A. Description

Reporting on the extent to which high risk women are delivered at facilities with 24/7 in-house physician coverage dedicated to the obstetrical service by an anesthesiologist who is qualified to provide obstetrical anesthesia

This measure is intended to be reported at the level of health plan or geographical entity, such as county, state, region, etc. It is not appropriate for measuring at the level of clinical provider.

This measure is a descriptor of the availability of care for the population of women who may need high risk obstetrical services and is not a measure of the quality of care received by any individual in that population.

B. Eligible Population

Women age 10-65 years inclusive, who are admitted to a hospital or health care facility and deliver an infant, whether living or dead. Delivery shall be identified using the table below, with exclusions as noted regardless of how delivery was identified. The table is recreated largely from work done by CDC researchers.

Identify Deliveries

<table>
<thead>
<tr>
<th>Description</th>
<th>Code(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revenue Code</td>
<td>722 Delivery</td>
</tr>
<tr>
<td>Outcome of delivery ICD-9</td>
<td>ICD-9-CM = V27</td>
</tr>
<tr>
<td>Normal delivery</td>
<td>ICD-9-CM = 650</td>
</tr>
<tr>
<td>Diagnosis-related group (DRG) delivery codes</td>
<td>370 (complicated cesarean section), 811,191 (3.03) 371 (uncomplicated cesarean section), 372 (complicated vaginal delivery), 373 (uncomplicated vaginal delivery) 374 (uncomplicated vaginal delivery with sterilization and/or dilatation &amp; curettage) 375 (vaginal delivery with operation room procedure except sterilization and/or dilatation &amp; curettage)</td>
</tr>
<tr>
<td><strong>Selected delivery related procedures</strong></td>
<td>ICD-9-CM = 720, 721, 7221, 7231, 7239, 724, 726 (forceps) 7251, 7252, 7253, 7254 (breech extraction) 7271, 7279 (vacuum extraction) 728, 729 (other specified and unspecified delivery) 7322 (internal and combined version and extraction) 7359 (other manually assisted deliveries) 736 (episiotomy) 740, 741, 742, 744, 7499 (cesarean section)</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td><strong>Exclusions</strong></td>
<td>ICD-9 = CM 630 (hydatidiform mole) 631 (other abnormal product of conception) 633 (ectopic pregnancy) 632 634 635 636 637 638 639 69.01, 69.51, 74.91, 75.0 (abortion)</td>
</tr>
</tbody>
</table>
### Identify Women in Need of High risk Services:

#### 1. Class A: Maternal Diagnoses and Comorbidities

<table>
<thead>
<tr>
<th>CCS Category</th>
<th>Look Back Period</th>
<th>Descriptor</th>
<th>Remove from inclusion List*</th>
</tr>
</thead>
</table>
| 49            | 2y               | DM without Cx | 7902 Abnormal Glucose  
79021Impaired fasting glucose  
79022Impaired glucose tolerance test (oral)  
79029 Other abnormal glucose  
7915Glycosuria |
| 50            | 2y               | DM with Cx  |
| 98            | 2y               | Essential HTN |
| 99            | 2y               | HTN with CX and Secondary HTN |
| 100           | 2y               | Acute MI |
| 101           | 2y               | Coronary atherosclerosis and other heart Disz |
| 104           | 2y               | Other and ill defined heart disz |
| 103           | 2y               | Pulmonary heart disease |
| 96            | 2y               | Heart valve disorders | 4240 Mitral valve disorders  
7852 Undiagnosed cardiac murmurs  
7853 Other abnormal heart sounds |
| 97            | 2y               | Peri, endo and myocarditis or cardiomyopathy |
| 105           | 2y               | Conduction disorders |
| 106           | 2y               | Cardiac Dyssrrhythmias |
| 107           | 2y               | Cardiac arrest and vfib |
| 108           | 2y               | CHF, non hypertensive |
| 109           | 2y               | Acute Cerebrovascular disz |
| 110           | 2y               | Occlusion or stenosis of pre cerebral arteries |
| 111           | 2y               | Other and ill defined cerebrovascular disz |
| 112           | 2y               | Transient cerebral ischemia |
| 156           | 2y               | Nephritis nephrosis, renal sclerosis |
| 158           | 2y               | Chronic kidney disease |
| 157           | 2y               | Acute and unspecified renal failure |
| 161           | 2y               | Other diseases of kidney and ureters | 5890 Unilateral small kidney  
5891Bilateral small kidneys  
5899 Small kidney, unspecified |
<p>| 128           | 10 m             | Asthma | 49381 Exercise induced |</p>
<table>
<thead>
<tr>
<th>Code</th>
<th>Age</th>
<th>Description</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>132</td>
<td>10m</td>
<td>Lung disease due to external agents</td>
<td>bronchospasm 49382 Cough variant asthma</td>
</tr>
<tr>
<td>133</td>
<td>2y</td>
<td>Other lower respiratory disease</td>
<td>78600 Respiratory abnormality, unspecified</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>78601 Hyperventilation</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>78602 Orthopnea</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>78605 Shortness of breath</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>78606 Tachypnea</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>78607 Wheezing</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>78606 Tachypnea</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>78607 Wheezing</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>7862 Cough</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>7864 Abnormal sputum</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>78652 painful respiration</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>7866 Swelling, mass, or lump in chest</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>7867 Abnormal chest sounds</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>7868 Hiccough</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>7931 nonspecific (abnormal) findings on radiological and other</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>examination of lung field</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>79311 Solitary pulmonary nodule</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>79319 Other nonspecific abnormal finding of lung field</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>7942 Nonspecific abnormal results of pulmonary function study</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>V126 personal history of diseases of respiratory system</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>V1260 personal history of unspecified disease of respiratory system</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>V1261 Personal history of pneumonia (recurrent) V1269</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Personal history of other diseases of respiratory system</td>
</tr>
<tr>
<td>59, 61, 63, 64</td>
<td>2y</td>
<td>59. Deficiency anemias 61. Sickle cell 63. WBC disease 64. Other hematologic conditions</td>
<td>281xx 2820 2821 2822 2823 28246 2825 2883 2885x 286x 2888 2889 289 2891 2892 2893 2894 2895 28950 28951 28953 28959 2896 2897 28983 2899</td>
</tr>
<tr>
<td>660</td>
<td>2y</td>
<td>Alcohol related</td>
<td></td>
</tr>
<tr>
<td>661</td>
<td>2y</td>
<td>Substance related</td>
<td></td>
</tr>
<tr>
<td>116</td>
<td>2y</td>
<td>Aortic and peripheral arterial embolic thrombotic</td>
<td></td>
</tr>
<tr>
<td>118</td>
<td>2y</td>
<td>Phlebitis, embolic, etc</td>
<td>4510 45182 4536 4537</td>
</tr>
<tr>
<td>5</td>
<td>2y</td>
<td>HIV</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>182</td>
<td>2y</td>
<td>Hemorrhage during pregnancy, abruption, previa</td>
<td>640 64200 64201 64202 64203 64080 64081 64083 64090 64091 64093</td>
</tr>
<tr>
<td>183</td>
<td>10m</td>
<td>Hypertension complicating pregnancy</td>
<td>64230 64231 64232 64233 64234</td>
</tr>
<tr>
<td>83</td>
<td>2y</td>
<td>Epilepsy</td>
<td></td>
</tr>
</tbody>
</table>

*These are ICD9 codes that are included in the CCS software for the indicated Group that need to be removed from the inclusion list. That is, they are not specific exclusions, but neither do they establish eligibility.

**Note:** The look back period is the preferred time before delivery to be included for analysis. When 2 full years prior to delivery are available, reporting entities should use 2 full years of data, the reporting year up until the month following the pregnancy and a prior look back year. For each delivery, use the shorter of the indicated look back period OR the total available data ending with the month of delivery.
2. Class B: Delivery Complications, Fetal Risk or Compromise, or Suboptimal Infant Outcomes
   a. Maternal Delivery Complication Codes (ICD9)

<table>
<thead>
<tr>
<th>ICD9 Codes</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>6565-65651 65653</td>
<td>Poor Fetal Growth</td>
</tr>
<tr>
<td>10m</td>
<td>Disorders of pregnancy and delivery</td>
</tr>
<tr>
<td>679</td>
<td>Complications of in utero procedures</td>
</tr>
<tr>
<td>6790x</td>
<td>Antepartum hemorrhage, abruptio placentae and previa</td>
</tr>
<tr>
<td>641xx</td>
<td>Umbilical cord complications</td>
</tr>
<tr>
<td>663</td>
<td>Uterine rupture</td>
</tr>
<tr>
<td>6511 – 6519</td>
<td>Significant fetal complications affecting management of mother</td>
</tr>
<tr>
<td>6560-65643</td>
<td>Postpartum bleed</td>
</tr>
<tr>
<td>666</td>
<td>Complications of anesthesia</td>
</tr>
<tr>
<td>668</td>
<td>Major puerperal infection</td>
</tr>
<tr>
<td>670</td>
<td>Deep thrombo-embolus</td>
</tr>
<tr>
<td>6713-67144</td>
<td>OB Pulm Embolus</td>
</tr>
<tr>
<td>673xx</td>
<td>Cerebrovascular disorders in the puerperium</td>
</tr>
<tr>
<td>6740x</td>
<td>Peripartum cardiomyopathy</td>
</tr>
<tr>
<td>6745x</td>
<td>Drug dependence</td>
</tr>
<tr>
<td>6483x</td>
<td>Mental disorders Complicating pregnancy, childbirth or puerperium</td>
</tr>
<tr>
<td>6484x</td>
<td>Congenital cardiac disorder, mother</td>
</tr>
<tr>
<td>6485x</td>
<td></td>
</tr>
<tr>
<td>6486x</td>
<td>Other CV disease cx pregnancy, etc</td>
</tr>
<tr>
<td>-------</td>
<td>----------------------------------</td>
</tr>
<tr>
<td>6494x</td>
<td>Epilepsy cx pregnancy, etc</td>
</tr>
<tr>
<td>6943x</td>
<td>Coagulation defects cx pregnancy, etc</td>
</tr>
<tr>
<td>345xx</td>
<td>Epilepsy</td>
</tr>
<tr>
<td>V23.5</td>
<td>History of Fetal Loss/Stillbirth</td>
</tr>
<tr>
<td>V23.41</td>
<td>History of pre-term Labor</td>
</tr>
<tr>
<td>V23.49</td>
<td>Poor OB history</td>
</tr>
</tbody>
</table>

### b. Maternal Stillbirth or Birth Hypoxia/Asphyxia Codes
- V27.1 Single Stillborn
- V27.3 One twin stillborn
- V27.4 Both twins stillborn
- V27.6 Other multiple birth, with stillborn
- V27.7 Other multiple birth, all stillborn
- 768xx Intrauterine hypoxia and Birth asphyxia
- 656.4x Intrauterine death affecting management of mother

### c. Premature or small infant. (Infant codes):

<table>
<thead>
<tr>
<th>76400 LIGHT-FOR-DATES WTNOS</th>
<th>76401 LIGHT-FOR-DATES 500-749G</th>
</tr>
</thead>
<tbody>
<tr>
<td>76403 LT-FOR-DATES 750-799G</td>
<td>76404 LT-FOR-DATES 800-1249G</td>
</tr>
<tr>
<td>76406 LT-FOR-DATES 1500-1749G</td>
<td>76407 LT-FOR-DATES 1750-1999G</td>
</tr>
<tr>
<td>76408 LT-FOR-DATES 2000-2499G</td>
<td>76409 LT-FOR-DATES 2500-2999G</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>76410 LT-FOR-DATE W/MAL WTNOS</th>
<th>76411 LT-FOR-DATE W/MAL &lt;500G</th>
</tr>
</thead>
<tbody>
<tr>
<td>76412 LT-DATE W/MAL 500-749G</td>
<td>76413 LT-DATE W/MAL 750-799G</td>
</tr>
<tr>
<td>76414 LT-DATE W/MAL 800-1249G</td>
<td>76415 LT-DATE W/MAL 1500-1749G</td>
</tr>
<tr>
<td>76416 LT-DATE W/MAL 1800-2499G</td>
<td>76417 LT-DATE W/MAL 2500-2999G</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>76418 LT-DATE W/MAL 3000-3499G</th>
<th>76419 LT-DATE W/MAL 3500-4000G</th>
</tr>
</thead>
<tbody>
<tr>
<td>76420 FETAL MALNUTRITION WTNOS</td>
<td>76421 FETAL MALNUTRITION &lt;500G</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>-----------------------------</td>
</tr>
<tr>
<td>76423 FETAL MALNUTRITION 500-749G</td>
<td>76424 FETAL MALNUTRITION 750-999G</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>-----------------------------</td>
</tr>
<tr>
<td>76425 FETAL MALNUTRITION 1000-1249G</td>
<td>76426 FETAL MALNUTRITION 1500-1749G</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>-----------------------------</td>
</tr>
<tr>
<td>76427 FETAL MALNUTRITION 1800-2499G</td>
<td>76428 FETAL MALNUTRITION 2500-2999G</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>76429 FETAL MALNUTRITION 3000-3499G</td>
<td>76430 FETAL MALNUTRITION 3500-4000G</td>
</tr>
</tbody>
</table>

### 3. Either Class A or Class B (UnDuplicated Union of the Class 1 and Class 2 Sets)
C. DATA SOURCES

A. Survey of hospitals, birthing centers, and other health care facilities at which eligible women have delivered:

   a. Classify by answer yes or no to the following question:

      **Does this facility always have 24/7 in-house coverage dedicated to the obstetrical service by an anesthesiologist who is qualified to provide obstetrical anesthesia?**

      a) Yes
      b) No
      c) Unsure
      d) Refuse

This is Question 2 of the four question HROB questionnaire included in the Appendix.

B. Data with billing and diagnosis codes

   a. Identify Eligible population

      i. Women who have deliveries in health care facilities
      ii. Identify those deliveries associated with high risk conditions

         1. Maternal record: High Risk Diagnoses
         2. Maternal record: Complicated Delivery
         3. Maternal record: Stillbirth or Birth Asphyxia
         4. Infant record: Premature or Small Infant

C. Woman’s medical record

   a. If needed for maternal race, ethnicity, or data regarding place of residence.

D. CALCULATION

Step 1: Identify all deliveries that occurred in medical facilities, using the criteria above.

Step 2 Link Maternal and Infant charts

Step 3 Identify Class A, Class B, and an unduplicated list that represents the Union of Class A or Class B High Risk Pregnancies. These are Denominator 1, Denominator 2, and Denominator 3, respectively. These are considered women in potential need of high risk services (“high risk” for short)

Step 4 Identify each health care facility that has at least one delivery that is in Denominator 1 or Denominator 2
Step 5: Identify which of those health care facilities answered “Yes” to above question. Classify each facility by whether or not they answered “Yes”. Missing data regarding the facility are considered to be “No” responses. Consider as Class 1 facilities answering “Yes”, Consider as Class 2 facilities that did not.

Step 6: Collect the following data elements for all eligible women

i. Race
ii. Ethnicity
iii. Insurance type (Public, Commercial, Uninsured)
iv. Benefit type (if insured): HMO, PPO, Medicaid Primary Care Management (PCCM) Plan, Fee for Service (FFS), Other
v. Zip Code, State and County or equivalent area of Mother’s residence. Record FIPS if available

Step 7: Create stratification variables

i. Race/Ethnicity: Hispanic, Non-Hispanic Black, Non-Hispanic White; Non-Hispanic Asian/Pacific Islander, Other Non-Hispanic
ii. Public vs Commercial (Private Insurance)
iii. HMO vs PPO vs FFS vs PCCM vs Other
iv. Urban Influence Code. Identify the Urban Influence Code or UIC. (2013 urban influence codes available at: [http://www.ers.usda.gov/data-products/urban-influence-codes.aspx#.UZUvG2cVoj8](http://www.ers.usda.gov/data-products/urban-influence-codes.aspx#.UZUvG2cVoj8)). Use mother's place of residence to determine UIC. State and County names can be linked or looked up directly or zip codes can be linked to County indirectly, using the Missouri Census Data Center ([http://mcdc.missouri.edu/](http://mcdc.missouri.edu/)). These data will link to County or County equivalents as used in various states.
Identify the Level of Poverty in the mother’s county of residence.

The percent of all residents in poverty by county or county equivalent are available from the US Department of Agriculture at http://www.ers.usda.gov/data-products/county-level-data-sets/download-data.aspx Our stratification standards are based on 2011 US population data that we have analyzed with SAS 9.3. Using Mother’s state and county of residence (or equivalent) or FIPS code, use the variable PCTPOVALL_2011 to categorize into one of 5 Strata:

- a. Lowest Quartile of Poverty if percent in poverty is <=12.5%
- b. Second Quartile of Poverty if percent in poverty is >12.5% and <=16.5%
- c. Third Quartile of poverty if percent in poverty is >16.5% and <=20.7%
- d. First upper quartile (75th-90th) if percent in poverty is >20.7% and <=25.7%
- e. Second upper quartile (>90th percentile

If needed, the Missouri Data center linked in Step 7. iv. may be used to link zip codes to county equivalents.

Step 8: Count the number of high risk deliveries that occurred in Class 1 and Class 2 facilities for each of the three ways of qualifying (Class A, Class B, and Union of Class A or Class B. These are Numerator 1, Numerator 2, and Numerator 3, respectively.

Step 9. Calculate the percentage of high risk pregnancies that were delivered in Class 1 and Class 2 Hospitals.

- Percentage1 is calculated as the 100*Numerator1/Denominator1,
- Percentage2 is calculated as the 100*Numerator2/Denominator2.
- Percentage3 is calculated as the 100*Numerator1/Denominator3.
- Report all percentages to 2 decimal places.

Step 10: Report the results of Step 9.

Step 11: Repeat steps 3,8, 9, & 10 for each stratification category listed below, using the following data elements. Report all strata with N of at least 250

- a. Race and ethnicity
- b. Insurance type (Public/Medicaid, Private/Commercial, None, other)
- c. Benefit type: HMO vs PPO vs FFS vs PCCM vs Other
- d. Urban Influence Code or UIC.
- e. Level of Poverty in the County of Residence.
Step 12: Optionally calculate 95% confidence intervals.

a. Calculate standard error as the square root of the proportion of newborns delivered in facilities with the given structure multiplied by 1-the same proportion divided by the number of deliveries.

b. Multiply the standard error by 1.96.

c. Subtract that value from the measured proportion. Report the greater of 0 and that number as the lower bound of the 95% confidence interval;

d. Add the product from b to the measured proportion. Use the lesser of that sum or 1 as the upper bound of the 95% confidence interval.