		
Riverside County		
Sacramento County		
San Mateo County		
Solano County		

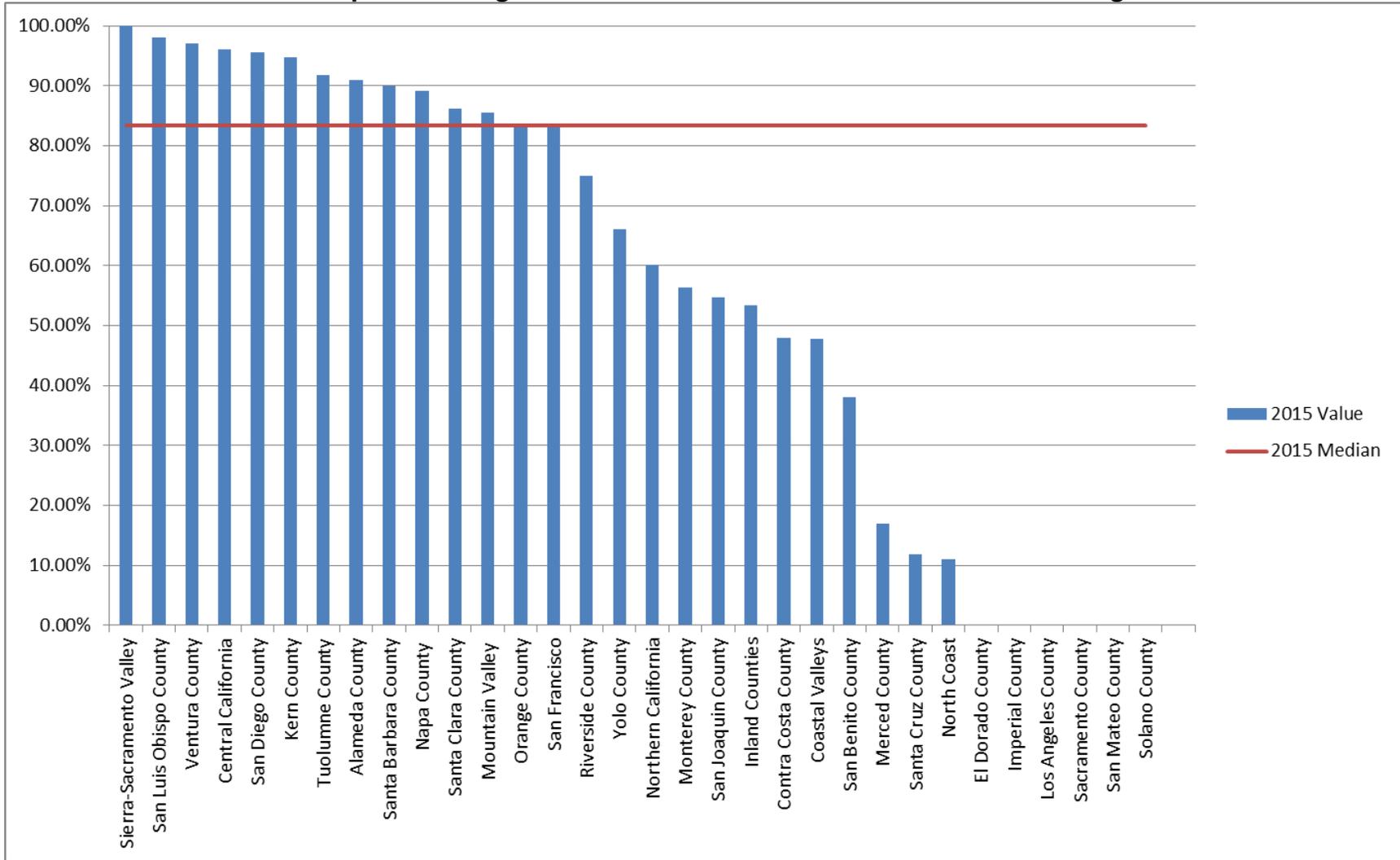
Measure ID	TRA-1
Response Count	27
Denominator Total	14036
Submission Rate (n=33)	81.82%
Average	0:23:49
Median	0:23:44



Of the 27 LEMSAs reporting these data for 2015, the median scene time was 23 minutes, 44 seconds. This is a decrease of one and one half minutes, from 2014 data, which is not of practical significance. 2015 data is the second year where the data were analyzed based on a revised trauma score that shifted from the more seriously injured to include all trauma patients meeting the CDC Trauma Triage Criteria. 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 and other scene variables. Moreover, the Golden Hour concept and trauma response time have both been challenged in the literature.

LEMSAs whose name appears in a grey cell indicate that the LEMSA did not report any clinical measures for the 2015 data year. LEMSAs whose name appears in a white cell, but have grey cells for their reported value, indicate participation in this year’s core measures reporting, but reported no values for this specific measure in 2015. Riverside EMS Agency submitted data but these are not represented on this associated chart or table because they were unable to aggregate information between 3 providers.

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

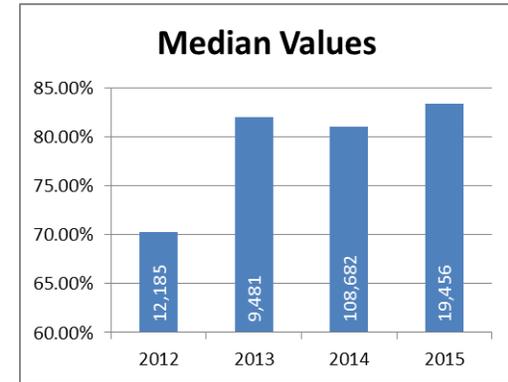


Multiple factors impact the validity and analysis of these retrospective data, including but not limited to incomplete documentation, documentation not reflective of services provided prior to ambulance arrival, inconsistent data dictionary definitions between local jurisdictions, geographic resource 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.

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

	2015 Value	2015 Denom.
Marin County	100.00%	29
Sierra-Sacramento Valley	98.03%	406
San Luis Obispo County	97.00%	73
Ventura County	96.00%	284
Central California	95.63%	1281
San Diego County	94.69%	8225
Kern County	91.80%	244
Tuolumne County	91.00%	11
Alameda County	90.00%	201
Santa Barbara County	89.20%	511
Napa County	86.16%	137
Santa Clara County	85.49%	772
Mountain Valley	83.73%	467
Orange County	83.00%	205
San Francisco	75.00%	483
Riverside County	66.12%	1966
Yolo County	60.20%	176
Northern California	56.41%	78
Monterey County	54.69%	490
San Joaquin County	53.31%	649
Inland Counties	48.00%	1109
Contra Costa County	47.80%	112
Coastal Valleys	38.00%	306
San Benito County	17.00%	58
Merced County	11.76%	340
Santa Cruz County	11.00%	843
North Coast		
El Dorado County		
Imperial County		
Los Angeles County		
Sacramento County		
San Mateo County		
Solano County		

Measure ID	TRA-2
Response Count	26
Denominator Total	19456
Submission Rate (n=33)	78.79%
Average	70.04%
Median	83.37%



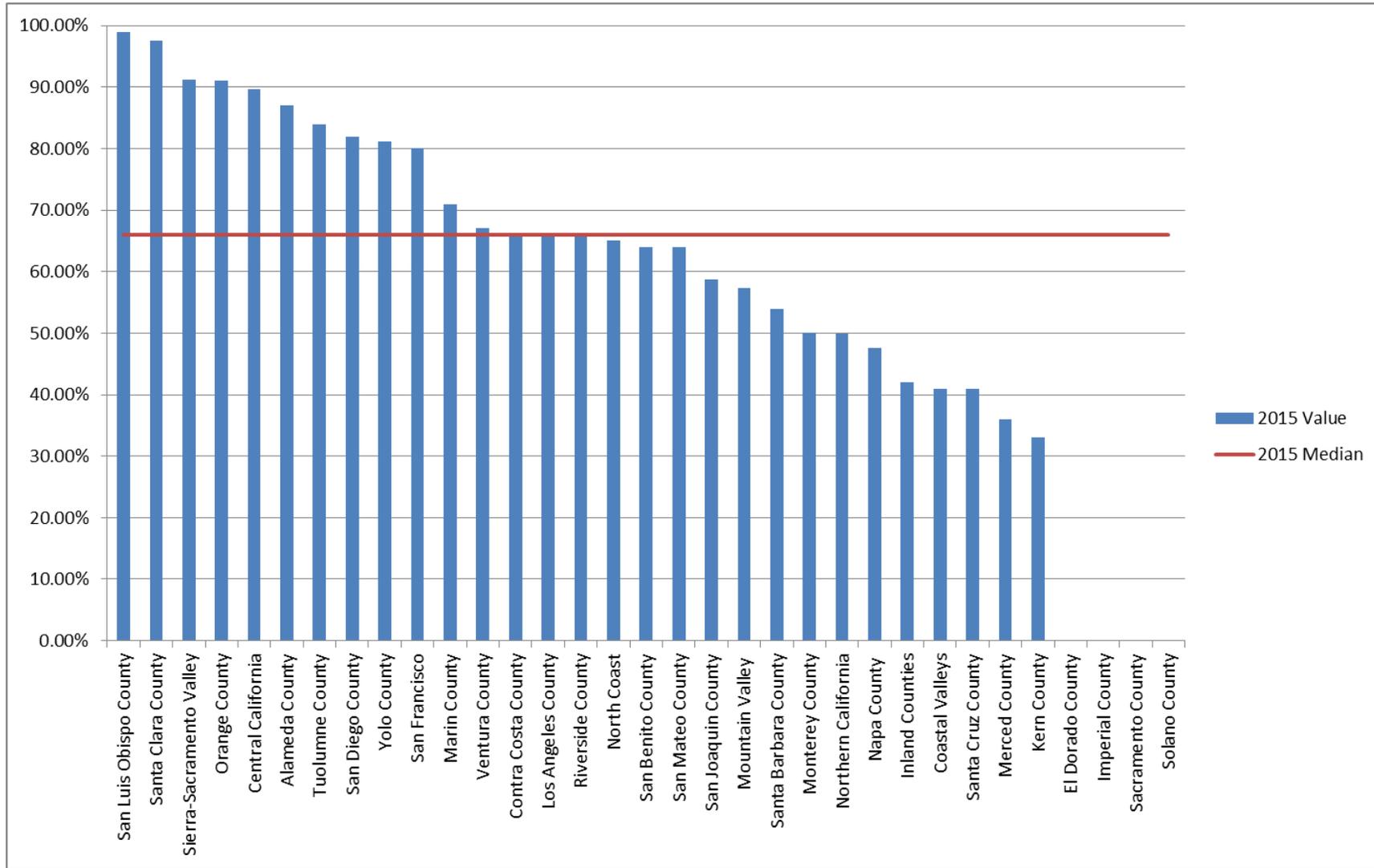
Of the 26 LEMSAs reporting these data for 2015, the median of patients transported directly to a trauma center was 83%. These results have been very stable for the past 3 years. Adjustments were made to the Trauma measures to analyze a larger population of trauma patients in calendar year 2014 and 2015. 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.

Direct transport to a designated trauma center has been shown to improve outcomes in seriously injured patients. 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. LEMSAs with low values despite accessible trauma centers available should consider auditing transport destinations.

This measure experienced a spike in the denominator value reported as a result of a change in the methodology for this indicator.

LEMSAs whose name appears in a grey cell indicate that the LEMSA did not report any clinical measures for the 2015 data year. LEMSAs whose name appears in a white cell, but have grey cells for their reported value, indicate participation in this year's core measures reporting, but reported no values for this specific measure in 2015.

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

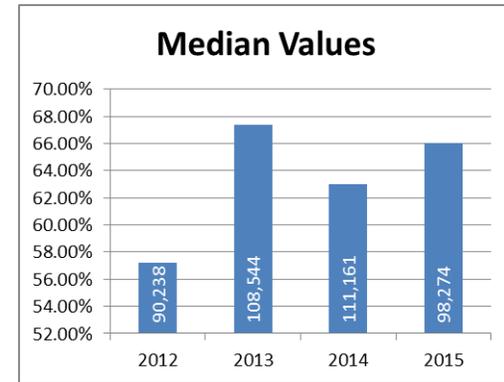


Multiple factors impact the validity and analysis of these retrospective data, including but not limited to incomplete documentation, documentation not reflective of services provided prior to ambulance arrival, inconsistent data dictionary definitions between local jurisdictions, geographic resource 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.

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

	2015 Value	2015 Denom.
San Luis Obispo County	99.00%	559
Santa Clara County	97.47%	2372
Sierra-Sacramento Valley	91.16%	4129
Orange County	91.00%	883
Central California	89.61%	5131
Alameda County	87.00%	3929
Tuolumne County	84.00%	286
San Diego County	81.85%	11156
Yolo County	81.10%	679
San Francisco	80.00%	1588
Marin County	71.00%	601
Ventura County	67.00%	2157
Contra Costa County	66.27%	3463
Los Angeles County	66.00%	18309
Riverside County	66.00%	9073
North Coast	65.00%	1116
San Benito County	64.00%	88
San Mateo County	64.00%	1393
San Joaquin County	58.72%	2505
Mountain Valley	57.40%	1993
Santa Barbara County	54.00%	1166
Monterey County	50.00%	964
Northern California	49.89%	437
Napa County	47.53%	751
Inland Counties	42.00%	13143
Coastal Valleys	41.00%	1564
Santa Cruz County	41.00%	863
Merced County	36.00%	2467
Kern County	33.00%	5509
El Dorado County		
Imperial County		
Sacramento County		
Solano County		

Measure ID	ACS-1
Response Count	29
Denominator Total	98274
Submission Rate (n=33)	84.85%
Average	66.28%
Median	66.00%



Of the 29 LEMSAs reporting these data for 2015, the median percentage of patients receiving aspirin in the field for complaints of chest pain or discomfort suggestive of cardiac origin was 66.28%, and the median value increased from 63% to 66%. The measured value has remained relatively stable (63-67%) for the past 3 years.

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.

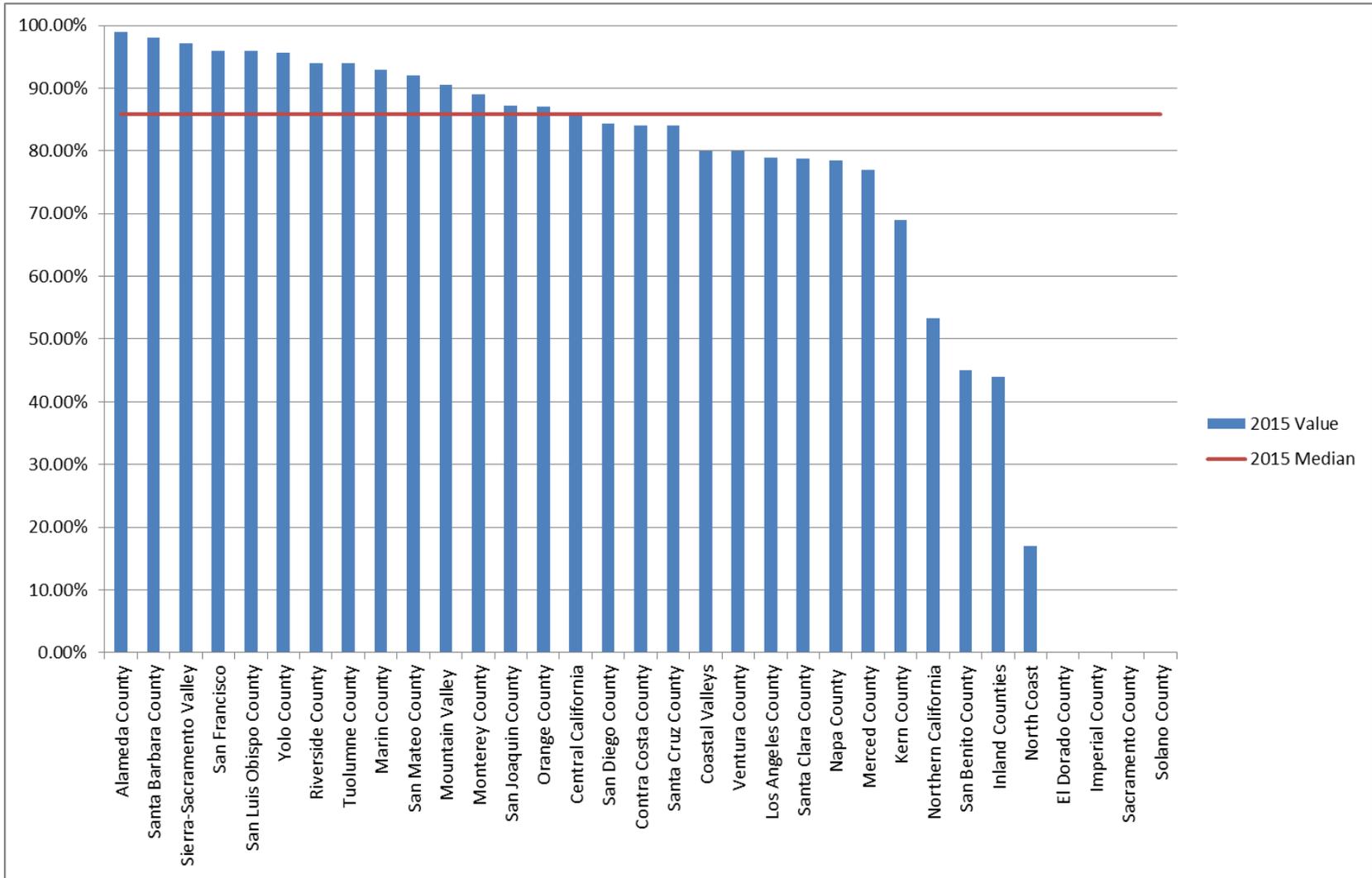
Aspirin administration is the standard of care for chest pain or chest discomfort of cardiac origin. All 29 reporting LEMSAs have aspirin administration in their protocol for management of suspected ACS patients.¹

LEMSAs whose name appears in a grey cell indicate that the LEMSA did not report any clinical measures for the 2015 data year. LEMSAs whose name appears in a white cell, but have grey cells for their reported value, indicate participation in this year's core measures reporting, but reported no values for this specific measure in 2015.

¹ Chest Pain of Suspected Cardiac Origin: Current Evidence-based Recommendations for Prehospital Care.

Savino PB, Sporer KA, Barger JA, Brown JF, Gilbert GH, Koenig KL, Rudnick EM, Salvucci AA. West J Emerg Med. 2015 Dec;16(7):983-95

ACS-2: 12 Lead ECG for Chest Pain Obtained in the Field – Part 1 of 2

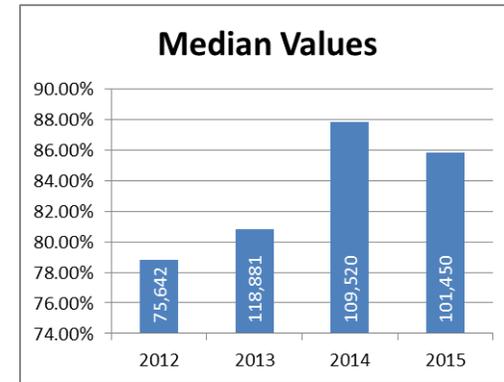


Multiple factors impact the validity and analysis of these retrospective data, including but not limited to incomplete documentation, documentation not reflective of services provided prior to ambulance arrival, inconsistent data dictionary definitions between local jurisdictions, geographic resource 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.

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

	2015 Value	2015 Denom.
Alameda County	99.00%	3895
Santa Barbara County	98.00%	88
Sierra-Sacramento Valley	97.17%	4129
San Francisco	96.00%	1588
San Luis Obispo County	96.00%	559
Yolo County	95.60%	679
Riverside County	94.00%	9073
Tuolumne County	94.00%	286
Marin County	93.00%	601
San Mateo County	92.00%	1393
Mountain Valley	90.47%	1993
Monterey County	89.00%	964
San Joaquin County	87.23%	2505
Orange County	87.00%	1868
Central California	85.81%	5131
San Diego County	84.39%	11156
Contra Costa County	84.08%	3859
Santa Cruz County	84.00%	863
Coastal Valleys	80.00%	1564
Ventura County	80.00%	2157
Los Angeles County	79.00%	18308
Santa Clara County	78.71%	5280
Napa County	78.42%	751
Merced County	77.00%	2467
Kern County	69.00%	5509
Northern California	53.32%	437
San Benito County	45.00%	88
Inland Counties	44.00%	13143
North Coast	17.00%	1116
El Dorado County		
Imperial County		
Sacramento County		
Solano County		

Measure ID	ACS-2
Response Count	29
Denominator Total	101450
Submission Rate (n=33)	84.85%
Average	80.97%
Median	85.81%



Of the 29 LEMSAs reporting these data for 2015, the median number of patients receiving 12-Lead ECG in the field for complaints of chest pain or discomfort suggestive of cardiac origin was 85.81%. The median decreased 2% from last year for this report.

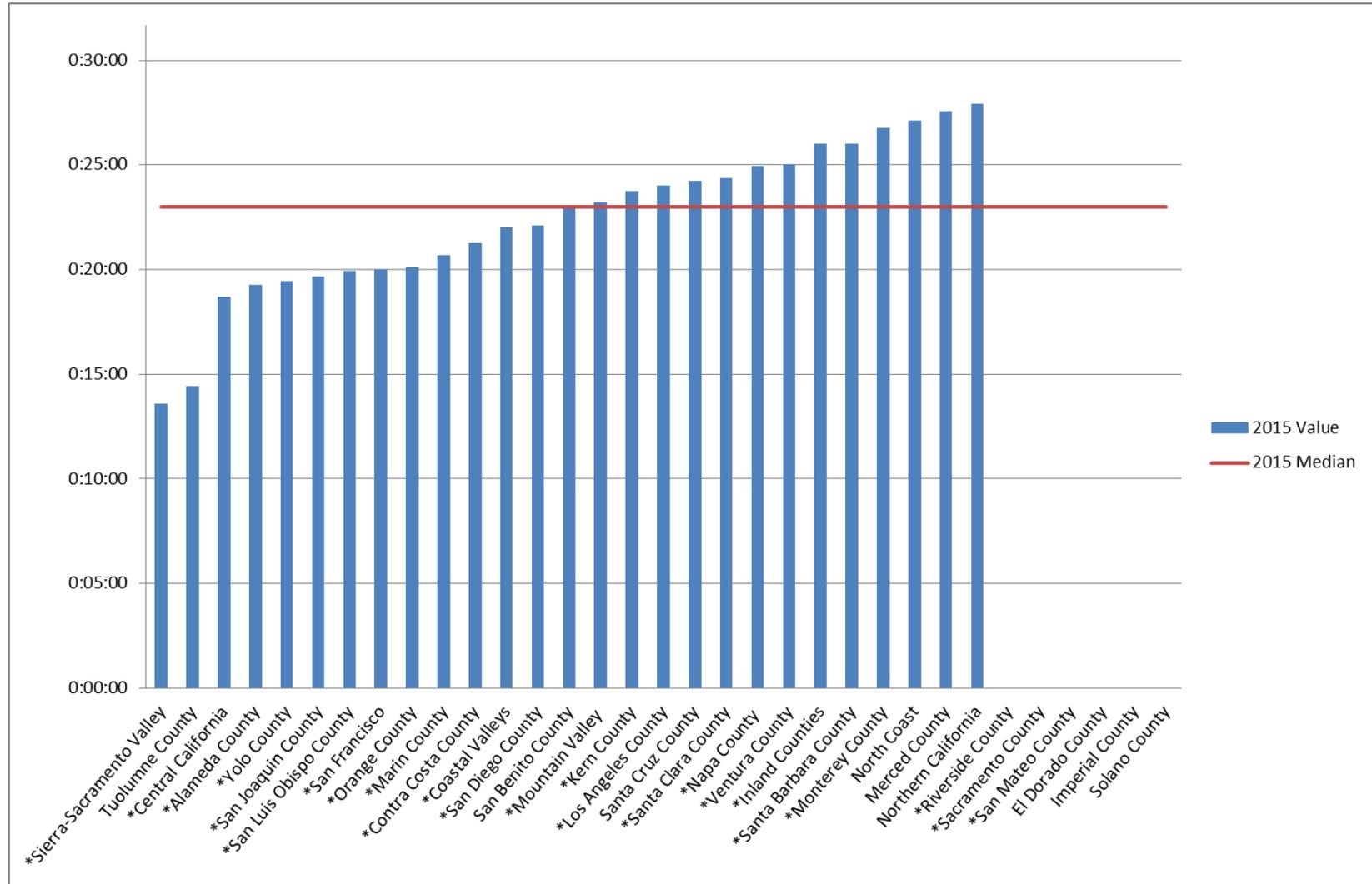
Low values in this report more likely represent data and methodological issues rather than actual performance. This measure is of particular importance with the widespread development of STEMI centers. LEMSAs with a STEMI system in place are more likely to use 12 lead for identifying STEMI patients, 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-two of 33 LEMSAs (all except San Benito EMS Agency) currently include field ECG in their management protocol.¹

LEMSAs whose name appears in a grey cell indicate that the LEMSA did not report any clinical measures for the 2015 data year. LEMSAs whose name appears in a white cell, but have grey cells for their reported value, indicate participation in this year’s core measures reporting, but reported no values for this specific measure in 2015.

¹ Chest Pain of Suspected Cardiac Origin: Current Evidence-based Recommendations for Prehospital Care.

Savino PB, Sporer KA, Barger JA, Brown JF, Gilbert GH, Koenig KL, Rudnick EM, Salvucci AA. West J Emerg Med. 2015 Dec;16(7):983-95

ACS-3: Scene Time for Suspected Heart Attack Patients – Part 1 of 2



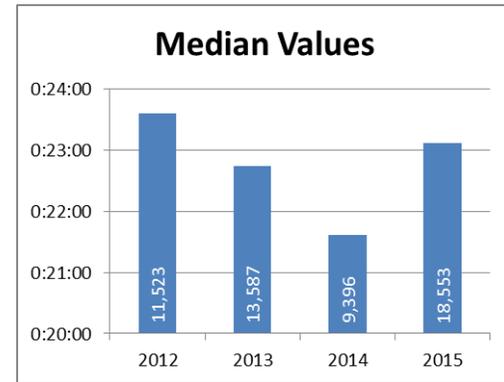
An (*) indicates the 24 LEMSAs with a STEMI Receiving Center

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.

ACS-3: Scene Time for Suspected Heart Attack Patients – Part 2 of 2

	2015 Value	2015 Denom.
*Sierra-Sacramento Valley	0:13:35	304
Tuolumne County	0:14:25	20
*Central California	0:18:42	170
*Alameda County	0:19:15	568
*Yolo County	0:19:27	679
*San Joaquin County	0:19:40	353
*San Luis Obispo County	0:19:55	89
*San Francisco	0:20:00	661
*Orange County	0:20:06	112
*Marin County	0:20:40	73
*Contra Costa County	0:21:16	3859
*Coastal Valleys	0:22:00	107
*San Diego County	0:22:06	4140
San Benito County	0:23:00	88
*Mountain Valley	0:23:14	1838
*Kern County	0:23:44	46
*Los Angeles County	0:24:00	1102
Santa Cruz County	0:24:15	45
*Santa Clara County	0:24:21	431
*Napa County	0:24:57	63
*Ventura County	0:25:03	206
*Inland Counties	0:26:00	710
*Santa Barbara County	0:26:01	88
*Monterey County	0:26:46	226
North Coast	0:27:06	90
Merced County	0:27:34	2467
Northern California	0:27:54	18
*Riverside County		
*Sacramento County		
*San Mateo County		
El Dorado County		
Imperial County		
Solano County		

Measure ID	ACS-3
Response Count	27
Denominator Total	18553
Submission Rate (n=33)	81.82%
Average	0:22:27
Median	0:23:07



Of the 27 LEMSAs reporting these data for 2015, the median scene time by ground ambulance for suspected heart attack patients with ST elevation on ECG was approximately 23 minutes and increased about 90 seconds from the prior year of reporting. It is not clear if the decrease was due to reporting by some different LEMSAs, since over the prior 3 years, there had been a progressive decrease in the mean.

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 administer thrombolytics and/or 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/MissionLifetimeHomePage/EMS/EMS-Strategies-to-Achieve-Ideal_UCM_312066_Article.jsp

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

LEMSAs whose name appears in a grey cell indicate that the LEMSA did not report any clinical measures for the 2015 data year. LEMSAs whose name appears in a white cell, but have grey cells for their reported value, indicate participation in this year's core measures reporting, but reported no values for this specific measure in 2015.

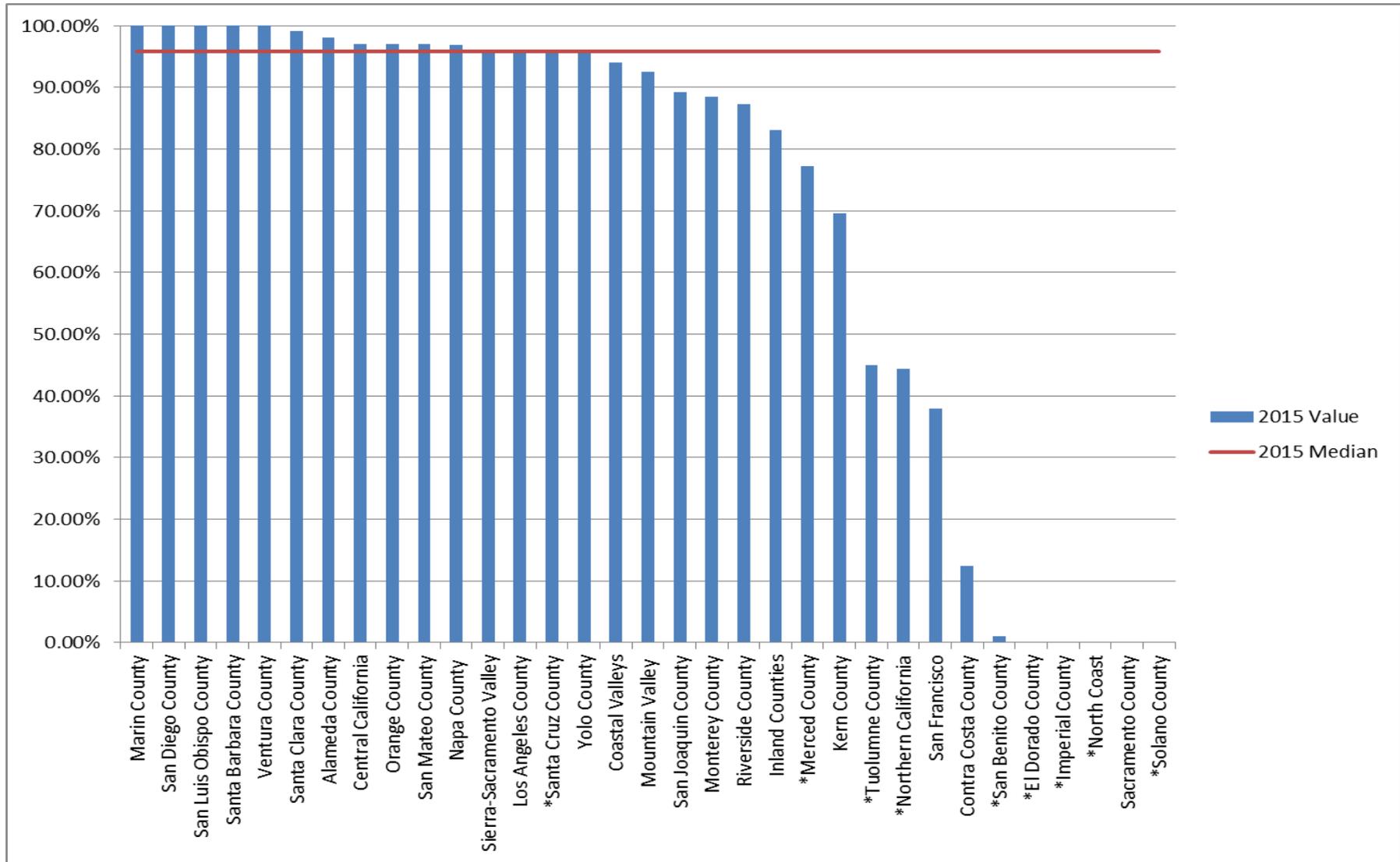
Contact Information:

Adam.davis@ems.ca.gov

(916) 322-4336 ext. 409

http://www.emsa.ca.gov/ems_core_quality_measures_project

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



An (*) indicates 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.

Contact Information:

Adam.davis@emsa.ca.gov

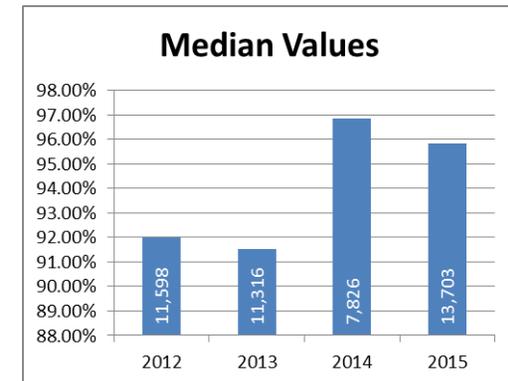
(916) 322-4336 ext. 409

http://www.emsa.ca.gov/ems_core_quality_measures_project

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

	2015 Value	2015 Denom.
Marin County	100.00%	73
San Diego County	100.00%	602
San Luis Obispo County	100.00%	89
Santa Barbara County	100.00%	88
Ventura County	100.00%	206
Santa Clara County	99.07%	431
Alameda County	98.00%	568
Central California	97.06%	170
Orange County	97.00%	107
San Mateo County	97.00%	211
Napa County	96.92%	65
Sierra-Sacramento Valley	96.05%	304
Los Angeles County	96.00%	1102
*Santa Cruz County	96.00%	45
Yolo County	95.70%	70
Coastal Valleys	94.00%	139
Mountain Valley	92.50%	200
San Joaquin County	89.24%	353
Monterey County	88.50%	226
Riverside County	87.32%	1178
Inland Counties	83.00%	710
*Merced County	77.22%	2467
Kern County	69.57%	46
*Tuolumne County	45.00%	20
*Northern California	44.44%	18
San Francisco	38.00%	661
Contra Costa County	12.50%	3455
*San Benito County	1.01%	99
*El Dorado County		
*Imperial County		
*North Coast		
Sacramento County		
*Solano County		

Measure ID	ACS-5
Response Count	28
Denominator Total	13703
Submission Rate (n=33)	81.82%
Average	81.83%
Median	95.85%



Of the 28 LEMSAs reporting these data, the median percentage of patients appropriately transported directly to a STEMI center was 95.85%, which varied by only one percent from 2014 to 2015.

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 low values for this measure have STEMI systems, implying poor data quality or potential protocol violations.

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

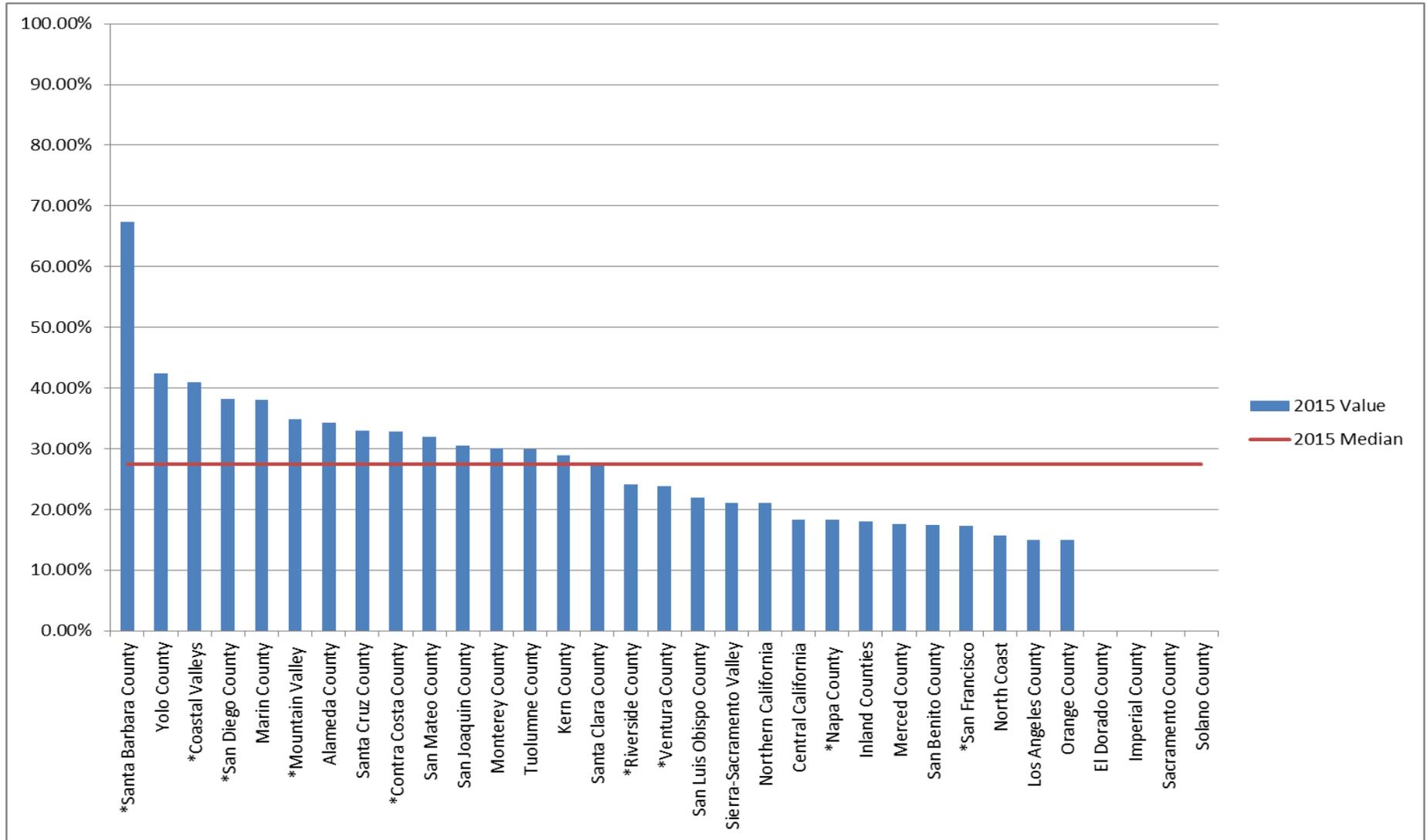
LEMSAs whose name appears in a grey cell indicate that the LEMSA did not report any clinical measures for the 2015 data year. LEMSAs whose name appears in a white cell, but have grey cells for their reported value, indicate participation in this year's core measures reporting, but reported no values for this specific measure in 2015.

Contact Information:

Adam.davis@emsa.ca.gov
(916) 322-4336 ext. 409

http://www.emsa.ca.gov/ems_core_quality_measures_project

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

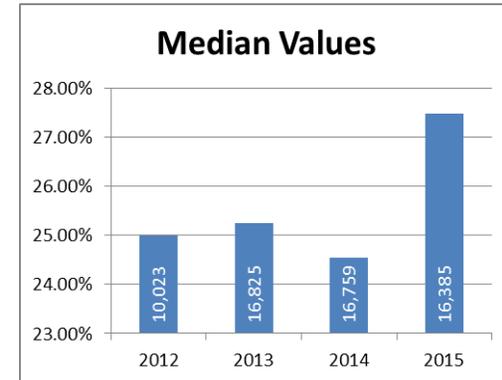


An (*) indicates Cardiac Arrest Registry to Enhance Survival (CARES) participants. Multiple factors impact the validity and analysis of these retrospective data, including but not limited to incomplete documentation, documentation not reflective of services provided prior to ambulance arrival, inconsistent 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.

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

	2015 Value	2015 Denom.
*Santa Barbara County	67.44%	43
Yolo County	42.40%	92
*Coastal Valleys	41.00%	133
*San Diego County	38.26%	677
Marin County	38.00%	74
*Mountain Valley	34.84%	376
Alameda County	34.27%	1109
Santa Cruz County	33.00%	70
*Contra Costa County	32.88%	672
San Mateo County	32.00%	228
San Joaquin County	30.58%	497
Monterey County	30.10%	196
Tuolumne County	30.00%	27
Kern County	28.85%	52
Santa Clara County	27.49%	902
*Riverside County	24.06%	2315
*Ventura County	23.90%	419
San Luis Obispo County	22.00%	203
Sierra-Sacramento Valley	21.13%	265
Northern California	21.05%	95
Central California	18.30%	918
*Napa County	18.30%	71
Inland Counties	18.00%	1501
Merced County	17.59%	290
San Benito County	17.39%	23
*San Francisco	17.37%	426
North Coast	15.70%	153
Los Angeles County	15.00%	4142
Orange County	15.00%	416
El Dorado County		
Imperial County		
Sacramento County		
Solano County		

Measure ID	CAR-2
Response Count	29
Denominator Total	16385
Submission Rate (n=33)	84.85%
Average	27.78%
Median	27.49%

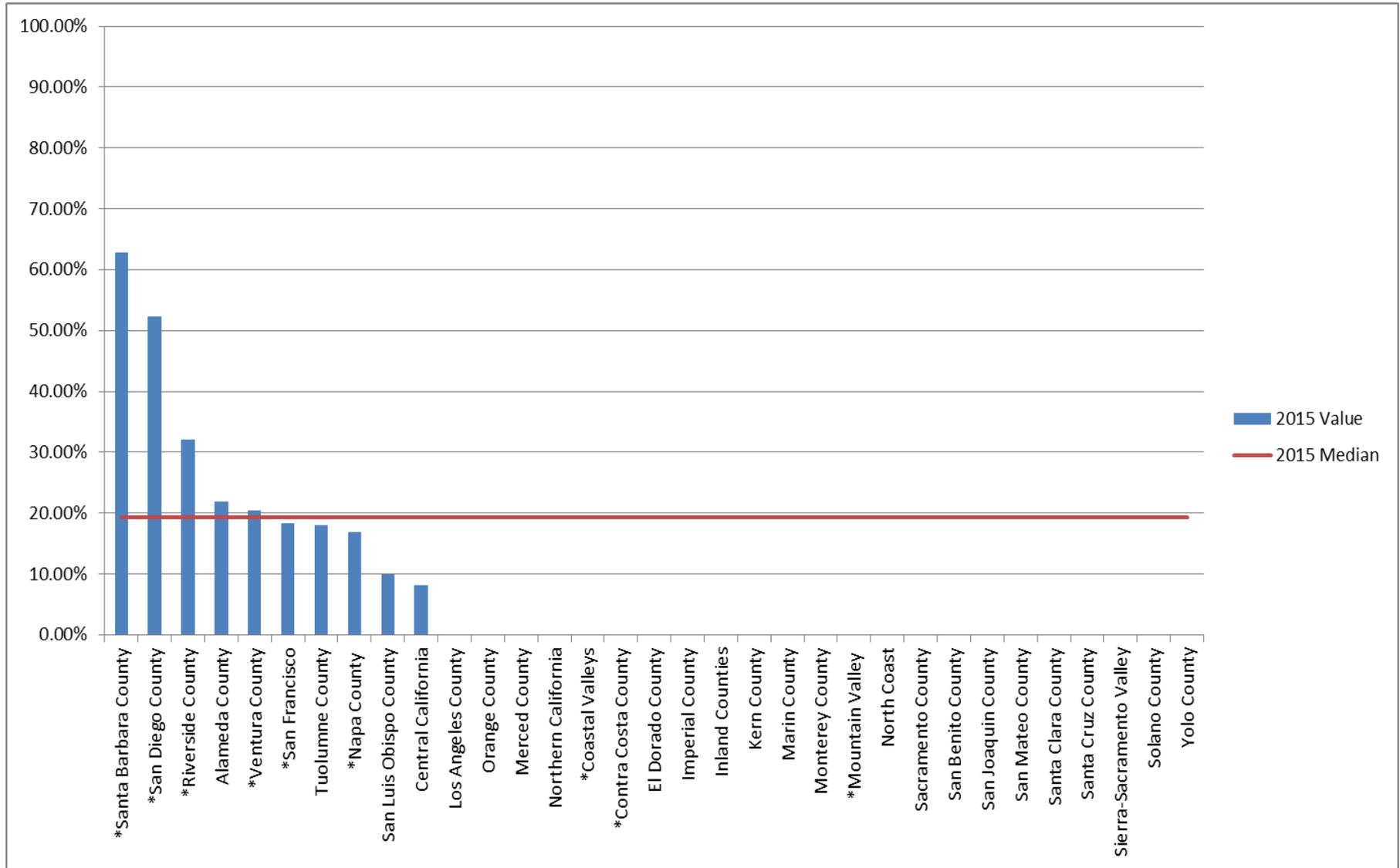


Of the 29 LEMSAs reporting these data for 2015, the median percent of patients that had a return of spontaneous circulation in the field after a cardiac arrest from all causes was 27.49%, a increase from 24.5% from the prior year reporting.

Nationally, this rate varies considerably by state and by local agency. Most jurisdictions reported rates from 10-40%, which are 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. 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. Those LEMSAs that submit data to the Cardiac Arrest Registry to Enhance Survival (CARES) have the best data collection process and data accuracy for this measure. More LEMSAs are joining CARES.

An (*) indicates Cardiac Arrest Registry to Enhance Survival (CARES) participants; the values are probably most reliable for these participants. LEMSAs whose name appears in a grey cell indicate that the LEMSA did not report any clinical measures for the 2015 data year. LEMSAs whose name appears in a white cell, but have grey cells for their reported value, indicate participation in this year's core measures reporting, but reported no values for this specific measure in 2015.

CAR-3: Out-Of-Hospital Cardiac Arrest Survival to Emergency Department Discharge – Part 1 of 2



An (*) indicates 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.

Contact Information:

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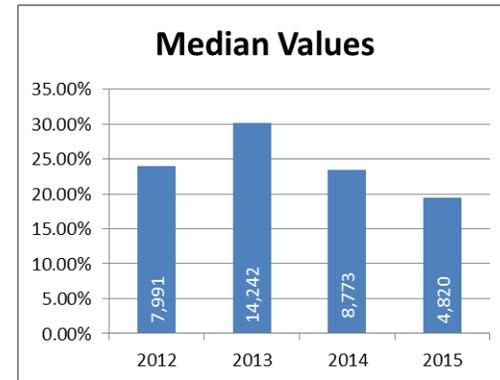
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CAR-3: Out-Of-Hospital Cardiac Arrest Survival to Emergency Department Discharge – Part 2 of 2

	2015 Value	2015 Denom.
*Santa Barbara County	62.79%	43
*San Diego County	52.31%	325
*Riverside County	32.07%	661
Alameda County	21.90%	927
*Ventura County	20.50%	419
*San Francisco	18.31%	426
Tuolumne County	18.00%	27
*Napa County	16.90%	71
San Luis Obispo County	10.00%	203
Central California	8.17%	918
Los Angeles County		
Orange County		415
Merced County		290
Northern California		95
*Coastal Valleys		
*Contra Costa County		
El Dorado County		
Imperial County		
Inland Counties		
Kern County		
Marin County		
Monterey County		
*Mountain Valley		
North Coast		
Sacramento County		
San Benito County		
San Joaquin County		
San Mateo County		
Santa Clara County		
Santa Cruz County		
Sierra-Sacramento Valley		
Solano County		
Yolo County		

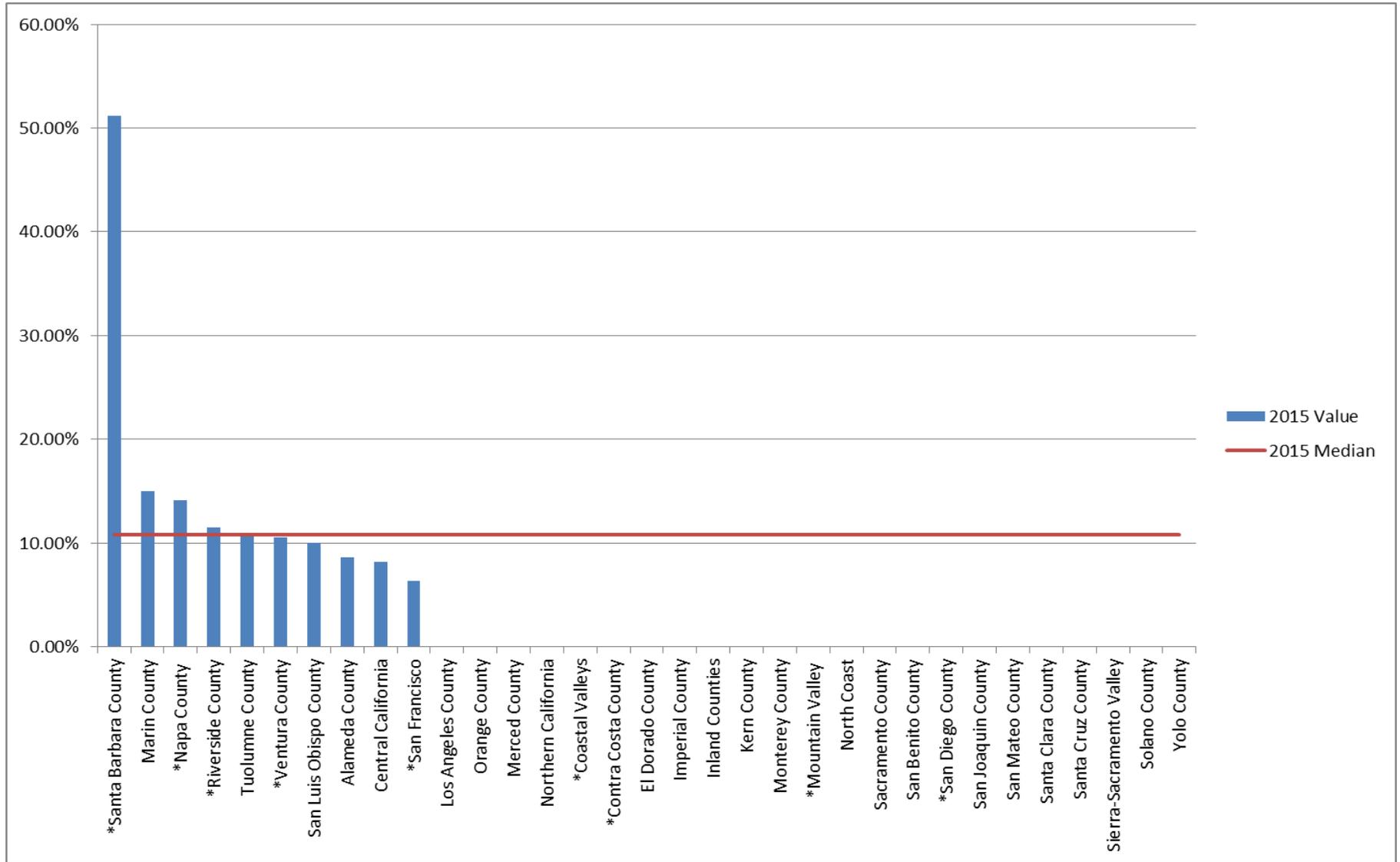
Measure ID	CAR-3
Response Count	10
Denominator Total	4820
Submission Rate (n=33)	30.30%
Average	26.10%
Median	19.41%



Of the 10 LEMSAs reporting these data for 2015, the median number of patients that survived a return hospital cardiac arrest to be admitted to the hospital was 19.41%, a decrease from values reported in previous years. 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. As more LEMSAs join the CARES registry, and as health information exchange improves, allowing LEMSAs to obtain patient outcomes, the amount and validity of data for this measure will increase.

An (*) on the table indicates Cardiac Arrest Registry to Enhance Survival (CARES) participants; the values are probably most reliable for these participants. LEMSAs whose name appears in a grey cell indicate that the LEMSAs did not report any clinical measures for the 2015 data year. LEMSAs whose name appears in a white cell, but have grey cells for their reported value, indicate participation in this year’s core measures reporting, but reported no values for this specific measure in 2015.

CAR-4: Out-Of-Hospital Cardiac Arrest Survival to Hospital Discharge – Part 1 of 2



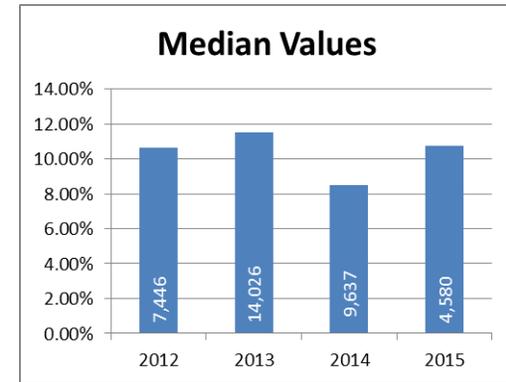
An (*) indicates Cardiac Arrest Registry to Enhance Survival (CARES) participants. Multiple factors impact the validity and analysis of these retrospective data, including but not limited to incomplete documentation, documentation not reflective of services provided prior to ambulance arrival, inconsistent 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.

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CAR-4: Out-Of-Hospital Cardiac Arrest Survival to Hospital Discharge – Part 2 of 2

	2015 Value	2015 Denom.
*Santa Barbara County	51.16%	43
Marin County	15.00%	85
*Napa County	14.08%	71
*Riverside County	11.50%	661
Tuolumne County	11.00%	27
*Ventura County	10.50%	419
San Luis Obispo County	10.00%	203
Alameda County	8.63%	927
Central California	8.17%	918
*San Francisco	6.34%	426
Los Angeles County		
Orange County		415
Merced County		290
Northern California		95
*Coastal Valleys		
*Contra Costa County		
El Dorado County		
Imperial County		
Inland Counties		
Kern County		
Monterey County		
*Mountain Valley		
North Coast		
Sacramento County		
San Benito County		
*San Diego County		
San Joaquin County		
San Mateo County		
Santa Clara County		
Santa Cruz County		
Sierra-Sacramento Valley		
Solano County		
Yolo County		

Measure ID	CAR-4
Response Count	10
Denominator Total	4580
Submission Rate (n=33)	30.30%
Average	14.64%
Median	10.75%

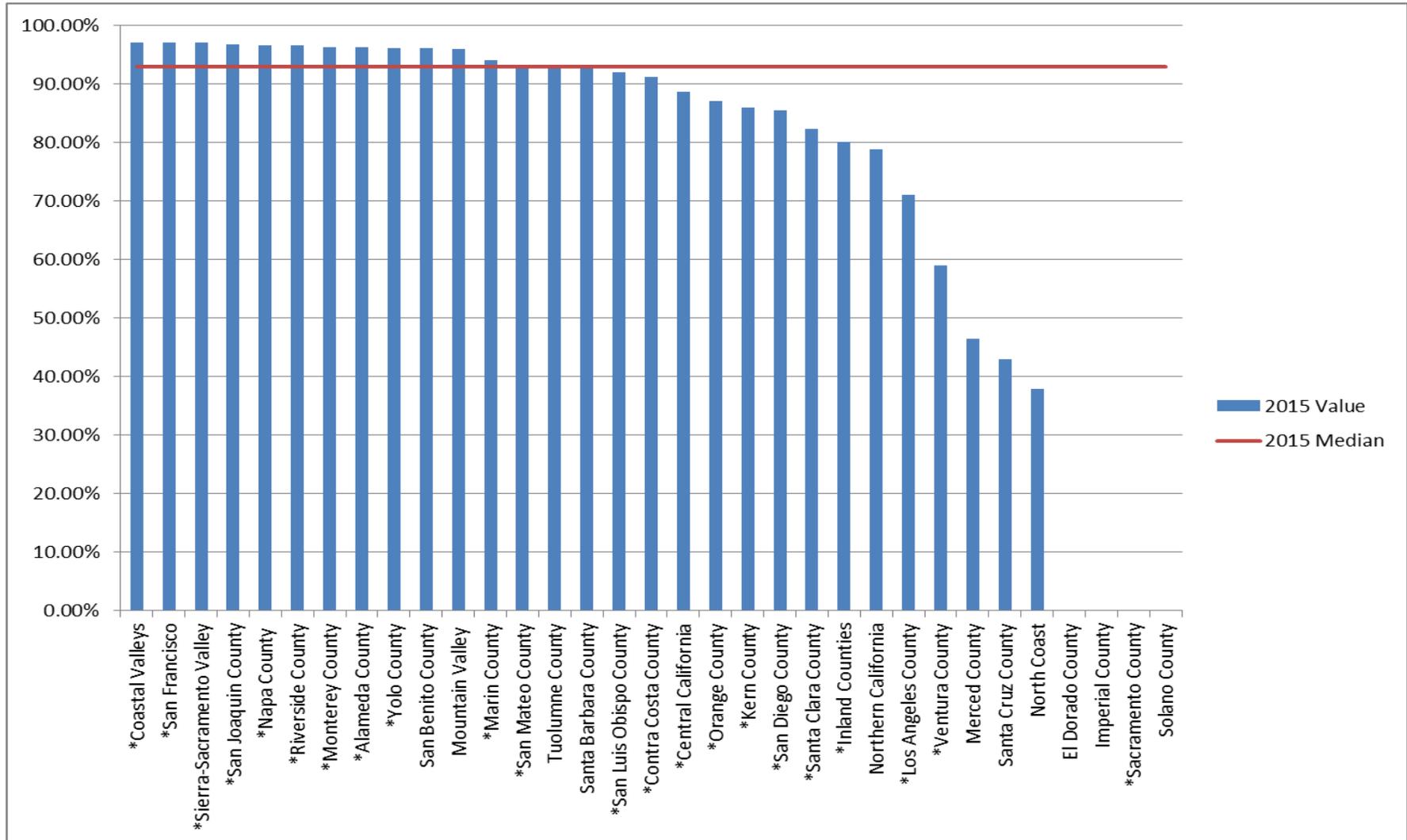


Of the 10 LEMSAs reporting these data for 2015, the median percentage of patients that had survived an out of hospital cardiac arrest and were discharged from the hospital was 10.75%. The value has been fairly stable over the past four years for those LEMSAs reporting. National rate for return to spontaneous circulation is 40% and survival to hospital discharge is 10%, which compares very closely with these reports values.

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. Values for a particular system should be used to track improvements.

An (*) on the table to the left indicates Cardiac Arrest Registry to Enhance Survival (CARES) participants. LEMSAs whose name appears in a grey cell indicate that the LEMSAs did not report any clinical measures for the 2015 data year. LEMSAs whose name appears in a white cell, but have grey cells for their reported value, indicate participation in this year's core measures reporting, but reported no values for this specific measure in 2015.

STR-2: Glucose Testing for Suspected Acute Stroke Patients – Part 1 of 2



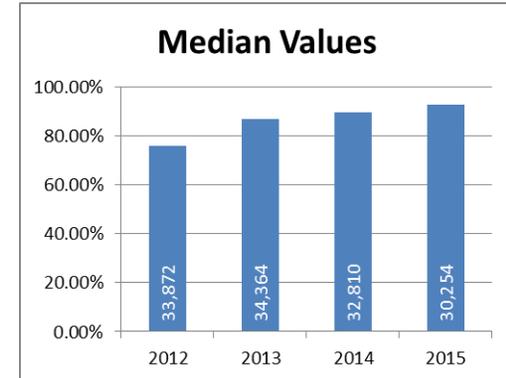
An (*) indicates the 22 LEMSAs identified as having implemented an approach to Stroke Care.

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-2: Glucose Testing for Suspected Acute Stroke Patients – Part 2 of 2

	2015 Value	2015 Denom.
*Coastal Valleys	97.00%	424
*San Francisco	97.00%	764
*Sierra-Sacramento Valley	96.96%	1120
*San Joaquin County	96.70%	757
*Napa County	96.59%	176
*Riverside County	96.53%	2217
*Monterey County	96.22%	502
*Alameda County	96.16%	2055
*Yolo County	96.10%	259
San Benito County	96.00%	25
Mountain Valley	95.84%	625
*Marin County	94.00%	238
*San Mateo County	93.00%	611
Tuolumne County	93.00%	114
Santa Barbara County	92.90%	351
*San Luis Obispo County	92.00%	154
*Contra Costa County	91.16%	1475
*Central California	88.61%	1396
*Orange County	87.00%	692
*Kern County	85.91%	1143
*San Diego County	85.47%	4115
*Santa Clara County	82.34%	2021
*Inland Counties	80.00%	2145
Northern California	78.70%	108
*Los Angeles County	71.00%	5370
*Ventura County	59.00%	464
Merced County	46.47%	411
Santa Cruz County	43.00%	300
North Coast	37.80%	222
El Dorado County		
Imperial County		
*Sacramento County		
Solano County		

Measure ID	STR-2
Response Count	29
Denominator Total	30254
Submission Rate (n=33)	84.85%
Average	84.91%
Median	92.90%



Of the 29 LEMSAs reporting these data for 2015, the median percentage of patients receiving glucose testing in the field for a possible stroke was 92.90%. The median percentage has increased steadily each year for four years. Inconsistent low values likely reflect data issues, but should be evaluated for adherence to protocol. Serum glucose abnormalities cause neurologic symptoms that can mimic stroke. It is essential to exclude these reversible causes prior to transporting to a stroke center and initiating a stroke team. 32/33 LEMSAs have protocols that advise routine testing of blood sugar in suspected stroke patients.¹

There are currently draft stroke regulations being finalized.

An (*) indicates 22 LEMSAs that have developed a stroke system with a designated primary stroke receiving center.

LEMSAs whose name appears in a grey cell indicate that the LEMSAs did not report any clinical measures for the 2015 data year. LEMSAs whose name appears in a white cell, but have grey cells for their reported value, indicate participation in this year's core measures reporting, but reported no values for this specific measure in 2015.

¹ *Acute Stroke: Current Evidence-based Recommendations for Prehospital Care.* Guber NK, Sporer KA, Guluma KZ, Serra JP, Barger JA, Brown JF, Gilbert GH, Koenig KL, Rudnick EM, Salvucci AA. *West J Emerg Med.* 2016 Mar;17(2):104-28.

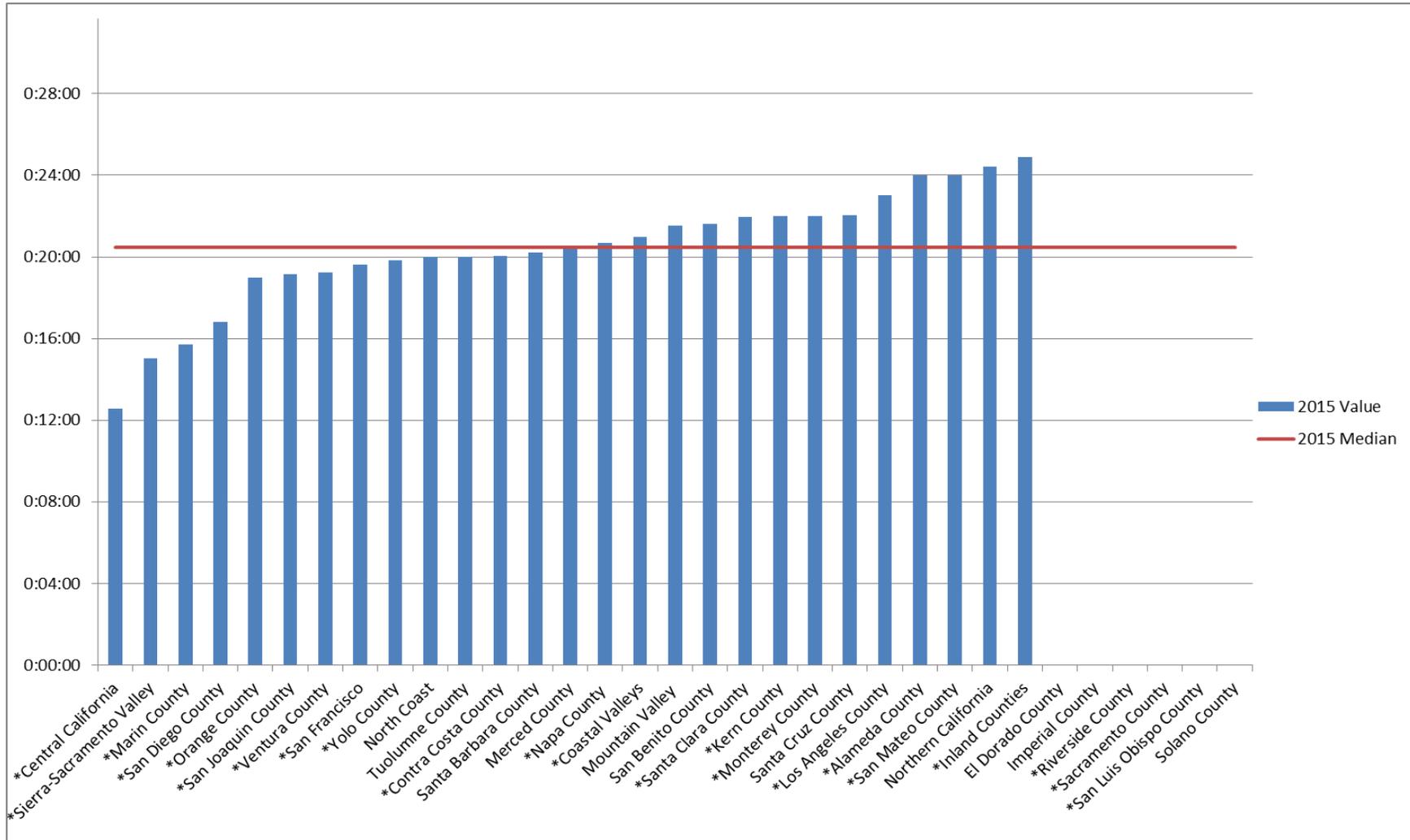
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STR-3: Scene Time for Suspected Acute Stroke Patients – Part 1 of 2



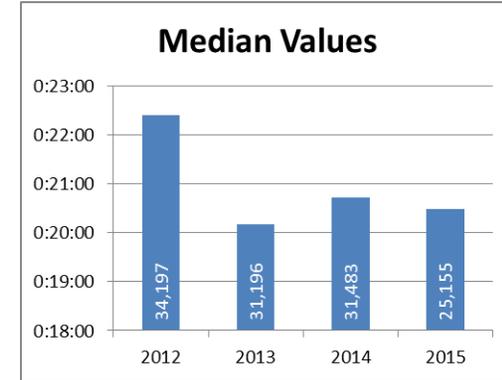
An (*) indicates the 22 LEMSAs identified as developing/implementing an approach to Stroke Care.

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.

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

	2015 Value	2015 Denom.
*Central California	0:12:34	1396
*Sierra-Sacramento Valley	0:15:03	1120
*Marin County	0:15:42	128
*San Diego County	0:16:48	2627
*Orange County	0:19:00	692
*San Joaquin County	0:19:10	757
*Ventura County	0:19:13	425
*San Francisco	0:19:36	764
*Yolo County	0:19:51	259
North Coast	0:20:00	243
Tuolumne County	0:20:00	114
*Contra Costa County	0:20:03	1475
Santa Barbara County	0:20:14	351
Merced County	0:20:29	411
*Napa County	0:20:41	169
*Coastal Valleys	0:20:58	420
Mountain Valley	0:21:32	620
San Benito County	0:21:36	24
*Santa Clara County	0:21:58	1561
*Kern County	0:22:00	1143
*Monterey County	0:22:00	486
Santa Cruz County	0:22:02	
*Los Angeles County	0:23:00	5537
*Alameda County	0:23:59	2055
*San Mateo County	0:24:00	608
Northern California	0:24:24	97
*Inland Counties	0:24:52	1673
El Dorado County		
Imperial County		
*Riverside County		
*Sacramento County		
*San Luis Obispo County		
Solano County		

Measure ID	STR-3
Response Count	26
Denominator Total	25155
Submission Rate (n=33)	75.76%
Average	0:20:24
Median	0:20:29



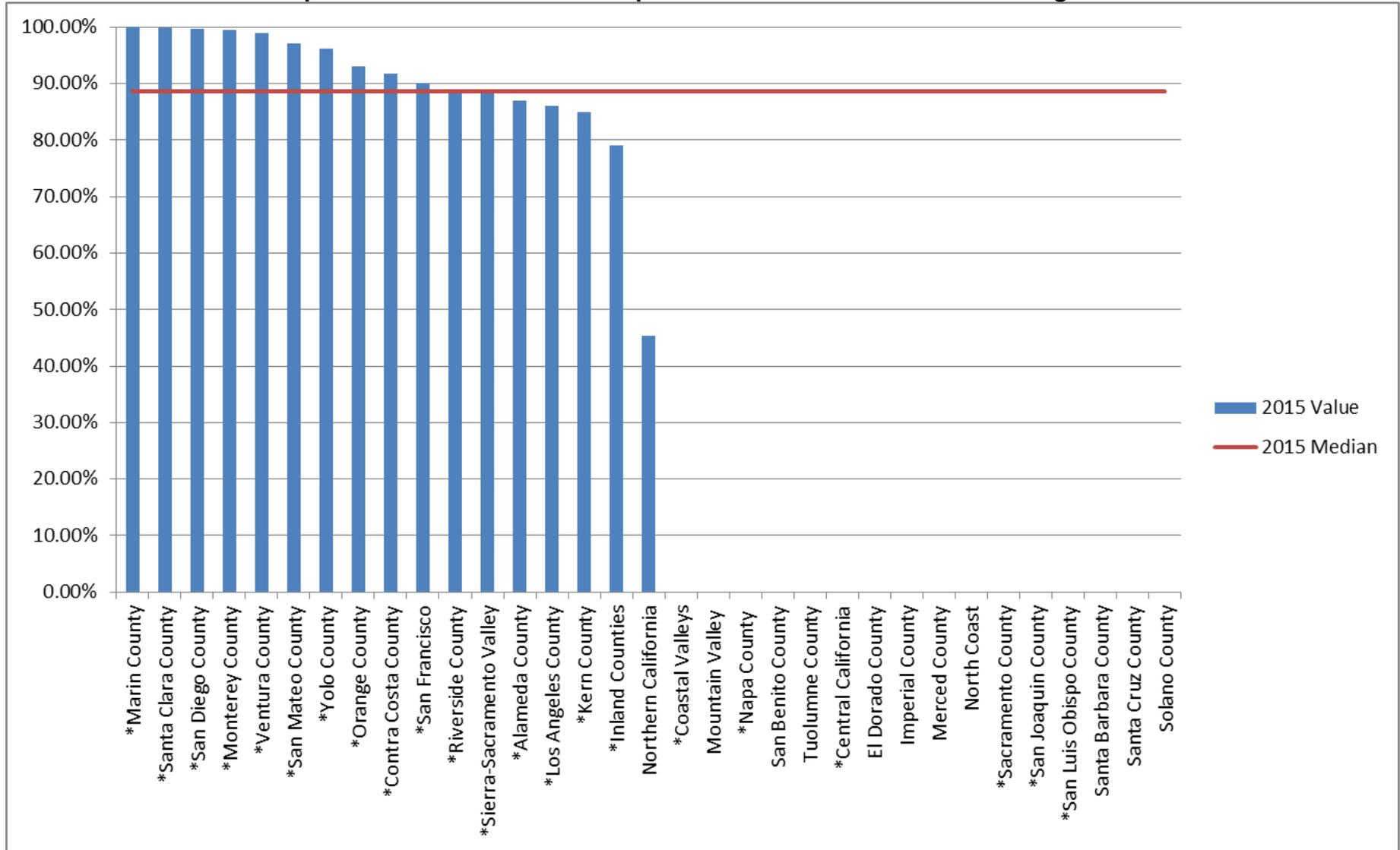
Of the 26 LEMSAs reporting these data for 2015, the median scene time by an ambulance for suspected stroke patients was approximately 20 and one-half minutes. This value has been quite stable for the past three years. Scene time reported from all local jurisdictions ranged between 12 and 25 minutes. 19/33 (58%) of LEMSAs have protocols that direct EMS to limit time on scene.¹

Time targets may not be realistic for many patients who require more time for history, examination, and difficult extraction from their residence. Stroke evaluation and treatment is a time sensitive measure, so extra minutes in the field add to other delays within the healthcare system.

An (*) indicates 22 LEMSAs that have developed a stroke system with a designated primary stroke receiving center. LEMSAs whose name appears in a grey cell indicate that the LEMSAs did not report any clinical measures for the 2015 data year. LEMSAs whose name appears in a white cell, but have grey cells for their reported value, indicate participation in this year's core measures reporting, but reported no values for this specific measure in 2015.

¹ *Acute Stroke: Current Evidence-based Recommendations for Prehospital Care.* Guber NK, Sporer KA, Guluma KZ, Serra JP, Barger JA, Brown JF, Gilbert GH, Koenig KL, Rudnick EM, Salvucci AA. *West J Emerg Med.* 2016 Mar;17(2):104-28.

STR-5: Direct Transport to Stroke Center for Suspected Acute Stroke Patients Meeting Criteria – Part 1 of 2



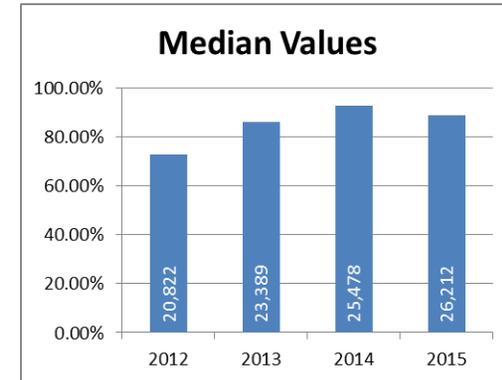
An (*) indicates the 22 LEMSAs identified as developing/implementing an approach to Stroke Care.

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.

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

	2015 Value	2015 Denom.
*Marin County	100.00%	238
*Santa Clara County	99.81%	1561
*San Diego County	99.68%	4022
*Monterey County	99.38%	846
*Ventura County	99.00%	425
*San Mateo County	97.00%	611
*Yolo County	96.10%	259
*Orange County	93.00%	692
*Contra Costa County	91.80%	1271
*San Francisco	90.00%	764
*Riverside County	89.00%	2217
*Sierra-Sacramento Valley	88.39%	1120
*Alameda County	87.00%	2137
*Los Angeles County	86.00%	5370
*Kern County	85.00%	1143
*Inland Counties	79.00%	1673
Northern California	45.36%	94
*Coastal Valleys	0.00%	424
Mountain Valley	0.00%	626
*Napa County	0.00%	169
San Benito County	0.00%	25
Tuolumne County	0.00%	114
*Central California		
El Dorado County		
Imperial County		
Merced County		411
North Coast		
*Sacramento County		
*San Joaquin County		
*San Luis Obispo County		
Santa Barbara County		
Santa Cruz County		
Solano County		

Measure ID	STR-5
Response Count	22
Denominator Total	26212
Submission Rate (n=33)	66.67%
Average	69.34%
Median	88.70%



Of the 22 LEMSAs reporting these data for 2015, the median number of patients transported directly to a Stroke center by ground ambulance was 89%. Median values increased for three successive years but decreased four percent from 93.00% in 2014 to 88.70% in 2015. 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. It is unclear why so many LEMSAs could not provide values for this measure.

The goal in a stroke system is to transport 100% of stroke patients to a designated stroke center.

An (*) indicates the 22 LEMSAs that have a designated primary stroke receiving center.

LEMSAs whose name appears in a grey cell indicate that the LEMSAs did not report any clinical measures for the 2015 data year. LEMSAs whose name appears in a white cell, but have grey cells for their reported value, indicate participation in this year's core measures reporting, but reported no values for this specific measure in 2015.

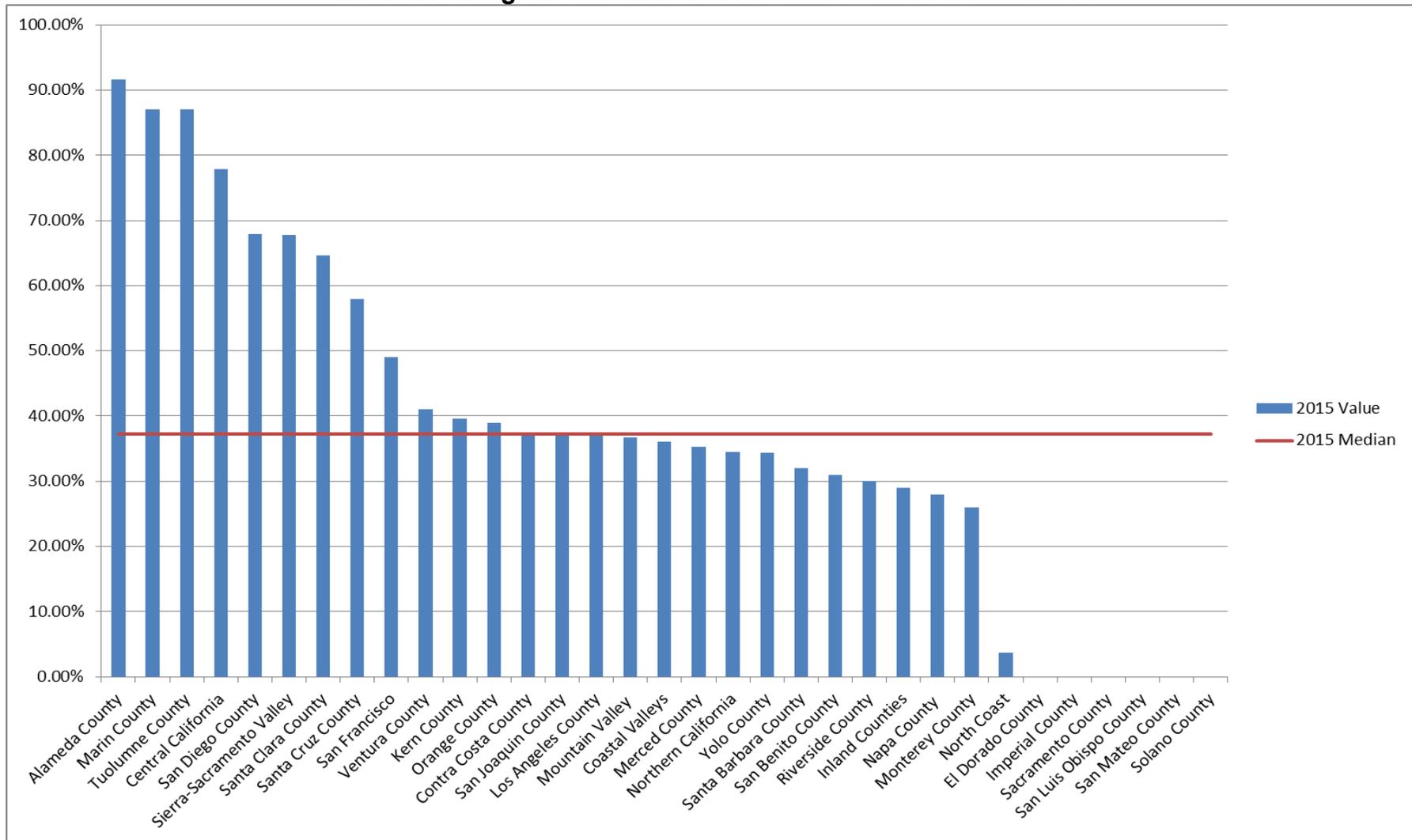
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RES-2: Beta2 Agonist Administration for Adult Patients – Part 1 of 2

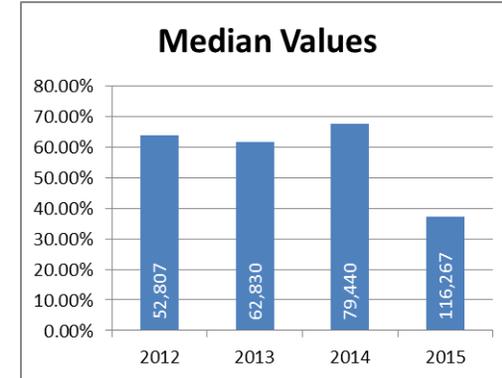


Multiple factors impact the validity and analysis of these retrospective data, including but not limited to incomplete documentation, documentation not reflective of services provided prior to ambulance arrival, inconsistent data dictionary definitions between local jurisdictions, geographic resource 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.

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

	2015 Value	2015 Denom.
Alameda County	91.65%	3055
Marin County	87.00%	234
Tuolumne County	87.00%	149
Central California	77.89%	5514
San Diego County	67.88%	5897
Sierra-Sacramento Valley	67.83%	1753
Santa Clara County	64.62%	2332
Santa Cruz County	58.00%	200
San Francisco	49.00%	3175
Ventura County	41.00%	206
Kern County	39.62%	5813
Orange County	39.00%	2216
Contra Costa County	37.50%	7491
San Joaquin County	37.21%	6484
Los Angeles County	37.00%	22575
Mountain Valley	36.72%	4738
Coastal Valleys	36.00%	2520
Merced County	35.27%	3054
Northern California	34.48%	670
Yolo County	34.40%	1403
Santa Barbara County	32.00%	1449
San Benito County	31.00%	184
Riverside County	30.06%	16190
Inland Counties	29.00%	14258
Napa County	27.89%	1201
Monterey County	25.97%	2091
North Coast	3.70%	1415
El Dorado County		
Imperial County		
Sacramento County		
San Luis Obispo County		
San Mateo County		
Solano County		

Measure ID	RES-2
Response Count	27
Denominator Total	116267
Submission Rate (n=33)	81.82%
Average	45.88%
Median	37.21%



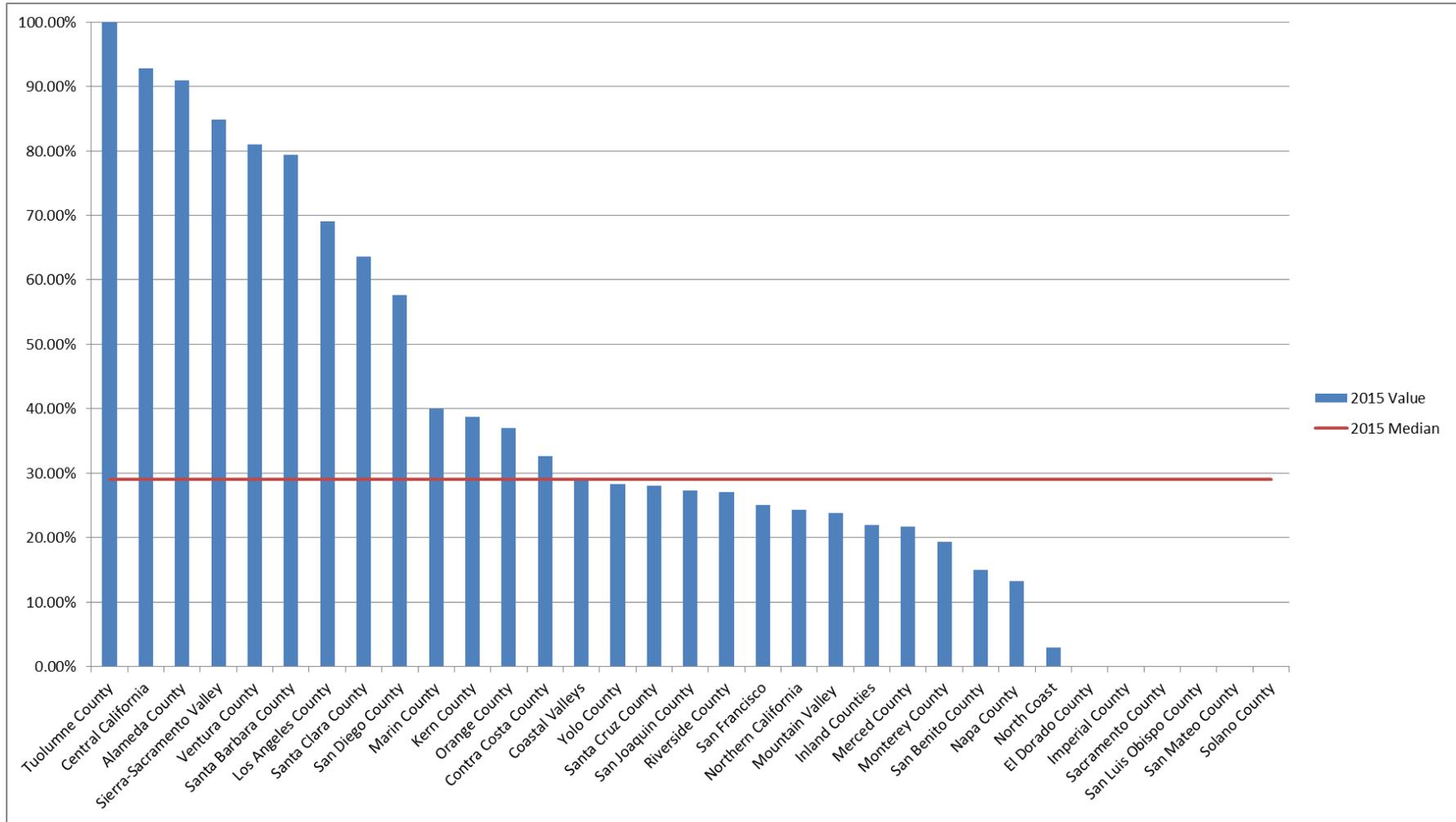
Of the 27 LEMSAs reporting these data for 2015, the median percentage of patients receiving a Beta-2 Agonist/bronchodilator for bronchospasm in adults (age 14 or older) was 37.21%, a large decrease from the prior three years, which were fairly stable.

The marked variability for this measure and major drop in median value for 2015 suggests challenges and changes identifying the appropriate denominator of patients for whom a bronchodilator is indicated. In addition, treatment may have been provided by first responders and not captured on the transport record.

Treatment protocols for which adult patients should receive Beta2 agonists may vary and clinical differentiation is difficult, however, inhaled bronchodilators are unlikely to be harmful, even if bronchospasm is not the primary pathophysiology.

LEMSAs whose name appears in a grey cell indicate that the LEMSA did not report any clinical measures for the 2015 data year. LEMSAs whose name appears in a white cell, but have grey cells for their reported value, indicate participation in this year's core measures reporting, but reported no values for this specific measure in 2015.

PED-1: Pediatric Patients with Wheezing Receiving Bronchodilators – Part 1 of 2

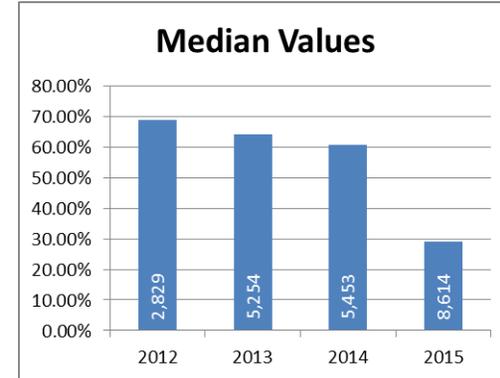


Multiple factors impact the validity and analysis of these retrospective data, including but not limited to incomplete documentation, documentation not reflective of services provided prior to ambulance arrival, inconsistent data dictionary definitions between local jurisdictions, geographic resource 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.

PED-1: Pediatric Patients with Wheezing Receiving Bronchodilators – Part 2 of 2

	2015 Value	2015 Denom.
Tuolumne County	100.00%	3
Central California	92.86%	182
Alameda County	91.00%	120
Sierra-Sacramento Valley	84.86%	185
Ventura County	81.00%	21
Santa Barbara County	79.40%	34
Los Angeles County	69.00%	594
Santa Clara County	63.64%	110
San Diego County	57.60%	342
Marin County	40.00%	10
Kern County	38.67%	497
Orange County	37.00%	175
Contra Costa County	32.66%	502
Coastal Valleys	29.00%	163
Yolo County	28.30%	145
Santa Cruz County	28.00%	859
San Joaquin County	27.30%	663
Riverside County	27.09%	1399
San Francisco	25.00%	166
Northern California	24.32%	37
Mountain Valley	23.82%	340
Inland Counties	22.00%	1555
Merced County	21.71%	175
Monterey County	19.35%	186
San Benito County	15.00%	13
Napa County	13.23%	68
North Coast	2.90%	70
El Dorado County		
Imperial County		
Sacramento County		
San Luis Obispo County		
San Mateo County		
Solano County		

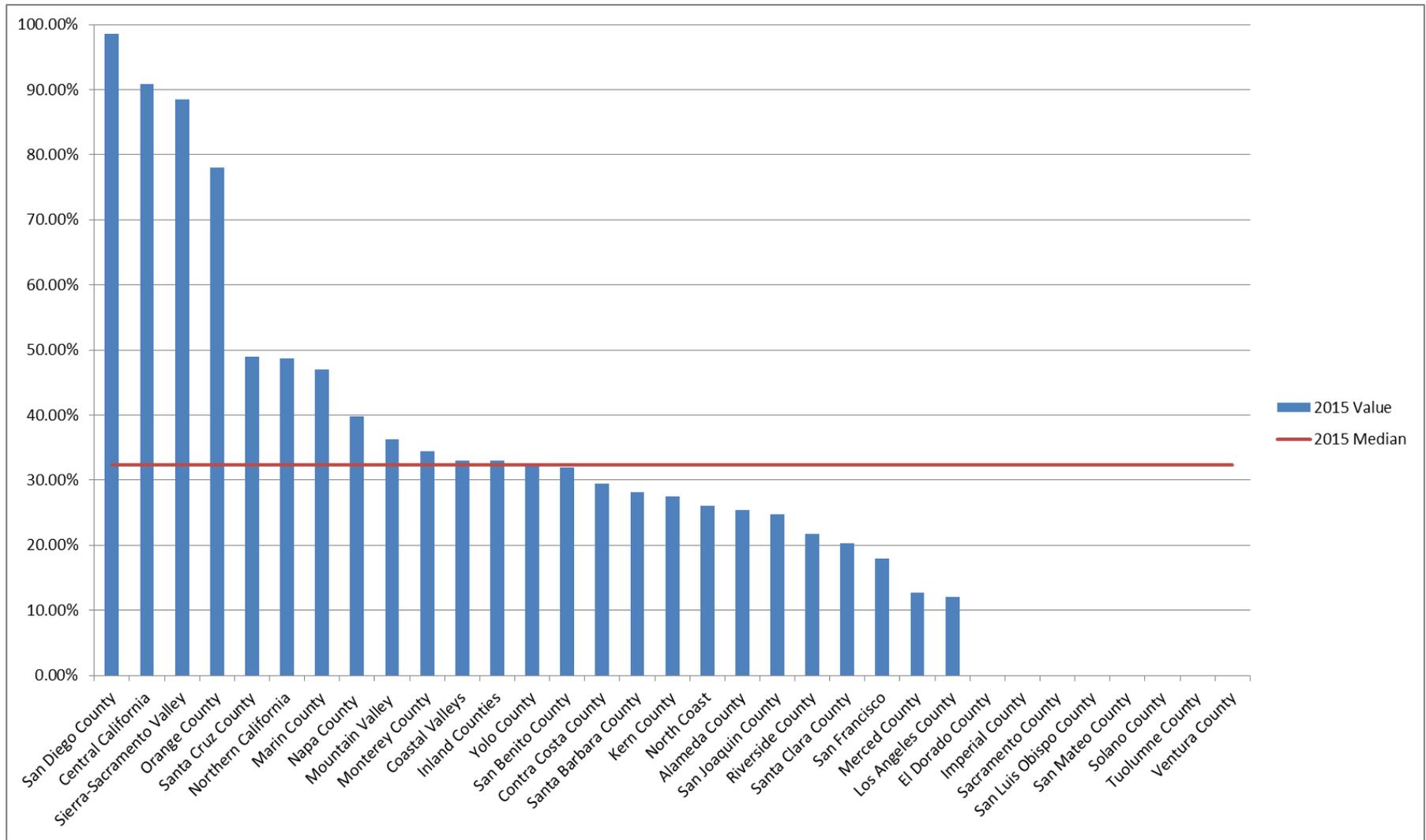
Measure ID	PED-1
Response Count	27
Denominator Total	8614
Submission Rate (n=33)	81.82%
Average	43.51%
Median	29.00%



Of the 27 LEMSAs reporting these data for 2015, the median number of pediatric patients receiving bronchodilators for asthma was 29.00%. The decrease over the last 4 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.

LEMSAs whose name appears in a grey cell indicate that the LEMSA did not report any clinical measures for the 2015 data year. LEMSAs whose name appears in a white cell, but have grey cells for their reported value, indicate participation in this year's core measures reporting, but reported no values for this specific measure in 2015.

PAI-1: Pain Intervention – Part 1 of 2

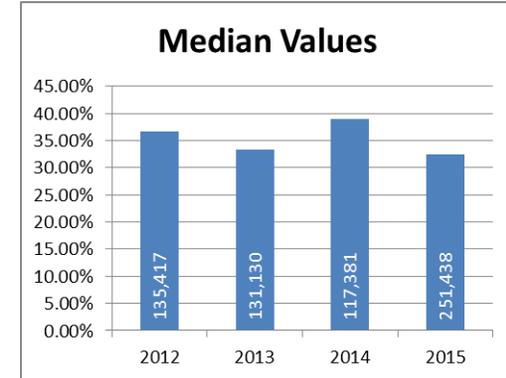


Multiple factors impact the validity and analysis of these retrospective data, including but not limited to incomplete documentation, documentation not reflective of services provided prior to ambulance arrival, inconsistent data dictionary definitions between local jurisdictions, geographic resource 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.

PAI-1: Pain Intervention – Part 2 of 2

	2015 Value	2015 Denom.
San Diego County	98.54%	1162
Central California	90.85%	2327
Sierra-Sacramento Valley	88.49%	4925
Orange County	78.00%	50
Santa Cruz County	49.00%	772
Northern California	48.64%	1252
Marin County	47.00%	1498
Napa County	39.85%	1764
Mountain Valley	36.27%	5046
Monterey County	34.41%	5310
Coastal Valleys	33.00%	4387
Inland Counties	33.00%	21132
Yolo County	32.40%	2833
San Benito County	32.00%	529
Contra Costa County	29.50%	15749
Santa Barbara County	28.10%	2334
Kern County	27.50%	15410
North Coast	26.10%	3875
Alameda County	25.44%	32310
San Joaquin County	24.79%	12848
Riverside County	21.80%	36151
Santa Clara County	20.32%	10320
San Francisco	18.00%	17569
Merced County	12.73%	2946
Los Angeles County	12.00%	48939
El Dorado County		
Imperial County		
Sacramento County		
San Luis Obispo County		
San Mateo County		
Solano County		
Tuolumne County		
Ventura County		

Measure ID	PAI-1
Response Count	25
Denominator Total	251438
Submission Rate (n=33)	75.76%
Average	39.51%
Median	32.40%

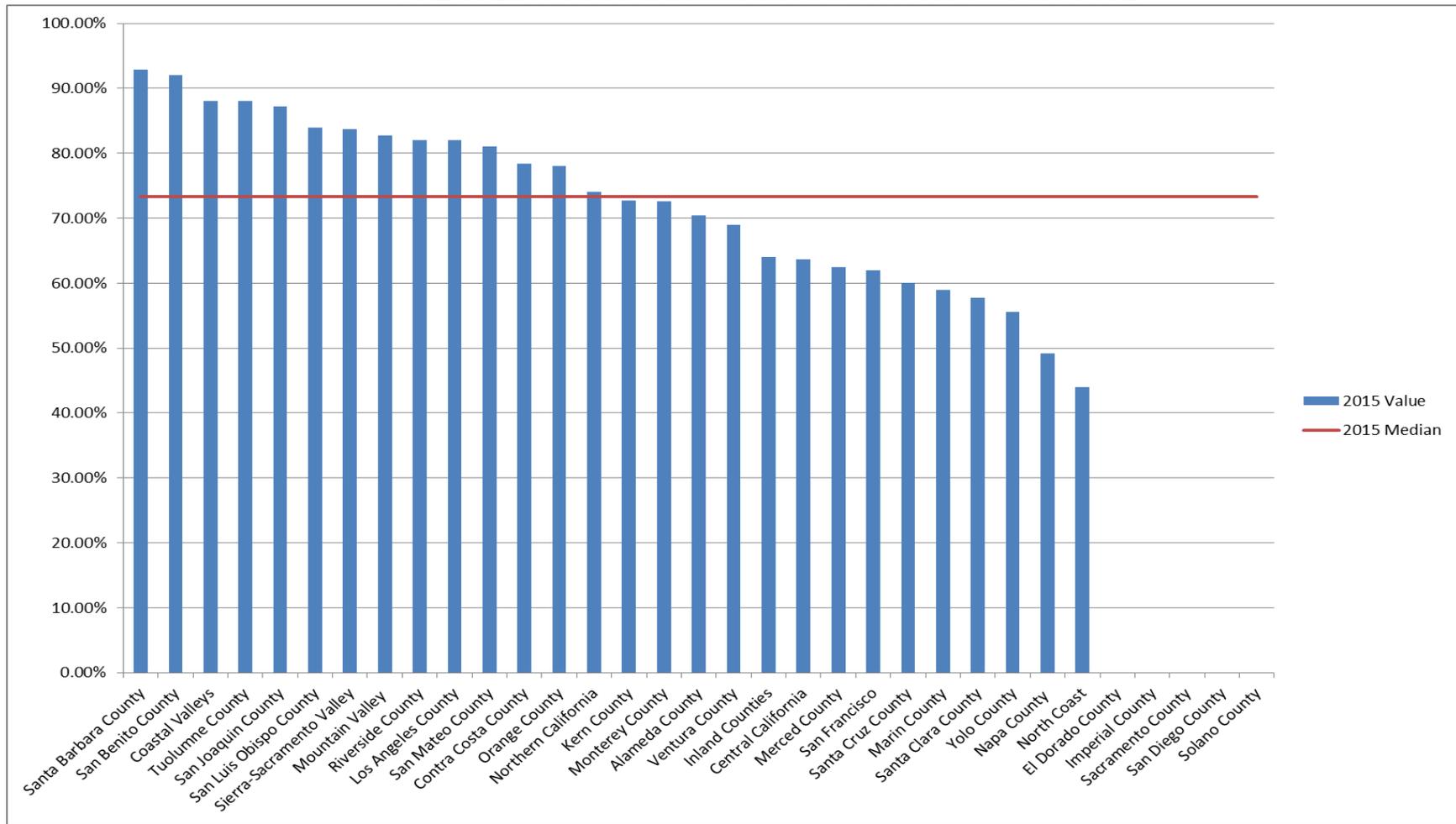


Of the 25 LEMSAs reporting these data for 2015, the median percentage of patients receiving intervention for any pain reported as 7 or greater on a 10-point pain scale was 32.40%. The median value has remained between 32 and 39% over the past four years. However, the variation between LEMSAs is remarkable. Pain intervention was defined as any analgesic medication or accepted procedure to reduce pain. This is an important intervention that EMS personnel can administer to make patients more comfortable during packaging and transport.

All paramedics have access to narcotics and other analgesics; however protocols for use may vary significantly. Some may have received pain medication from first responders and documentation may be inconsistent within the record. The wide variation deserves closer investigation.

LEMSAs whose name appears in a grey cell indicate that the LEMSA did not report any clinical measures for the 2015 data year. LEMSAs whose name appears in a white cell, but have grey cells for their reported value, indicate participation in this year's core measures reporting, but reported no values for this specific measure in 2015.

SKL-1: Endotracheal Intubation Success Rate – Part 1 of 2

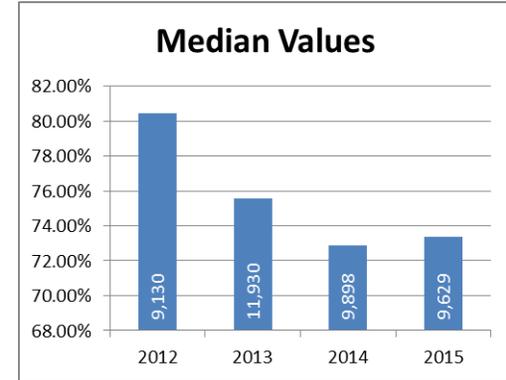


Multiple factors impact the validity and analysis of these retrospective data, including but not limited to incomplete documentation, documentation not reflective of services provided prior to ambulance arrival, inconsistent data dictionary definitions between local jurisdictions, geographic resource 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.

SKL-1: Endotracheal Intubation Success Rate – Part 2 of 2

	2015 Value	2015 Denom.
Santa Barbara County	92.90%	99
San Benito County	92.00%	13
Coastal Valleys	88.00%	104
Tuolumne County	88.00%	17
San Joaquin County	87.16%	335
San Luis Obispo County	84.00%	117
Sierra-Sacramento Valley	83.76%	425
Mountain Valley	82.71%	133
Riverside County	82.03%	1252
Los Angeles County	82.00%	1577
San Mateo County	81.00%	284
Contra Costa County	78.41%	315
Orange County	78.00%	264
Northern California	74.00%	50
Kern County	72.74%	642
Monterey County	72.60%	146
Alameda County	70.47%	789
Ventura County	69.00%	54
Inland Counties	64.00%	1328
Central California	63.72%	430
Merced County	62.41%	290
San Francisco	62.00%	234
Santa Cruz County	60.00%	70
Marin County	59.00%	56
Santa Clara County	57.70%	331
Yolo County	55.60%	18
Napa County	49.23%	65
North Coast	44.00%	191
El Dorado County		
Imperial County		
Sacramento County		
San Diego County		
Solano County		

Measure ID	SKL-1
Response Count	28
Denominator Total	9629
Submission Rate (n=33)	81.82%
Average	72.73%
Median	73.37%

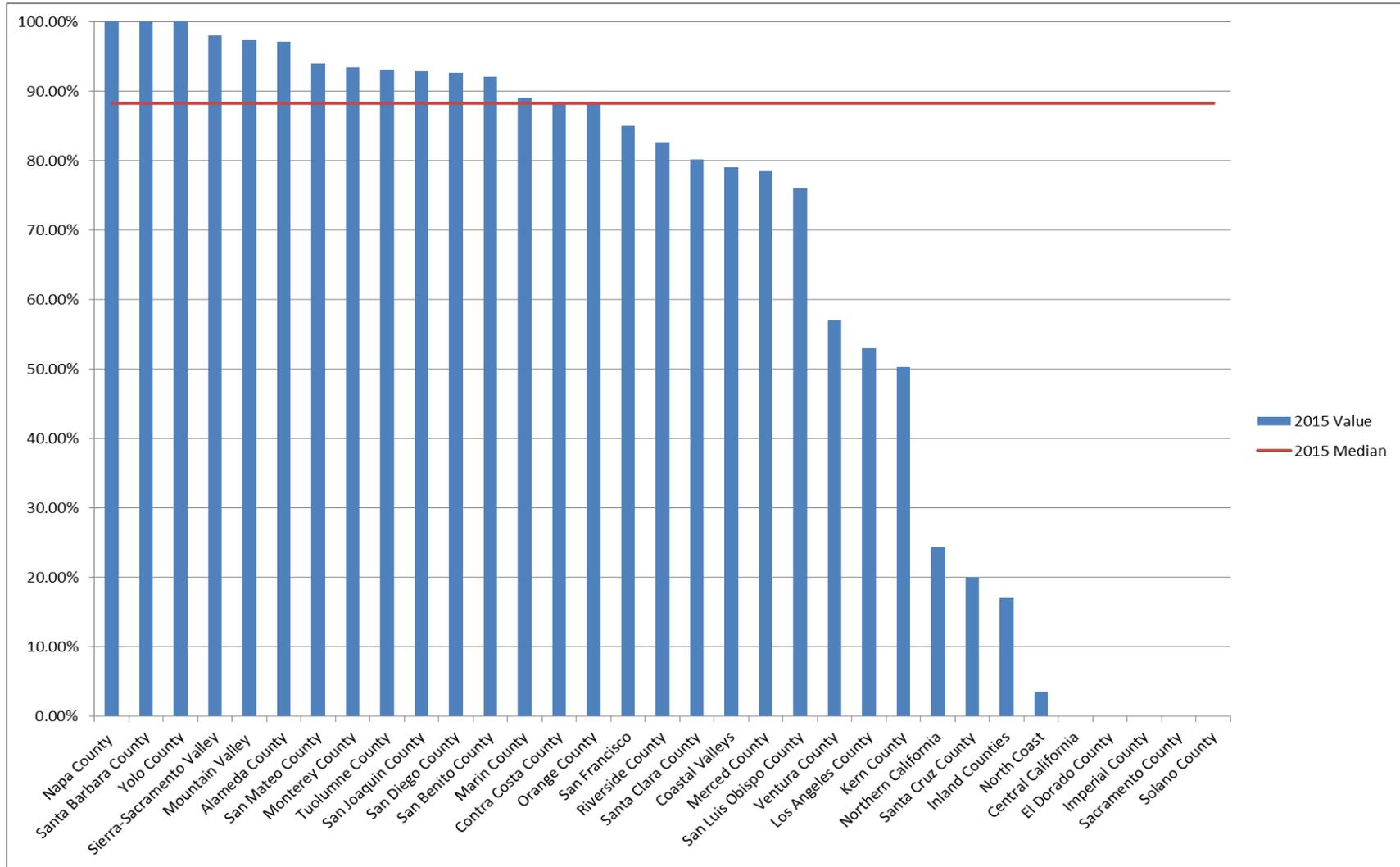


Of the 28 LEMSAs reporting these data for 2015, the median percentage of successful endotracheal intubations (within 2 attempts) was 73.37%. Median values have been fairly consistent for the past three years. These values are consistent with reported values in the literature, which vary between 75 and 80%. Variation between LEMSAs is notable and of interest to validate.

The values may decrease in the future, since the value of intubation has been questioned for many patients, and other methods of airway management have recently been shown to be as effective as intubation. It is important to monitor this measure to determine the need for skill maintenance.

LEMSAs whose name appears in a grey cell indicate that the LEMSA did not report any clinical measures for the 2015 data year. LEMSAs whose name appears in a white cell, but have grey cells for their reported value, indicate participation in this year's core measures reporting, but reported no values for this specific measure in 2015.

SKL-2: End-tidal CO2 Performed on any Successful Endotracheal Intubation – Part 1 of 2

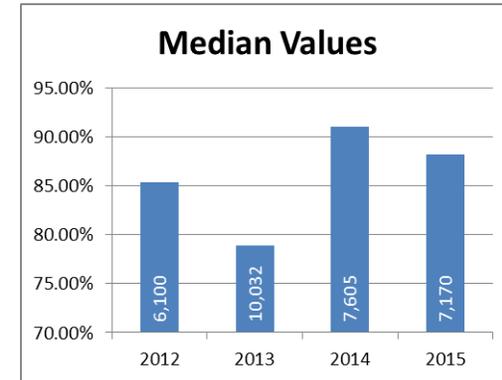


Multiple factors impact the validity and analysis of these retrospective data, including but not limited to incomplete documentation, documentation not reflective of services provided prior to ambulance arrival, inconsistent data dictionary definitions between local jurisdictions, geographic resource 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.

SKL-2: End-tidal CO2 Performed on any Successful Endotracheal Intubation – Part 2 of 2

	2015 Value	2015 Denom.
Napa County	100.00%	32
Santa Barbara County	100.00%	99
Yolo County	100.00%	10
Sierra-Sacramento Valley	98.03%	356
Mountain Valley	97.27%	110
Alameda County	97.12%	556
San Mateo County	94.00%	230
Monterey County	93.44%	106
Tuolumne County	93.00%	15
San Joaquin County	92.81%	292
San Diego County	92.56%	242
San Benito County	92.00%	12
Marin County	89.00%	112
Contra Costa County	88.50%	261
Orange County	88.00%	50
San Francisco	85.00%	144
Riverside County	82.58%	916
Santa Clara County	80.10%	191
Coastal Valleys	79.00%	91
Merced County	78.45%	181
San Luis Obispo County	76.00%	99
Ventura County	57.00%	37
Los Angeles County	53.00%	1378
Kern County	50.31%	642
Northern California	24.32%	37
Santa Cruz County	20.00%	40
Inland Counties	17.00%	847
North Coast	3.60%	84
Central California		
El Dorado County		
Imperial County		
Sacramento County		
Solano County		

Measure ID	SKL-2
Response Count	28
Denominator Total	7170
Submission Rate (n=33)	81.82%
Average	75.79%
Median	88.25%



Of the 28 LEMSAs reporting these data for 2015, the median percentage of End-Tidal CO2 monitoring with waveform capnography after any successful endotracheal intubations was 88.25%. The value significantly increased from last year, but has been variable over the prior years of measurement, but generally about 8-90%.

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.

LEMSAs whose name appears in a grey cell indicate that the LEMSA did not report any clinical measures for the 2015 data year. LEMSAs whose name appears in a white cell, but have grey cells for their reported value, indicate participation in this year's core measures reporting, but reported no values for this specific measure in 2015.