

Supplemental Online Content

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This supplemental material has been provided by the authors to give readers additional information about their work.

Supplemental Table 1: ICD-9 and ICD-10 codes used to identify independent and dependent variables

Variable	ICD-9	ICD-10
Descriptive variables		
Delivery admissions	DX: V27, 650 – 669 PR: 72-75	DX: O60 – O82, Z37-Z38 PR: 10D07Z3 – 10D07Z8, 10D00Z0 – 10D00Z2, 10E0XZZ, 0DQR0ZZ, 0HQ9XZZ, 0KQM0ZZ, 0W8NXZZ
Exposures		
Sickle cell disease	282.60 – 282.69 or 282.41 – 282.42	D57.0 – D57.2*, D57.4*, D57.8*
Pregnancy outcomes		
Acute heart failure ^a	997.1	I97.12*, I97.13*, I19.71*
Acute myocardial infarction	410.*	I21.01, I21.02, I21.09, I21.11, I21.19, I21.21, I21.29, I21.3, I21.4, I21.9
Acute renal failure ^a	584.5, 584.6, 584.7, 584.8, 584.9, 669.3*	N17.0, N17.1, N17.2, N17.8, N17.9, O90.4
Adult respiratory distress syndrome ^a	518.5*, 518.81, 518.82, 518.84, 799.1	J80, J95.1, J95.2, J95.3, J95.821, J95.922, J96.00, J96.01, J96.02, J96.20, J96.21, J96.22, R09.2
Air or thrombotic embolism ^a	415.1*, 673.0*, 673.2*, 673.3*, 673.8*	I26.*, O88.0*, O88.2*, O88.3*, O88.8*
Amniotic fluid embolism ^a	673.1*	O88.11*, O88.12, O88.13
Aneurysm ^a	441.*	I71.00-I71.03, I71.1, I71.2, I71.3, I71.4, I71.5, I71.6, I71.8, I71.9, I79.0
Cardiac arrest ^a	427.41, 427.42, 427.5	I46.2, I46.8, I46.9, I49.0*
Cerebrovascular event ^a	430.0 – 437.99, 671.5*, 674.0*, 997.02	I60 – I68.8, O22.51, O22.52 I97.81*, I97.82*, O87.3
Cesarean delivery	DX: 669.7 PR: 74.0, 74.1, 74.2, 74.4, 74.9*	DX: O82*, O75.82, z3801, z3831, z3862, z3864, z3866, z3869 PR: 10D00Z0-10D00Z1
Conversion of cardiac rhythm ^a	99.6*	5A2204Z, 5A12012
Disseminated intravascular coagulation ^a	286.6, 286.9, 666.3*	D65, D68.8, D68.9, O72.3
Eclampsia ^a	642.6*	O15.0*, O15.1, O15.2, O15.9
Hypertensive disorder of pregnancy, composite	642.3* 642.4* 642.5* 642.6* 642.7*	O11* O13* O14* O15*
Hysterectomy ^a	PR: 68.3* - 68.9*	PR: 0UT90ZZ, 0UT94ZZ, 0UT97ZZ, 0UT98ZZ, 0UT9FZZ

Instrumented vaginal delivery	DX: 669.5 PR: 72*	PR: 10D07Z3, 10D07Z4, 10D07Z5, 10D07Z6, 10D07Z7
Intrauterine fetal demise	656.4*, V27.1, V27.3, V27.4, V27.6, V27.7	O36.4*, Z37.1, Z37.3, Z37.4, Z37.6, Z37.7
Intrauterine growth restriction	656.5*	O36.5*
Peripartum infection	646.5*, 646.6*, 658.4, 659.3*, 670*, 672*, 674.1*, 674.2*, 674.3*	O23.0*, O23.1*, O23.2*, O23.3*, O23.4*, O41.1*, O75.3*, O85*, O86.0*, O86.1*, O86.2*, O86.4*, O86.8*, O90.0, O90.1
Placental abruption	641.2*	O45*
Post-partum hemorrhage	666*	O67.0, O67.8, O67.9, O72.0, O72.1, O72.2, O72.3
Preterm delivery	644.2	O60.1*
Preeclampsia	642.4*, 642.5*, 642.7*	O11*, O14*
Preterm premature rupture of membranes	658.1	O42.01*, O42.11*, O42.91*
Pulmonary edema ^a	518.4, 428.1, 428.0, 428.21, 428.23, 428.31, 428.33, 428.41, 428.43	J81.0, I50.1, I50.20, I50.21, I50.23, I50.30, I50.31, I50.33, I50.40, I50.41, I50.43, I50.9
Sepsis ^a	O38.*, 995.91, 995.92, 670.2*	O85, O86.04, T80.211, T81.4*
Severe anesthesia complications ^a	668.0*, 668.1*, 668.2*	O74.0, O74.1, O74.2, O74.3, O89.01, O89.09, O89.1, O89.2
Shock ^a	669.1*, 785.5*, 99.0, 995.4, 998.0*	O75.1, R57.*, R65.21, T78.2*, T88.2*, T88.6*, T81.1*
Temporary tracheostomy ^a	PR: 31.1	PR: 0B110Z4, 0B110F4, 0B113Z4, 0B113F4, 0B114Z4, 0B114F4
Transfusion	DX: V58.2 PR: 99.0*	PR: 30230H* 30230N* 30230P* 30233H* 30233N* 30233P* 30240H* 30240N* 30240P* 30243H* 30243N* 30243P*
Venous thromboembolism	415.1*, 453.4*, 453.82, 453.83, 453.84, 453.85, 453.86, 453.87, 453.89, 671.3, 671.4, 673.2	I26*, O22.3*, O87.1, O88.2*
Ventilation ^a	PR: 93.90, 96.01, 96.02, 96.03, 96.05	PR: 5A1935Z, 5A1945Z, 5A1955Z

^aIncluded in the Severe Maternal Morbidity Index; *Includes all codes that have additional digits, as long as digits preceding the asterisk match

Supplemental Table 2: Proportion of missing data, by variable

Variable	Missing SCD %	Missing Black %	Missing control %	Missing total %
Race	2.4	0.0	6.6	5.7
Income quartile by zip code	1.8	1.3	1.3	1.3
Public insurance	0.1	0.2	0.2	0.2
Hospital volume	--	--	--	0
Hospital location	--	--	--	0
Hospital teaching status	--	--	--	0
Hospital ownership	--	--	--	0

Supplemental Table 3: Survey-weighted rates of composite severe maternal morbidity and component events in delivery admissions, by group

Complication	Rate, SCD, %	Rate, Black race, %	Rate, control, %
Severe maternal morbidity	5.68	1.12	0.72
Acute myocardial infarction	0.03	0.01	<0.01
Acute pulmonary edema	0.69	0.13	0.05
Acute renal failure	1.07	0.22	0.09
Acute respiratory distress syndrome	1.71	0.15	0.08
Air or thrombotic embolism	0.64	0.05	0.03
Amniotic fluid embolism	--	<0.01	<0.01
Anesthesia complications	0.13	0.02	0.10
Aneurysm	--	<0.01	<0.01
Cardiac arrest	0.16	0.02	0.01
Cardioversion	0.13	0.02	0.01
Cerebrovascular event	0.88	0.05	0.03
Disseminated intravascular coagulation	0.91	0.29	0.25
Eclampsia	0.32	0.13	0.07
Hysterectomy	0.35	0.13	0.12
Mechanical ventilation	0.43	0.07	0.03
Obstetric shock	0.37	0.09	0.07
Sepsis	1.28	0.15	0.10
Temporary tracheostomy	0.05	0.01	<0.01

Supplemental Table 4: Comparative results of sensitivity analysis: minimal meaningful change in risk when considering only admissions coded with Black race

	SCD deliveries versus controls deliveries (all races)	SCD deliveries versus control deliveries, restricted only to deliveries with Black race
	SCD, aOR (95% CI) n=3,901	SCD, aOR (95% CI) n=3,070
Severe maternal morbidity	7.22 (6.25-8.34)	5.26 (4.49-6.15)
Cerebrovascular event	22.00 (15.25-1.72)	18.76 (12.84-27.39)
Air or thrombotic embolism	17.34 (11.55-26.03)	12.79 (8.24-19.87)
Acute respiratory distress syndrome	15.99 (12.35-20.72)	11.42 (8.67-1.07)
Acute pulmonary edema	11.43 (7.55-17.32)	5.63 (3.59-8.82)
Mechanical ventilation	10.16 (6.03-17.13)	5.98 (3.49-10.25)
Sepsis	9.95 (7.46-13.26)	8.19 (5.94-11.30)
Acute renal failure	8.90 (6.37-12.42)	4.90 (3.45-6.95)
Obstetric shock	4.79 (2.83-8.09)	3.94 (2.18-7.14)
Eclampsia	4.23 (2.40-7.48)	2.69 (1.48-4.88)
Hypertensive disorders of pregnancy	1.77 (1.62-1.93)	1.28 (1.17-1.41)
Preeclampsia	2.30 (2.08-2.55)	1.58 (1.42-1.77)
Cesarean delivery	1.47 (1.37-1.57)	1.27 (1.18-1.37)
Any peripartum infection	2.75 (2.47-3.06)	2.28 (2.03-2.55)

aORs are adjusted for patient age, public insurance status, and income quartile by zip code; and hospital geographical region, bed size, and teaching status.