Frequently Asked Questions

For Severe Obstetric Complications Electronic Clinical Quality Measure (eCQM)

October 2024 Public Reporting

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Measure Overview

Overview of the Measure

1. Why is CMS measuring obstetric complications?

Maternal morbidity and mortality pose serious health threats to pregnant women in the United States, where rates have been on the rise in comparison to other developed nations.[1] Recent data indicate a rate of 17.4 maternal deaths per 100,000 live births,[2] and severe complications occurring in 144 out of 10,000 delivery hospitalizations.[3] Hemorrhage, hypertensive disorders of pregnancy (HDP), sepsis/infection, cardiovascular conditions, cardiomyopathy, embolism, and mental health conditions have been identified as overall leading causes of peripartum death.[4] Nearly 16% of pregnancy-related deaths can be attributed to cardiovascular conditions.[5]

This has prompted national health experts and organizations to prioritize quality improvement strategies to mitigate risk of adverse outcomes among maternal populations. The U.S. Department of Health & Human Services (HHS) has also called for action to improve maternal health and outcomes and outlines seven actions for healthcare professionals, including participating in quality improvement and safety initiatives.[6] Most nationally implemented quality measures focused on maternal health are mostly process measures and limited in scope. While these existing measures aim to promote coordination of care and standardize health care processes, maternal health outcome measures are needed. Measures that are focused on maternal health outcomes will address the patient safety priority area under the Meaningful Measures 2.0 framework, and likewise will use EHR data to address interoperability, another meaningful measure area for assessing quality of health care.[7]

[1] Centers for Disease Control and Prevention. Severe Maternal Morbidity in the United States. January 31, 2020; https://www.cdc.gov/reproductivehealth/maternalinfanthealth/severematernalmorbidity.html.
[2] Hoyert DL, Mini?o AM. Maternal mortality in the United States: changes in coding, publication, and data release, 2018. 2020.
[3] Centers for Disease Control and Prevention. Severe Maternal Morbidity in the United States. January 31, 2020; https://www.cdc.gov/reproductivehealth/maternalinfanthealth/severematernalmorbidity.html.
[4] Hoyert DL, Mini?o AM. Maternal mortality in the United States: changes in coding, publication, and data release, 2018. 2020.
[5] National Quality Forum. Maternal Morbidity and Mortality Environmental Scan. 2020
[6] U.S. Department of Health & Human Services. The Surgeon General's Call to Action to Improve Maternal Health. 2020.
[7] Centers for Medicare & Medicaid Services. Meaningful Measures 2.0: Moving from Measure Reduction to Modernization. 2020; https://www.cms.gov/meaningful-measures-20-movingmeasure-reduction-modernization, 2020.

Data Sources

Data Sources

2. What data did CMS use to calculate the Severe Obstetric Complications eCQM?

The Severe Obstetric Complications Electronic Clinical Quality Measure (PC-07) uses electronic health record data and data from other electronic clinical systems, depending on hospital site workflows, to define all components of the measures. For the 2024 results, hospitals submitted data for discharges occurring between January 1, 2023 – December 31, 2023. See the Measure Specifications for a further breakdown of the measure components and Results for how to interpret calculations.

Measure Specifications

Cohort

3. Which patients are part of the measure cohort?

The measure cohort (the denominator) includes all inpatient hospitalizations for patients between 8 years to under 65 years who delivered at least one baby (live or stillborn ≥20 weeks old). Patients with COVID-19 are only excluded if they had a respiratory complication during the hospitalization.

Outcome

4. What is the measure outcome?

The severe obstetric complications measure is unique in that it has two outcomes:

1) **Any complications**: Severe medical (i.e., sepsis, eclampsia, respiratory, cardiac, etc.) and procedural (i.e., hysterectomy) complications, including death.
2) **Any Complications excluding blood transfusion only cases**: Any complications (above) but excludes cases where blood transfusion was the only complication.

The measure outcome (the numerator) is based on the Center for Disease Control and Prevention's (CDC) definition of Severe Maternal Morbidity[8] and uses the International Classification of Diseases 10th Revision (ICD-10) to define diagnoses and procedures that are indicative of a complication. ICD-10 codes are used for billing in hospitals and therefore are generally widely available and offer stability over time. Different from the CDC definition, the measure uses present on admission (POA) codes to only consider as outcome events complications that occurred after admission for delivery. The numerator also includes patients who die during the inpatient delivery encounter.

The measure outcome is defined as the number of inpatient delivery hospitalizations among the denominator who experience any of the following numerator events (note that only diagnoses not present on admission are considered a numerator event), or death:

- Acute myocardial infarction
- Aortic aneurysm
- Cardiac arrest/ventricular fibrillation
- Heart failure/arrest during procedure or surgery
- Disseminated intravascular coagulation
- Shock
- Acute renal failure
- Adult respiratory distress syndrome
- Pulmonary edema/Acute heart failure[9]
- Sepsis
- Air and thrombotic embolism
- Amniotic fluid embolism
- Eclampsia
- Severe anesthesia complications
- Puerperal cerebrovascular disorder
- Sickle cell disease with crisis
- Blood transfusion
- Conversion of cardiac rhythm
- Hysterectomy
- Temporary tracheostomy
- Ventilation

Read more about the measure outcome within the measure methodology report located on the eCQI Resource Center.

5. Why are there two measure outcomes?

Blood transfusions, generally needed in response to excessive bleeding around delivery, account for the greatest proportion of patients identified as having an obstetric complication, but patients for whom this is the only identified numerator event may represent a less severe outcome experience.

[8] The Centers for Disease Control and Prevention (CDC). (2024). Severe Maternal Morbidity. https://www.cdc.gov/maternal-infant-health/php/severe-maternal-morbidity/index.html

[9] CDC utilizes 21 indicators for defining SMM, but for the purposes of this measure's outcome, one of the indicators (Pulmonary edema/Acute heart failure) is defined using two distinct value sets. It is listed here as one indicator, but the value sets identify these as two distinct diagnoses. Likewise, the Measure Authoring Tool (MAT) header that supports this eCQM identifies these two diagnoses separately.

Risk Adjustment

6. How does the measure risk-adjust for differences in the measure population?

The goal of risk adjustment is to account for patient-level factors that are clinically relevant, have strong relationships with the outcome, and are outside of the control of the reporting entity, without obscuring important quality differences. Risk factors can increase (or decrease) the likelihood that a patient experiences a certain outcome. Risk adjustment for case mix differences among hospitals is based on clinical status of the patient and other patient characteristics at the time of admission. Only conditions or comorbidities that convey information about the patient at the time of the admission are included in risk adjustment, determined by present on admission indicators. Complications that arise during the hospitalization are not used in risk adjustment. The following risk variables were included in the final risk model:

- Patient demographics: maternal age (derived from birthdate)
- Preexisting conditions and pregnancy characteristics defined by ICD-10 codes:
- Anemia
- Asthma
- Autoimmune disease
- Bariatric surgery
- Bleeding disorder
- Body Mass Index (BMI) >= 40
- Cardiac disease
- Gastrointestinal disease
- Gestational diabetes
- Human Immunodeficiency Virus (HIV)
- Hypertension
- Mental health disorder
- Multiple pregnancy
- Neuromuscular disease
- Obstetric venous thromboembolism (VTE)
- Other pre-eclampsia
- Placental accreta spectrum
- Placental abruption
- Placenta previa
- Preexisting diabetes
- Preterm birth
- Previous cesarean
- Pulmonary hypertension
- Renal disease
- Severe pre-eclampsia
- Substance abuse
- Thyrotoxicosis
- Laboratory tests and vital signs upon hospital arrival [first resulted value within 24 hours prior to initial encounter (earliest between inpatient admission, emergency department/obstetric triage, observation stay) and before delivery]: Hematocrit, White blood cell (WBC) count, Heart rate, Systolic blood pressure
- Long-term anticoagulant medication use
- Social Risk Factors: economic/housing instability

7. Do people with more codes with the same risk factor have that risk factor weighted more?

No, multiple conditions within a condition category do not more heavily weight the risk adjustment.

8. Does this measure risk adjust for social risk factors?

Yes, one social risk factor was selected for adjustment to develop a parsimonious model that included relevant variables strongly associated with a severe obstetric complication. Social risk factors are dependent on the availability of information in the EHR. As noted above, economic/housing instability was included in the model, and was chosen due to support in research literature for its inclusion and availability in the EHR.[10] Due to differences in maternal outcomes by race/ethnicity as demonstrated in the literature, race/ethnicity were examined as stratification variables rather than risk variables. It was determined that illumination of outcome disparities by race/ethnicity, rather than adjustment of outcomes by race/ethnicity, would best inform stakeholders and patients and be most impactful in incentivizing improvements in the quality and equity of maternal care (see FAQ 12 for more information about stratification by race and ethnicity).

CMS Disparity Methods

Using Disparity Methods

9. Why measure obstetric disparities?

Promoting health equity is a priority in CMS's *Meaningful Measures* framework and the 2023 CMS Strategic Framework. *The Meaningful Measures* framework is CMS's initiative to ensure "high quality and timely care with equal access for all patients and consumers, including those with social risk and demographic variables" (for example, patients who are Black, Hispanic, or Asian American and Native Hawaiian or other Pacific Islander [AA and NHPI]) "for all health episodes in all settings of care" (see the Meaningful Measures Hub for more information). Identifying disparities in care is an important first step to close gaps in care. The 2023 CMS Strategic Framework, which outlines strategic priorities identified by CMS, includes advancing health equity across CMS programs as a priority. CMS's commitment to advancing health equity is further described in the CMS Framework for Health Equity, which highlights the need to expand the analysis of quality information to identify disparities.

Multiple studies have shown that several social risk and demographic variables, including race

[10] Leonard SA, Kennedy CJ, Carmichael SL, Lyell DJ, Main EK. An expanded obstetric comorbidity scoring system for predicting severe maternal morbidity. Obstetrics & Gynecology. 2020;136(3):440-449.

and ethnicity,[11] are associated with worse maternal outcomes. There are also differences in maternal outcomes by race & ethnicity and payer.[12,13,14,15] To decrease health inequity and enable populations that have been disadvantaged or historically marginalized to fully access the care to which they are entitled, CMS is committed to understanding the relationship between the presence of specified social risk and demographic variables and the risk for poor health outcomes in patients enrolled in Medicare.

To help hospitals improve health outcomes for disadvantaged or historically marginalized populations, CMS is providing hospitals with this information so that they can evaluate their own performance with respect to these groups, within their facilities.

10. What are the CMS Within-hospital Disparity Methods?

CMS created the CMS Disparity Methods to measure differences in the quality of care received by patients enrolled in Medicare with certain social risk and demographic characteristics when compared to similar patients with other social risk and demographic characteristics (for instance, patients who are Black compared to patients who are White, or patients that have Medicaid insurance compared to patients that have private insurance). CMS also created the methods to encourage facilities to improve the care they provide to patients who are more likely to receive poor quality care and to help patients and their families make informed decisions.

The measure utilizes the *Within-Hospital Disparity Method* to measure differences in the quality of care by comparing results for different patient social risk and demographic variables, within an individual hospital; for example, between patients who are White compared with patients who are Black, Hispanic, or AA and NHPI; or between patients that receive Medicaid versus patients that have private insurance. More specifically, it answers the questions:

[11] Cruz-Flores, S., Rabinstein, A., Biller, J., Elkind, M. S., Griffith, P., Gorelick, P. B., ... & Valderrama, A. L. (2011). Racial-ethnic disparities in stroke care: The American experience: A statement for healthcare professionals from the American Heart Association/American Stroke Association. *Stroke*, 42(7): 2091-2116.
[12] Brown CC, Adams CE, Moore JE. Race, Medicaid Coverage, and Equity in Maternal Morbidity. Women's Health Issues. 2021;31(3). doi:https://doi.org/10.1016/j.whi.2020.12.005
[13] Leonard SA, Main EK, Scott KA, Profit J, Carmichael SL. Racial and ethnic disparities in severe maternal morbidity prevalence and trends. Annals of Epidemiology. 2019;33:30-36. doi:https://doi.org/10.1016/j.annepidem.2019.02.007
[14] Petersen EE, Davis NL, Goodman D, et al. Racial/Ethnic Disparities in Pregnancy-Related Deaths — United States, 2007–2016. MMWR Morbidity and Mortality Weekly Report. 2019;68(35):762-765. doi:https://doi.org/10.15585/mmwr.mm6835a3
[15] Creanga AA, Bateman BT, Kuklina EV, Callaghan WM. Racial and ethnic disparities in severe maternal morbidity: a multistate analysis, 2008-2010. American Journal of Obstetrics and Gynecology. 2014;210(5):435.e1-435.e8. doi:https://doi.org/10.1016/j.ajog.2013.11.039

- ***"Do patients who are Black, Hispanic, or AA and NHPI and who receive services at Hospital A have worse health outcomes than patients who are White and receive services at Hospital A?"***
- ***"Do patients who have Medicaid and receive services at Hospital A have worse health outcomes than patients who have private health insurance and receive services at Hospital A?"***

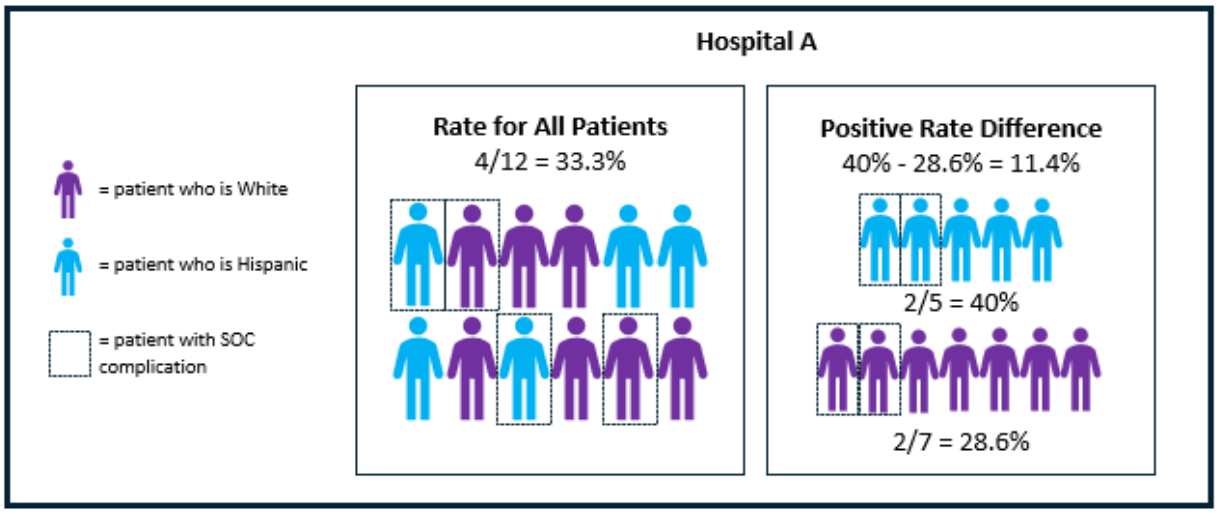
Hospitals can use the results from the within-hospital Disparity Methods to determine if they have a gap in the care provided to patients with certain social risk and demographic variables compared to care provided to patients without social risk and demographic variables. CMS may consider using the across-hospital Disparity Method in future reports.

11. How does CMS calculate the Within-Hospital Disparity Methods?

CMS calculates the Within-Hospital disparity methods using adaptations of the approach used to calculate the publicly reported severe obstetric complication measure. As with the publicly reported measures, the CMS Within-Hospital disparity methods uses a statistical model that accounts for differences in how sick patients are and their medical histories by adjusting for characteristics such as age or chronic illnesses, like diabetes. The Within-Hospital disparity methods calculates a risk standardized Rate Difference (RD) between the patient group with the social risk and demographic variable and patients without the same variable.

Figure 1 provides a conceptual example of the Within-Hospital Disparity Method calculation using race and ethnicity (patients who are White versus patients who are Hispanic). In this example, Hospital A's Rate Difference is calculated by subtracting patients who are Hispanic complication rate (40%) from patients who are White complication rate (28.6%), resulting in a Rate Difference of 11.4% (40% minus 28.6%). For payer, the Rate Difference would be calculated by subtracting the complication rate for patients who have Medicaid from the complication rate for patients who have private insurance. For information on how to interpret this result, please go to FAQ 15.

Figure 1: Within-Hospital Disparity Method Calculation Example



For more information on how the within-hospital disparity methods is calculated and for measure-specific information, please refer to the Severe Obstetric Complications Electronic Clinical Quality Measure Appendix on the eCQI Resource Center.

Race, Ethnicity, and Payer-Based Maternal Disparities

12. How does CMS identify a patient's race or ethnicity?

Patient race and ethnicity comes directly from the hospital submitted data and however the hospital inputs self-reported patient race and ethnicty data into their electronic health records. There are four buckets for race and ethnicty stratification: Hispanic, Non-Hispanic Black/African American, Non-Hispanic White, and Non-Hispanic Asian and Native Hawaiian or Other Pacific Islander (AA/NHPI). At this time non-Hispanic American Indian or Native American, unknown race or ethncity, and multiple races were not included due to low or no data present.

For further information on race and ethnicity categories, see Table 1a of the measure methodology report on the eCQI Resource Center.

13. How does CMS identify a patient's payer?

Primary patient health insurance (or payer) comes directly from the hospital submitted data and however the hospital input health insurance information into the patient's EHR. There are three buckets for payer stratification: private, Medicaid, and other (which includes Medicare, self-pay or uninsured, and other).

For further information on payer categories, see Table 1a of the measure methodology report on the eCQI Resource Center.

14. Why didn't my hospital receive disparity results?

For a hospital to receive results for the CMS Within-Hospital Disparity Methods, it must have a minimum number of patients included in the stratification calculation as described in Table 1 below.

Table 1: CMS Within-Hospital Disparity Methods Patient Sample Sizes for Stratification

CMS Disparity Method	Minimum Patient Sample Size for Stratification by Race and Ethnicity	Minimum Patient Sample Size for Stratification by Payer
Within-Hospital Disparity Method	25 total patients (including at least 12 patients who are White and at least 12 patients who are Black, Hispanic, or AA and NHPI)	25 total patients (including at least 12 patients who had Medicaid, and at least 12 patient who had private insurance)

Results

Interpretation of Results

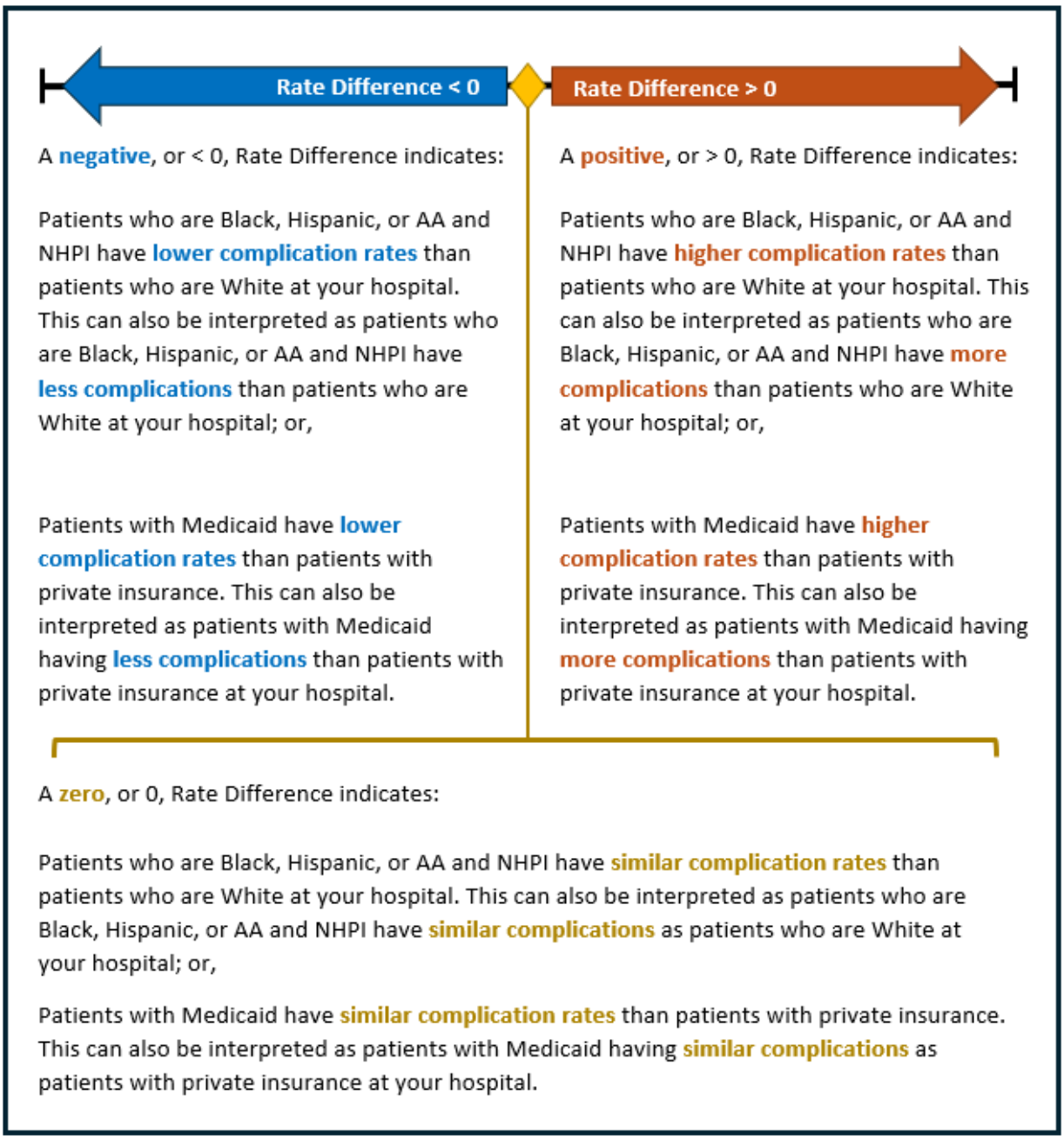
15. How should I interpret my hospital's Within-Hospital Disparity Method results?

The results for the Within-Hospital Disparity Method are presented as a Rate Difference (see FAQ 11 for an example).

Your hospital's Rate Difference is compared against a baseline Rate Difference of 0 (which represents similar outcomes for patients with social risk and demographic variables and patients without social risk and demographic variables). Your hospital's Rate Difference can have either a positive or negative value.

Figure 2 provides information on how negative and positive Rate Difference values may be interpreted based on race/ethnicity and payer for the Within-Hospital Disparity Method.

Figure 2: Interpreting Rate Differences



Risk Standardized Obstetric Complications Rate

16. What is a Risk Standardized Obstetric Complications Rate (RSCR)?

Hospital-level measure scores are calculated as a standardized proportion of the number of delivery hospitalizations for patients who experience a severe obstetric complication, as defined by the numerator, by the total number of delivery hospitalizations in the denominator during the measurement period. A hospital's Risk Standardized Obstetric Complications Rate (RSCR) is calculated as the ratio of a hospital's "predicted" number of delivery hospitalizations with a severe obstetric complication to "expected" number of delivery hospitalizations with a severe obstetric complication, multiplied by the overall observed rate of delivery hospitalizations with a severe obstetric complication. The expected number of delivery hospitalizations with a complication for each hospital (denominator) was estimated using its patient mix and the average hospital-specific intercept (i.e., the average intercept among all hospitals in the sample). The predicted number of delivery hospitalizations with a complication for each hospital (numerator) was estimated given the same patient mix but an estimated hospital-specific intercept. Operationally, the expected number of delivery hospitalizations with a complication for each hospital was obtained by summing the expected complications for all delivering patients in the hospital. The expected complications outcome for each delivering patient was calculated via the hierarchical model, which applies the estimated regression coefficients to the observed patient characteristics and adds the average of the hospital-specific intercept. The predicted number of delivery hospitalizations with a complication for each hospital was calculated by summing the predicted complications for all delivering patients in the hospital. The predicted complications outcome for each delivering patient was calculated through the hierarchical model, which applies the estimated regression coefficients to the patient characteristics observed and adds the hospital-specific intercept.

Figure 3 provides a visual depiction of how a hospital-level RSCR is calculated, along with an example in Figure 4 for Hospital A's RSCR.

Figure 3: Risk Standarized Obstertric Complications Rate (RSCR) Calculation

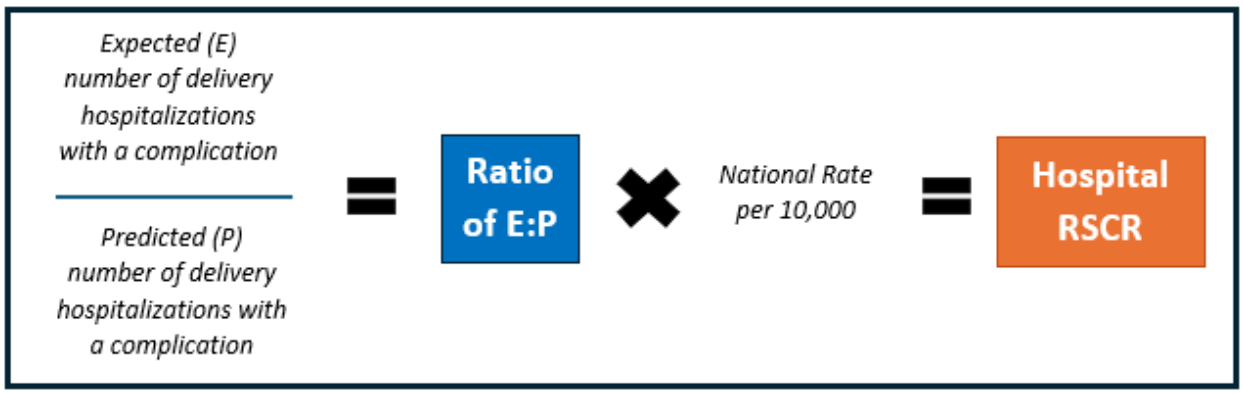
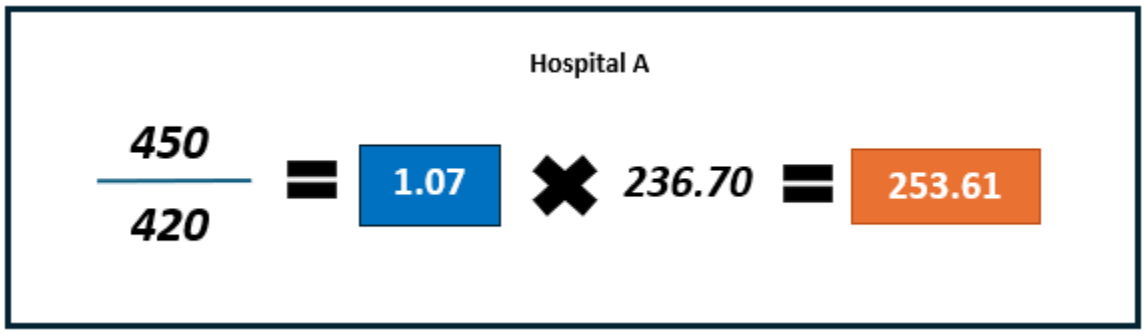


Figure 4: Risk Standarized Obstertric Complications Rate (RSCR) Calculation Example



This example hospital has a RSCR that is higher than the national complication rate.

Hospital-Specific Reports

17. What is in my results?

CMS is providing your facility with a summary of the results called a Hospital-Specific Report (HSR) (see Figure 5 below) as well as a detailed downloadable CSV file with patient level data and accompanying user guide. For instructions on accessing these reports, see the following video on YouTube. You will find the following results on the Hospital Quality Reporting platform:

Figure 5: Example Summary of Facility Results

Performance Overview

Metric	Facility	State	National
Observed Rate (per 10,000)			
Risk-standardized rate (per 10,000)*			
Numerator (Outcome events among eligible deliveries)			
Denominator (Eligible Deliveries)*			

Stratifications by race/ethnicity

Metric	Non-Hispanic White	Non-Hispanic Black	Hispanic	Asian American or NHPI
Observed Rate (per 10,000)				
Numerator (Outcome events among eligible deliveries)				
Denominator (Eligible Deliveries)				

Risk-standardized rate difference between…	Facility	State	National
…Black and White patients (per 10,000)			
…Hispanic and White patients (per 10,000)			
…AA or NHPI and White patients (per 10,000)			

Stratification by Payer

Metric	Medicaid	Private Insurance
Observed Rate (per 10,000)		
Numerator (Outcome events among eligible deliveries)		
Denominator (Eligible Deliveries)		

Risk-standardized rate difference between…	Facility	State	National
…Medicaid and Private Insurance			

Indicates publicly reported data

18. Why didn't my hospital receive measure results?

Your hospital will not receive an HSR if it was not defined as open during the measurement period/reporting period deadline.

If you believe that your hospital should have received an HSR but did not, please contact the *QualityNet* Service Center at qnetsupport@cms.hhs.gov. Please ***do not include Personally Identifiable Information or Protected Health Information in questions submitted.***

19. Are my results publicly reported?

Your hospital's RSCR for both outcomes will be publicly reported on the data catalog on Medicare.data.gov, however your hospital's CMS disparity method results will not be public.

Additional Resources

20. Where can I find more information on this measure?

The Measure Methodology Report is located on the eCQI Resource Center. You can find the report, stratification appendix, and a supplemental file containing beta coefficients by clicking here, or learn more about measure information, specifications, and data elements by heading here. Additional information can be found on QualityNet.

21. Where do I go to ask questions?

If your question is about technical measure specifications, you can submit your question on JIRA at https://oncprojectracking.healthit.gov/olp -> create an issue ticket.

Please submit other questions about the measure following these steps:

1. Access the QualityNet Q&A tool - Opens in new browser tab.
2. Select "IQR - Inpatient Quality Reporting" from the drop-down menu in the Program field
3. Click into the Topic field and select "eCQMs" under "IQR - Inpatient Quality Reporting"
4. Complete all other mandatory fields, the CAPTCHA, and click "Submit Question"

For proper handling of inquiries, please reference the specific measure (PC-07 or severe obstetric complications for this measure) to which your questions relate.

Glossary

Hospital-Specific Reports (HSRs): Reports issued by CMS in the Hospital IQR Program and other quality programs that give hospitals detailed measure results, discharge-level data, and state and national results.

Inequity: The lack of consistent, systemic, fair, just, and impartial treatment of all individuals, including individuals who belong to underserved communities that have been denied such treatment.

Medicaid: Medicaid is a joint federal and state health insurance program that provides health coverage to low-income individuals and individuals with disabilities.

Outcome: The result of performance (or nonperformance) of a function or process.

Outcome measure: A measure that assesses what happens or does not happen to a patient following a process; agreed upon desired patient characteristics to be achieved; or undesired patient conditions to be avoided.

Race and Ethnicity (R&E): Refers to the categorization of patients based on their racial and ethnic background. This stratification is utilized to analyze healthcare data, particularly in the assessment of disparities in health outcomes.

Rate Difference: The difference in predicted complication rates between patients with private insurance and Medicaid or based on individual racial and ethnic group (i.e., Black, Hispanic, AA and NHPI) in a hospital. This is calculated as [Medicaid rate] – [Private insurance rate] or [Black, Hispanic, or AA and NHPI] – [White].

Risk adjustment: Risk adjustment means looking at things like severity of illness or age to estimate the chance of a patient having a particular outcome, such as a complication. In some cases, CMS adjusts for risk when reporting performance measures to compare performance.

Social risk and demographic variables: Social risk factors (such as low-income status or geographic indices) that influence health outcomes and demographic factors (such as race and ethnicity) associated with structural inequity.