

## Calculating State-Level Rates Using Data from Multiple Reporting Units

### Introduction

The Child, Adult, and Health Home Core Sets of health care quality measures are designed to provide state- and program-level snapshots of the quality of care provided to children and adults enrolled in Medicaid, the Children's Health Insurance Program (CHIP), and Medicaid health home programs. In many states, data for the measures are collected separately by multiple entities, such as by program (Medicaid or CHIP); payment system (fee-for-service [FFS], primary care case management [PCCM], managed care [MC], or integrated care model [ICM]); or provider. We refer to each of these entities as reporting units. In such cases, states would have to combine separate rates across multiple reporting units to calculate a state-level rate that represents the quality of health care for children or adults, regardless of the program in which they are enrolled, the system used to pay for their care, or the managed care plans or providers that serve them.<sup>1</sup> Calculating a state-level rate based on data from multiple reporting units requires weighting the individual rates according to the size of the eligible population represented by each reporting unit. This technical assistance resource describes approaches to calculating and reporting state-level rates using data from multiple reporting units.

### Background

Depending on how a state organizes its Medicaid and CHIP programs, the number and kinds of reporting units that contribute to a state-level rate may vary. For example,

<sup>1</sup> For the Health Home Core Set, states should report a separate rate for each State Plan Amendment (SPA). For the purposes of this resource, the term "state-level rate" is equivalent to SPA-level rate.

<sup>2</sup> In addition, several Core Set measures are calculated using survey data, such as the Consumer Assessment of Healthcare Providers and Systems (CAHPS). Methodologies for calculating state-level rates for these measures may differ and are not covered in this resource.

states might need to combine data across different payment systems, such as FFS and MC, or programs, such as Medicaid and CHIP. Similarly, if multiple managed care plans each report a separate rate, states would have to combine rates across plans to produce a state-level rate.

The general approach for calculating a state-level rate is the same, regardless of the number and types of reporting units. However, states must consider the method each reporting unit used to calculate the measure when calculating a state-level rate:<sup>2</sup>

- The *administrative method* calculates a rate using data for the *entire population* eligible for the measure. Administrative data sources may include claims and encounter data, clinical registries, electronic health records, and vital records.
- The *hybrid method* calculates a rate using data for a *sample of the population* eligible for the measure, using a combination of administrative and medical records data to identify individuals in the measure-eligible population who should be included in the numerator.<sup>3</sup>

### Calculating State-Level Rates When All Reporting Units Used the Administrative Method

For measures calculated using the administrative method, the denominator is the *entire* measure-eligible population, as defined in the measure specifications. The eligible population for each measure is defined in the

<sup>3</sup> For each case in the sample, administrative data are used to find evidence of the numerator service, such as an immunization or prenatal visit. When evidence of the numerator service is not found in administrative data, medical records are searched for evidence of the service. The events found in administrative data and medical record review are combined for each case to form the numerator. The rate is the numerator divided by the denominator (the sample size).

technical specifications for the Child, Adult, and Health Home Core Sets.<sup>4</sup>

When reporting units are mutually exclusive, separate numerators, denominators, and rates may first be calculated for each reporting unit (such as program, provider, or managed care plan). In this situation, the state-level rate is calculated by summing the denominators and numerators for the reporting units. Table 1 shows an example of calculating a state-level rate for four reporting units (such as four managed care plans). In this example, each beneficiary is enrolled in only one plan during the measurement period, and the state-level rate is calculated by combining these data elements across plans. The state-level denominator is calculated by summing the denominators for the plans (column 2) and the state-level numerator is calculated by summing the numerators for the plans (column 3). In this example, the state-level rate (column 4) for the four reporting units is 71.9 percent (241,000/335,000). Because the denominator is the measure-eligible population for each reporting unit, no further weighting of results is required.

**Table 1. Calculating State-Level Rates When All Reporting Units Used the Administrative Method**

Reporting Unit (Column 1)	Denominator (Column 2)	Numerator (Column 3)	Rate (Column 4)
A	10,000	8,000	80.0%
B	25,000	15,000	60.0%
C	100,000	70,000	70.0%
D	200,000	148,000	74.0%
<b>State-Level Total</b>	<b>335,000</b>	<b>241,000</b>	<b>71.9%</b>

Notes: The data in Table 1 illustrate how to calculate a state-level rate using administrative method data. States may find that using different data sources results in different performance rates.

The rate for each reporting unit and the state-level rate should be calculated to one decimal place.

### Calculating State-Level Rates When All Reporting Units Used the Hybrid Method

For measures calculated using the hybrid method, the denominator is a *sample* of the measure-eligible population using a combination of administrative and medical records data. When separate samples are drawn and individual rates are calculated by different reporting

units—such as individual programs (Medicaid and CHIP) or individual managed care plans—the state-level rate is the average of the rates for each of the reporting units, weighted by the size of the eligible population for each of those units.

State-level rates based on hybrid method data are calculated using the following steps, as illustrated in Table 2 (page 3):

1. Sum the measure-eligible population across the reporting units to derive a state-level total (column 2).
2. Divide each reporting unit’s measure-eligible population by this sum to get the weight for each reporting unit (column 3). For example, the weight for reporting unit A is  $10,000/335,000 = 0.0299$ .
3. Multiply the rate for each reporting unit (column 6) by its corresponding weight (column 3) to get the weighted rate (column 7).
4. Sum the weighted rates across all reporting units to get the weighted state-level rate. In this example, the weighted state-level rate is 72.0 percent.

### Calculating State-Level Rates When Reporting Units Used a Combination of Administrative and Hybrid Methods

States might have to combine rates developed using the administrative method for some reporting units and the hybrid method for others. For example, in a state that has both FFS and MC delivery systems, the FFS rate may be calculated using the administrative method and the managed care plans may calculate the rate using the hybrid method. As another example, some managed care plans may calculate rates using the administrative method while others may use the hybrid method.

To calculate a state-level rate when some reporting units used the administrative method and others used the hybrid method, a weight based on the proportion of the reporting unit’s measure-eligible population to the total state measure-eligible population must be applied to each rate, just as when a state-level rate is calculated across multiple reporting units using the hybrid method alone.

Table 3 shows how to combine rates calculated using different methods. For rates calculated using the administrative method (reporting units A and C), the

<sup>4</sup> The technical specifications and resource manuals for the Child, Adult, and Health Home Core Sets are available on [Medicaid.gov](http://Medicaid.gov). Links to Core Set-specific resources are provided at the end of this document.

measure-eligible population (column 2) and denominator (column 4) are the same. In contrast, for rates calculated using the hybrid method (reporting units B and D), the denominator (column 4) is smaller than the measure-eligible population (column 2) because the denominator is the sample size. To calculate a state-level rate, a weight (column 3) is applied to the rate (column 6) for

each reporting unit. The weight for each reporting unit reflects the proportion of the measure-eligible population to the total measure-eligible population in the state (column 3), and the state-level rate (column 7) is the sum of the weighted rates across reporting units (72.0 percent).

**Table 2. Calculating State-Level Rates When All Reporting Units Used the Hybrid Method**

Reporting Unit (Column 1)	Measure-Eligible Population (Column 2)	Weight <sup>a</sup> (Column 3)	Denominator (Sample Size) (Column 4)	Numerator (Column 5)	Rate <sup>b</sup> (Column 6)	Weighted Rate <sup>c</sup> (Column 7)
A	10,000	0.0299	411	329	80.0%	2.4%
B	25,000	0.0746	411	247	60.1%	4.5%
C	100,000	0.2985	411	288	70.1%	20.9%
D	200,000	0.5970	411	304	74.0%	44.2%
<b>State-Level Total</b>	<b>335,000</b>	<b>1.0000</b>	<b>1,644</b>	<b>1,168</b>	<b>n.a.</b>	<b>72.0%</b>

Notes: The data in Table 2 illustrate how to calculate a state-level rate using hybrid method data. States may find that using different methods results in different performance rates.

To retain precision of final rates, reporting unit weights should be calculated to four decimal places. Reporting unit and state-level rates should be rounded to one decimal place.

<sup>a</sup> The weight is calculated by dividing the measure-eligible population for each reporting unit by the state-level total eligible population (column 2); for example, the weight for reporting unit A is calculated as  $10,000/335,000 = 0.0299$ .

<sup>b</sup> The rate is calculated by dividing the numerator (column 5) by the denominator (column 4) for each reporting unit; for example, the rate for reporting unit A is calculated as  $329/411 = 0.80$  or 80.0 percent.

<sup>c</sup> The weighted rate is calculated by multiplying the weight (column 3) and rate (column 6) for each reporting unit; for example, the weighted rate for reporting unit A is calculated as  $0.0299 \times 0.80 = 0.024$  or 2.4 percent.

n.a. = not applicable

**Table 3. Calculating State-Level Rates When Reporting Units Used a Combination of Administrative and Hybrid Methods**

Reporting Unit (Method) (Column 1)	Measure-Eligible Population (Column 2)	Weight <sup>a</sup> (Column 3)	Denominator (Total or Sample Size) <sup>b</sup> (Column 4)	Numerator (Column 5)	Rate <sup>c</sup> (Column 6)	Weighted Rate <sup>d</sup> (Column 7)
A (Admin)	10,000	0.0299	10,000	8,000	80.0%	2.4%
B (Hybrid)	25,000	0.0746	411	247	60.1%	4.5%
C (Admin)	100,000	0.2985	100,000	70,000	70.0%	20.9%
D (Hybrid)	200,000	0.5970	411	304	74.0%	44.2%

Notes: The data in Table 3 illustrate how to calculate a state-level rate using administrative and hybrid method data. States may find that using different methods results in different performance rates.

To retain precision of final rates, reporting unit weights should be calculated to four decimal places. Reporting unit and state-level rates should be rounded to one decimal place.

<sup>a</sup> The weight is calculated by dividing the measure-eligible population for each reporting unit by the state-level total population (column 2); for example, the weight for reporting unit A is calculated as  $10,000/335,000 = 0.0299$ .

<sup>b</sup> The measure-eligible population is shown as the denominator for reporting units that used administrative data to calculate the rate (reporting units A and C), whereas the sample size is shown for reporting units that used the hybrid method (reporting units B and D).

<sup>c</sup> The rate is calculated by dividing the numerator (column 5) by the denominator (column 4) for each reporting unit; for example, the rate for reporting unit A is calculated as  $8,000/10,000 = 0.80$  or 80 percent.

<sup>d</sup> The weighted rate is calculated by multiplying the weight (column 3) and rate (column 6) for each reporting unit; for example, the weighted rate for reporting unit A is calculated as  $0.0299 \times 0.80 = 0.024$  or 2.4 percent.

n.a. = not applicable.

## Reporting State-Level Rates

The web-based reporting system that states use to report the Core Set measures allows states to report a state-level numerator, denominator, and rate for each measure. The information states report in the web-based reporting system will vary depending on the method used to calculate a state-level rate for a measure.

- When the state-level rate is based on multiple rates calculated using *only administrative method data*, states should report the numerator and denominator totals used to calculate the state-level rate in the denominator and numerator fields (the totals in columns 2 and 3 in Table 1, respectively). The reporting system will auto-calculate the rate.
- States that used *only hybrid method data* to create a state-level rate should enter the total size of the sample used to calculate the measure across reporting units (the sum of samples for all reporting units) in the denominator field (Column 4 in Table 2) and the sum of the numerators in the numerator field (Column 5 in Table 2). The state should also indicate that the denominator is a sum of samples in the

“Additional Notes / Comments on the Measure” section and describe the number of reporting units. The state should also review the rate after entering the numerator and denominator to confirm that the rate is correctly weighted based on the information for each reporting unit (see Table 2). The reporting system will auto-calculate the rate based on the numerator and denominator entered, but the state should review and override the auto-calculated rate, if needed, to account for weighting of the reporting entities.

- When the state-level rate is based on a *combination of administrative and hybrid method data*, states should enter the total measure-eligible population in the denominator field (Column 2 in Table 3), enter 0 in the numerator field, and manually enter the rate in the rate field. In the “Data Sources” section, the state should identify the number of reporting units that used each method (administrative and hybrid). The reporting system will auto-calculate the rate based on the numerator and denominator entered, but the state should review and override the auto-calculated rate.

**Table 4. How to Report Information About State-Level Rates Calculated Across Multiple Reporting Units**

Data Field	Administrative Method Only	Hybrid Method Only	Both Administrative and Hybrid Methods
Data Source	Select Administrative Data and provide the administrative data source	Select Hybrid (Administrative and Medical Records Data) and provide the administrative data and medical records data sources	Select Administrative Data and provide the administrative data source Select Hybrid (Administrative and Medical Records Data) and provide the administrative data and medical records data sources In the text field, describe how many reporting entities used each data source
Denominator	Sum of measure-eligible population (denominators) for each reporting unit (Column 2 total, Table 1)	Sum of samples (denominators) for each reporting unit (Column 4 total, Table 2)	Enter the total measure-eligible population to denote that denominators are a mix of sample sizes and measure-eligible populations
Numerator	Sum of numerators for each reporting unit (Column 3 total, Table 1)	Sum of numerators for each reporting unit (Column 5 total, Table 2)	Enter “0” to denote that numerators cannot be summed across reporting units and enter the rate manually
“Specify the sample size”	Not applicable	Sum of samples (denominators) for each reporting unit (Column 4 total, Table 2)	Not applicable

Data Field	Administrative Method Only	Hybrid Method Only	Both Administrative and Hybrid Methods
“What number of your measure-eligible population are included in the measure?”	Not applicable	Sum of measure-eligible population for each reporting unit (Column 2 total, Table 2)	Sum of measure-eligible population for each reporting unit (Column 2 total, Table 3)
“Combined Rate(s) from Multiple Reporting Units”	Select “Yes, we combined rates from multiple reporting units to create a State-level rate” and report that rates are unweighted	Select “Yes” and report the weighting method (weighted based on the size of the measure-eligible population for each reporting unit, if calculated using the guidance in this resource)	Select “Yes” and report the weighting method (weighted based on the size of the measure-eligible population for each reporting unit, if calculated using the guidance in this resource)
“Additional Notes / Comments on the Measure” section	Not applicable	If the denominator and sample size field values differ, please explain	If the denominator and measure eligible population field values differ, please explain

### Caveats About State-Level Rates Calculated Using Data from Multiple Reporting Units

Calculating rates across multiple reporting units is more complex than calculating measures for a single reporting unit. Combining data across programs, payment systems, managed care plans, or providers can affect the rates in several ways. For example, methods can vary (even when following the same specifications) and introduce inconsistencies in how the rates are produced across reporting units. States should note any deviations from the measure specifications in the “Additional Notes/Comments on the Measure” section in the web-based reporting system.

In addition, some eligible individuals may be excluded (such as those transferring between programs or managed care plans), or double-counted, depending on how the eligible population is specified by each reporting unit. Individuals should be attributed to the program in which they were enrolled at the end of the continuous enrollment period, or on the date of the qualifying event applicable to the measure (such as their birthday or delivery date of a newborn).

### For More Information

Background information on the Child, Adult, and Health Home Core Set measures, guidance for collecting and reporting the measures, and technical specifications for each measure can be found in the technical specifications and resource manuals for each Core Set.

Information about the Child, Adult, and Health Home Core Sets, including the technical specifications and resource manuals, is available on Medicaid.gov:

- **Child Core Set:**  
<https://www.medicaid.gov/medicaid/quality-of-care/performance-measurement/child-core-set/index.html>
- **Adult Core Set:**  
<https://www.medicaid.gov/medicaid/quality-of-care/performance-measurement/adult-core-set/index.html>
- **Health Home Core Set:**  
<https://www.medicaid.gov/state-resource-center/medicaid-state-technical-assistance/health-homes-technical-assistance/health-home-quality-reporting.html>

To request technical assistance with calculating or reporting the Child, Adult, and Health Home Core Set measures, please contact the TA mailbox at [MACQualityTA@cms.hhs.gov](mailto:MACQualityTA@cms.hhs.gov).