Supplemental Online Content

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

eTable 1. Maternal Characteristics Overall and by Whether or Not Included in the Analytic Sample, U.S. Natality Files, 2014-2020

Characteristic	Overall	Final analytic sample	Excluded
	26,986,716	1,560,822	25,425,894
Age (years)[a]	29 (24, 33)	31 (27, 35)	29 (24, 33)
Delivery year			
2014	3,998,175 (14.8)	192,236 (12.3)	3,805,939 (15.0)
2015	3,988,733 (14.8)	199,661 (12.8)	3,789,072 (14.9)
2016	3,956,112 (14.7)	215,275 (13.8)	3,740,837 (14.7)
2017	3,864,754 (14.3)	224,631 (14.4)	3,640,123 (14.3)
2018	3,801,534 (14.1)	231,596 (14.8)	3,569,938 (14.0)
2019	3,757,582 (13.9)	237,681 (15.2)	3,519,901 (13.8)
2020	3,619,826 (13.4)	259,742 (16.6)	3,360,084 (13.2)
Multiparous	16,608,443 / 26,892,524 (61.8)	1,030,197 / 1,557,592 (66.1)	15,578,246 / 25,334,932 (61.5)
Tobacco use during pregnancy	1,830,820 / 26,574,146 (6.9)	96,978 / 1,552,942 (6.2)	1,733,842 / 25,021,204 (6.9)
Education (n=26,423,488)			
Some high school or less	3,539,183 (13.4)	213,504 (13.8)	3,325,679 (13.4)
High school graduate	6,766,374 (25.6)	372,720 (24.1)	6,393,654 (25.7)
Any college	16,117,931 (61.0)	961,168 (62.1)	15,156,763 (60.9)
Insurance (n=26,588,123)			
Medicaid	11,327,310 (42.6)	656,663 (42.3)	10,670,647 (42.6)
Private Insurance	13,095,260 (49.3)	790,493 (50.9)	12,304,767 (49.2)
Self-pay	1,131,007 (4.3)	48,486 (3.1)	1,082,521 (4.3)
Other[1]	1,034,546 (3.9)	56,434 (3.6)	978,112 (3.9)
WIC enrolled	9,987,079 / 26,384,586 (37.9)	599,580 / 1,541,676 (38.9)	9,387,499 / 24,842,910 (37.8)
Prenatal care (n=26,027,729)			
Started in 1st trimester	20,093,658 (77.2)	1,221,761 (79.9)	18,871,897 (77.0)
Stated in 2nd trimester	4,315,667 (16.6)	237,490 (15.5)	4,078,177 (16.7)
Started in 3rd trimester	1,618,404 (6.2)	70,379 (4.6)	1,548,025 (6.3)
Pregestational BMI, kg/m² (n=26,053,097)			
<25, Underweight/nomal	12,113,282 (46.5)	412,493 (27.0)	11,700,789 (47.7)
25-<30, Overweight	6,862,024 (26.3)	403,145 (26.4)	6,458,879 (26.3)
30-<35, Class I obesity	3,844,621 (14.8)	328,394 (21.5)	3,516,227 (14.3)
35-39, Class II obesity	1,888,368 (7.3)	203,808 (13.4)	1,684,560 (6.9)
≥40, Class IIII obesity	1,344,802 (5.2)	177,963 (11.7)	1,166,839 (4.8)
Chronic hypertension	519,668 / 26,746,076 (1.9)	71,236 / 1,560,822 (4.6)	448,432 / 25,185,254 (1.8)
Prior cesarean delivery	4,105,982 / 26,746,076 (15.4)	323,882 / 1,560,822 (20.8)	3,782,100 / 25,185,254 (15.0)
Prior preterm birth among multipara	872,486 / 16,469,129 (5.3)	75,029 / 1,030,197 (7.3)	797,457 / 15,438,932 (5.2)

[a]Median (IQR).
Abbreviations: IQR (interquartile range), SD (standard deviation), BMI (body mass index), WIC (Special Supplemental Nutrition Program for Women, Infants, and Children).

eTable 2. Maternal and Infant Outcomes From 2014 to 2020 to Pregnant Individuals Age 15 to 44 Years With Gestational Diabetes

	Frequency, n / 1,000 live births (95% CI) in 2014	Frequency, n / 1,000 live births (95% CI) in 2020	Mean annual percent change, APC (95% CI) from 2014 to 2020[a]
Maternal outcomes			
Cesarean delivery			
American Indian	366.0 (347.2 to 384.7)	350.5 (333.5 to 367.5)	-0.5 (-1.5 to 0.5)
Asian/Pacific Islander	384.7 (378.4 to 391.1)	365.4 (360.1 to 370.6)	-0.9 (-1.2 to -0.7)
Black	482.4 6.0 to 488.9)	465.6 (460.1 to 471.0)	-0.8 (-1.2 to -0.3)
Hispanic/Latina	414.5 (410.2 to 418.8)	394.2 (390.6 to 397.9)	-0.9 (-1.1 to -0.6)
White	409.7 (406.5 to 412.8)	391.3 (388.6 to 394.1)	-0.8 (-1.0 to -0.6)
Overall	416.1 (413.9 to 418.3)	397.6 (395.8 to 399.5)	-1.4 (-1.7 to -1.1)
Primary cesarean delivery[b]			
American Indian	242.0 (223.4 to 260.6)	222.2 (205.6 to 238.7)	-0.8 (-2.7 to 1.1)
Asian/Pacific Islander	269.0 (262.5 to 275.4)	251.7 (246.4 to 256.9)	-1.1 (-1.7 to -0.6)
Black	357.3 (350.2 to 364.3)	329.5 (323.6 to 335.4)	-1.5 (-1.8 to -1.2)
Hispanic/Latina	263.1 (258.7 to 267.5)	246.0 (242.4 to 249.7)	-1.0 (-1.5 to -0.5)
White	292.2 (289.0 to 295.4)	272.5 (269.7 to 275.2)	-1.2 (-1.8 to -0.6)[e]
Overall	289.0 (286.7 to 291.2)	269.1 (267.1 to 271.0)	-1.2 (-1.5 to -0.9)
Preeclampsia or gestational hypertension			
American Indian	132.3 (119.1 to 145.5)	181.4 (167.7 to 195.2)	5.7 (3.7 to 7.8)
Asian/Pacific Islander	59.5 (56.4 to 62.6)	84.9 (81.8 to 87.9)	4.6 (1.1 to 8.2)
Black	146.4 (141.8 to 150.9)	178.3 (174.1 to 182.5)	3.2 (2.5 to 4.0)
Hispanic/Latina	98.7 (96.1 to 101.3)	133.2 (130.7 to 135.7)	5.1 (4.3 to 5.8)
White	117.1 (115.0 to 119.1)	148.7 (146.7 to 150.7)	4.2 (3.3 to 5.1)
Overall	109.2 (107.8 to 110.6)	140.7 (139.3 to 142.0)	4.2 (3.3 to 5.2)
Intensive care unit admission[c]			
American Indian	2.3 (0.4 to 4.2)	0.9 (-0.1 to 2.1)	-2.4 (-32.3 to 40.8)
Asian/Pacific Islander	2.0 (1.4 to 2.6)	2.3 (1.8 to 2.8)	5.8 (-3.5 to 16.0)
Black	3.5 (2.7 to 4.3)	2.8 (2.2 to 3.4)	-2.5 (-6.7 to 1.7)
Hispanic/Latina	2.7 (2.2 to 3.1)	2.0 (1.7 to 2.3)	-3.0 (-9.2 to 3.8)
White	1.7 (1.5 to 2.0)	3.5 (2.7 to 4.3)	2.7 (-2.5 to 8.3)
Overall	2.2 (2.0 to 2.4)	2.0 (1.8 to 2.2)	0.5 (-5.2 to 6.5)
Transfusion[c]			
American Indian	8.2 (4.7 to 11.8)	15.8 (11.3 to 20.2)	14.0 (2.5 to 26.9)
Asian/Pacific Islander	3.0 (2.3 to 3.8)	5.1 (4.4 to 5.9)	10.1 (2.8 to 17.8)
Black	4.4 (3.5 to 5.2)	5.3 (4.5 to 6.1)	6.7 (-1.1 to 15.2)
Hispanic/Latina	3.1 (2.6 to 3.6)	5.1 (4.5 to 5.6)	7.2 (3.1 to 11.4)
White	3.5 (3.2 to 3.9)	5.2 (4.8 to 5.6)	8.0 (3.0 to 13.4)
Overall	3.5 (3.3 to 3.8)	5.3 (5.0 to 5.6)	8.0 (3.8 to 12.4)
Infant outcomes			
Preterm birth <37 weeks[d]			
American Indian	112.1 (99.8 to 124.4)	123.8 (112.1 to 135.5)	2.3 (0.6 to 4.1)
Asian/Pacific Islander	92.4 (88.6 to 96.2)	96.9 (93.7 to 100.1)	0.6 (-0.6 to 1.9)
Black	150.0 (145.3 to 154.6)	157.8 (153.8 to 161.7)	0.9 (0.1 to 1.8)
Hispanic/Latina	115.3 (112.5 to 118.1)	120.8 (118.4 to 123.2)	1.1 (0.3 to 1.8)
White	98.7 (96.8 to 100.6)	103.0 (101.2 to 104.7)	0.8 (0.3 to 1.4)
Overall	108.6 (107.2 to 110.0)	114.1 (112.9 to 115.3)	0.9 (0.3 to 1.5)
NICU admission			
American Indian	104.0 (92.1 to 115.9)	107.7 (96.7 to 118.7)	0.0 (-1.1 to 1.1)
Asian/Pacific Islander	99.4 (95.5 to 103.3)	97.9 (94.7 to 101.2)	0.0 (-1.1 to 1.1)[e]
Black	150.2 (145.6 to 154.9)	158.6 (154.6 to 162.6)	1.0 (-1.7 to 3.9)[e]

Hispanic/Latina	108.0 (105.3 to 110.7)	113.8 (111.4 to 116.1)	0.9 (0.7 to 1.1)e[e]
White	98.2 (96.3 to 100.1)	107.5 (105.7 to 109.2)	1.6 (0.9 to 2.3)
Overall	107.2 (105.8 to 108.5)	114.4 (113.1 to 115.6)	1.0 (0.3 to 1.7)
Large-for-gestational age[d]			
American Indian	267.1 (249.8 to 284.5)	247.1 (231.7 to 262.4)	-1.1 (-1.9 to -0.3)
Asian/Pacific Islander	103.6 (99.6 to 107.6)	83.0 (79.9 to 86.0)	-3.9 (-4.9 to -2.9)
Black	189.8 (184.7 to 194.9)	164.9 (160.9 to 169.0)	-2.4 (-3.1 to -1.7)
Hispanic/Latina	203.8 (200.2 to 207.3)	179.4 (176.5 to 182.2)	-2.2 (-2.9 to -1.5)
White	205.9 (203.3 to 208.5)	184.9 (182.7 to 187.1)	-2.0 (-2.5 to -1.5)
Overall	192.3 (190.6 to 194.1)	169.0 (167.6 to 170.4)	-2.3 (-2.8 to -1.8)
Macrosomia[d]			
American Indian	185.3 (170.2 to 200.5)	149.9 (137.2 to 162.6)	-3.4 (-4.4 to -2.4)
Asian/Pacific Islander	62.8 (59.6 to 65.9)	44.1 (41.9 to 46.4)	-5.9 (-7.1 to -4.7)
Black	110.3 (106.2 to 114.3)	85.4 (82.4 to 88.5)	-4.3 (-5.4 to -3.1)
Hispanic/Latina	130.6 (127.7 to 133.6)	98.8 (96.6 to 101.0)	-4.6 (-5.4 to -3.9)
White	128.3 (126.2 to 130.5)	100.5 (98.8 to 102.2)	-4.5 (-5.3 to -3.6)
Overall	119.9 (118.4 to 121.3)	91.7 (90.6 to 92.8)	-4.7 (-5.3 to -4.0)
Small-for-gestational age[d]			
American Indian	54.4 (45.5 to 63.3)	63.5 (54.8 to 72.2)	1.6 (-0.9 to 4.2)
Asian/Pacific Islander	125.3 (121.0 to 129.7)	139.7 (135.9 to 143.5)	1.7 (0.5 to 2.9)
Black	106.7 (102.6 to 110.6)	99.8 (96.5 to 103.0)	-0.5 (-1.7 to 0.7)
Hispanic/Latina	70.2 (68.0 to 72.4)	71.2 (69.4 to 73.1)	0.4 (0.2 to 0.5)[f]
White	68.0 (66.3 to 69.6)	65.6 (64.2 to 66.9)	-0.4 (-1.4 to 0.5)
Overall	79.7 (78.4 to 80.9)	80.5 (79.5 to 81.6)	0.4 (-0.3 to 1.1)

[a]To quantify the trend over time from 2014 to 2020, the mean annual percent change of the outcome rate was calculated.

[b]Analysis conducted among individuals without a prior history of cesarean delivery.

[c]Outcome ascertained at delivery hospitalization.

[d]Preterm birth included a birth <37 weeks based on the best obstetric estimate for any indication. Large-for-gestational-age was defined as a parity-specific standardized birthweight >90th percentile, and small-for-gestational-age as <10th percentile. Macrosomia was defined as a birthweight >4,000 grams.

[e]Joinpoint regression introduced an inflection point in the year 2016.

[f]Joinpoint regression introduced an inflection point in the year 2018.

Abbreviations: CI (confidence interval), NICU (neonatal intensive care unit).

eTable 3. Maternal and Infant Outcomes in Nulliparous Pregnant Individuals Age 15 to 44 Years With Gestational Diabetes, U.S. Natality Files, 2014-2020

	Frequency, n / 1,000 live births (95% CI) in 2014	Frequency, n / 1,000 live births (95% CI) in 2020	Mean annual percent change, APC (95% CI) from 2014 to 2020[a]
Maternal outcomes			
Cesarean delivery			
American Indian	358.7 (321.9 to 395.4)	376.3 (342.0 to 410.6)	0.4 (-1.0 to 1.9)
Asian/Pacific Islander	378.7 (368.9 to 388.5)	360.0 (351.9 to 368.1)	-0.9 (-1.5 to -0.4)
Black	503.1 (491.5 to 514.7)	478.8 (468.9 to 488.7)	-0.9 (-1.5 to -0.3)
Hispanic/Latina	427.5 (418.7 to 436.3)	392.2 (385.2 to 399.1)	-1.4 (-2.1 to -0.7)
White	409.5 (404.3 to 414.6)	389.6 (385.1 to 394.1)	-0.8 (-0.9 to -0.7)
Overall	418.2 (414.4 to 422.0)	395.4 (392.2 to 398.6)	-1.0 (-1.1 to -0.8)
Primary cesarean delivery[c]			
American Indian	358.7 (321.9 to 395.4)	376.3 (342.0 to 410.6)	0.4 (-1.0 to 1.7)
Asian/Pacific Islander	377.9 (368.1 to 387.7)	359.7 (351.7 to 367.8)	-0.9 (-1.4 to -0.3)
Black	502.3 (490.7 to 513.9)	478.1 (468.2 to 488.0)	-0.9 (-1.5 to -0.3)
Hispanic/Latina	426.6 (417.8 to 435.4)	391.2 (384.8 to 398.6)	-1.4 (-2.1 to -0.7)
White	408.9 (403.8 to 414.0)	389.2 (384.7 to 393.7)	-0.8 (-0.9 to -0.7)
Overall	417.5 (413.7 to 421.3)	394.9 (391.7 to 398.2)	-0.9 (-1.1 to -0.8)
Preeclampsia or gestational hypertension			
American Indian	186.7 (156.8 to 216.5)	261.4 (230.3 to 292.5)	5.8 (3.1 to 8.6)
Asian/Pacific Islander	68.8 (63.7 to 73.9)	97.1 (92.1 to 102.1)	4.4 (0.4 to 8.7)
Black	174.8 (166.0 to 183.6)	221.7 (213.5 to 229.9)	4.0 (2.9 to 5.1)
Hispanic/Latina	131.5 (125.5 to 137.5)	169.4 (164.1 to 174.7)	4.2 (3.5 to 4.9)
White	142.3 (138.7 to 146.0)	180.2 (176.7 to 183.7)	3.9 (3.0 to 4.8)
Overall	133.6 (131.0 to 136.3)	170.4 (167.9 to 172.9)	3.9 (2.8 to 5.0)
Intensive care unit admission[d]			
American Indian	--[b]	--[b]	--[b]
Asian/Pacific Islander	1.9 (1.0 to 2.8)	2.1 (1.4 to 2.9)	6.9 (-5.8 to 21.4)
Black	4.2 (2.7 to 5.7)	2.1 (1.2 to 3.1)	-6.6 (-17.2 to 5.4)
Hispanic/Latina	2.7 (1.8 to 3.6)	1.8 (1.2 to 2.4)	-3.7 (-12.5 to 6.1)
White	2.2 (1.7 to 2.7)	1.7 (1.3 to 2.1)	-0.1 (-7.7 to 8.1)
Overall	2.4 (2.1 to 2.8)	1.8 (1.6 to 2.1)	-1.0 (-8.9 to 7.7)
Transfusion[d]			
American Indian	6.0 (0.1 to 12.0)	26.0 (14.8 to 37.3)	28.3 (21.0 to 36.1)
Asian/Pacific Islander	3.4 (2.2 to 4.6)	5.2 (4.0 to 6.5)	9.8 (-0.2 to 20.8)
Black	2.9 (1.7 to 4.2)	4.9 (3.5 to 6.3)	6.2 (-0.4 to 13.1)
Hispanic/Latina	2.9 (1.9 to 3.8)	5.1 (4.1 to 6.1)	7.7 (2.2 to 13.5)
White	3.7 (3.1 to 4.3)	5.9 (5.2 to 6.6)	10.0 (3.5 to 16.8)
Overall	3.4 (3.0 to 3.9)	5.7 (5.2 to 6.2)	9.6 (5.3 to 14.2)
Infant outcomes			
Preterm birth <37 weeks[e]			
American Indian	116.8 (92.3 to 141.4)	126.1 (102.6 to 149.7)	0.7 (-2.0 to 3.4)
Asian/Pacific Islander	92.2 (86.3 to 98.0)	100.8 (95.7 to 105.8)	0.8 (-0.9 to 2.6)
Black	152.3 (144.0 to 160.6)	161.8 (154.5 to 169.1)	1.1 (0.1 to 2.1)
Hispanic/Latina	122.2 (116.3 to 128.0)	120.7 (116.1 to 125.3)	-0.1 (-0.7 to 0.5)
White	102.9 (99.7 to 106.0)	107.0 (104.2 to 109.9)	0.7 (-0.2 to 1.5)
Overall	110.5 (108.1 to 112.9)	115.2 (113.1 to 117.3)	0.6 (-0.1 to 1.4)
NICU admission			
American Indian	120.2 (95.3 to 145.2)	101.4 (80.0 to 122.8)	-3.9 (-8.7 to 1.3)
Asian/Pacific Islander	121.0 (114.3 to 127.5)	115.2 (109.9 to 120.6)	-0.6 (-2.6 to 1.3)[f]
Black	168.8 (160.1 to 177.6)	177.2 (169.6 to 184.8)	0.9 (-1.8 to 3.7)[f]

Hispanic/Latina	140.2 (134.0 to 146.4)	132.7 (127.9 to 137.5)	-1.1 (-1.6 to -0.5)[f]
White	112.4 (109.1 to 115.7)	120.1 (117.1 to 123.1)	1.2 (0.6 to 1.8)
Overall	125.1 (122.6 to 127.7)	128.2 (126.0 to 130.4)	0.3 (-0.7 to 1.2)
Large-for-gestational age[e]			
American Indian	221.8 (190.0 to 253.7)	247.0 (216.5 to 277.6)	0.6 (-2.5 to 3.7)
Asian/Pacific Islander	85.4 (79.7 to 91.0)	64.9 (60.7 to 69.0)	-4.6 (-6.5 to -2.6)
Black	178.9 (170.0 to 187.8)	150.5 (143.4 to 157.6)	-2.8 (-4.1 to -1.5)
Hispanic/Latina	186.0 (179.1 to 192.9)	165.9 (160.7 to 171.2)	-1.8 (-2.2 to -1.4)
White	187.4 (183.4 to 191.5)	173.1 (169.7 to 176.6)	-1.4 (-2.0 to -0.8)
Overall	171.7 (168.8 to 174.6)	153.1 (150.8 to 155.5)	-2.0 (-2.5 to -1.4)
Macrosomia[e]			
American Indian	129.2 (103.5 to 154.9)	102.7 (81.2 to 124.2)	-4.2 (-7.8 to -0.4)
Asian/Pacific Islander	41.6 (37.5 to 45.6)	26.0 (23.4 to 28.7)	-6.9 (-9.3 to -4.4)
Black	84.3 (77.9 to 90.8)	58.9 (54.3 to 63.6)	-5.9 (-7.3 to -4.4)
Hispanic/Latina	91.4 (86.3 to 96.5)	68.0 (64.4 to 71.6)	-4.6 (-5.6 to -3.5)
White	94.2 (91.1 to 97.2)	71.6 (69.2 to 73.9)	-4.7 (-5.4 to -4.1)
Overall	85.3 (83.1 to 87.4)	62.7 (61.1 to 64.3)	-5.1 (-5.5 to -4.7)
Small-for-gestational age[e]			
American Indian	63.8 (45.1 to 82.5)	63.7 (46.4 to 81.0)	-1.4 (-8.5 to 6.3)
Asian/Pacific Islander	134.0 (127.2 to 140.9)	150.1 (144.1 to 156.1)	1.6 (0.4 to 2.7)
Black	113.9 (106.6 to 121.3)	105.9 (99.8 to 112.0)	-0.7 (-3.0 to 1.6)
Hispanic/Latina	80.4 (75.6 to 85.2)	76.4 (72.7 to 80.2)	-0.3 (-2.1 to 1.5)
White	76.2 (73.4 to 78.9)	72.2 (69.8 to 74.6)	-0.8 (-1.7 to 0.0)
Overall	89.4 (87.2 to 91.6)	88.7 (86.8 to 90.6)	0.0 (-0.8 to 0.8)

[a]To quantify the trend over time from 2014 to 2020, the mean annual percent change of the outcome rate was calculated.

[b]"- -" reflects n<10 individuals with the outcome in cell.

[c]Analysis conducted among individuals without a prior history of cesarean delivery.

[d]Outcome ascertained at delivery hospitalization.

[e]Preterm birth included a birth <37 weeks based on the best obstetric estimate for any indication. Large-for-gestational-age was defined as a parity-specific standardized birthweight >90th percentile, and small-for-gestational-age as <10th percentile. Macrosomia was defined as a birthweight >4,000 grams.

[f]Joinpoint regression introduced an inflection point in the year 2016.

Abbreviations: CI (confidence interval), NICU (neonatal intensive care unit).

N=527,395 nulliparous individuals.

eTable 4. Association Between Race and Ethnicity and Adverse Pregnancy Outcomes Among Pregnant Individuals With Gestational Diabetes, U.S. Natality Files, Restricted to 2016-2020	
	Adjusted RR (95% CI)
Maternal outcomes[a,b]	
Cesarean delivery (n=1,168,704)	
American Indian	0.98 (0.95 – 1.01)
Asian/Pacific Islander	0.93 (0.92 – 0.94)
Black	1.13 (1.12 – 1.14)
Hispanic/Latina	1.02 (1.01 – 1.03)
White	1.00
Primary cesarean delivery (n=925,866)	
American Indian	0.99 (0.96 – 1.03)
Asian/Pacific Islander	0.91 (0.90 – 0.93)
Black	1.24 (1.23 – 1.26)
Hispanic/Latina	1.03 (1.02 – 1.04)
White	1.00
Preeclampsia or gestational hypertension (n=1,168,925)	
American Indian	1.25 (1.19 – 1.30)
Asian/Pacific Islander	0.58 (0.56 – 0.59)
Black	1.21 (1.19 – 1.22)
Hispanic/Latina	0.88 (0.87 – 0.89)
White	1.00
Intensive care unit admission[c] (n=1,168,122)	
American Indian	1.43 (1.03 – 2.00)
Asian/Pacific Islander	1.34 (1.18 – 1.52)
Black	1.51 (1.35 – 1.70)
Hispanic/Latina	1.15 (1.03 – 1.28)
White	1.00
Transfusion[c] (n=1,168,122)	
American Indian	2.58 (2.20 – 3.02)
Asian/Pacific Islander	1.00 (0.91 – 1.10)
Black	1.17 (1.08 – 1.27)
Hispanic/Latina	0.99 (0.92 – 1.06)
White	1.00
Infant outcomes[a,b]	
Preterm birth <37 weeks (n=1,168,795)	
American Indian	1.11 (1.05 – 1.16)
Asian/Pacific Islander	1.03 (1.02 – 1.05)
Black	1.40 (1.38 – 1.42)
Hispanic/Latina	1.18 (1.17 – 1.20)
White	1.00
NICU admission[d] (n=1,168,319)	
American Indian	1.03 (0.98 – 1.08)
Asian/Pacific Islander	1.04 (1.02 – 1.06)
Black	1.44 (1.42 – 1.46)
Hispanic/Latina	1.12 (1.10 – 1.13)
White	1.00
Large-for-gestational age[d] (N=1,165,482)	
American Indian	1.24 (1.21 – 1.28)
Asian/Pacific Islander	0.52 (0.51 – 0.53)
Black	0.84 (0.83 – 0.85)
Hispanic/Latina	0.95 (0.94 – 0.96)
White	1.00
Macrosomia[d] (n=1,168,594)	

American Indian	1.33 (1.27 – 1.38)
Asian/Pacific Islander	0.50 (0.49 – 0.51)
Black	0.79 (0.77 – 0.80)
Hispanic/Latina	0.92 (0.91 – 0.93)
White	1.00
Small-for-gestational age[d] (n=1,165,482)	
American Indian	0.95 (0.89 – 1.02)
Asian/Pacific Islander	1.87 (1.84 – 1.90)
Black	1.60 (1.57 – 1.64)
Hispanic/Latina	1.09 (1.08 – 1.11)
White	1.00

Baseline comparison is to White.

RR=relative risk

[a]Model adjusted for: age, tobacco use in pregnancy, chronic hypertension, WIC receipt, pre-pregnancy body mass index, education status, insurance status, prior preterm birth, and delivery year. All models adjusted for prior cesarean delivery except primary cesarean delivery. Model for primary cesarean delivery conducted among individuals without a prior history of cesarean delivery.

[b]All models except LGA and SGA adjusted for parity, as we used parity-standardized LGA and SGA definitions.

[c]Outcome ascertained at delivery hospitalization.

[d]Outcomes also adjusted for infant sex.

eTable 5. Association Between Race and Ethnicity and Adverse Pregnancy Outcomes Restricted to Nulliparous Pregnant Individuals With Gestational Diabetes, U.S. Natality Files, 2014-2020	
	Adjusted RR (95% CI)
Maternal outcomes[a]	
Cesarean delivery (n=527,289)	
American Indian	0.99 (0.95 – 1.04)
Asian/Pacific Islander	0.96 (0.95 – 0.97)
Black	1.20 (1.19 – 1.22)
Hispanic/Latina	1.06 (1.05 – 1.07)
White	1.00
Primary cesarean delivery (n=526,645)	
American Indian	0.99 (0.95 – 1.04)
Asian/Pacific Islander	0.96 (0.95 – 0.97)
Black	1.20 (1.19 – 1.22)
Hispanic/Latina	1.06 (1.05 – 1.07)
White	1.00
Preeclampsia or gestational hypertension (n=527,395)	
American Indian	1.25 (1.18 – 1.33)
Asian/Pacific Islander	0.56 (0.54 – 0.57)
Black	1.18 (1.15 – 1.20)
Hispanic/Latina	0.90 (0.89 – 0.92)
White	1.00
Intensive care unit admission[b] (n=526,922)	
American Indian	1.42 (0.82 – 2.46)
Asian/Pacific Islander	1.14 (0.95 – 1.37)
Black	1.47 (1.23 – 1.75)
Hispanic/Latina	1.21 (1.03 – 1.42)
White	1.00
Transfusion[b] (n=526,922)	
American Indian	3.08 (2.41 – 3.93)
Asian/Pacific Islander	0.95 (0.84 – 1.08)
Black	1.00 (0.88 – 1.15)
Hispanic/Latina	0.91 (0.82 – 1.02)
White	1.00
Infant outcomes[a]	
Preterm birth <37 weeks (n=527,335)	
American Indian	1.10 (1.01 – 1.19)
Asian/Pacific Islander	1.01 (0.99 – 1.04)
Black	1.42 (1.39 – 1.46)
Hispanic/Latina	1.15 (1.13 – 1.18)
White	1.00
NICU admission[c] (n=526,940)	
American Indian	1.00 (0.92 – 1.09)
Asian/Pacific Islander	1.12 (1.10 – 1.14)
Black	1.46 (1.43 – 1.50)
Hispanic/Latina	1.19 (1.17 – 1.21)
White	1.00
Large-for-gestational age[c] (n=526,436)	
American Indian	1.23 (1.17 – 1.29)
Asian/Pacific Islander	0.48 (0.47 – 0.50)
Black	0.85 (0.83 – 0.87)
Hispanic/Latina	0.95 (0.94 – 0.97)
White	1.00
Macrosomia[c] (n=527,211)	

American Indian	1.31 (1.21 – 1.43)
Asian/Pacific Islander	0.46 (0.45 – 0.48)
Black	0.82 (0.79 – 0.84)
Hispanic/Latina	0.93 (0.91 – 0.96)
White	1.00
Small-for-gestational age[c] (n=526,436)	
American Indian	0.94 (0.85 – 1.05)
Asian/Pacific Islander	1.80 (1.76 – 1.84)
Black	1.58 (1.54 – 1.63)
Hispanic/Latina	1.10 (1.08 – 1.13)
White	1.00

Baseline comparison is to White.
RR=relative risk
[a]Model adjusted for: age, tobacco use in pregnancy, chronic hypertension, WIC receipt, pre-pregnancy body mass index, education status, insurance status, and delivery year. All models adjusted for prior cesarean delivery except primary cesarean delivery. Model for primary cesarean delivery conducted among individuals without a prior history of cesarean delivery.
[b]Outcome ascertained at delivery hospitalization.
[c]Outcome also adjusted for infant sex.

eTable 6. Disparity Ratios for Adverse Pregnancy Outcomes Comparing Each Subgroup to White Individuals (Reference), U.S. Natality Files, 2014-2020		
	2014	**2020**
Maternal outcomes	**Disparity Ratio (95% CI)**	**Disparity Ratio (95% CI)**
Cesarean delivery		
American Indian	0.89 (0.85 to 0.94)	0.90 (0.85 to 0.94)
Asian/Pacific Islander	0.94 (0.92 to 0.96)	0.93 (0.92 to 0.95)
Black	1.17 (1.16 to 1.20)	1.19 (1.17 to 1.21)
Hispanic/Latina	1.01 (1.00 to 1.02)	1.01 (1.00 to 1.02)
White	1.00	1.00
Primary cesarean delivery		
American Indian	0.83 (0.77 to 0.89)	0.82 (0.76 to 0.88)
Asian/Pacific Islander	0.92 (0.90 to 0.95)	0.92 (0.90 to 0.95)
Black	1.22 (1.20 to 1.25)	1.21 (1.18 to 1.23)
Hispanic/Latina	0.90 (0.88 to 0.92)	0.90 (0.89 to 0.92)
White	1.00	1.00
Preeclampsia or gestational hypertension		
American Indian	1.13 (1.02 to 1.25)	1.22 (1.13 to 1.32)
Asian/Pacific Islander	0.51 (0.48 to 0.54)	0.57 (0.55 to 0.59)
Black	1.25 (1.21 to 1.30)	1.20 (1.17 to 1.23)
Hispanic/Latina	0.84 (0.82 to 0.87)	0.90 (0.88 to 0.92)
White	1.00	1.00
Intensive care unit admission		
American Indian	1.33 (0.59 to 3.00)	0.54 (0.17 to 1.69)
Asian/Pacific Islander	1.13 (0.81 to 1.57)	1.28 (0.98 to 1.66)
Black	1.99 (1.53 to 2.60)	1.58 (1.24 to 2.01)
Hispanic/Latina	1.52 (1.22 to 1.91)	1.12 (0.91 to 1.38)
White	1.00	1.00
Transfusion		
American Indian	2.31 (1.49 to 3.58)	3.00 (2.24 to 4.02)
Asian/Pacific Islander	0.86 (0.66 to 1.11)	0.98 (0.83 to 1.17)
Black	1.23 (0.99 to 1.54)	1.01 (0.86 to 1.20)
Hispanic/Latina	0.87 (0.72 to 1.05)	0.97 (0.85 to 1.10)
White	1.00	1.00
Infant outcomes		
Preterm birth <37 weeks		
American Indian	1.14 (1.02 to 1.27)	1.20 (1.09 to 1.32)
Asian/Pacific Islander	0.94 (0.89 to 0.98)	0.94 (0.91 to 0.98)
Black	1.52 (1.46 to 1.58)	1.53 (1.49 to 1.58)
Hispanic/Latina	1.17 (1.13 to 1.20)	1.17 (1.14 to 1.20)
White	1.00	1.00
NICU admission		
American Indian	1.06 (0.94 to 1.19)	1.00 (0.90 to 1.11)
Asian/Pacific Islander	1.01 (0.97 to 1.06)	0.91 (0.88 to 0.95)
Black	1.53 (1.48 to 1.59)	1.48 (1.43 to 1.52)
Hispanic/Latina	1.10 (1.07 to 1.14)	1.06 (1.03 to 1.09)
White	1.00	1.00
Large-for-gestational age		
American Indian	1.42 (1.38 to 1.46)	1.33 (1.25 to 1.42)
Asian/Pacific Islander	0.50 (0.48 to 0.52)	0.44 (0.43 to 0.46)
Black	0.92 (0.89 to 0.94)	0.89 (0.86 to 0.91)
Hispanic/Latina	0.98 (0.96 to 1.01)	0.97 (0.95 to 0.98)
White	1.00	1.00

Macrosomia		
American Indian	1.44 (1.33 to 1.57)	1.49 (1.37 to 1.63)
Asian/Pacific Islander	0.49 (0.46 to 0.52)	0.44 (0.42 to 0.46)
Black	0.86 (0.83 to 0.90)	0.85 (0.82 to 0.88)
Hispanic/Latina	1.01 (0.99 to 1.05)	1.06 (1.03 to 1.09)
White	1.00	1.00
Small-for-gestational age		
American Indian	0.80 (0.68 to 0.94)	0.96 (0.84 to 1.11)
Asian/Pacific Islander	1.84 (1.76 to 1.92)	2.13 (2.05 to 2.20)
Black	1.56 (1.50 to 1.63)	1.52 (1.46 to 1.58)
Hispanic/Latina	1.03 (0.99 to 1.07)	1.08 (1.04 to 1.12)
White	1.00	1.00

eTable 7. P-values for Interaction of Race/Ethnicity (Referent White Individuals) With Year of Delivery, U.S. Natality Files, 2014-2020

	Overall for all subgroups
Maternal outcomes[a,b]	p-value
Cesarean delivery	
American Indian	0.91
Asian/Pacific Islander	0.79
Black	0.23
Hispanic/Latina	0.41
Overall	0.47
Primary cesarean delivery	
American Indian	0.97
Asian/Pacific Islander	0.82
Black	0.43
Hispanic/Latina	0.19
Overall	0.47
Preeclampsia or gestational hypertension	
American Indian	0.50
Asian/Pacific Islander	0.53
Black	0.03
Hispanic/Latina	0.20
Overall	0.50
Intensive care unit admission	
American Indian	0.29
Asian/Pacific Islander	0.25
Black	0.02
Hispanic/Latina	0.01
Overall	0.51
Transfusion	
American Indian	0.11
Asian/Pacific Islander	0.34
Black	0.37
Hispanic/Latina	0.60
Overall	0.37
Infant outcomes[a,b]	
Preterm birth <37 weeks	
American Indian	0.45
Asian/Pacific Islander	0.81
Black	0.66
Hispanic/Latina	0.69
Overall	0.89
NICU admission[c]	
American Indian	0.04
Asian/Pacific Islander	<0.001
Black	0.001
Hispanic/Latina	<0.001
Overall	<0.001
Large-for-gestational age[c]	
American Indian	0.39
Asian/Pacific Islander	<0.001
Black	0.29
Hispanic/Latina	0.16
Overall	<0.01
Macrosomia[c]	
American Indian	0.37

Asian/Pacific Islander	<0.01
Black	0.39
Hispanic/Latina	0.77
Overall	0.04
Small-for-gestational age[c]	
American Indian	0.13
Asian/Pacific Islander	<0.001
Black	0.79
Hispanic/Latina	0.001
Overall	<0.001

[a]All models adjusted for: racial and ethnic subgroup x delivery year (interaction term), racial and ethnic subgroup, delivery year, age, tobacco use in pregnancy, chronic hypertension, WIC receipt, pre-pregnancy body mass index, education status, insurance status, and prior preterm birth. All models adjusted for prior cesarean delivery except primary cesarean delivery. Model for primary cesarean delivery conducted among individuals without a prior history of cesarean delivery.
[b]All models except LGA and SGA adjusted for parity, as parity-standardized LGA and SGA definitions were used.
[c]Outcome also adjusted for infant sex.

eFigure. Directed Acyclic Graph (DAG)