SECTION II. DETAILED MEASURE SPECIFICATIONS

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.

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), 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)

Identification of Women in Need of High-risk Services:

1. Class A: Maternal Diagnoses and Comorbidities

CCS Category	Look Back Period	Descriptor	ICD9 Codes to 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 disease	
104	2y	Other and ill-defined heart disease	
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 dysrhythmias	
107	2y	Cardiac arrest and vfib	
108	2y	CHF, non-hypertensive	
109	2y	Acute cerebrovascular disease	
110	2y	Occlusion or stenosis of pre cerebral arteries	
111	2y	Other and ill-defined cerebrovascular disease	
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	Deficiency anemias Sickle cell WBC disease 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, emobolic, 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 underlinexclusions/underline, 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)

65650 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
66501 – 66511		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
  i. V27.1 Single stillborn
  ii. V27.3 One twin stillborn
  iii. V27.4 Both twins stillborn
  iv. Other multiple birth, with stillborn
  v. V27.7 Other multiple birth, all stillborn
  vi. 768xx Intrauterine hypoxia and Birth asphyxia
  vii. 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 IMMAT 1000-1249G
76415	LT-DATE W/MAL 1250-1499G	76505	EXTREME IMMAT 1250-1499G
76416	LT-DATE W/MAL 1500-1749G	76506	EXTREME IMMAT 1500-1749G
76417	LT-DATE W/MAL 1750-1999G	76507	EXTREME IMMAT 1750-1999G
76418	LT-DATE W/MAL 2000-2499G	76508	EXTREME IMMAT 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

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

    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.)

2. 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
3. Woman's medical record

    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 and 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:
      • Lowest Quartile of Poverty if percent in poverty is <=12.5%

- Second Quartile of Poverty if percent in poverty is >12.5% and <=16.5%
- Third Quartile of poverty if percent in poverty is >16.5% and <=20.7%
- First Upper Quartile (75th-90th) if percent in poverty is >20.7% and <=25.7%
- Second Upper Quartile (>90th percentile) if percent in poverty is >25.7%

(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.
- Percentage 1 is calculated as the 100*Numerator1/Denominator 1
- Percentage 2 is calculated as the 100*Numerator2/Denominator 2
- Percentage 3 is calculated as the 100*Numerator3/Denominator 3
- 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.
- Race and ethnicity
- Insurance type (Public/Medicaid, Private/Commercial, None, other)
- Benefit type: HMO vs PPO vs FFS vs PCCM vs Other
- Urban Influence Code or UIC.
- 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 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.