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eTable 1. List of ICD-9-CM and ICD-10-CM diagnosis/procedure codes for obstetric hemorrhage

Condition	Diagnosis or Procedure Codes	ICD-9 Codes	ICD-10 Codes
Placenta previa with hemorrhage	Has any of the diagnosis codes	641.10	O44.10
		641.11	O44.12
		641.13	O44.13
			O44.30
			O44.32
			O44.33
			O44.50
			O44.52
	O44.53		
Abruptio placentae	Has any of the diagnosis codes	641.20	O45.002
		641.21	O45.003
		641.23	O45.009
			O45.012
			O45.013
			O45.019
			O45.022
			O45.023
			O45.029
			O45.092
			O45.093
			O45.099
			O45.8X2
			O45.8X3
			O45.8X9
			O45.90
	O45.92		
	O45.93		
Antepartum hemorrhage	Has any of the diagnosis codes	641.30	O46.002
		641.31	O46.003
		641.33	O46.009
		641.80	O46.012
		641.81	O46.013
		641.83	O46.019
		641.90	O46.022
		641.91	O46.023
		641.93	O46.029
			O46.092
			O46.093
			O46.099
			O46.8X2
			O46.8X3
	O46.8X9		
	O46.92		
	O46.93		
Postpartum hemorrhage	Has any of the diagnosis codes	666.00	O43.212
		666.02	O43.213
		666.04	O43.219
		666.10	O43.222
		666.12	O43.223
		666.14	O43.229
		666.20	O43.232
		666.22	O43.233
		666.24	O43.239
		666.30	O72.0
		666.32	O72.1
		666.34	O72.2

		O72.3	
Transfusion	Has any of the transfusion procedure codes	99.00	30233H1
		99.01	30233K1
		99.02	30233L1
		99.03	30233M1
		99.04	30233N1
		99.05	30233P1
		99.06	30233R1
		99.07	30233T1
		99.08	30240H1
		99.09	30240K1
			30240L1
			30240M1
			30240N1
			30240P1
			30240R1
			30240T1
			30243H1
			30243K1
			30243L1
			30243M1
			30243N1
			30243P1
			30243R1
			30243T1
			30233N0
			30233P0
			30240N0
	30240P0		
	30243N0		
	30243P0		
	D57.00		
Does not have any of the diagnosis codes for sickle cell crisis	282.62	D57.01	
	282.64	D57.02	
	282.69	D57.211	
		D57.212	
		D57.219	
		D57.411	
		D57.412	
		D57.419	
		D57.811	
		D57.812	
	D57.819		

eTable 2. Single-covariate adjusted model - Association between race/ethnicity and severe maternal morbidity among women with obstetric hemorrhage, by study period

Race Ethnicity	Baseline	Post-Intervention
	RR (95% CI)*	RR (95% CI)*
Unadjusted model		
White	1.00	1.00
Black	1.34 (1.27-1.42)	1.22 (1.05-1.40)
Asian	1.03 (0.95-1.11)	1.13 (1.00-1.28)
Hispanics	1.09 (1.03-1.15)	1.10 (0.99-1.23)
Others	1.08 (1.00-1.18)	1.07 (0.92-1.25)
Single-covariate adjusted model		
Adjustment for Age at Delivery		
White	1.00	1.00
Black	1.35 (1.28-1.43)	1.22 (1.06-1.41)
Asian	1.02 (0.94-1.09)	1.12 (0.99-1.26)
Hispanics	1.10 (1.04-1.16)	1.11 (1.00-1.24)
Others	1.07 (0.99-1.17)	1.06 (0.91-1.24)
Adjustment for Education		
White	1.00	1.00
Black	1.32 (1.25-1.40)	1.19 (1.03-1.38)
Asian	1.03 (0.96-1.10)	1.12 (0.99-1.27)
Hispanics	1.06 (1.01-1.12)	1.05 (0.94-1.18)
Others	1.08 (0.99-1.18)	1.06 (0.91-1.24)
Adjustment for Parity		
White	1.00	1.00
Black	1.35 (1.27-1.43)	1.22 (1.05-1.41)
Asian	1.03 (0.95-1.11)	1.13 (1.00-1.28)
Hispanics	1.09 (1.04-1.15)	1.10 (0.99-1.23)
Others	1.08 (1.00-1.18)	1.07 (0.92-1.25)
Adjustment for Insurance Status		
White	1.00	1.00
Black	1.32 (1.25-1.40)	1.19 (1.03-1.38)
Asian	1.03 (0.97-1.10)	1.14 (1.01-1.29)
Hispanics	1.07 (1.02-1.13)	1.08 (0.97-1.21)
Others	1.08 (0.99-1.17)	1.07 (0.92-1.24)
Adjustment for Prenatal Care		
White	1.00	1.00
Black	1.35 (1.27-1.43)	1.21 (1.05-1.40)
Asian	1.03 (0.96-1.10)	1.12 (1.00-1.26)
Hispanics	1.09 (1.03-1.15)	1.09 (0.98-1.21)
Others	1.08 (0.99-1.17)	1.05 (0.90-1.21)
Adjustment for Pre-pregnancy BMI		
White	1.00	1.00
Black	1.36 (1.27-1.45)	1.21 (1.05-1.41)

Asian	1.04 (0.98-1.10)	1.13 (0.99-1.28)
Hispanics	1.10 (1.04-1.16)	1.11 (0.99-1.23)
Others	1.09 (1.01-1.19)	1.09 (0.93-1.26)

Adjustment for Multiple Gestation

White	1.00	1.00
Black	1.36 (1.28-1.44)	1.23 (1.07-1.42)
Asian	1.04 (0.96-1.12)	1.14 (1.01-1.28)
Hispanics	1.11 (1.05-1.17)	1.12 (1.01-1.25)
Others	1.11 (1.02-1.21)	1.09 (0.94-1.27)

Adjustment for Chronic hypertension

White	1.00	1.00
Black	1.33 (1.26-1.41)	1.20 (1.04-1.39)
Asian	1.03 (0.96-1.11)	1.13 (1.01-1.28)
Hispanics	1.09 (1.03-1.15)	1.10 (0.99-1.23)
Others	1.08 (0.99-1.17)	1.06 (0.91-1.23)

Adjustment for Gestational Diabetes

White	1.00	1.00
Black	1.34 (1.26-1.42)	1.21 (1.05-1.40)
Asian	1.01 (0.94-1.09)	1.12 (0.99-1.26)
Hispanics	1.08 (1.03-1.14)	1.09 (0.98-1.22)
Others	1.06 (0.98-1.15)	1.05 (0.90-1.22)

Adjustment for Prior Cesarean Delivery

White	1.00	1.00
Black	1.28 (1.21-1.36)	1.15 (1.00-1.33)
Asian	1.03 (0.96-1.10)	1.12 (1.00-1.26)
Hispanics	1.07 (1.01-1.13)	1.09 (0.98-1.21)
Others	1.05 (0.97-1.14)	1.05 (0.90-1.22)

Adjustment for Labor Induction

White	1.00	1.00
Black	1.34 (1.27-1.42)	1.22 (1.05-1.41)
Asian	1.03 (0.95-1.11)	1.13 (1.00-1.28)
Hispanics	1.09 (1.03-1.15)	1.10 (0.99-1.23)
Others	1.08 (1.00-1.18)	1.07 (0.92-1.25)

Adjustment for Preterm Birth

White	1.00	1.00
Black	1.33 (1.25-1.41)	1.20 (1.04-1.40)
Asian	1.03 (0.96-1.11)	1.14 (1.01-1.28)
Hispanics	1.09 (1.04-1.15)	1.10 (0.99-1.23)
Others	1.08 (0.99-1.17)	1.07 (0.92-1.24)

Adjustment for Method of Delivery

White	1.00	1.00
Black	1.24 (1.17-1.32)	1.11 (0.96-1.27)
Asian	1.02 (0.94-1.10)	1.13 (1.00-1.28)
Hispanics	1.11 (1.05-1.17)	1.12 (1.01-1.25)

Others

1.05 (0.97-1.14)

1.06 (0.91-1.24)

Abbreviations: RR, relative risk; CI: confidence interval.

*Model included study period, race ethnicity, the interaction term between study period and race ethnicity, and the specified covariate as fixed effects and hospital of delivery as random effect.

eTable 3. Sensitivity analysis - Association between race/ethnicity and severe maternal morbidity among women with obstetric hemorrhage, by study period

Race Ethnicity	Baseline	Post-Intervention
	RR (95% CI)*	RR (95% CI)*
Fully adjusted model		
White	1.00	1.00
Black	1.22 (1.15-1.30)	1.07 (0.92-1.24)
Asian	1.02 (0.96-1.09)	1.09 (0.96-1.23)
Hispanics	1.09 (1.04-1.15)	1.06 (0.97-1.16)
Others	1.07 (0.98-1.16)	1.03 (0.89-1.21)
Sensitivity analysis		
Fully adjusted model excluding Age at Delivery		
White	1.00	1.00
Black	1.23 (1.15-1.31)	1.08 (0.93-1.25)
Asian	1.02 (0.96-1.08)	1.09 (0.97-1.23)
Hispanics	1.10 (1.04-1.15)	1.06 (0.97-1.17)
Others	1.07 (0.98-1.16)	1.04 (0.89-1.21)
Fully adjusted model excluding Education		
White	1.00	1.00
Black	1.24 (1.17-1.32)	1.09 (0.95-1.26)
Asian	1.02 (0.96-1.08)	1.10 (0.98-1.24)
Hispanics	1.11 (1.05-1.16)	1.10 (1.00-1.21)
Others	1.06 (0.98-1.15)	1.05 (0.90-1.21)
Fully adjusted model excluding Parity		
White	1.00	1.00
Black	1.21 (1.14-1.29)	1.06 (0.91-1.22)
Asian	1.02 (0.96-1.09)	1.09 (0.96-1.23)
Hispanics	1.09 (1.03-1.14)	1.05 (0.96-1.16)
Others	1.06 (0.97-1.15)	1.03 (0.88-1.20)
Fully adjusted model excluding Insurance Status		
White	1.00	1.00
Black	1.24 (1.16-1.32)	1.09 (0.94-1.26)
Asian	1.02 (0.95-1.09)	1.08 (0.96-1.22)
Hispanics	1.10 (1.05-1.16)	1.07 (0.97-1.17)
Others	1.07 (0.98-1.16)	1.04 (0.89-1.21)
Fully adjusted model excluding Prenatal Care		
White	1.00	1.00
Black	1.21 (1.14-1.29)	1.07 (0.92-1.24)
Asian	1.02 (0.96-1.09)	1.09 (0.97-1.24)
Hispanics	1.09 (1.04-1.14)	1.07 (0.97-1.18)
Others	1.07 (0.98-1.16)	1.06 (0.91-1.24)
Fully adjusted model excluding Pre-pregnancy BMI		

White	1.00	1.00
Black	1.20 (1.13-1.27)	1.05 (0.91-1.22)
Asian	1.04 (0.98-1.11)	1.12 (0.99-1.25)
Hispanics	1.07 (1.03-1.13)	1.05 (0.95-1.15)
Others	1.06 (0.97-1.15)	1.02 (0.87-1.20)
Fully adjusted model excluding Multiple Gestation		
White	1.00	1.00
Black	1.21 (1.14-1.30)	1.06 (0.91-1.23)
Asian	1.01 (0.95-1.07)	1.08 (0.96-1.23)
Hispanics	1.09 (1.03-1.14)	1.05 (0.96-1.16)
Others	1.04 (0.96-1.13)	1.02 (0.88-1.19)
Fully adjusted model excluding Chronic hypertension		
White	1.00	1.00
Black	1.23 (1.15-1.31)	1.08 (0.93-1.24)
Asian	1.02 (0.96-1.08)	1.09 (0.96-1.22)
Hispanics	1.09 (1.04-1.15)	1.06 (0.97-1.16)
Others	1.07 (0.98-1.16)	1.04 (0.89-1.21)
Fully adjusted model excluding Gestational Diabetes		
White	1.00	1.00
Black	1.22 (1.15-1.30)	1.07 (0.92-1.24)
Asian	1.02 (0.96-1.09)	1.09 (0.97-1.24)
Hispanics	1.10 (1.04-1.15)	1.06 (0.97-1.17)
Others	1.07 (0.99-1.17)	1.04 (0.89-1.21)
Fully adjusted model excluding Prior Cesarean Delivery		
White	1.00	1.00
Black	1.23 (1.16-1.31)	1.08 (0.93-1.24)
Asian	1.02 (0.95-1.08)	1.09 (0.97-1.23)
Hispanics	1.10 (1.04-1.15)	1.06 (0.96-1.16)
Others	1.07 (0.98-1.16)	1.04 (0.89-1.21)
Fully adjusted model excluding Labor Induction		
White	1.00	1.00
Black	1.22 (1.15-1.30)	1.07 (0.92-1.24)
Asian	1.01 (0.95-1.08)	1.08 (0.96-1.22)
Hispanics	1.09 (1.04-1.15)	1.06 (0.96-1.16)
Others	1.06 (0.98-1.15)	1.03 (0.88-1.20)
Fully adjusted model excluding Preterm Birth		
White	1.00	1.00
Black	1.22 (1.14-1.30)	1.07 (0.92-1.24)
Asian	1.02 (0.96-1.09)	1.10 (0.97-1.24)
Hispanics	1.10 (1.04-1.15)	1.06 (0.97-1.17)
Others	1.07 (0.98-1.16)	1.04 (0.89-1.21)

Fully adjusted model excluding Method of Delivery

White	1.00	1.00
Black	1.29 (1.21-1.38)	1.14 (0.98-1.32)
Asian	1.03 (0.97-1.10)	1.09 (0.97-1.23)
Hispanics	1.09 (1.04-1.15)	1.07 (0.97-1.17)
Others	1.09 (1.00-1.19)	1.04 (0.89-1.21)

Abbreviations: RR, relative risk; CI: confidence interval.

*Fully adjusted model excluding the specified covariate.

eTable 4. Single-mediator adjustment model - Association between race/ethnicity and severe maternal morbidity excluding transfusions-only cases among women with obstetric hemorrhage, by study period

Race Ethnicity	Baseline	Post-Intervention
	RR (95% CI)*	RR (95% CI)*
Unadjusted model		
White	1.00	1.00
Black	1.46 (1.30-1.65)	1.22 (0.98-1.52)
Asian	1.15 (1.05-1.25)	1.09 (0.90-1.32)
Hispanics	1.05 (0.95-1.15)	0.96 (0.82-1.12)
Others	1.02 (0.87-1.19)	0.97 (0.75-1.27)
Single-covariate adjusted model		
Adjustment for Age at Delivery		
White	1.00	1.00
Black	1.56 (1.38-1.76)	1.27 (1.02-1.59)
Asian	1.10 (1.00-1.20)	1.06 (0.87-1.28)
Hispanics	1.11 (1.01-1.22)	1.02 (0.87-1.19)
Others	1.00 (0.85-1.17)	0.96 (0.74-1.25)
Adjustment for Education		
White	1.00	1.00
Black	1.43 (1.26-1.62)	1.15 (0.91-1.47)
Asian	1.14 (1.05-1.25)	1.07 (0.88-1.30)
Hispanics	1.02 (0.93-1.12)	0.93 (0.79-1.10)
Others	1.02 (0.87-1.19)	0.98 (0.75-1.29)
Adjustment for Parity		
White	1.00	1.00
Black	1.44 (1.27-1.63)	1.20 (0.96-1.49)
Asian	1.14 (1.05-1.25)	1.09 (0.90-1.32)
Hispanics	1.03 (0.93-1.13)	0.95 (0.81-1.11)
Others	0.99 (0.85-1.16)	0.96 (0.74-1.25)
Adjustment for Insurance Status		
White	1.00	1.00
Black	1.46 (1.29-1.65)	1.21 (0.97-1.52)
Asian	1.15 (1.05-1.26)	1.10 (0.91-1.33)
Hispanics	1.04 (0.95-1.14)	0.96 (0.82-1.12)
Others	1.01 (0.87-1.18)	0.97 (0.75-1.27)
Adjustment for Prenatal Care		
White	1.00	1.00
Black	1.47 (1.30-1.67)	1.21 (0.96-1.52)
Asian	1.15 (1.05-1.25)	1.08 (0.89-1.31)
Hispanics	1.04 (0.95-1.15)	0.95 (0.82-1.10)
Others	1.02 (0.87-1.20)	0.92 (0.71-1.19)
Adjustment for Pre-pregnancy BMI		
White	1.00	1.00

Black	1.48 (1.30-1.69)	1.19 (0.94-1.50)
Asian	1.14 (1.04-1.25)	1.14 (0.93-1.40)
Hispanics	1.04 (0.94-1.16)	0.98 (0.84-1.15)
Others	1.02 (0.87-1.19)	1.02 (0.79-1.32)
Adjustment for Multiple Gestation		
White	1.00	1.00
Black	1.48 (1.31-1.68)	1.23 (0.99-1.54)
Asian	1.16 (1.06-1.27)	1.10 (0.91-1.33)
Hispanics	1.07 (0.97-1.17)	0.98 (0.84-1.14)
Others	1.04 (0.89-1.22)	0.99 (0.76-1.28)
Adjustment for Chronic hypertension		
White	1.00	1.00
Black	1.44 (1.28-1.63)	1.19 (0.95-1.48)
Asian	1.15 (1.05-1.26)	1.10 (0.91-1.33)
Hispanics	1.05 (0.95-1.15)	0.96 (0.82-1.12)
Others	1.00 (0.86-1.17)	0.95 (0.72-1.23)
Adjustment for Gestational Diabetes		
White	1.00	1.00
Black	1.45 (1.29-1.64)	1.21 (0.97-1.51)
Asian	1.12 (1.02-1.22)	1.06 (0.88-1.29)
Hispanics	1.03 (0.94-1.13)	0.94 (0.81-1.10)
Others	0.98 (0.83-1.14)	0.94 (0.72-1.22)
Adjustment for Prior Cesarean Delivery		
White	1.00	1.00
Black	1.36 (1.21-1.53)	1.11 (0.89-1.39)
Asian	1.14 (1.05-1.25)	1.08 (0.89-1.31)
Hispanics	1.01 (0.93-1.11)	0.94 (0.81-1.09)
Others	0.97 (0.83-1.13)	0.95 (0.72-1.24)
Adjustment for Labor Induction		
White	1.00	1.00
Black	1.46 (1.30-1.65)	1.22 (0.97-1.52)
Asian	1.14 (1.04-1.25)	1.09 (0.90-1.32)
Hispanics	1.04 (0.95-1.15)	0.96 (0.82-1.12)
Others	1.01 (0.87-1.18)	0.97 (0.74-1.26)
Adjustment for Preterm Birth		
White	1.00	1.00
Black	1.42 (1.26-1.60)	1.19 (0.95-1.49)
Asian	1.16 (1.06-1.26)	1.11 (0.92-1.34)
Hispanics	1.05 (0.96-1.16)	0.97 (0.83-1.13)
Others	1.01 (0.86-1.18)	0.97 (0.74-1.26)
Adjustment for Method of Delivery		
White	1.00	1.00
Black	1.33 (1.18-1.50)	1.08 (0.87-1.35)
Asian	1.12 (1.02-1.24)	1.09 (0.90-1.32)

Hispanics	1.08 (0.98-1.18)	1.00 (0.86-1.16)
Others	0.98 (0.83-1.15)	0.96 (0.73-1.25)

Abbreviations: RR, relative risk; CI: confidence interval.

*Model included study period, race ethnicity, the interaction term between study period and race ethnicity, and the specified covariate as fixed effects and hospital of delivery as random effect.

eTable 5. Sensitivity analysis - Association between race/ethnicity and severe maternal morbidity excluding transfusions-only cases among women with obstetric hemorrhage, by study period

Race Ethnicity	Baseline	Post-Intervention
	RR (95% CI)*	RR (95% CI)*
Fully adjusted model		
White	1.00	1.00
Black	1.33 (1.16-1.52)	0.99 (0.76-1.29)
Asian	1.06 (0.96-1.18)	1.05 (0.86-1.27)
Hispanics	1.05 (0.95-1.16)	0.96 (0.82-1.12)
Others	0.95 (0.80-1.12)	0.92 (0.70-1.22)
Sensitivity analysis		
Fully adjusted model excluding Age at Delivery		
White	1.00	1.00
Black	1.31 (1.14-1.49)	0.97 (0.75-1.27)
Asian	1.08 (0.97-1.19)	1.05 (0.87-1.28)
Hispanics	1.04 (0.94-1.15)	0.95 (0.82-1.11)
Fully adjusted model excluding Education		
White	1.00	1.00
Black	1.37 (1.20-1.57)	1.04 (0.81-1.32)
Asian	1.06 (0.96-1.18)	1.06 (0.88-1.28)
Hispanics	1.09 (0.98-1.21)	1.00 (0.87-1.16)
Others	0.94 (0.79-1.11)	0.91 (0.70-1.19)
Fully adjusted model excluding Parity		
White	1.00	1.00
Black	1.32 (1.16-1.51)	0.98 (0.75-1.28)
Asian	1.06 (0.96-1.18)	1.05 (0.86-1.27)
Hispanics	1.05 (0.95-1.16)	0.96 (0.82-1.11)
Others	0.94 (0.80-1.12)	0.92 (0.70-1.21)
Fully adjusted model excluding Insurance Status		
White	1.00	1.00
Black	1.34 (1.17-1.52)	0.99 (0.77-1.29)
Asian	1.06 (0.95-1.18)	1.03 (0.86-1.25)
Hispanics	1.06 (0.96-1.17)	0.96 (0.83-1.12)
Others	0.95 (0.80-1.13)	0.92 (0.70-1.22)
Fully adjusted model excluding Prenatal Care		
White	1.00	1.00
Black	1.32 (1.16-1.50)	1.00 (0.77-1.30)
Asian	1.07 (0.97-1.19)	1.08 (0.88-1.32)
Hispanics	1.06 (0.96-1.16)	0.98 (0.83-1.15)
Others	0.96 (0.81-1.13)	0.99 (0.74-1.31)
Fully adjusted model excluding Pre-pregnancy BMI		
White	1.00	1.00
Black	1.29 (1.14-1.46)	0.98 (0.76-1.26)

Asian	1.12 (1.02-1.23)	1.05 (0.87-1.26)
Hispanics	1.04 (0.95-1.14)	0.93 (0.80-1.09)
Others	0.96 (0.81-1.13)	0.88 (0.67-1.17)

Fully adjusted model excluding Multiple Gestation

White	1.00	1.00
Black	1.32 (1.16-1.50)	0.98 (0.76-1.28)
Asian	1.05 (0.95-1.17)	1.04 (0.86-1.26)
Hispanics	1.05 (0.95-1.16)	0.95 (0.82-1.11)
Others	0.93 (0.79-1.11)	0.91 (0.69-1.21)

Fully adjusted model excluding Chronic hypertension

White	1.00	1.00
Black	1.34 (1.17-1.53)	1.00 (0.77-1.30)
Asian	1.06 (0.96-1.18)	1.04 (0.86-1.26)
Hispanics	1.05 (0.95-1.16)	0.96 (0.82-1.12)
Others	0.95 (0.80-1.13)	0.93 (0.71-1.23)

Fully adjusted model excluding Gestational Diabetes

White	1.00	1.00
Black	1.33 (1.17-1.52)	0.98 (0.76-1.28)
Asian	1.07 (0.97-1.19)	1.05 (0.87-1.28)
Hispanics	1.06 (0.96-1.17)	0.96 (0.83-1.12)
Others	0.96 (0.81-1.13)	0.93 (0.71-1.22)

Fully adjusted model excluding Prior Cesarean Delivery

White	1.00	1.00
Black	1.34 (1.17-1.54)	1.00 (0.77-1.30)
Asian	1.06 (0.95-1.17)	1.05 (0.87-1.28)
Hispanics	1.05 (0.95-1.17)	0.96 (0.82-1.12)
Others	0.95 (0.80-1.13)	0.92 (0.70-1.22)

Fully adjusted model excluding Labor Induction

White	1.00	1.00
Black	1.33 (1.16-1.52)	0.99 (0.76-1.29)
Asian	1.06 (0.95-1.17)	1.04 (0.86-1.26)
Hispanics	1.05 (0.95-1.16)	0.96 (0.82-1.12)
Others	0.94 (0.80-1.12)	0.92 (0.70-1.21)

Fully adjusted model excluding Preterm Birth

White	1.00	1.00
Black	1.33 (1.17-1.51)	0.99 (0.76-1.29)
Asian	1.06 (0.96-1.18)	1.05 (0.86-1.27)
Hispanics	1.05 (0.95-1.16)	0.96 (0.82-1.12)
Others	0.95 (0.80-1.12)	0.92 (0.70-1.22)

Fully adjusted model excluding Method of Delivery

White	1.00	1.00
Black	1.43 (1.25-1.63)	1.05 (0.81-1.37)

Asian	1.09 (0.99-1.20)	1.05 (0.86-1.27)
Hispanics	1.05 (0.96-1.16)	0.96 (0.83-1.13)
Others	0.98 (0.83-1.16)	0.94 (0.72-1.23)

Abbreviations: RR, relative risk; CI: confidence interval.

*Fully adjusted model excluding the specified covariate.

eTable 6. Rate of hemorrhage-related severe maternal morbidity^a (SMM), by race/ethnicity and study period

Race/Ethnicity	Rate of hemorrhage-related SMM						Effect Estimate	
	Baseline Num/Denom	Rate (%)	Post-Intervention Num/Denom	Rate (%)	Absolute Rate Reduction (%)	Percentage Rate Reduction (%)	RR ^b (95% CI)	RR ^c (95% CI)
Hemorrhage-related SMM								
All combined	11,876/54,311	21.9	3481/19165	18.2	3.7	17.0	0.84 (0.75-0.93)	0.83 (0.75-0.93)
White	3,095/15,775	19.6	859/5401	15.9	3.7	19.0	0.83 (0.70-0.97)	0.85 (0.73-0.98)
Black	957/3,404	28.1	231/1114	20.7	7.4	26.2	0.74 (0.61-0.90)	0.74 (0.63-0.88)
Asian	1,652/8,180	20.2	602/3195	18.8	1.4	6.7	0.91 (0.79-1.05)	0.90 (0.78-1.05)
Hispanics	5,399/23,051	23.4	1582/8161	19.4	4.0	17.3	0.84 (0.75-0.93)	0.82 (0.74-0.91)
Others	773/3,901	19.8	207/1294	16.0	3.8	19.3	0.81 (0.68-0.96)	0.81 (0.67-0.98)
Hemorrhage-related SMM excluding cases with transfusion alone^d								
All combined	3,522/54,311	6.5	960/19165	5.0	1.5	22.7	0.75 (0.66-0.85)	0.74 (0.65-0.85)
White	955/15,775	6.1	269/5401	5.0	1.1	17.7	0.80 (0.66-0.97)	0.80 (0.66-0.96)
Black	293/3,404	8.6	65/1114	5.8	2.8	32.3	0.65 (0.50-0.84)	0.60 (0.45-0.78)
Asian	562/8,180	6.9	167/3195	5.2	1.6	23.9	0.75 (0.59-0.95)	0.77 (0.59-1.00)
Hispanics	1,504/23,051	6.5	406/8161	5.0	1.6	23.8	0.74 (0.64-0.86)	0.72 (0.62-0.84)
Others	208/3,901	5.3	53/1294	4.1	1.2	23.1	0.74 (0.55-0.99)	0.75 (0.55-1.02)

Abbreviations: SMM, severe maternal morbidity; Num, numerator; Denom, denominator; RR, relative risk; CI, confidence interval.

^aHemorrhage-related severe maternal morbidity includes transfusion, acute renal failure, adult respiratory distress, cardiac arrest, disseminated intravascular coagulation, acute heart failure, pulmonary edema, shock, hysterectomy, and ventilation.

^bModel included study period, race/ethnicity, and the interaction term between study period and race/ethnicity as fixed effects and hospital of delivery as random effect.

^cModel additionally included all of the maternal sociodemographic and clinical factors listed in Table 1 as fixed effects.

^dIn models estimating relative risks and confidence intervals for hemorrhage-related severe maternal morbidities, women with transfusion alone were excluded from the analysis.

eTable 7. Association between race/ethnicity and hemorrhage-related severe maternal morbidity^a (SMM), by study period

Race/Ethnicity	<u>Hemorrhage-related SMM</u>		<u>Hemorrhage-related SMM excluding cases with transfusion alone^b</u>	
	Baseline RR (95% CI)	Post- Intervention RR (95% CI)	Baseline RR (95% CI)	Post- Intervention RR (95% CI)
Model 1^c: Unadjusted model				
White	1.00	1.00	1.00	1.00
Black	1.33 (1.26-1.41)	1.20 (1.03-1.40)	1.41 (1.24-1.61)	1.14 (0.90-1.44)
Asian	1.03 (0.95-1.11)	1.13 (1.00-1.29)	1.15 (1.04-1.27)	1.08 (0.86-1.34)
Hispanics	1.09 (1.04-1.15)	1.11 (0.99-1.24)	1.04 (0.94-1.14)	0.96 (0.82-1.13)
Others	1.06 (0.98-1.16)	1.04 (0.90-1.22)	0.94 (0.81-1.10)	0.87 (0.65-1.15)
Model 2^d: Adjusted model – adjustment for sociodemographic factors				
White	1.00	1.00	1.00	1.00
Black	1.31 (1.24-1.38)	1.17 (1.00-1.37)	1.42 (1.24-1.62)	1.12 (0.88-1.44)
Asian	1.02 (0.96-1.09)	1.12 (0.98-1.27)	1.10 (1.00-1.22)	1.03 (0.82-1.29)
Hispanics	1.07 (1.02-1.12)	1.06 (0.95-1.18)	1.03 (0.94-1.13)	0.95 (0.80-1.13)
Others	1.05 (0.97-1.15)	1.03 (0.88-1.20)	0.90 (0.77-1.06)	0.85 (0.64-1.13)
Model 3^e: Adjusted model – adjustment for sociodemographic and clinical factors except for method of delivery				
White	1.00	1.00	1.00	1.00
Black	1.28 (1.20-1.36)	1.13 (0.96-1.33)	1.37 (1.20-1.57)	1.02 (0.78-1.33)
Asian	1.03 (0.97-1.09)	1.09 (0.96-1.23)	1.07 (0.96-1.20)	1.01 (0.80-1.26)
Hispanics	1.10 (1.04-1.15)	1.07 (0.97-1.18)	1.05 (0.95-1.16)	0.96 (0.82-1.12)
Others	1.07 (0.99-1.16)	1.01 (0.86-1.18)	0.90 (0.76-1.05)	0.83 (0.63-1.09)
Model 4^f: Adjusted model – adjustment for all sociodemographic and clinical factors including method of delivery (fully adjusted model)				
White	1.00	1.00	1.00	1.00
Black	1.21 (1.14-1.29)	1.06 (0.91-1.24)	1.28 (1.12-1.47)	0.96 (0.74-1.24)
Asian	1.01 (0.95-1.08)	1.08 (0.95-1.23)	1.05 (0.94-1.17)	1.01 (0.81-1.26)
Hispanics	1.10 (1.04-1.15)	1.06 (0.96-1.17)	1.05 (0.95-1.17)	0.95 (0.81-1.12)
Others	1.04 (0.96-1.13)	1.00 (0.86-1.17)	0.87 (0.74-1.02)	0.82 (0.62-1.08)

Abbreviations: SMM, severe maternal morbidity; RR, relative risk; CI: confidence interval.

^aHemorrhage-related severe maternal morbidity includes transfusion, acute renal failure, adult respiratory distress, cardiac arrest, disseminated intravascular coagulation, acute heart failure, pulmonary edema, shock, hysterectomy, and ventilation.

^bCases with transfusion alone were excluded from the analysis.

^cUnadjusted model. Model included study period, race ethnicity, and the interaction term between study period and race ethnicity as fixed effects and hospital of delivery as random effect.

^dBased on model 1, additionally included maternal sociodemographic factors (age at delivery, education levels, parity, and insurance status) as fixed effect.

^eBased on model 2, additionally included maternal clinical factors (prenatal visits, pre-pregnancy body mass index, multiple pregnancy, chronic hypertension, gestational diabetes, prior cesarean delivery, labor induction, and pre-term birth) as fixed effect.

^fFully adjusted model. Based on model 3, additionally included method of delivery as fixed effect.