



EMS Core Measures Project
Reporting Capability of EMSA and LEMSA Data Systems
and
Results from Performance Measures
Data Year 2018
With Comparison to Data Year 2016 and 2017

EMSA #R002-2020

October 2019

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EMS Core Measures Project, Data from 2018: Reporting Capability of EMSA and LEMSA Data Systems and Results from Clinical Measure Reports

Methodology

A task force consisting of data and quality leaders from local EMS agencies, LEMSA medical directors, hospitals, and pre-hospital EMS providers assisted in the development of the initial core measures. The measures are based on evidence-based processes and treatments for a condition or illness. Each year, the measures are updated based on data system changes and operational considerations. 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. EMS system quality improvement regulations have been established (CCR, Title 22, Division 9, Chapter 12) that define the requirements for local EMS agencies, EMS service providers, and base hospitals in their role as part of the EMS system. These requirements include, but are not limited to, the implementation of an EMS Quality Improvement program (EMS QI) and the use of defined indicators to assess the local EMS system as found in EMSA #166, Appendix E. The measures are reviewed each year to improve results.

LEMSA participation in the California Emergency Medical Services Information System (CEMSIS) is required, consistent with HSC 1797.102, to provide 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 LEMSAs run their core measure reports from their local database and submit aggregate results to EMSA. Since each of the 33 LEMSAs maintains their own EMS database and each is dependent on their EMS provider agencies to submit data, there is variability in their capability to report core measures and some intrinsic variation in results.

For this year of reporting, EMSA requested the LEMSAs use the California EMS Systems Core Quality Measures Specifications when running reports and not use any custom elements or fields specific to their local jurisdiction or EMS providers. The specifications were drafted by a consensus group in November of 2018 from the local jurisdictions and recommendations from previous reporting years and were incorporated into the most current version of the Core Measures Instruction Manual. Adherence to this request is critical to maintain the integrity of this statewide assessment. The use of the specifications is key to comparing the reported results throughout the State.

Limitations and Challenges

Core measure reporting depends on the development of compatible data systems at several levels of the EMS system, which will take several more years to achieve the level of confidence of other healthcare sector quality assessment reporting. Other challenges to reporting the core measures to EMSA are enumerated below. Of the 33 LEMSAs, 19 reported at least one measure for 2018 data. All LEMSAs reported at least 10 of the 13 measures which yielded a measure response rate of 75% or greater for all measures.

Limitations

Non-Responses to Core Measures Request – All 33 LEMSAs were contacted to provide Core Measures Information to EMSA by a set date. 21 of the 33 LEMSAs provided a formal response to EMSA's request for Core Measure Information. 2 additional LEMSAs contacted EMSA and expressed their challenges in reporting. The remaining 10 LEMSAs failed to provide any response to the information request. In October of 2019, EMSA reached out the non-responsive LEMSAs to determine what barriers exist to responding and reporting Core Measures Information as 32 of the 33 LEMSAs have reporting some information in past year of the project, as seen on Table 1 of page 7 of this report.

Partial System Representation – Only a portion of the actual EMS business conducted in California is represented in this report; the values reported by the LEMSAs do not represent 100% of the providers in the state. Multiple LEMSAs reported that not all their providers were represented in their reporting for various reasons.

In future years, system improvements listed below will facilitate data collection and more accurate reporting. These advances should improve data validity and decrease variability related to documentation and measure specifications.

1. Additional LEMSAs successfully exporting data to CEMSIS
2. CEMSIS accumulating sufficient records to generate reports on core measures from patient-level data
3. Data validation between CEMSIS data and LEMSA data.

Tables, Charts and Graphs Generated from Core Measure Reports

LEMSAs Reporting Data for Any Core Measures (Table 1) and LEMSA Providing a Formal Response to Request for Core Measures Information (Table 2):

Table 1 shows which LEMSAs submitted core measures data for years 2009-2018. For 2018 reporting year, 19/33 LEMSAs reported at least one measure. If a LEMSA submitted a value for any of the measures found in *California EMS System Core Quality Measures, EMSA 166, Appendix E*, the cell associated with that data year is populated with an "X" and shaded green. For LEMSAs that did not submit any core measure information to EMSA, the cell for that corresponding year appears white. For Table 2, LEMSAs who responded to EMSAs request for Core Measures Information are populated with an "X" and shaded green. Non-Responsive LEMSAs will have an empty cell.

Measures Response Count, Denominator Total, Submission Rate, Average, and Median as Reported by LEMSA (Table 3):

Table 2 shows the total number of LEMSAs that reported a value for the specific clinical measure, the aggregate denominator total (number of patient records) of all responses, the percent of LEMSAs that submitted a value for each measure (submission rate), the average and median reported value for each measure.

Percent of Responses for 2016 - 2018 (Chart 1); Count of Measures Reported by each LEMSA for 2018 Data (Chart 2):

The histogram shows the percent of measures reported by each LEMSA grouped as follows: 100% - 75%, 75% - 50%, 50% - 25%, 25% - 0, and "No Response". Each of the 33 LEMSAs is tallied in one of these groups based on the percent of measures they reported. Chart 2 also illustrates the number of clinical measures each LEMSA reported, organized by LEMSA alphabetically.

Individual 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 provides a table of the LEMSA response count for each measure, the population denominator for the measure, submission rate for the measure, average reported value, and median value for all responses for that 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 contains no value and is shaded grey. The yellow box features some comments and evaluation on the measure and responses.

Table 1: LEMSAs Reporting Data for Any Core Measure
Core Measure Reporting by LEMSA

| | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|--------------------------------------|------|------|------|------|------|------|------|------|------|------|
| Alameda County EMS | | X | X | X | X | X | X | X | X | X |
| Central California EMS | X | X | X | X | X | X | X | X | X | X |
| Coastal Valleys EMS | | | | X | X | X | X | X | X | |
| Contra Costa County EMS | | X | X | 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 | X | X | X |
| Kern County EMS | | X | X | | X | X | X | X | X | X |
| Los Angeles County EMS | X | X | X | X | X | X | X | X | X | X |
| Marin County EMS | | X | X | | X | X | X | X | X | |
| Merced County EMS | X | X | X | X | X | X | X | X | X | X |
| Monterey County EMS | | X | X | X | X | X | X | X | X | X |
| Mountain Valley EMS | | X | X | X | X | X | X | X | X | X |
| Napa County EMS | | | | | X | X | X | X | X | |
| North Coast EMS | | X | X | X | X | X | X | X | X | X |
| Northern California EMS | X | X | X | X | X | X | X | X | X | X |
| Orange County EMS | | | | | X | X | X | X | X | |
| Riverside County EMS | | X | X | X | X | X | X | X | X | X |
| Sacramento County EMS | | X | X | X | X | X | | | X | |
| San Benito County EMS | | | | | X | X | X | X | X | |
| San Diego County EMS | | X | X | X | X | X | X | X | X | X |
| San Francisco EMS | X | X | X | X | X | X | X | X | X | X |
| San Joaquin County EMS | | | | X | X | X | X | X | X | X |
| San Luis Obispo County EMS | | X | X | | X | X | X | X | X | |
| San Mateo County EMS | | X | X | X | X | X | X | X | X | |
| Santa Barbara County EMS | X | X | X | | X | X | X | X | X | |
| Santa Clara County EMS | X | X | X | X | X | X | X | X | X | X |
| Santa Cruz County EMS | X | X | X | | X | X | X | X | X | X |
| Sierra-Sacramento Valley EMS | X | X | X | X | X | X | X | X | X | X |
| Solano County EMS | | | | X | X | X | | | | |
| Tuolumne County EMS | | X | X | X | X | X | X | | X | |
| Ventura County EMS | | X | X | X | X | X | X | X | X | X |
| Yolo County EMS | | | | | X | X | X | X | X | X |
| Total Participants | 10 | 24 | 24 | 23 | 32 | 32 | 29 | 28 | 30 | 19 |
| X=Reported At Least 1 Measure | | | | | | | | | | |
| No Measures Submitted | | | | | | | | | | |

Table 2: LEMSA Providing a Formal Response to Request for Core Measures Information Challenges in this reporting period

| | 2018 |
|---|------|
| Alameda County EMS | X |
| Central California EMS | X |
| Coastal Valleys EMS | |
| Contra Costa County EMS | |
| El Dorado County EMS | |
| Imperial County EMS | |
| Inland Counties EMS | X |
| Kern County EMS | X |
| Los Angeles County EMS | X |
| Marin County EMS | |
| Merced County EMS | X |
| Monterey County EMS | X |
| Mountain Valley EMS | X |
| Napa County EMS | |
| North Coast EMS | X |
| Northern California EMS | X |
| Orange County EMS | X |
| Riverside County EMS | X |
| Sacramento County EMS | |
| San Benito County EMS | X |
| San Diego County EMS | X |
| San Francisco EMS | X |
| San Joaquin County EMS | X |
| San Luis Obispo County EMS | |
| San Mateo County EMS | |
| Santa Barbara County EMS | |
| Santa Clara County EMS | X |
| Santa Cruz County EMS | X |
| Sierra-Sacramento Valley EMS | X |
| Solano County EMS | X |
| Tuolumne County EMS | |
| Ventura County EMS | X |
| Yolo County EMS | X |
| Total Respondents | 22 |
| X=Provided Formal Response to Request for Information | |
| No Formal Response Provided | |

Table 3: Aggregated Values across all LEMSAs of Clinical Measures Response Count*, Denominator Total, Submission Rate, Average and Median Value

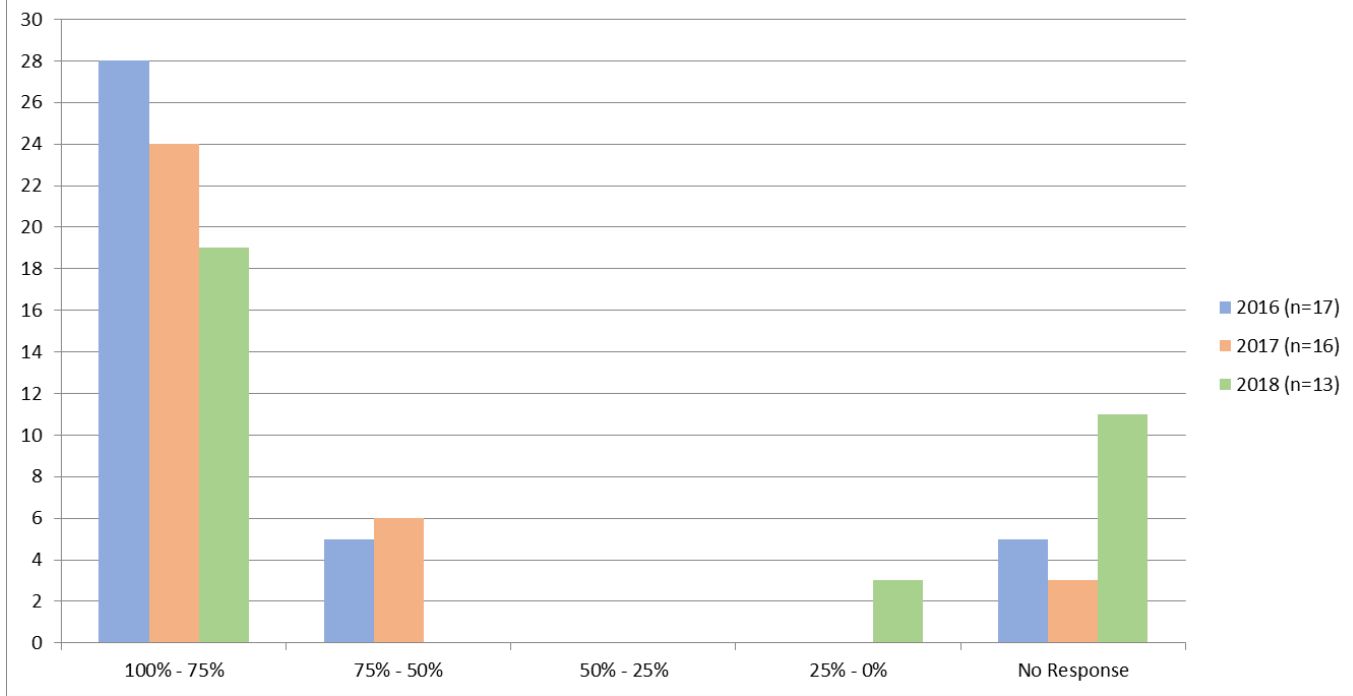
| 2018 | | | | | | | | | | | | | |
|--|--------|--------|--------|--------|---------|--------|--------|--------|--------|--------|--------|---------|---------|
| Measure ID | TRA-1 | TRA-2 | ACS-1 | ACS-3 | ACS-4 | ACS-6 | HYP-1 | STR-1 | STR-2 | STR-4 | PED-3 | RST-4 | RST-5 |
| Response Count | 19 | 19 | 19 | 18 | 18 | 18 | 19 | 19 | 19 | 19 | 17 | 19 | 19 |
| Denominator Total | 112128 | 52479 | 75587 | 7262 | 7561 | 3672 | 31246 | 36614 | 36333 | 24707 | 3830 | 2645561 | 1709883 |
| Submission Rate (n=33) | 57.58% | 57.58% | 57.58% | 54.55% | 54.55% | 54.55% | 57.58% | 57.58% | 57.58% | 57.58% | 51.52% | 57.58% | 57.58% |
| Average | 27 | 53.20% | 62.86% | 27 | 127.98% | 17 | 64.91% | 82.05% | 90.02% | 51.68% | 96% | 78.32% | 12.02% |
| Median | 26 | 64.00% | 61.00% | 23 | 83.00% | 15 | 73.00% | 88.00% | 92.55% | 57.83% | 97% | 78.77% | 9.00% |
| 19 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 thirteen measures had a 75% response rate or greater. The following measures were reported by at least 14 of the 19 participating LEMSAs (19 of 33):

1. TRA-1 Time for trauma patients transported to a trauma center.
2. TRA-2 Measurement of trauma patients transported to a trauma center
3. ACS-1 Aspirin administration for chest pain/discomfort rate
4. ACS-3 Scene time for STEMI patients
5. ACS-4 Advance hospital notification for STEMI patients
6. ACS-6 Time to EKG
7. HYP-1 Treatment administered for hypoglycemia
8. STR-1 Prehospital screening for suspected stroke patients
9. STR-2 Glucose testing for suspected acute stroke patients
10. STR-4 Advance hospital notification for stroke patients
11. PED-3 Respiratory assessment for pediatric patients
12. RST-4 911 Requests for services that include a lights and/or siren response
13. RST-5 911 Requests for service that include a lights and/or siren transport

Chart 1: Frequency Histogram of LEMSA Percent of Responses for 2016 - 2018

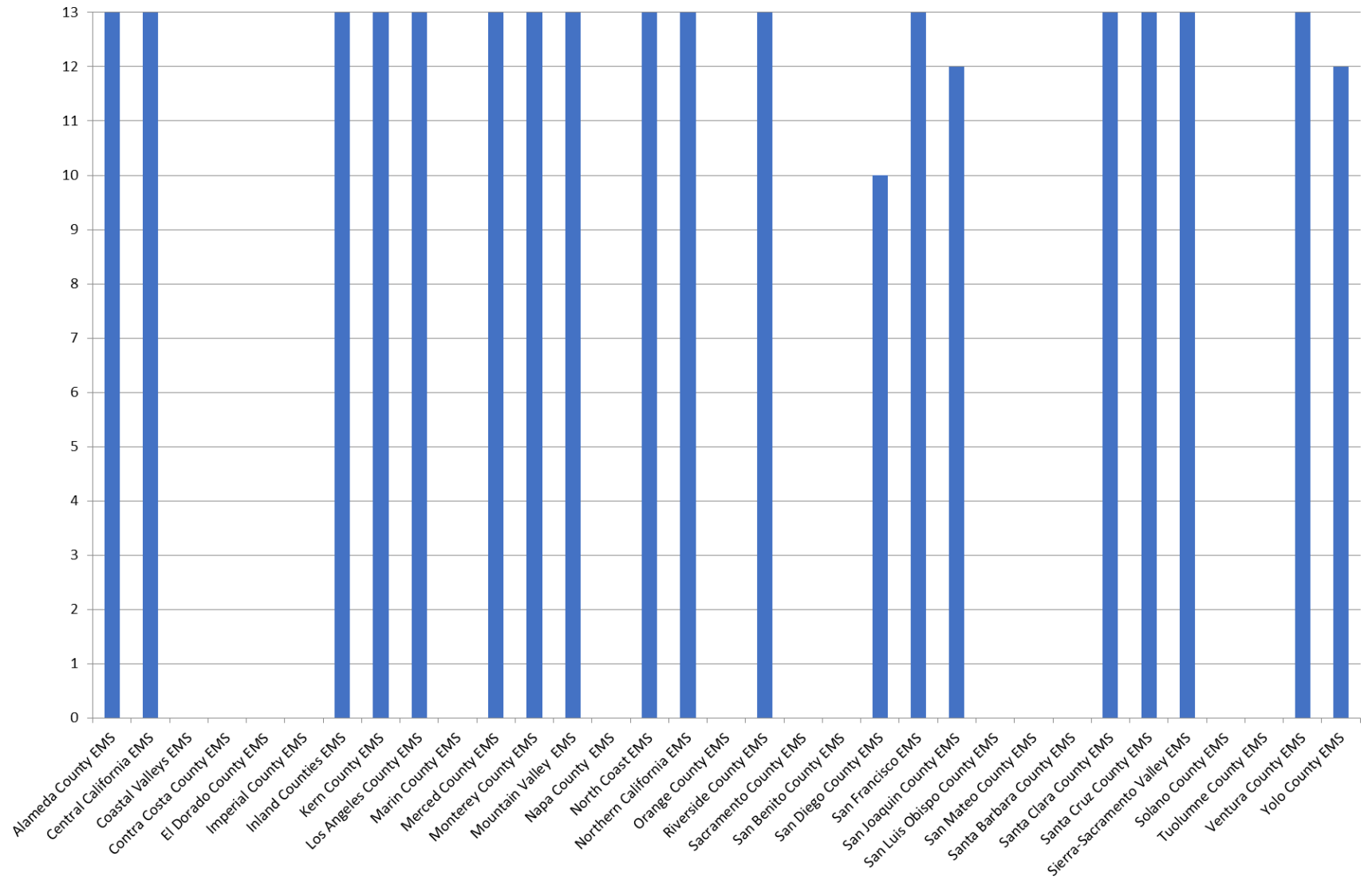


Count of LEMSA reporting a value noted in the calendar year

| Percentage of Measures | 2016 (n=17) | 2017 (n=16) | 2018 (n=13) |
|------------------------|-------------|-------------|-------------|
| 100% - 75% | 28 | 24 | 19 |
| 75% - 50% | 5 | 6 | 0 |
| 50% - 25% | 0 | 0 | 0 |
| 25% - 0% | 0 | 0 | 3 |
| No Response | 5 | 3 | 11 |

Note: For 2016 data, LEMSAs utilized the NEMSIS 2.2.1 data standard to report 17 measures. 2017 was considered a transitional year which was the first attempt to calculate measures based on the NEMSIS 3 data standard of which there were 16 measures. For 2017 reporting, LEMSAs could deviate from the specifications and report on the intent of the measure. For 2018 data, EMSA requested information on 13 measures and asked that LEMSAs to adhere to the specifications. Multiple factors contributed to the lack of participation, which are examined throughout this report. The ability to report these measures is an indicator of the capability of the LEMSA data system to report the retrospective clinical data and may not represent a LEMSA's commitment to data collection or quality improvement.

Chart 2: LEMSA Response Count to 13 Core Measures for 2018 Data



Core Measure Responses

Caveats applying to all Measures:

- Non-reporting LEMSAs did not indicate why they were unable to report information on this measure
- Adjustments to this measure will be made for the 2019 reporting year to provide clarification on the intent of the measure as well as to more accurately report EMS performance in the field
- 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. These retrospective data have not been validated. These limitations caution against comparison between jurisdictions and limit the reliance of the aggregate values.

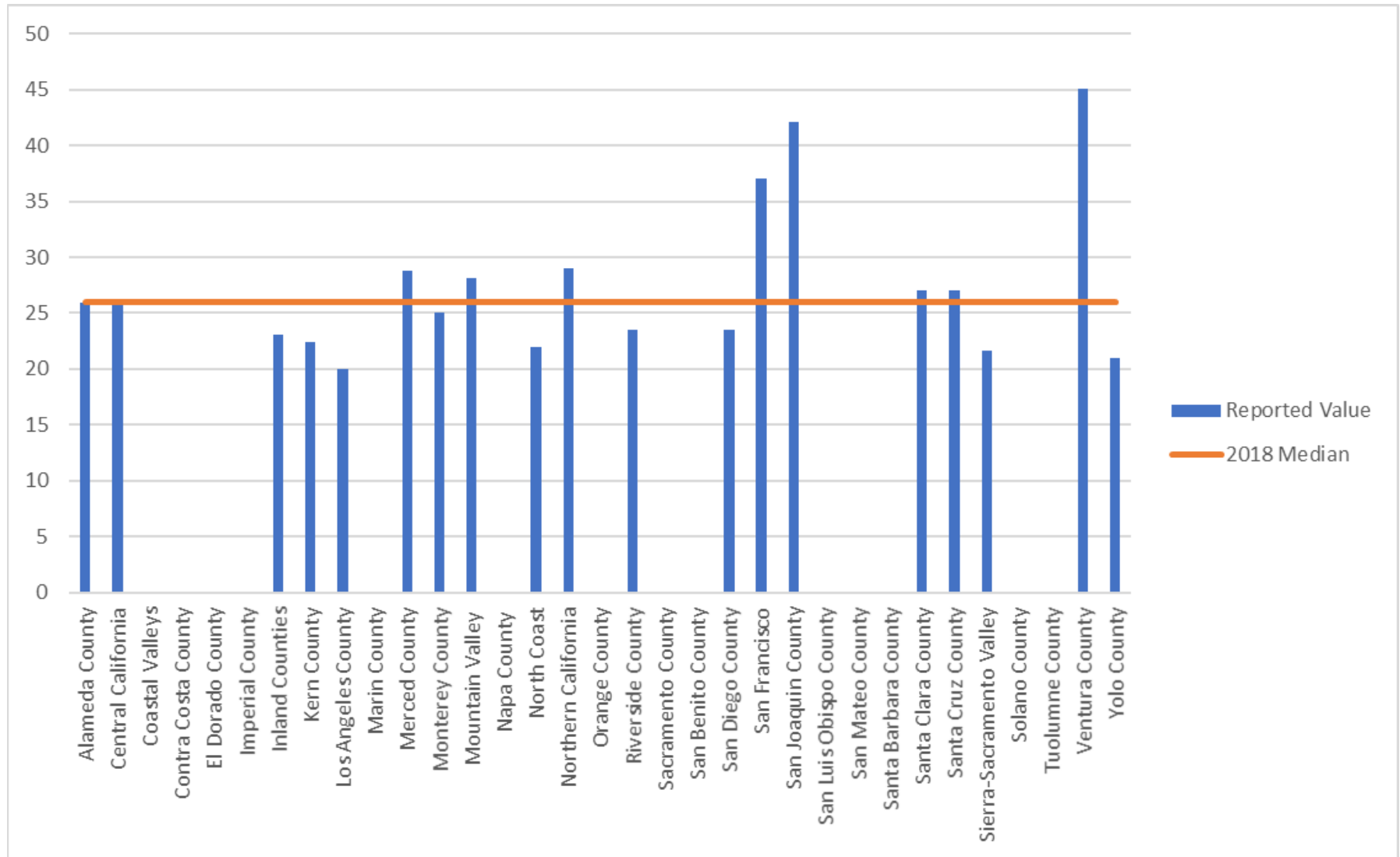
Contact Information:

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

TRA-1: On-Scene Time (minutes) 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. These 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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TRA-1: On-Scene Time for Trauma Patients – Part 2 of 2

| | Denominator | Minutes |
|--------------------------|-------------|---------|
| Alameda County | 4737 | 26.0 |
| Central California | 675 | 26.2 |
| Coastal Valleys | | |
| Contra Costa County | | |
| El Dorado County | | |
| Imperial County | | |
| Inland Counties | 31816 | 23.1 |
| Kern County | 1140 | 22.4 |
| Los Angeles County | 6840 | 20.0 |
| Marin County | | |
| Merced County | 2632 | 28.8 |
| Monterey County | 230 | 25.0 |
| Mountain Valley | 7967 | 28.1 |
| Napa County | | |
| North Coast | 3688 | 22.0 |
| Northern California | 1225 | 29.0 |
| Orange County | | |
| Riverside County | | 23.5 |
| Sacramento County | | |
| San Benito County | | |
| San Diego County | 15209 | 23.5 |
| San Francisco | 1442 | 37.0 |
| San Joaquin County | 69 | 42.1 |
| San Luis Obispo County | | |
| San Mateo County | | |
| Santa Barbara County | | |
| Santa Clara County | 8360 | 27.0 |
| Santa Cruz County | | 27.0 |
| Sierra-Sacramento Valley | 22110 | 21.7 |
| Solano County | | |
| Tuolumne County | | |
| Ventura County | 912 | 45.1 |
| Yolo County | 3076 | 21.0 |

Empty grey cells indicate no value reported

| 2018 | |
|------------------------|--------|
| Measure ID | TRA-1 |
| Response Count | 19 |
| Denominator Total | 112128 |
| Submission Rate (n=33) | 57.58% |
| Average | 27 |
| Median | 26 |

Of the 19 responding LEMSAs reporting these data for 2018, the median on-scene time was 26 minutes while the reported average on-scene time was 27 minutes.

There was some confusion regarding the measure description and the elements used to calculate the on-scene time. This may have resulted in variation in how the measures were run and reported. This can be seen in the wide range of reported times.

TRA-1 and TRA-2 will be adjusted to be capture same denominator population for 2019 reporting.

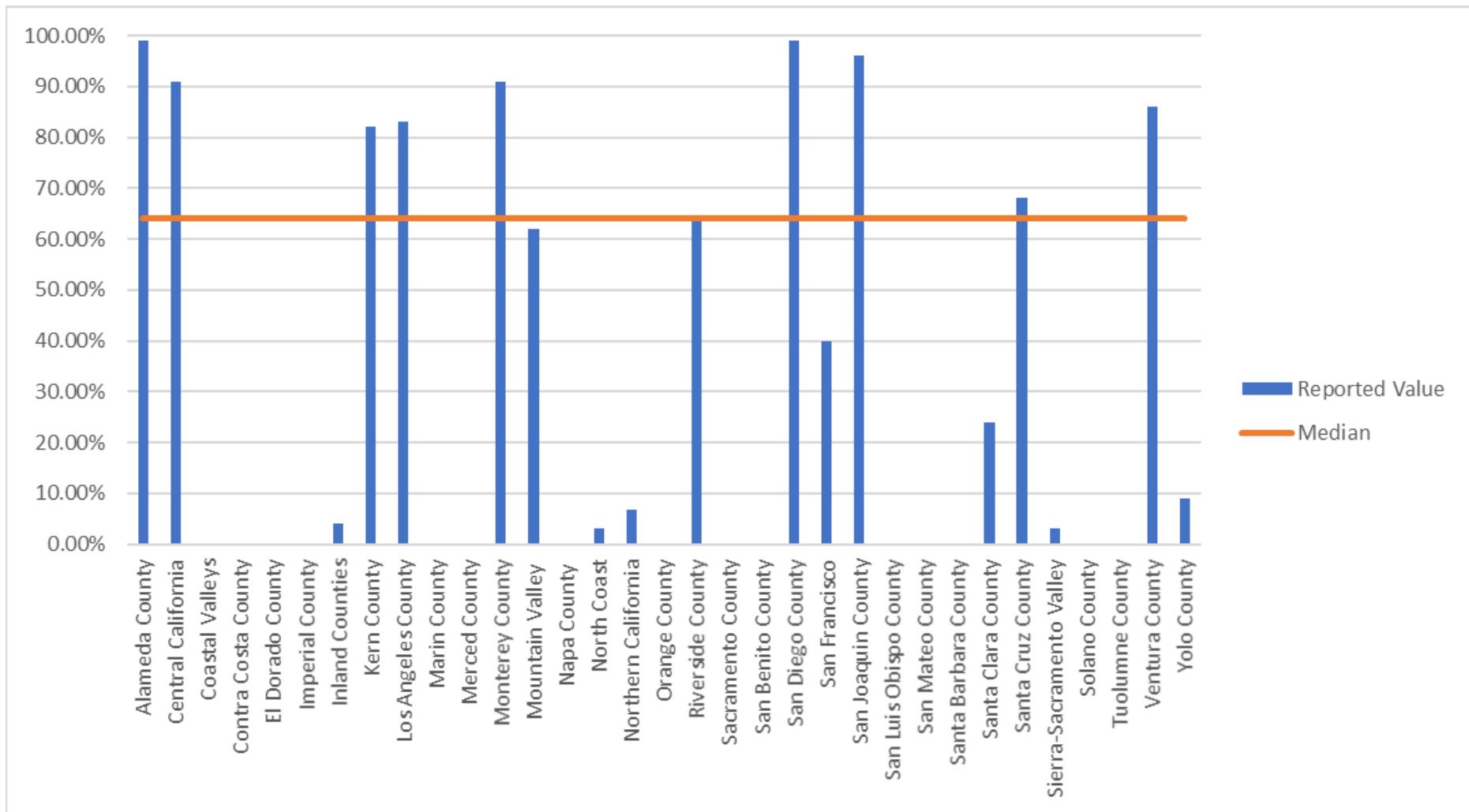
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TRA-2: Measurement of trauma patients transported to a trauma center– Part 1 of 2



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. These retrospective data have not been validated. These limitations caution against comparison between jurisdictions and limit the reliance of the aggregate values.

TRA-2: Measurement of trauma patients transported to a trauma center– Part 2 of 2

| | Denominator | Reported Value |
|--------------------------|-------------|----------------|
| Alameda County | 4690 | 99.02% |
| Central California | 675 | 91.00% |
| Coastal Valleys | | |
| Contra Costa County | | |
| El Dorado County | | |
| Imperial County | | |
| Inland Counties | 54806 | 4.00% |
| Kern County | 634 | 82.00% |
| Los Angeles County | 8502 | 83.00% |
| Marin County | | |
| Merced County | 3059 | 0.00% |
| Monterey County | 1060 | 91.00% |
| Mountain Valley | 676 | 62.00% |
| Napa County | | |
| North Coast | 4322 | 3.00% |
| Northern California | 1460 | 6.78% |
| Orange County | | |
| Riverside County | 2743 | 64.00% |
| Sacramento County | | |
| San Benito County | | |
| San Diego County | 8221 | 99.00% |
| San Francisco | 1619 | 40.00% |
| San Joaquin County | 69 | 96.00% |
| San Luis Obispo County | | |
| San Mateo County | | |
| Santa Barbara County | | |
| Santa Clara County | 8564 | 24.00% |
| Santa Cruz County | | 68.00% |
| Sierra-Sacramento Valley | 27611 | 3.00% |
| Solano County | | |
| Tuolumne County | | |
| Ventura County | 916 | 86.00% |
| Yolo County | 3968 | 9.00% |

Empty grey cells indicate no value reported

| 2018 | |
|------------------------|--------|
| Measure ID | TRA-2 |
| Response Count | 19 |
| Denominator Total | 52479 |
| Submission Rate (n=33) | 57.58% |
| Average | 53.20% |
| Median | 64.00% |

Of the 19 responding LEMSAs reporting these data for 2018, the median reported value was 64% while the reported average reported value was 53.2%.

There was some confusion regarding the measure description and the elements used to calculate this measure. This may have resulted in variation in how the measures were run and reported.

TRA-1 and TRA-2 will be adjusted to be capture same denominator population for 2019 reporting.

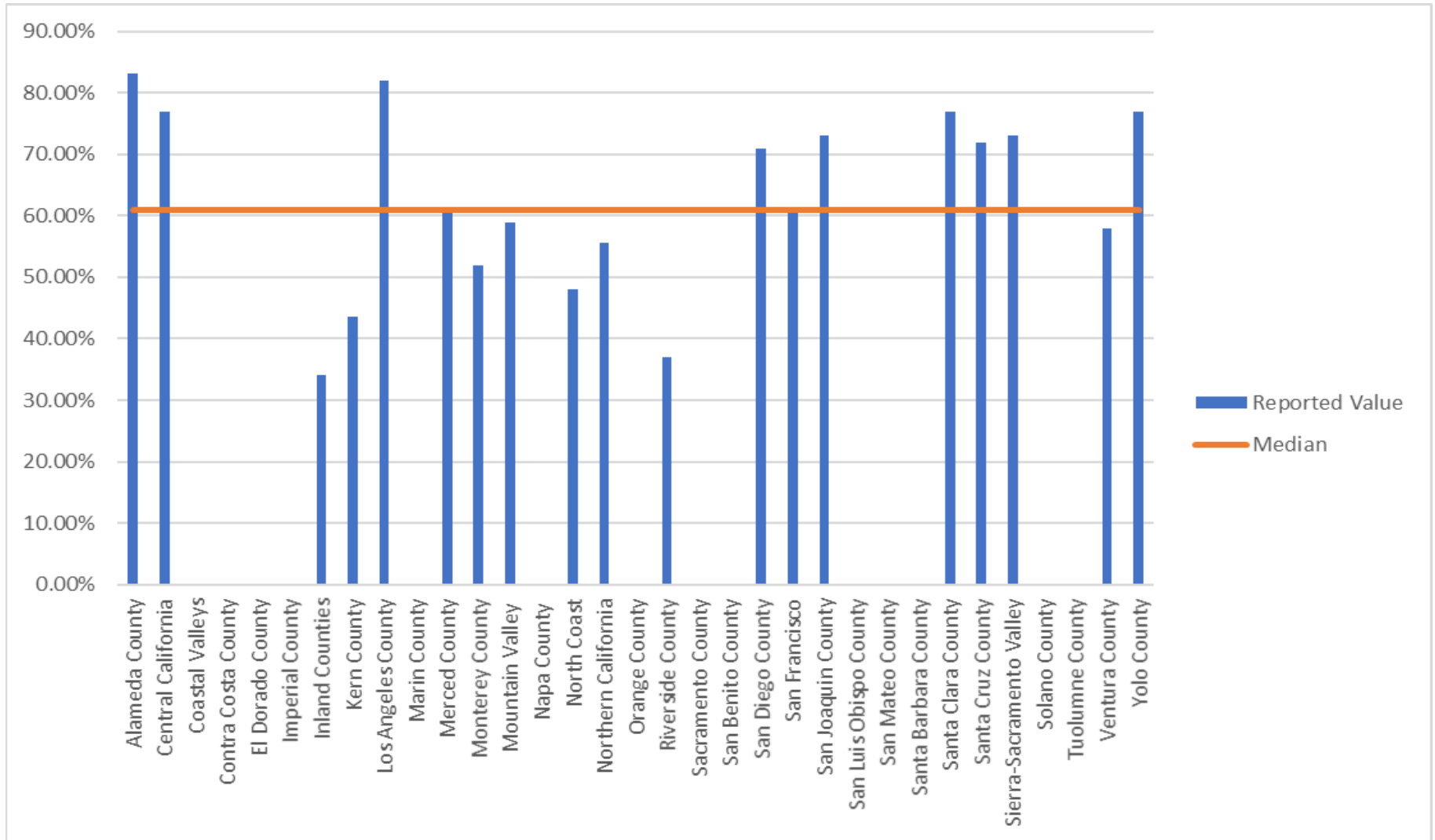
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ACS-1: Aspirin Administration for Chest Pain/Discomfort Rate – Part 1 of 2



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. These 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

| | Denominator | Reported Value |
|--------------------------|-------------|----------------|
| Alameda County | 3450 | 83.11% |
| Central California | 6155 | 77.00% |
| Coastal Valleys | | |
| Contra Costa County | | |
| El Dorado County | | |
| Imperial County | | |
| Inland Counties | 12248 | 34.00% |
| Kern County | 766 | 43.60% |
| Los Angeles County | 19294 | 82.00% |
| Marin County | | |
| Merced County | 789 | 61.00% |
| Monterey County | 1098 | 52.00% |
| Mountain Valley | 1987 | 59.00% |
| Napa County | | |
| North Coast | 763 | 48.00% |
| Northern California | 189 | 55.56% |
| Orange County | | |
| Riverside County | 6189 | 37.00% |
| Sacramento County | | |
| San Benito County | | |
| San Diego County | 8271 | 71.00% |
| San Francisco | 2603 | 61.00% |
| San Joaquin County | 2664 | 73.00% |
| San Luis Obispo County | | |
| San Mateo County | | |
| Santa Barbara County | | |
| Santa Clara County | 1496 | 77.00% |
| Santa Cruz County | | 72.00% |
| Sierra-Sacramento Valley | 5508 | 73.00% |
| Solano County | | |
| Tuolumne County | | |
| Ventura County | 1356 | 58.00% |
| Yolo County | 761 | 77.00% |

Empty grey cells indicate no value reported

| 2018 | |
|------------------------|--------|
| Measure ID | ACS-1 |
| Response Count | 19 |
| Denominator Total | 75587 |
| Submission Rate (n=33) | 57.58% |
| Average | 62.86% |
| Median | 61.00% |

Of the 19 responding LEMSAs reporting these data for 2018, the median reported value was 61% while the reported average value was 62.86%.

Some LEMSAs noted that patients were being excluded from the numerator population and not the denominator population. This may have resulted in variation in how the measures were run and reported.

Exclusion criteria for this will be made clear and applied appropriately to both numerator and denominator. Relevant Provider Primary/Secondary Impressions may be included in 2019 to further capture the suspected ACS population.

All 33 LEMSAs have aspirin administration in their protocol for management of suspected ACS patients. With the recommended changes to this measure for 2019, the reported values are expected to increase to more accurately reflect medical care administered.

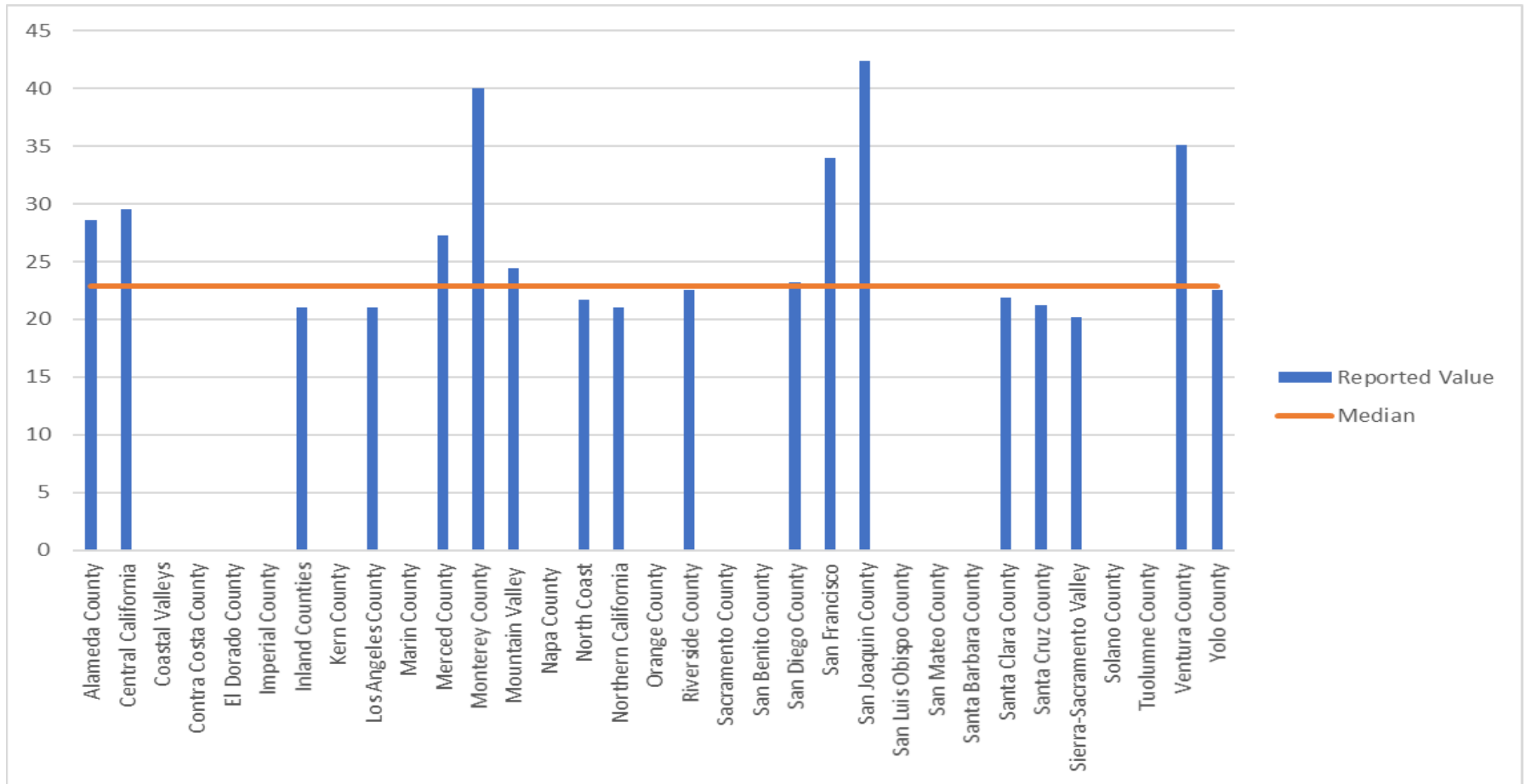
Contact Information:

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ACS-3: Scene time (Minutes) for STEMI 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. These 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 STEMI patients– Part 2 of 2

| | Denominator | Minutes |
|--------------------------|-------------|---------|
| Alameda County | 458 | 28.6 |
| Central California | 432 | 29.5 |
| Coastal Valleys | | |
| Contra Costa County | | |
| El Dorado County | | |
| Imperial County | | |
| Inland Counties | 220 | 21.0 |
| Kern County | 231 | |
| Los Angeles County | 3766 | 21.0 |
| Marin County | | |
| Merced County | 1 | 27.3 |
| Monterey County | 167 | 40.0 |
| Mountain Valley | 1 | 24.4 |
| Napa County | | |
| North Coast | 14 | 21.7 |
| Northern California | 11 | 21.0 |
| Orange County | | |
| Riverside County | | 22.6 |
| Sacramento County | | |
| San Benito County | | |
| San Diego County | 322 | 23.2 |
| San Francisco | 214 | 34.0 |
| San Joaquin County | 285 | 42.4 |
| San Luis Obispo County | | |
| San Mateo County | | |
| Santa Barbara County | | |
| Santa Clara County | 351 | 21.9 |
| Santa Cruz County | | 21.2 |
| Sierra-Sacramento Valley | 396 | 20.2 |
| Solano County | | |
| Tuolumne County | | |
| Ventura County | 298 | 35.1 |
| Yolo County | 95 | 22.6 |

Empty grey cells indicate no value reported

| 2018 | |
|------------------------|--------|
| Measure ID | ACS-3 |
| Response Count | 18 |
| Denominator Total | 7262 |
| Submission Rate (n=33) | 54.55% |
| Average | 27 |
| Median | 23 |

Of the 18 responding LEMSAs reporting these data for 2018, the median scene time for STEMI patients was 23 minutes while the average reported time was 27 minutes.

Some LEMSAs noted that patients were being excluded from the numerator population and not the denominator population. This may have resulted in variation in how the measures were run and reported.

Clarification will be provided to ensure this measure appropriately captures the STEMI population.

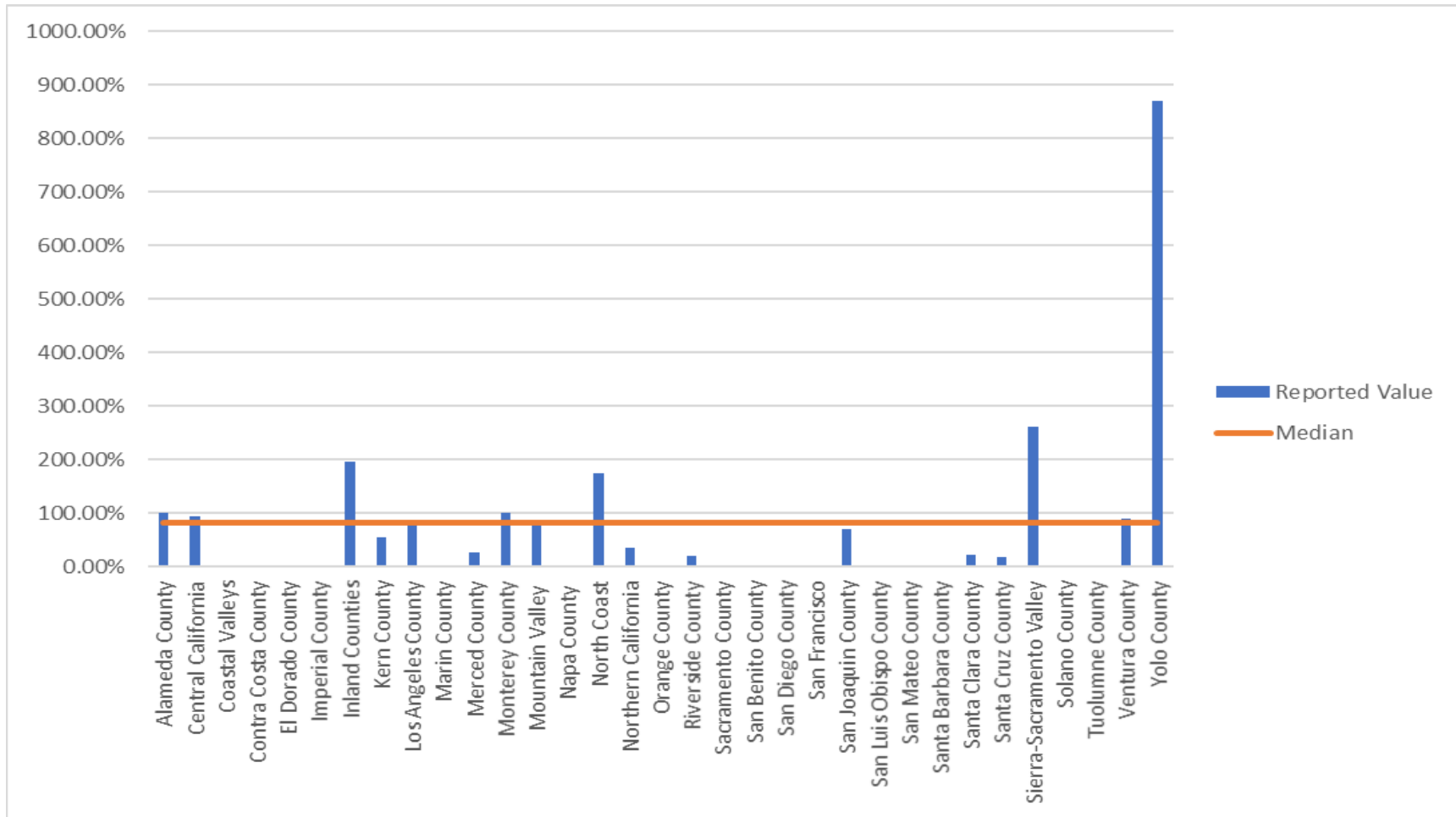
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ACS-4: Advance hospital notification for STEMI patients – Part 1 of 2



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. These retrospective data have not been validated. These limitations caution against comparison between jurisdictions and limit the reliance of the aggregate values.

ACS-4: Advance hospital notification for STEMI patients. – Part 2 of 2

| | Denominator | Reported Value |
|--------------------------|-------------|----------------|
| Alameda County | 458 | 100.00% |
| Central California | 432 | 95.00% |
| Coastal Valleys | | |
| Contra Costa County | | |
| El Dorado County | | |
| Imperial County | | |
| Inland Counties | 240 | 197.00% |
| Kern County | 231 | 56.28% |
| Los Angeles County | 3841 | 88.00% |
| Marin County | | |
| Merced County | 23 | 26.00% |
| Monterey County | 167 | 100.00% |
| Mountain Valley | 43 | 78.00% |
| Napa County | | |
| North Coast | 19 | 174.00% |
| Northern California | 11 | 36.36% |
| Orange County | | |
| Riverside County | 276 | 20.00% |
| Sacramento County | | |
| San Benito County | | |
| San Diego County | | |
| San Francisco | 220 | 0.00% |
| San Joaquin County | 285 | 71.00% |
| San Luis Obispo County | | |
| San Mateo County | | |
| Santa Barbara County | | |
| Santa Clara County | 550 | 22.00% |
| Santa Cruz County | | 18.00% |
| Sierra-Sacramento Valley | 401 | 261.00% |
| Solano County | | |
| Tuolumne County | | |
| Ventura County | 269 | 90.00% |
| Yolo County | 95 | 871.00% |

Empty grey cells indicate no value reported

| 2018 | |
|------------------------|---------|
| Measure ID | ACS-4 |
| Response Count | 18 |
| Denominator Total | 7561 |
| Submission Rate (n=33) | 54.55% |
| Average | 127.98% |
| Median | 83.00% |

Of the 18 responding LEMSAs reporting these data for 2018, the median reported value was 83% while the average reported value was 128%.

Some LEMSAs noted discrepancies between the numerator population and not the denominator population. This may have resulted in variation in how the measures were run and reported.

4 LEMSAs reported values greater than 100% due to issues with the specification allowing multiple notification for a single patient.

EMSA will work with EMS Stakeholder to determine how to capture and report this information for the 2019 data year.

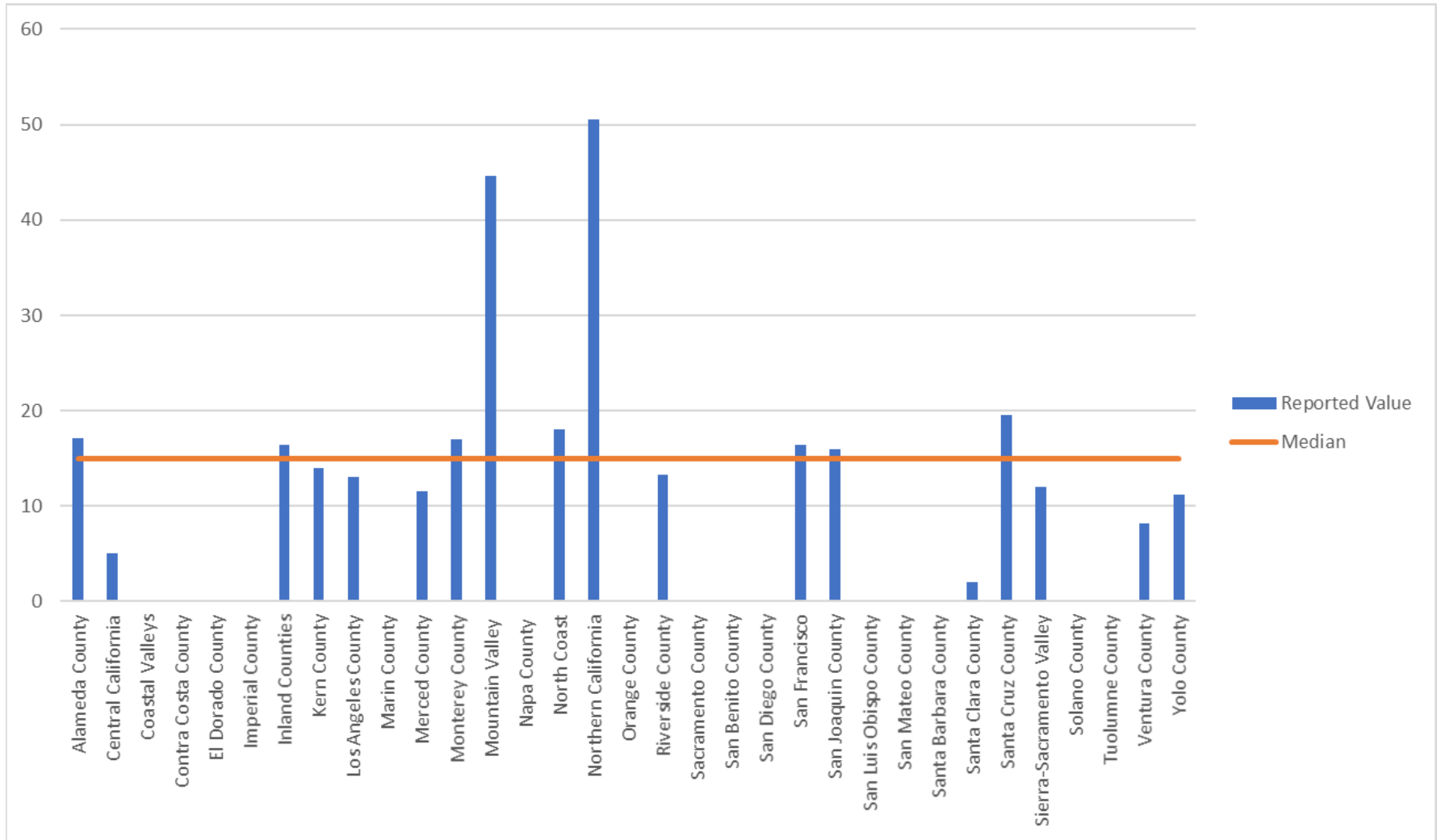
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ACS-6: Time (Minutes) to EKG – Part 1 of 2



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. These retrospective data have not been validated. These limitations caution against comparison between jurisdictions and limit the reliance of the aggregate values.

ACS-6: Time to EKG – Part 2 of 2

| | Denominator | Minutes |
|--------------------------|-------------|---------|
| Alameda County | 377 | 17 |
| Central California | 432 | 5 |
| Coastal Valleys | | |
| Contra Costa County | | |
| El Dorado County | | |
| Imperial County | | |
| Inland Counties | 66 | 16 |
| Kern County | 612 | 14 |
| Los Angeles County | 803 | 13 |
| Marin County | | |
| Merced County | 357 | 11 |
| Monterey County | 87 | 17 |
| Mountain Valley | 4 | 45 |
| Napa County | | |
| North Coast | 19 | 18 |
| Northern California | 5 | 51 |
| Orange County | | |
| Riverside County | | 13 |
| Sacramento County | | |
| San Benito County | | |
| San Diego County | | |
| San Francisco | 126 | 16 |
| San Joaquin County | 112 | 16 |
| San Luis Obispo County | | |
| San Mateo County | | |
| Santa Barbara County | | |
| Santa Clara County | 318 | 2 |
| Santa Cruz County | | 20 |
| Sierra-Sacramento Valley | 227 | 12 |
| Solano County | | |
| Tuolumne County | | |
| Ventura County | 71 | 8 |
| Yolo County | 56 | 11 |

Empty grey cells indicate no value reported

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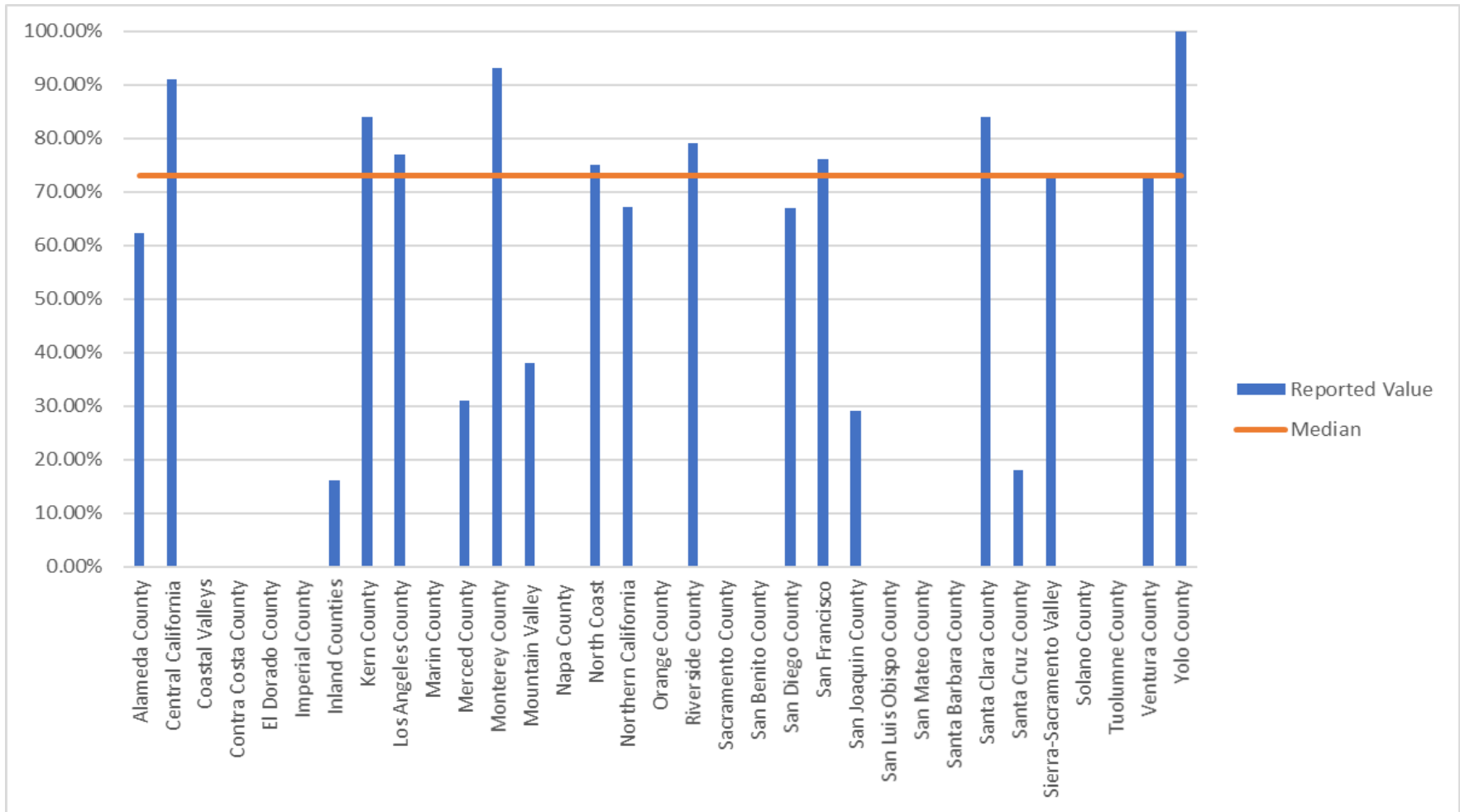
| 2018 | |
|------------------------|--------|
| Measure ID | ACS-6 |
| Response Count | 18 |
| Denominator Total | 3672 |
| Submission Rate (n=33) | 54.55% |
| Average | 17 |
| Median | 15 |

Of the 18 responding LEMSAs reporting these data for 2018, the median scene time for STEMI patients was 15 minutes while the average reported time was 17 minutes.

Some LEMSAs noted that patients were being excluded from the target population. Additionally, some LEMSAs noted that the measure incorrectly applied pertinent negative to this population resulting in inaccurate reporting.

Exclusion criteria for this measure will be made clear for 2019 reporting and applied appropriately to both numerator and denominator populations. Relevant Provider Primary/Secondary Impressions may be included in 2019 to further capture the suspected ACS population. Some LEMSAs noted that the measure incorrectly applied pertinent negative to this population resulting in inaccurate reporting.

HYP-1: Treatment administered for hypoglycemia – 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. These retrospective data have not been validated. These limitations caution against comparison between jurisdictions and limit the reliance of the aggregate values.

HYP-1: Treatment administered for hypoglycemia – Part 2 of 2

| | Denominator | Reported Value |
|--------------------------|-------------|----------------|
| Alameda County | 1063 | 62.24% |
| Central California | 2187 | 91.00% |
| Coastal Valleys | | |
| Contra Costa County | | |
| El Dorado County | | |
| Imperial County | | |
| Inland Counties | 3954 | 16.00% |
| Kern County | 2187 | 84.00% |
| Los Angeles County | 8285 | 77.00% |
| Marin County | | |
| Merced County | 183 | 31.00% |
| Monterey County | 256 | 93.00% |
| Mountain Valley | 663 | 38.00% |
| Napa County | | |
| North Coast | 190 | 75.00% |
| Northern California | 82 | 67.07% |
| Orange County | | |
| Riverside County | 3435 | 79.00% |
| Sacramento County | | |
| San Benito County | | |
| San Diego County | 1725 | 67.00% |
| San Francisco | 1061 | 76.00% |
| San Joaquin County | 915 | 29.00% |
| San Luis Obispo County | | |
| San Mateo County | | |
| Santa Barbara County | | |
| Santa Clara County | 2526 | 84.00% |
| Santa Cruz County | | 18.00% |
| Sierra-Sacramento Valley | 1680 | 73.00% |
| Solano County | | |
| Tuolumne County | | |
| Ventura County | 691 | 73.00% |
| Yolo County | 163 | 100.00% |

Empty grey cells indicate no value reported

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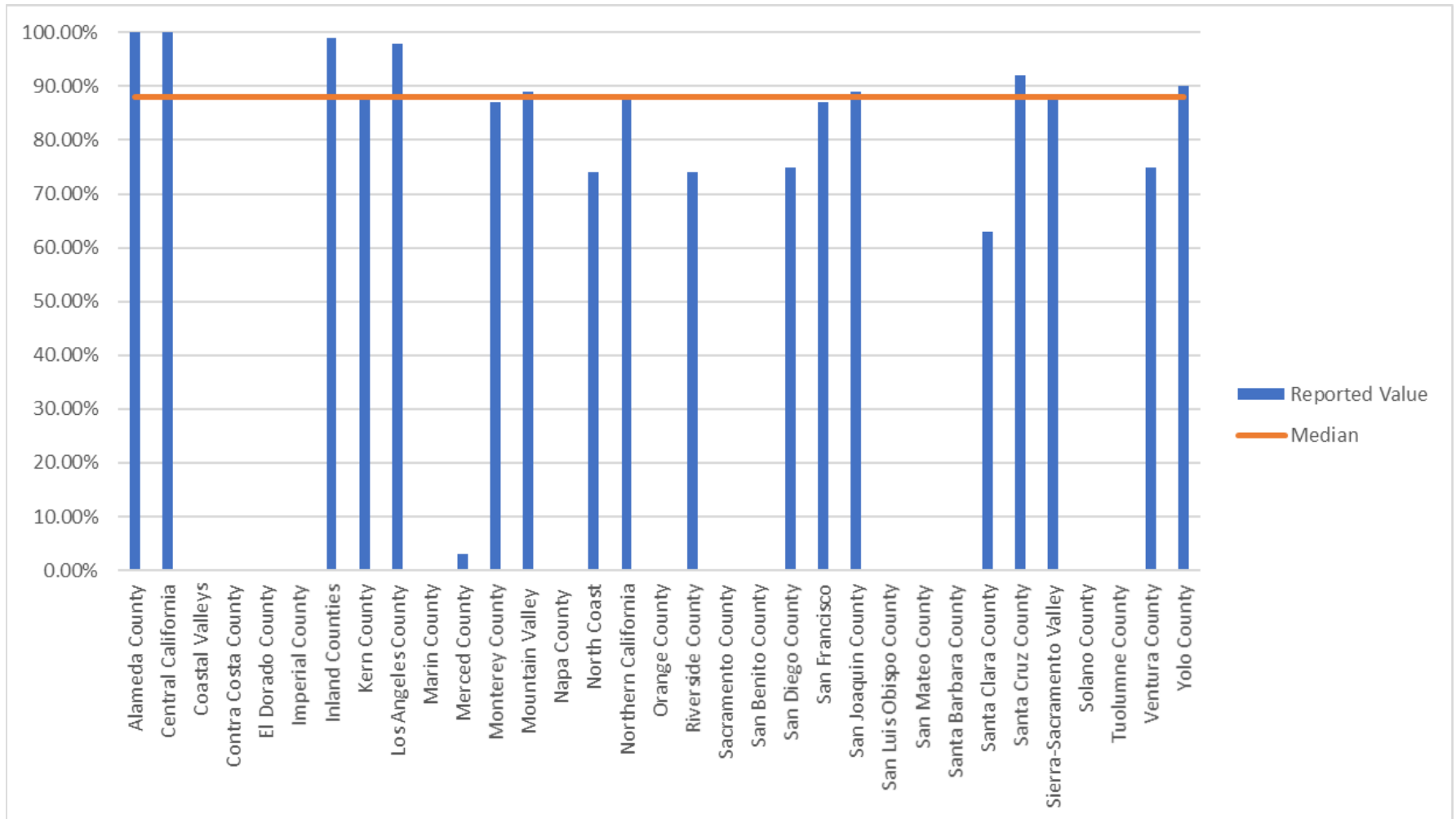
http://www.emsa.ca.gov/ems_core_quality_measures_project

| 2018 | |
|------------------------|--------|
| Measure ID | HYP-1 |
| Response Count | 19 |
| Denominator Total | 31246 |
| Submission Rate (n=33) | 57.58% |
| Average | 64.91% |
| Median | 73.00% |

Of the 19 responding LEMSAs reporting these data for 2018, the median reported value was 73% while the average reported value was 64.91%.

Some LEMSAs noted that the measure incorrectly applied pertinent negative to this population resulting in inaccurate reporting. This will be corrected for 2019 reporting.

STR-1: Prehospital screening for suspected stroke 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. These retrospective data have not been validated. These limitations caution against comparison between jurisdictions and limit the reliance of the aggregate values.

STR-1: Prehospital screening for suspected stroke patients – Part 2 of 2

| | Denominator | Reported Value |
|--------------------------|-------------|----------------|
| Alameda County | 2147 | 100.00% |
| Central California | 7790 | 100.00% |
| Coastal Valleys | | |
| Contra Costa County | | |
| El Dorado County | | |
| Imperial County | | |
| Inland Counties | 3691 | 99.00% |
| Kern County | 1251 | 88.07% |
| Los Angeles County | 7645 | 98.00% |
| Marin County | | |
| Merced County | 788 | 3.00% |
| Monterey County | 430 | 87.00% |
| Mountain Valley | 618 | 89.00% |
| Napa County | | |
| North Coast | 337 | 74.00% |
| Northern California | 81 | 87.90% |
| Orange County | | |
| Riverside County | 1228 | 74.00% |
| Sacramento County | | |
| San Benito County | | |
| San Diego County | 2080 | 75.00% |
| San Francisco | 1121 | 87.00% |
| San Joaquin County | 1033 | 89.00% |
| San Luis Obispo County | | |
| San Mateo County | | |
| Santa Barbara County | | |
| Santa Clara County | 2731 | 63.00% |
| Santa Cruz County | | 92.00% |
| Sierra-Sacramento Valley | 2461 | 88.00% |
| Solano County | | |
| Tuolumne County | | |
| Ventura County | 857 | 75.00% |
| Yolo County | 325 | 90.00% |

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| 2018 | |
|------------------------|--------|
| Measure ID | STR-1 |
| Response Count | 19 |
| Denominator Total | 36614 |
| Submission Rate (n=33) | 57.58% |
| Average | 82.05% |
| Median | 88.00% |

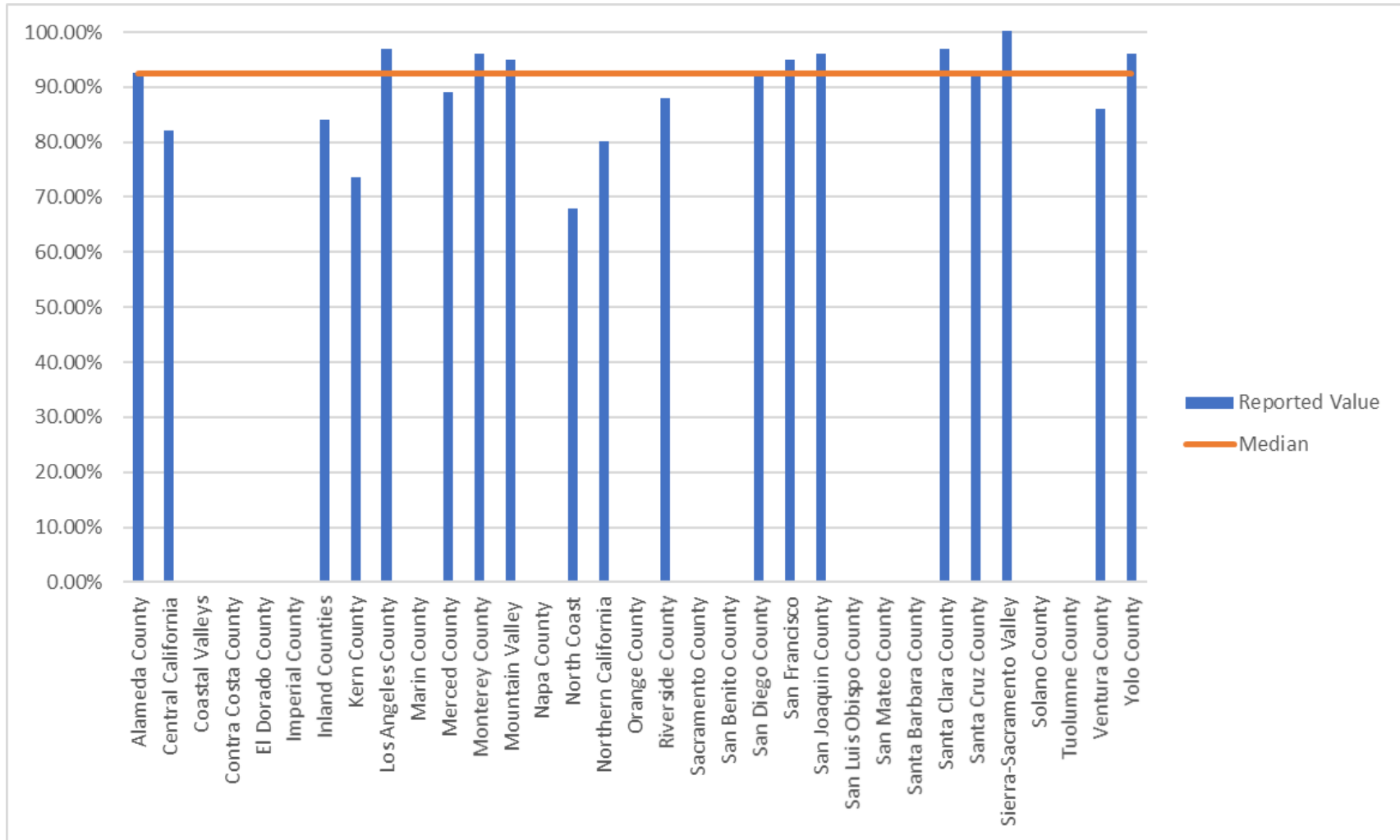
Of the 19 responding LEMSAs reporting these data for 2018, the median reported value was 73% while the average reported value was 64.91%.

One LEMSA noted that the measure did not include values for the stroke scale specific to their LEMSA.

Adjustments to this measure will be made for the 2019 reporting year to allow for "Other Stroke Scale" to be represented in reporting.

With Specialty Care System Regulations implemented in 2019, EMSA will be closely monitoring Specialty Care System data.

STR-2: Glucose testing for suspected stroke 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. These 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 stroke patients – Part 2 of 2

| | Denominator | Reported Value |
|--------------------------|-------------|----------------|
| Alameda County | 2147 | 92.55% |
| Central California | 7790 | 82.00% |
| Coastal Valleys | | |
| Contra Costa County | | |
| El Dorado County | | |
| Imperial County | | |
| Inland Counties | 3691 | 84.00% |
| Kern County | 1431 | 73.65% |
| Los Angeles County | 7645 | 97.00% |
| Marin County | | |
| Merced County | 202 | 89.00% |
| Monterey County | 430 | 96.00% |
| Mountain Valley | 618 | 95.00% |
| Napa County | | |
| North Coast | 337 | 68.00% |
| Northern California | 81 | 80.25% |
| Orange County | | |
| Riverside County | 1228 | 88.00% |
| Sacramento County | | |
| San Benito County | | |
| San Diego County | 2080 | 92.00% |
| San Francisco | 1121 | 95.00% |
| San Joaquin County | 1033 | 96.00% |
| San Luis Obispo County | | |
| San Mateo County | | |
| Santa Barbara County | | |
| Santa Clara County | 2731 | 97.00% |
| Santa Cruz County | | 93.00% |
| Sierra-Sacramento Valley | 2461 | 110.00% |
| Solano County | | |
| Tuolumne County | | |
| Ventura County | 982 | 86.00% |
| Yolo County | 325 | 96.00% |

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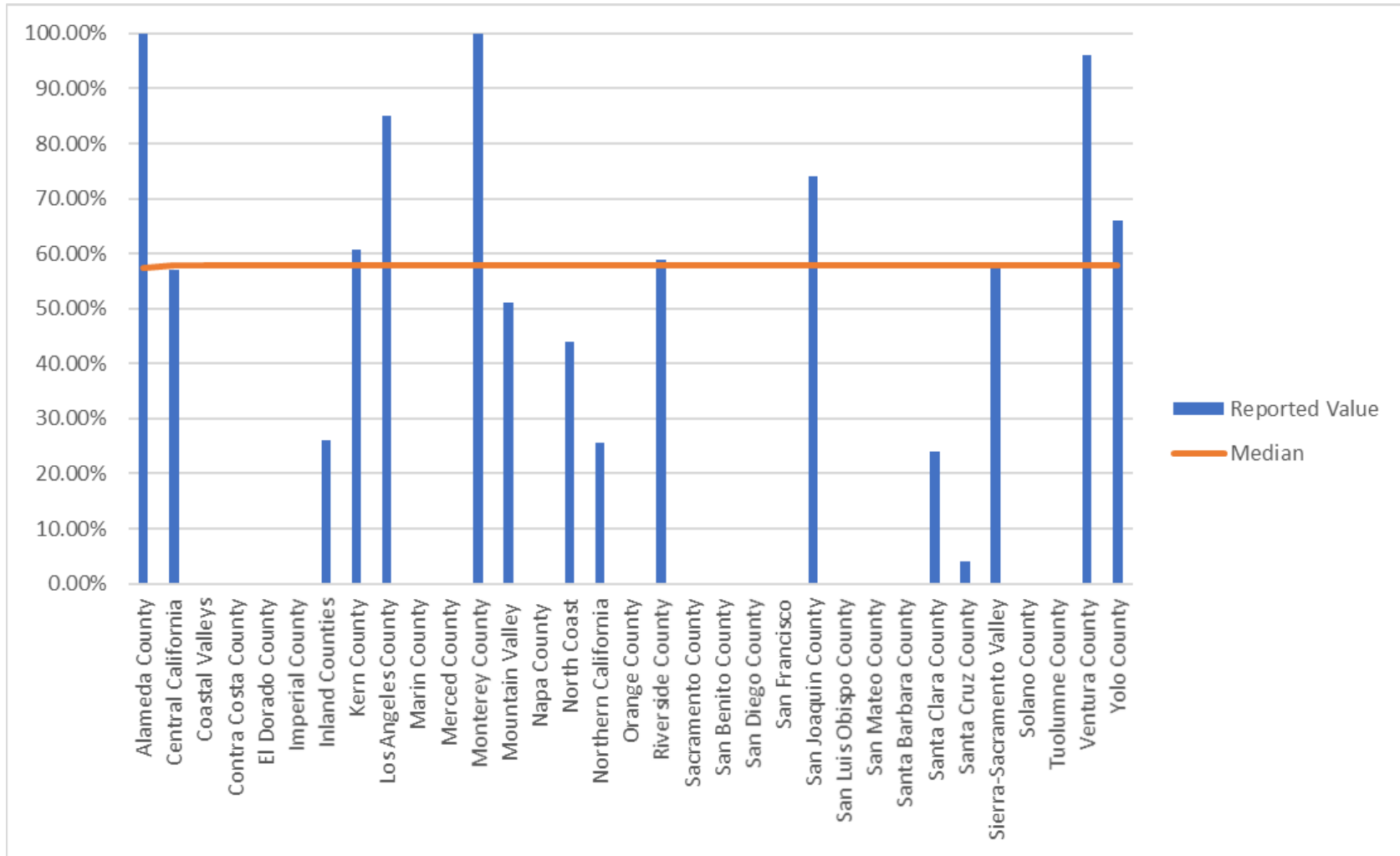
| 2018 | |
|------------------------|--------|
| Measure ID | STR-2 |
| Response Count | 19 |
| Denominator Total | 36333 |
| Submission Rate (n=33) | 57.58% |
| Average | 90.02% |
| Median | 92.55% |

Of the 19 responding LEMSAs reporting these data for 2018, the median reported value was 92.55% while the average reported value was 90.02%.

Some LEMSAs noted that patients were being excluded from the target population. Additionally, some LEMSAs noted that the measure incorrectly applied pertinent negative to this population resulting in only a subset of the intended population being reported.

Relevant Provider Primary/Secondary Impressions may be included in 2019 to better capture the suspected population.

STR-4: Advance hospital notification for stroke 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. These retrospective data have not been validated. These limitations caution against comparison between jurisdictions and limit the reliance of the aggregate values.

STR-4: Advance hospital notification for stroke patients – Part 2 of 2

| | Denominator | Reported Value |
|--------------------------|-------------|----------------|
| Alameda County | 1447 | 100.00% |
| Central California | 7790 | 57.00% |
| Coastal Valleys | | |
| Contra Costa County | | |
| El Dorado County | | |
| Imperial County | | |
| Inland Counties | 2856 | 26.00% |
| Kern County | 835 | 60.73% |
| Los Angeles County | 3289 | 85.00% |
| Marin County | | |
| Merced County | 202 | 0.00% |
| Monterey County | 430 | 100.00% |
| Mountain Valley | 561 | 51.00% |
| Napa County | | |
| North Coast | 165 | 44.00% |
| Northern California | 47 | 25.53% |
| Orange County | | |
| Riverside County | 1579 | 59.00% |
| Sacramento County | | |
| San Benito County | | |
| San Diego County | | |
| San Francisco | 1018 | 0.00% |
| San Joaquin County | 653 | 74.00% |
| San Luis Obispo County | | |
| San Mateo County | | |
| Santa Barbara County | | |
| Santa Clara County | 1259 | 24.00% |
| Santa Cruz County | | 4.00% |
| Sierra-Sacramento Valley | 1547 | 58.00% |
| Solano County | | |
| Tuolumne County | | |
| Ventura County | 694 | 96.00% |
| Yolo County | 335 | 66.00% |

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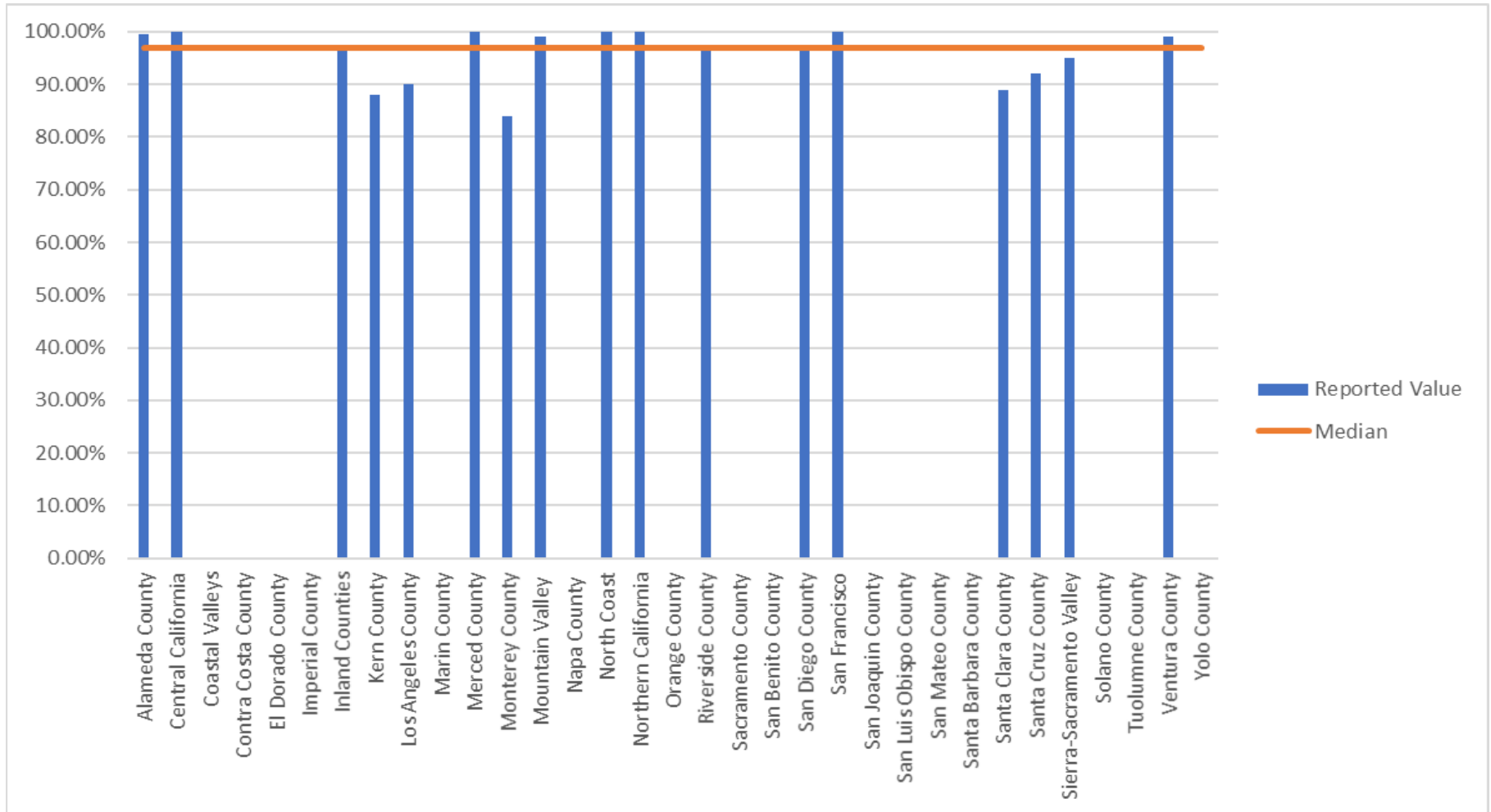
| 2018 | |
|-------------------------------|--------------|
| Measure ID | STR-4 |
| Response Count | 19 |
| Denominator Total | 24707 |
| Submission Rate (n=33) | 57.58% |
| Average | 51.68% |
| Median | 57.83% |

Of the 19 LEMSAs reporting these data for 2018, the median reported value was 57.83% while the average reported value was 51.68%.

One LEMSA indicated that they do not use one of the elements required to calculate this measure. Some LEMSAs indicated that they do not use one of the elements required to calculate this measure. Clarification will be provided to ensure this measure appropriately captures the STEMI population and captures the intent of the measure.

EMSA will work with EMS Stakeholder to determine how to better capture and report this information for the 2019 data year.

PED-3 Respiratory assessment for pediatric 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. These retrospective data have not been validated. These limitations caution against comparison between jurisdictions and limit the reliance of the aggregate values.

PED-3 Respiratory assessment for pediatric patients – Part 2 of 2

| | Denominator | Reported Value |
|--------------------------|-------------|----------------|
| Alameda County | 461 | 99.57% |
| Central California | 537 | 100.00% |
| Coastal Valleys | | |
| Contra Costa County | | |
| El Dorado County | | |
| Imperial County | | |
| Inland Counties | 799 | 97.00% |
| Kern County | 114 | 88.00% |
| Los Angeles County | 961 | 90.00% |
| Marin County | | |
| Merced County | 22 | 100.00% |
| Monterey County | 143 | 84.00% |
| Mountain Valley | 207 | 99.00% |
| Napa County | | |
| North Coast | 17 | 100.00% |
| Northern California | 1 | 100.00% |
| Orange County | | |
| Riverside County | 159 | 97.00% |
| Sacramento County | | |
| San Benito County | | |
| San Diego County | 100 | 97.00% |
| San Francisco | 5 | 100.00% |
| San Joaquin County | | |
| San Luis Obispo County | | |
| San Mateo County | | |
| Santa Barbara County | | |
| Santa Clara County | 141 | 89.00% |
| Santa Cruz County | | 92.00% |
| Sierra-Sacramento Valley | 77 | 95.00% |
| Solano County | | |
| Tuolumne County | | |
| Ventura County | 86 | 99.00% |
| Yolo County | | |

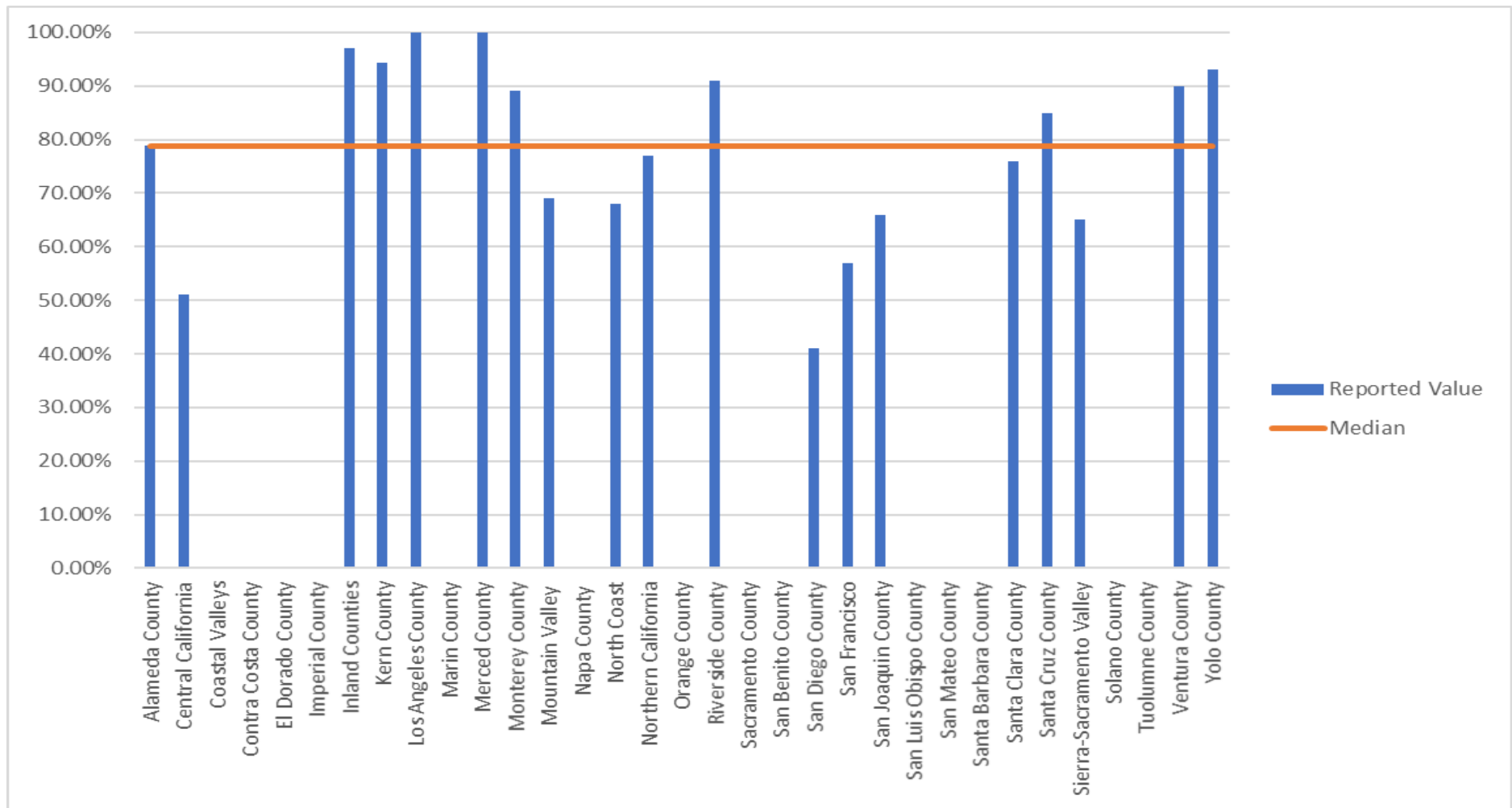
| 2018 | |
|------------------------|--------|
| Measure ID | PED-3 |
| Response Count | 17 |
| Denominator Total | 3830 |
| Submission Rate (n=33) | 51.52% |
| Average | 96% |
| Median | 97% |

Of the 17 LEMSAs reporting these data for 2018, the median reported value was 97% while the average reported value was 96%.

This measure may be adjusted for 2019 reporting to capture a larger population by including additional Provider Primary/Secondary Impressions.

EMS for Children Regulations went into effect on July 1, 2019.

RST-4 911 requests for services that include a lights and/or siren response – 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. These retrospective data have not been validated. These limitations caution against comparison between jurisdictions and limit the reliance of the aggregate values.

RST-4 911 requests for services that include a lights and/or siren response– Part 2 of 2

| | Denominator | Reported Value |
|--------------------------|-------------|----------------|
| Alameda County | 159672 | 78.77% |
| Central California | 231135 | 51.00% |
| Coastal Valleys | | |
| Contra Costa County | | |
| El Dorado County | | |
| Imperial County | | |
| Inland Counties | 455553 | 97.00% |
| Kern County | 142020 | 94.30% |
| Los Angeles County | 755898 | 100.00% |
| Marin County | | |
| Merced County | 20831 | 100.00% |
| Monterey County | 29924 | 89.00% |
| Mountain Valley | 54087 | 69.00% |
| Napa County | | |
| North Coast | 23410 | 68.00% |
| Northern California | 7980 | 77.06% |
| Orange County | | |
| Riverside County | 229223 | 91.00% |
| Sacramento County | | |
| San Benito County | | |
| San Diego County | 12855 | 41.00% |
| San Francisco | 106201 | 57.00% |
| San Joaquin County | 81282 | 66.00% |
| San Luis Obispo County | | |
| San Mateo County | | |
| Santa Barbara County | | |
| Santa Clara County | 120115 | 76.00% |
| Santa Cruz County | | 85.00% |
| Sierra-Sacramento Valley | 145568 | 65.00% |
| Solano County | | |
| Tuolumne County | | |
| Ventura County | 52908 | 90.00% |
| Yolo County | 16899 | 93.00% |

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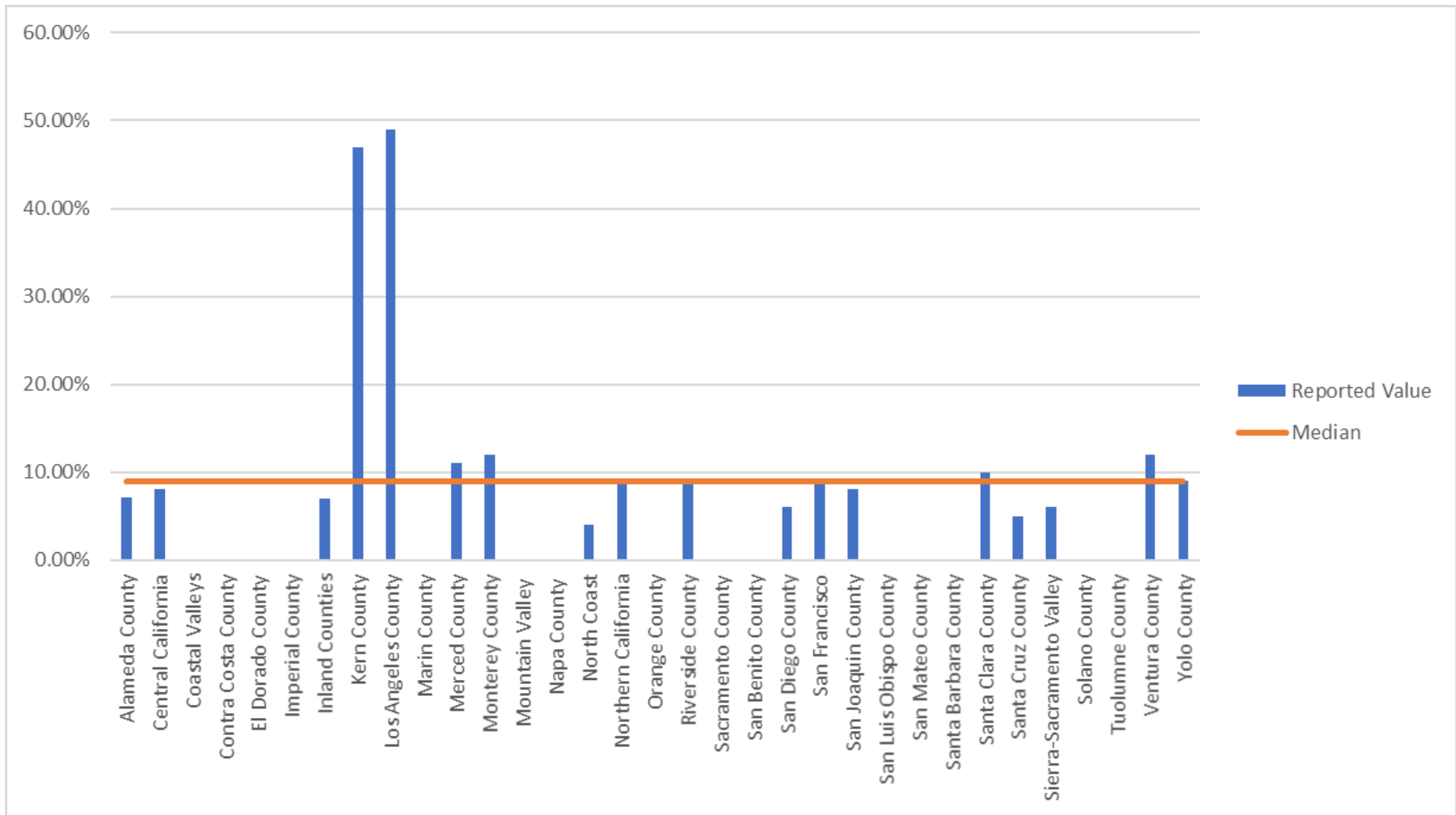
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| 2018 | |
|------------------------|---------|
| Measure ID | RST-4 |
| Response Count | 19 |
| Denominator Total | 2645561 |
| Submission Rate (n=33) | 57.58% |
| Average | 78.32% |
| Median | 78.77% |

Of the 19 LEMSAs reporting these data for 2018, the median reported value was 78.77% while the average reported value was 78.32%.

All LEMSAs have policy regarding requests for service and the use of lights and/or sirens for an EMS response. This measure should be reportable by all LEMSAs.

RST-5 911 requests for services that include a lights and/or siren transport – 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. These retrospective data have not been validated. These limitations caution against comparison between jurisdictions and limit the reliance of the aggregate values.

RST-5 911 Requests for service that include a lights and/or siren transport – Part 2 of 2

| | Denominator | Reported Value |
|--------------------------|-------------|----------------|
| Alameda County | 113259 | 7.16% |
| Central California | 159154 | 8.00% |
| Coastal Valleys | | |
| Contra Costa County | | |
| El Dorado County | | |
| Imperial County | | |
| Inland Counties | 162703 | 7.00% |
| Kern County | 78652 | 46.92% |
| Los Angeles County | 518462 | 49.00% |
| Marin County | | |
| Merced County | 16816 | 11.00% |
| Monterey County | 19887 | 12.00% |
| Mountain Valley | 5376 | 0.00% |
| Napa County | | |
| North Coast | 20489 | 4.00% |
| Northern California | 4798 | 9.23% |
| Orange County | | |
| Riverside County | 158186 | 9.00% |
| Sacramento County | | |
| San Benito County | | |
| San Diego County | 100663 | 6.00% |
| San Francisco | 87629 | 9.00% |
| San Joaquin County | 64726 | 8.00% |
| San Luis Obispo County | | |
| San Mateo County | | |
| Santa Barbara County | | |
| Santa Clara County | 83701 | 10.00% |
| Santa Cruz County | | 5.00% |
| Sierra-Sacramento Valley | 95700 | 6.00% |
| Solano County | | |
| Tuolumne County | | |
| Ventura County | 5297 | 12.00% |
| Yolo County | 14385 | 9.00% |

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| 2018 | |
|------------------------|---------|
| Measure ID | RST-5 |
| Response Count | 19 |
| Denominator Total | 1709883 |
| Submission Rate (n=33) | 57.58% |
| Average | 12.02% |
| Median | 9.00% |

Of the 19 LEMSAs reporting these data for 2018, the median reported value was 9% while the average reported value was 12.02%.

All LEMSAs have policy regarding requests for service and the use of lights and/or sirens for an EMS transport. This measure should be reportable by all LEMSAs.