

A. Description

Reporting on the extent to which high risk women are delivered at facilities with a 24/7 in-house physician capable of safely managing labor and delivery, and performing a cesarean section, including an emergent cesarean section. 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

| Identification of Deliveries of Interest | |
|---|--|
| Description | Code(s) |
| Revenue Code | 722 Delivery |
| Outcome of delivery ICD-9 | ICD-9-CM = V27 |
| Normal delivery | ICD-9-CM = 650 |
| Diagnosis-related group (DRG) delivery codes | 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 & curettage) 375 (vaginal delivery with operation room procedure except sterilization and/or dilatation & curettage) |

| | |
|---|---|
| Selected delivery related procedures | ICD-9-CM = 720, 721, 7221, 7229, 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) |
| Exclusions | 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) |

Identify Women in Need of High risk Services:

1. Class A: Maternal Diagnoses and Comorbidities

| CCS Category | Look Back Period | Descriptor | Remove from inclusion List* |
|--------------|------------------|--|--|
| 49 | 2y | DM without Cx | 7902 Abnormal Glucose 79021 Impaired fasting glucose 79022 Impaired glucose tolerance test (oral) 79029 Other abnormal glucose 7915 Glycosuria |
| 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 Dyssrhythmias | |
| 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 5891 Bilateral small kidneys 5899 Small kidney, unspecified |
| | | | |
| 128 | 10 m | Asthma | 49381 Exercise induced |

| | | | |
|----------------|------|--|---|
| | | | bronchospasm 49382 Cough variant asthma |
| 132 | 10 m | Lung disease due to external agents | |
| 133 | 2y | Other lower respiratory disease | 78600 Respiratory abnormality, unspecified 78601 Hyperventilation 78602 Orthopnea 78605 Shortness of breath 78606 Tachypnea 78607 Wheezing 78606 Tachypnea 78607 Wheezing 7862 Cough 7864 Abnormal sputum 78652 painful respiration 7866 Swelling, mass, or lump in chest 7867 Abnormal chest sounds 7868 Hiccough 7931 nonspecific (abnormal) findings on radiological and other examination of lung field 79311 Solitary pulmonary nodule 79319 Other nonspecific abnormal finding of lung field 7942 Nonspecific abnormal results of pulmonary function study V126 personal history of diseases of respiratory system V1260 personal history of unspecified disease of respiratory system V1261 Personal history of pneumonia (recurrent) V1269 Personal history of other diseases of respiratory system |
| 59, 61, 63, 64 | 2y | 59. Deficiency anemias 61. Sickle cell 63. WBC disease 64. Other hematologic conditions | 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 |
| 660 | 2y | Alcohol related | |
| 661 | 2y | Substance related | |
| 116 | 2y | Aortic and peripheral arterial embolic thrombotic | |
| 118 | 2y | Phlebitis, embolic, etc | 4510 45182 4536 4537 |
| 5 | 2y | HIV | |

| | | | |
|-----|-----|--|---|
| 182 | 2y | Hemorrhage during pregnancy, abruption, previa | 640 64200 64201 64202 64203 64080 64081 64083 64090 64091 64093 |
| 183 | 10m | Hypertension complicating pregnancy | 64230 64231 64232 64233 64234 |
| 83 | 2y | Epilepsy | |

*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)

The following are additional ICD9 Codes that should be included

| | | | |
|----------------------|-----|---|--|
| 6565- 65651 65653 | 10m | Poor Fetal Growth | |
| | 10m | Disorders of pregnancy and delivery | |
| 679 6790x | | Complications of in utero procedures | |
| 641xx | | Antepartum hemorrhage abruptio placentae and previa | |
| 663 | | Umbilical cord complications | |
| 6511 – 6519 | | Uterine rupture | |
| 6560-65643 | | Significant fetal complications affecting management t of mother | |
| 666 | | Postpartum bleed | |
| 668 | | Complications of anesthesia | |
| 670 | | Major puerperal infection | |
| 6713-67144 | | Deep thrombo-embolus | |
| 673xx | | OB Pulm Embolus | |
| 6740x | | Cerebrovascular disorders in the puerperium | |
| 6745x | | Peripartum cardiomyopathy | |
| 6483x | | Drug dependence | |
| 6484x | | Mental disorders Complicating pregnancy, childbirth or puerperium | |
| 6485x | | Congenital cardiac disorder, mother | |

| | | | |
|--------|--|--------------------------------------|--|
| 6486x | | Other CV disease cx pregnancy, etc | |
| 6494x | | Epilepsy cx pregnancy, etc | |
| 6943x | | Coagulation dfects cx pregnancy, etc | |
| 345xx | | Epilepsy | |
| V23.5 | | History of Fetal Loss/Stillbirth | |
| V23.41 | | History of pre-term Labor | |
| V23.49 | | Poor OB history | |

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):

| | | | |
|-------|--------------------------|-------|----------------------------|
| 76400 | LIGHT-FOR-DATES WTNOS | 76490 | FET GROWTH RETARD WTNOS |
| 76401 | LIGHT-FOR-DATES <500G | 76491 | FET GROWTH RETARD <500G |
| 76402 | LT-FOR-DATES 500-749G | 76492 | FET GROWTH RET 500-749G |
| 76403 | LT-FOR-DATES 750-999G | 76493 | FET GROWTH RET 750-999G |
| 76404 | LT-FOR-DATES 1000-1249G | 76494 | FET GRWTH RET 1000-1249G |
| 76405 | LT-FOR-DATES 1250-1499G | 76495 | FET GRWTH RET 1250-1499G |
| 76406 | LT-FOR-DATES 1500-1749G | 76496 | FET GRWTH RET 1500-1749G |
| 76407 | LT-FOR-DATES 1750-1999G | 76497 | FET GRWTH RET 1750-1999G |
| 76408 | LT-FOR-DATES 2000-2499G | 76498 | FET GRWTH RET 2000-2499G |
| 76410 | LT-FOR-DATE W/MAL WTNOS | 76500 | EXTREME IMMATUR WTNOS |
| 76411 | LT-FOR-DATE W/MAL <500G | 76501 | EXTREME IMMATUR <500G |
| 76412 | LT-DATE W/MAL 500-749G | 76502 | EXTREME IMMATUR 500-749G |
| 76413 | LT-DATE W/MAL 750-999G | 76503 | EXTREME IMMATUR 750-999G |
| 76414 | LT-DATE W/MAL 1000-1249G | 76504 | EXTREME IMMATUR 1000-1249G |
| 76415 | LT-DATE W/MAL 1250-1499G | 76505 | EXTREME IMMATUR 1250-1499G |
| 76416 | LT-DATE W/MAL 1500-1749G | 76506 | EXTREME IMMATUR 1500-1749G |
| 76417 | LT-DATE W/MAL 1750-1999G | 76507 | EXTREME IMMATUR 1750-1999G |
| 76418 | LT-DATE W/MAL 2000-2499G | 76508 | EXTREME IMMATUR 2000-2499G |
| 76420 | FETAL MALNUTRITION WTNOS | 76510 | PRETERM INFANT NEC WTNOS |
| 76421 | FETAL MALNUTRITION <500G | 76511 | PRETERM NEC <500G |
| 76422 | FETAL MALNUTR 500-749G | 76512 | PRETERM NEC 500-749G |
| 76423 | FETAL MAL 750-999G | 76513 | PRETERM NEC 750-999G |
| 76424 | FETAL MAL 1000-1249G | 76514 | PRETERM NEC 1000-1249G |
| 76425 | FETAL MAL 1250-1499G | 76515 | PRETERM NEC 1250-1499G |
| 76426 | FETAL MAL 1500-1749G | 76516 | PRETERM NEC 1500-1749G |
| 76427 | FETAL MALNUTR 1750-1999G | 76517 | PRETERM NEC 1750-1999G |
| 76428 | FETAL MALNUTR 2000-2499G | 76518 | PRETERM NEC 2000-2499G |

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 dedicated coverage of the obstetrical service by a physician capable of safely managing labor and delivery, and performing a cesarean section, including an emergent cesarean section?

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

This is Question 1 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(1) or UIC. (2013 urban influence codes available at: <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/>). These data will link to County or County equivalents as used in various states.

- v. 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 $\leq 12.5\%$
 - b. Second Quartile of Poverty if percent in poverty is $> 12.5\%$ and $\leq 16.5\%$
 - c. Third Quartile of poverty if percent in poverty is $> 16.5\%$ and $\leq 20.7\%$
 - d. First upper quartile (75th-90th) if percent in poverty is $> 20.7\%$ and $\leq 25.7\%$
 - e. Second upper quartile (> 90 th 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 $100 * \text{Numerator1} / \text{Denominator1}$,
- Percentage2 is calculated as the $100 * \text{Numerator2} / \text{Denominator2}$.
- Percentage3 is calculated as the $100 * \text{Numerator1} / \text{Denominator3}$.
- 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.