

SUPPLEMENTAL MATERIAL

Table S1. Diagnoses for the exposure, covariates, and outcomes of interest based on hospitalization and emergency department International Classification of Diseases, Ninth and Tenth Revision, Clinical Modification (ICD-9-CM) and (ICD-10-CM) codes or as reported on birth certificates or death certificates

DIAGNOSIS	ICD-9-CM CODE	ICD-10-CM CODE
Outcome of delivery (birth) *	V27.x, V30.x, 640-649, 650-659, 660-669	Z37.x
Single liveborn; single live birth *	V27.0, V30.0	Z37.0
Diabetes (maternal/gestational)	250.00-250.92, 648.01-648.02, 648.81-648.82	E10.x, E11.x, O24.0-O24.3, O24.4, O24.9,
Pre-pregnancy diabetes (birth certificate)	--	--
Gestational diabetes (birth certificate)	--	--
Kidney transplant	procedure code: 55.6, V42.0	Z94.0
Coronary heart disease (CHD)		
Ischemic heart disease, Atherosclerosis, Cardiovascular disease, unspecified; Atherosclerotic heart disease of native coronary artery without angina pectoris	410.x-414.x, 429.2, 440	I20.x, I21.x, I24.x, I25.x, I70
Stroke		
Acute ischemic stroke	430, 431, 433.x1, 434.x1, 436	I60.9, I61.9, I62.x, I63x, I66.x, I67.x
Hypertensive disorders of pregnancy (HDP)		
Gestational hypertension, Pre-eclampsia, Eclampsia, Pre-existing hypertension with pre-eclampsia	642.3-642.7	O11.x, O13.x-O.16.x
Gestational hypertension (birth certificate)	--	--
Pre-pregnancy hypertension		
Benign essential hypertension complicating pregnancy, childbirth, and the puerperium; Hypertension secondary to renal disease complicating pregnancy, childbirth, and the puerperium; Other pre-existing hypertension complicating pregnancy, childbirth, and the puerperium; Pre-existing essential hypertension complicating pregnancy, childbirth, and the puerperium, Pre-existing hypertensive heart disease complicating pregnancy, childbirth and the puerperium	642.0-642.2	O10.0
Pre-pregnancy hypertension (birth certificate)	--	--
Pre-pregnancy hypertension with superimposed HDP †		
Pre-eclampsia or eclampsia superimposed on pre-existing hypertension; Pre-existing hypertension with pre-eclampsia	642.7	O13.x-O15.x

* Obtained from the mother's hospitalization/emergency department visit record.

† Also defined by a combination of the above diagnosis codes for hypertensive disorders of pregnancy and pre-pregnancy hypertension.

Table S2. Demographic and clinical characteristics of mothers at index birth in South Carolina stratified by racial/ethnic group, 2004-2016 ^{*,†,‡,§}

Characteristic	Non-Hispanic	Non-Hispanic	Hispanic	p-value
	white	black		
n (%) or mean ±SD	N=254,491 (58.7)	N=137,784 (31.8)	N=41,155 (9.5)	
Neither pre-pregnancy hypertension nor HDP	211,871 (83.3)	105,092 (76.3)	36,612 (89.0)	<0.0001
Pre-pregnancy hypertension alone	716 (0.3)	760 (0.6)	114 (0.3)	
HDP alone	37,544 (14.8)	26,583 (19.3)	4,087 (9.9)	
Both pre-pregnancy hypertension and HDP	4,360 (1.7)	5,347 (3.9)	342 (0.8)	
Maternal age at delivery	28.4±5.8	26.5±5.9	27.6±6.0	<0.0001
Education				
<High school	29,083 (11.4)	24,083 (17.5)	22,326 (54.2)	<0.0001
High school graduate	55,580 (21.8)	43,356 (31.5)	8,411 (20.4)	
Some college	63,471 (24.9)	43,048 (31.2)	5,216 (12.7)	
≥College graduate	106,357 (41.8)	27,297 (19.8)	5,202 (12.6)	
Rural residence	56,802 (22.3)	46,519 (33.8)	11,011 (26.8)	<0.0001
Annual household income				
<\$36,000	46,942 (18.4)	61,372 (44.5)	9,723 (23.6)	<0.0001
\$36,000-<\$54,000	131,233 (51.6)	53,797 (39.0)	19,645 (47.7)	

≥\$54,000	70,272 (27.6)	21,095 (15.3)	10,341 (25.1)	
Primary payer during pregnancy				
Medicaid	97,886 (38.5)	95,778 (69.5)	18,245 (44.3)	<0.0001
Private	131,820 (51.8)	33,639 (24.4)	6,103 (14.8)	
Self-pay	6,565 (2.6)	2,409 (1.7)	13,250 (32.2)	
Other	16,732 (6.6)	5,052 (3.7)	2,820 (6.9)	
WIC eligibility in pregnancy	91,532 (36.0)	99,137 (72.0)	26,002 (63.2)	<0.0001
Pre-pregnancy smoking	51,330 (20.2)	13,874 (10.1)	1,523 (3.7)	<0.0001
Pre-pregnancy BMI (kg/m ²)	26.5±6.5	29.4±7.4	26.9±5.6	<0.0001
Pre-pregnancy or gestational diabetes	16,758 (6.6)	10,218 (7.4)	3,183 (7.7)	<0.0001
Prenatal care as measured by R-GINDEX				
Inadequate	47,417 (18.6)	22,285 (16.2)	7,588 (18.4)	<0.0001
Intermediate	64,638 (25.4)	24,753 (18.0)	6,232 (15.1)	
Adequate	4,227 (1.7)	2,089 (1.5)	419 (1.0)	
Intensive	77,280 (30.4)	39,016 (28.3)	7,254 (17.6)	
No care	1,537 (0.6)	1,717 (1.2)	883 (2.1)	
Missing	59,392 (23.3)	47,924 (34.8)	18,779 (45.6)	

BMI, body mass index; HDP, hypertensive disorders of pregnancy; R-GINDEX, Revised Graduated Prenatal Care Utilization Index; SD, standard deviation; WIC, Women, Infants, and Children.

* Data includes person-level diagnostic codes at time of discharge or birth certificate. Hypertensive disorders of pregnancy (HDP) were defined as gestational

hypertension, pre-eclampsia, or eclampsia (International Classification of Diseases, Ninth and Tenth Revision, Clinical Modification [ICD-9-CM/ICD-10-CM]: 642.3-642.7; O11.x, O13.x-O16.x) based on hospitalization/emergency department (ED) visit data, or gestational hypertension as reported on the birth certificate. Pre-pregnancy hypertension was based on hospitalization/ED visit data or birth certificates.

† For pre-pregnancy smoking, $\leq 0.1\%$ of data are missing and not shown.

‡ Variables with $>0.1\%$ missing data included: annual household income, $n=9,010$; primary payer during pregnancy, $n=3,131$; Women, Infants, and Children eligibility in pregnancy, $n=6,583$; and prenatal care as measured by R-GINDEX, $n=126,095$.

§ Pre-pregnancy smoking, pre-pregnancy BMI, pre-pregnancy diabetes, and gestational diabetes were available from the birth certificate. Gestational diabetes was also defined using hospitalization/ED visit data based on ICD-9-CM and ICD-10-CM codes.

¶ P -values were calculated by Chi-square tests for categorical variables or analysis of variance (ANOVA) for continuous variables.

Table S3. Characteristics of mothers and infants at index pregnancy in South Carolina including prenatal data, complications, and delivery variables overall and by hypertensive disorders of pregnancy (HDP) and pre-pregnancy hypertension (HTN) status, 2004-2016 ^{*, †, ‡, §}

Characteristic	Total	Neither pre-preg HTN nor HDP	Pre-preg HTN alone	HDP alone	Both pre-preg HTN and HDP	p-value
	N=433,430	N=353,575 (81.6)	N=1,591 (0.4)	N=68,212 (15.7)	N=10,052 (2.3)	
Maternal age at delivery						
<20	32,207 (7.4)	27,089 (7.7)	62 (3.9)	4,736 (6.9)	320 (3.2)	<0.0001
20-24	109,944 (25.4)	91,351 (25.8)	268 (16.8)	16,913 (24.8)	1,412 (14.0)	
25-29	126,182 (29.1)	103,381 (29.2)	420 (26.4)	19,775 (29.0)	2,606 (25.9)	
30-34	103,087 (23.8)	83,516 (23.6)	427 (26.8)	16,183 (23.7)	2,961 (29.5)	
35-39	50,673 (11.7)	39,768 (11.2)	313 (19.7)	8,501 (12.5)	2,091 (20.8)	
40-49	11,337 (2.6)	8,470 (2.4)	101 (6.3)	2,104 (3.1)	662 (6.6)	
Smoking during pregnancy	51,749 (11.9)	42,627 (12.1)	179 (11.3)	7,840 (11.5)	1,103 (11.0)	0.0048
BMI at delivery (kg/m ²)	32.3 ±6.6	31.5 ±6.2	36.4 ±7.7	35.4 ±7.3	38.1 ±7.7	<0.0001
Underweight (<18.5)	237 (0.1)	213 (0.1)	1 (0.1)	19 (0.0)	4 (0.0)	<0.0001
Normal weight (18.5 to <25)	44,630 (10.3)	40,792 (11.5)	73 (4.6)	3,497 (5.1)	268 (2.7)	
Overweight (25 to <30)	138,466 (31.9)	123,232 (34.9)	280 (17.6)	13,689 (20.1)	1,265 (12.6)	
Obese (≥30)	248,337 (57.3)	187,906 (53.1)	1,231 (77.4)	50,736 (74.4)	8,464 (84.2)	
Gestational age at delivery (weeks)	38.4 ±1.9	38.6 ±1.7	37.8 ±2.4	37.7 ±2.3	37.1 ±2.7	<0.0001
<28	2,054 (0.5)	1,332 (0.4)	18 (1.1)	549 (0.8)	155 (1.5)	<0.0001

Characteristic	Total	Neither pre-preg	Pre-preg	HDP alone	Both pre-preg	p-value
		HTN nor HDP	HTN alone		HTN and HDP	
n (%) or mean \pm SD	N=433,430	N=353,575 (81.6)	N=1,591 (0.4)	N=68,212 (15.7)	N=10,052 (2.3)	
Early preterm (28 to <34)	8,381 (1.9)	4,543 (1.3)	70 (4.4)	2,968 (4.4)	800 (8.0)	
Late preterm (34 to <37)	30,172 (7.0)	20,154 (5.7)	164 (10.3)	8,279 (12.1)	1,575 (15.7)	
\geq 37	392,559 (90.6)	327,320 (92.6)	1,337 (84.0)	56,382 (82.7)	7,520 (74.8)	
Birth weight (g)	3,266 \pm 571	3,302 \pm 533	3,156 \pm 669	3,123 \pm 677	2,971 \pm 765	<0.0001
Birth weight for gestational age (g)						
Appropriate for gestational age	347,433 (80.2)	286,576 (81.1)	1,218 (76.6)	52,147 (76.4)	7,492 (74.5)	<0.0001
Small for gestational age	44,017 (10.2)	33,281 (9.4)	187 (11.8)	9,030 (13.2)	1,519 (15.1)	
Large for gestational age	41,704 (9.6)	33,484 (9.5)	184 (11.6)	6,997 (10.3)	1,039 (10.3)	
Induction	68,600 (15.8)	51,322 (14.5)	255 (16.0)	14,935 (21.9)	2,088 (20.8)	<0.0001
Previous preterm births	14,824 (3.4)	10,550 (3.0)	108 (6.8)	3,429 (5.0)	737 (7.3)	<0.0001
Prenatal care as measured by R-GINDEX						
Inadequate	77,290 (17.8)	65,644 (18.6)	219 (13.8)	10,265 (15.0)	1,162 (11.6)	<0.0001
Intermediate	95,623 (22.1)	80,178 (22.7)	279 (17.5)	13,540 (19.8)	1,626 (16.2)	
Adequate	6,735 (1.6)	5,330 (1.5)	25 (1.6)	1,222 (1.8)	158 (1.6)	
Intensive	123,550 (28.5)	94,610 (26.8)	576 (36.2)	23,890 (35.0)	4,474 (44.5)	
No Care	4,137 (1.0)	3,316 (0.9)	14 (0.9)	718 (1.1)	89 (0.9)	

Characteristic	Total	Neither pre-preg HTN nor HDP	Pre-preg HTN alone	HDP alone	Both pre-preg HTN and HDP	p-value
	<hr/> N=433,430	<hr/> N=353,575 (81.6)	<hr/> N=1,591 (0.4)	<hr/> N=68,212 (15.7)	<hr/> N=10,052 (2.3)	
Missing	126,095 (29.1)	104,497 (29.6)	478 (30.0)	18,577 (27.2)	2,543 (25.3)	

BMI, body mass index; HDP, hypertensive disorders of pregnancy; HTN, hypertension; pre-preg, pre-pregnancy; R-GINDEXT, Revised-Graduated Prenatal Care Utilization Index; SD, standard deviation.

* Data includes person-level diagnostic codes at time of discharge or birth certificate. Hypertensive disorders of pregnancy (HDP) were defined as gestational hypertension, pre-eclampsia, or eclampsia (International Classification of Diseases, Ninth and Tenth Revision, Clinical Modification [ICD-9-CM/ICD-10-CM]: 642.3-642.7; O11.x, O13.x-16.x) by hospitalization/emergency department (ED) visit data, or gestational hypertension as reported on the birth certificate. Pre-pregnancy hypertension was based on hospitalization/ED visit data or birth certificates.

† For smoking during pregnancy, gestational age at delivery, and birth weight for gestational age, ≤0.1% of data are missing and not shown.

‡ Variables with >0.1% missing data included: BMI at delivery, n=1,760; and prenatal care as measured by R-GINDEXT, n=126,095.

§ Smoking during pregnancy, BMI at delivery, gestational age at delivery, birth weight, induction, and previous preterm births were available from the birth certificate.

^{||} *P-values* were calculated by Chi-square tests for categorical variables or analysis of variance (ANOVA) for continuous variables.