



Measure Fact Sheet – The AHRQ-CMS Pediatric Quality Measures Program (PQMP)

## Measure: Cesarean Delivery for Nulliparous (NTSV) Women (Appropriate Use)

Measure Developer: Pediatric Measurement Center of Excellence (PMCoE)

Numerator	Denominator	Exclusions	Data Source(s)
Patients who had a cesarean delivery.	All nulliparous patients, regardless of age, who gave birth during a 12-month period to a live singleton in vertex presentation at or beyond 37 weeks of gestation.	None.	Electronic medical record.

### Measure Importance

- The incidence of cesarean delivery without a medical need remains high in the United States and there is substantial variation by State and hospital.<sup>1,2</sup>
- Overall, nearly a third of all births (32.8 percent) occurred by cesarean delivery in 2012, ranging across States from a low rate of 23.4 percent to a high rate of 40.2 percent.
- Rates of cesarean delivery for women without other risk factors can be influenced by the number of providers in an area, provider preference, and the relative frequency of malpractice suits.<sup>3</sup>
- Cesarean deliveries are costly and can put women at risk. On average, they are twice as costly as vaginal births.<sup>4</sup> Women who deliver by cesarean section rather than vaginally are at risk for surgical complications, future reproductive problems, and experiencing adverse outcomes in future pregnancies.<sup>5,6</sup>



## Evidence Base for the Focus of the Measure

- This measure is consistent with guidance from the American College of Obstetricians and Gynecologists (ACOG).<sup>7</sup> The 2013 ACOG Committee Opinion cites evidence of risks from the procedure, and, at a minimum, recommends waiting until the fetus is 39 weeks old.
- A review of evidence published by “Childbirth Connection” in 2004 found 33 dimensions on which cesarean delivery was found to involve more risk than vaginal birth, including risks to mothers and children, and only 4 dimensions where vaginal birth had greater risk than cesarean delivery.<sup>8</sup>

## Advantages of the Measure

- This measure is specified to be calculated using data from electronic health records (EHR), using the National Quality Forum Quality Data Model.

## Levels of Aggregation Applicable to the Measure<sup>9</sup>

The measure is intended for aggregation and comparison at the State, regional, payer, health plan, hospital, provider group, and individual clinician levels.

## Reliability and Validity of the Measure

- The measure is reliable, as assessed using a beta-binomial model of signal to noise ratio. This measure has high reliability (0.73) for clinicians that had the average annual number of deliveries (around 40), and moderate reliability (0.41) for clinicians that had the minimum annual number of deliveries needed to calculate the measure (10).
- The face validity of the measure was assessed using expert and public opinion.<sup>10</sup>

## Measure Testing

- This measure’s reliability was tested using 2010 data from the EHR system of an urban, tertiary-care-level hospital. The measure was calculated for the 116 physicians that had a minimum of 10 deliveries in the measurement year.
- The measure’s feasibility was tested in that same location and a suburban community hospital.
- Selected Results from Tests of the Measure
- Based on the sample of 116 physicians, the mean performance rate is 0.21.
- The range of the performance rate is 0.76 (0.0–0.76).
- The measure performance rate and the variation in performance indicate opportunities for quality improvement.

## Related Measures

- This new measure aligns with a similar measure developed by the Joint Commission on Accreditation of Healthcare Organizations, but also has the potential to capture the clinician-level rate of cesarean deliveries.
- The Child Core Set of Health Care Quality Measures for voluntary use by State Medicaid and CHIP programs includes a similar measure derived from administrative data sources (vital records and discharge data).<sup>11</sup>

## Caveats

- Use of the measure is limited to sites documenting clinical information in EHRs.
- It is highly likely that missing data or ambiguous information stored in a provider's EHR will lead to calculation errors and low performance on the measure.

## Similar Measures

A measure of cesarean delivery in nulliparous women is included in the Child Core Set for voluntary reporting by State Medicaid and CHIP programs.

## More Information

- AHRQ: [CHIPRAqualitymeasures@ahrq.hhs.gov](mailto:CHIPRAqualitymeasures@ahrq.hhs.gov)
- Contact at PMCOE: [Lisa Ciesielczyk at lciesielczyk@aap.org](mailto:lciesielczyk@aap.org)
- Coming soon: Link to measure details on the AHRQ Web site.

For more information about the PQMP, visit [www.ahrq.gov/CHIPRA](http://www.ahrq.gov/CHIPRA).

The Children's Health Insurance Program Reauthorization Act (CHIPRA) called for establishment of a Pediatric Quality Measures Program (PQMP) as a followup to identifying an initial core set of children's health care quality measures. This fact sheet was produced by the Agency for Healthcare Research and Quality (AHRQ), based on information provided by the AHRQ-CMS Pediatric Measurement Center of Excellence (PMCoE) at the Medical College of Wisconsin, which was funded by an AHRQ/CMS grant as a CHIPRA Center of Excellence. A listing of all submitted PQMP Centers of Excellence can be found at [www.ahrq.gov/CHIPRA](http://www.ahrq.gov/CHIPRA). All measures are publicly available for noncommercial use.

## Notes

<sup>1</sup>Martin JA, Hamilton BE, Osterman MJK, et al. Births: Final Data for 2012. National Vital Statistics Reports December 30, 2013 Vol. 62, No. 9. Hyattsville MD: Centers for Disease Control and Prevention, National Center for Health Statistics.

<sup>2</sup>Kozhimannil K, Arcayam M, Subramanian S. Maternal clinical diagnoses and hospital variation in the risk of cesarean delivery: analyses of a National US Hospital Discharge Database. *PLoS Med.* 2014;11(10).

<sup>3</sup>Baicker K, Buckles KS, Chandra A. Geographic Variation in The Appropriate Use Of Cesarean Delivery. *Health Affairs* 25 (2006): w355–w367; 10.1377/hlthaff.25.w355

<sup>4</sup>Baicker K et al., *ibid.*

<sup>5</sup>Childbirth Connection. Comparing risks of cesarean and vaginal birth to mothers, babies, and future reproductive capacity: a systematic review. New York: Childbirth Connection, April 2004.

<sup>6</sup>Lydon-Rochelle M, Holt VL, Martin DP, et al. Association between method of delivery and maternal rehospitalization. *JAMA.* 2000;283(18):2411-2416. doi: 10.1001/jama.283.18.2411.

<sup>7</sup>American College of Obstetricians and Gynecologists (ACOG). Committee Opinion No. 559. Cesarean Delivery On Maternal Request. *Obstet Gynecol.* April 2013 2013:121;904–7. Available at: [https://www.acog.org/Resources\\_And\\_Publications/Committee\\_Opinions/Committee\\_on\\_Obstetric\\_Practice/Cesarean\\_Delivery\\_on\\_Maternal\\_Request](https://www.acog.org/Resources_And_Publications/Committee_Opinions/Committee_on_Obstetric_Practice/Cesarean_Delivery_on_Maternal_Request)

<sup>8</sup>Childbirth Connection, *ibid.*

<sup>9</sup>The Children’s Health Insurance Program Reauthorization Act required measures developed under this program to “permit comparison of quality and data at a State, plan, and provider level.” The measure developer identified the intended levels of aggregation and comparison as reported here.

<sup>10</sup>The expert panel that reviewed the measure consisted of 24 members, with representation from measure methodologists, patient advocacy groups, and the following clinical specialties: anesthesiology, family practice, geriatric medicine, maternal fetal medicine, neonatology, nurse midwife, obstetrics and gynecology, and perinatal nursing. All expert panel members that responded to a survey on validity (n=13) agree or strongly agree that the scores obtained from the measure as specified will accurately differentiate quality across providers. A panel of consumer, purchaser, and patient representatives also reviewed the measure, and the measure developers received input from a 30-day public comment period.

<sup>11</sup>Core Set of Children’s Health Care Quality Measures for Medicaid and CHIP (Child Core Set): Technical Specifications and Resource Manual for Federal Fiscal Year 2013 Reporting. Updated May 2013. Available: <http://www.medicaid.gov/Medicaid-CHIP-Program-Information/By-Topics/Quality-of-Care/Downloads/Medicaid-and-CHIP-Child-Core-Set-Manual.pdf>

