

**Appendix**  
**Gestational Diabetes and Overweight/Obesity: Analysis of Nulliparous Women in the U.S., 2011–2019**  
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**Appendix Table 1.** Maternal Characteristics by BMI Category in Nulliparous Women in the U.S., 2011–2019

<b>Characteristic</b>	<b>Underweight<sup>a</sup></b>	<b>Normal weight<sup>a</sup></b>	<b>Overweight<sup>a</sup></b>	<b>Obese<sup>a</sup></b>
N	539,634	5,789,317	2,993,289	2,628,641
Maternal age, mean (SD)	24.3 (5.7)	26.3 (5.9)	26.6 (5.8)	26.5 (5.7)
Race/Ethnicity, <i>n</i> (%)				
Non-Hispanic White	274,069 (50.8)	3,475,075 (60.0)	1,620,041 (54.1)	1,440,738 (54.8)
Non-Hispanic Black	74,139 (13.7)	680,766 (11.8)	430,961 (14.4)	497,323 (18.9)
Hispanic	103,128 (19.1)	1,183,361 (20.4)	674,395 (22.5)	559,343 (21.3)
Non-Hispanic Asian	88,298 (16.4)	450,115 (7.8)	267,892 (8.9)	131,237 (5.0)
Education, <i>n</i> (%)				
Less than high school	100,239 (18.7)	687,515 (12.0)	318,179 (10.7)	256,721 (9.8)
High school graduate	157,554 (29.4)	1,274,184 (22.2)	698,764 (23.5)	723,434 (27.7)
Greater than high school	277,501 (51.8)	3,789,420 (65.9)	1,956,685 (65.8)	1,633,742 (62.5)
Payment method, <i>n</i> (%)				
Private insurance	221,434 (41.4)	3,217,060 (56.0)	1,639,178 (55.2)	1,357,660 (52.0)
Medicaid	266,207 (49.8)	2,059,477 (35.9)	1,106,823 (37.3)	1,104,296 (42.3)
Other/Self pay	47,196 (8.8)	465,841 (8.1)	223,742 (7.5)	147,216 (5.6)
Received prenatal care, <i>n</i> (%)	517,477 (98.5)	5,589,505 (98.8)	2,893,684 (98.8)	2,543,363 (98.9)
Smoked during pregnancy, <i>n</i> (%)	51,011 (9.7)	316,996 (5.6)	164,381 (5.6)	186,534 (7.3)

<sup>a</sup>Underweight (<18.5 kg/m<sup>2</sup>); Normal weight (18.5-24.9 kg/m<sup>2</sup> [18.5-22.9 kg/m<sup>2</sup> for Asian women]); Overweight (25.0-29.9 kg/m<sup>2</sup> [23.0-27.4 kg/m<sup>2</sup> for Asian women]); Obese (≥30.0 kg/m<sup>2</sup> [≥27.5 kg/m<sup>2</sup> for Asian women]).

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**Appendix Table 2.** Age-Standardized Rates of Gestational Diabetes by Race/Ethnicity and BMI Category in Nulliparous Women

Race/ethnicity	2011	2012	2013	2014	2015	2016	2017	2018	2019
	Gestational diabetes mellitus per 1,000 live births								
Non-Hispanic White									
Underweight	26.0	27.2	27.9	27.9	27.8	27.7	31.0	34.4	32.8
Normal weight	25.6	26.4	26.2	27.2	28.5	28.5	31.2	32.8	33.3
Overweight	46.9	48.8	48.5	47.9	49.8	49.6	52.6	54.3	55.0
Obese	98.1	102.1	101.5	102.0	102.5	102.7	108.5	110.6	114.4
Non-Hispanic Black									
Underweight	16.7	25.5	15.5	23.3	17.9	26.9	23.7	23.1	25.8
Normal weight	25.3	28.5	29.2	28.2	29.0	29.2	29.9	28.5	30.4
Overweight	48.4	48.2	46.1	47.4	46.3	47.6	48.7	47.5	48.5
Obese	84.0	84.7	82.6	81.9	81.6	85.6	85.3	83.2	88.4
Hispanic									
Underweight	22.0	24.4	25.2	23.7	25.3	25.6	30.4	31.3	33.1
Normal weight	30.4	31.8	30.6	31.9	31.5	33.5	37.3	38.6	37.5
Overweight	53.6	55.4	58.1	58.7	58.0	60.8	61.7	62.7	63.6
Obese	95.8	105.0	101.9	106.1	108.9	113.6	114.9	116.5	117.8
Non-Hispanic Asian									
Underweight	42.9	45.1	45.9	49.1	51.9	51.1	55.3	61.5	65.2
Normal weight	55.9	58.3	59.7	61.6	64.3	67.2	71.1	77.5	75.9
Overweight	86.7	95.9	97.7	99.3	103.3	105.3	111.5	112.7	116.0
Obese	130.3	147.2	139.5	147.3	152.3	155.5	162.9	166.3	169.7

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**Appendix Table 3.** Population Attributable Fractions for Gestational Diabetes Associated With Prepregnancy Overweight and Obesity in Nulliparous Women

	2011	2012	2013	2014	2015	2016	2017	2018	2019
<b>Race/ethnicity</b>	<b>Population attributable fraction, % (95% CI)</b>								
<b>Non-Hispanic White</b>									
Normal weight	ref	ref	ref	ref	ref	ref	ref	ref	ref
Overweight	10.8 (10.2, 11.4)	10.9 (10.3, 11.5)	10.7 (10.1, 11.3)	10.0 (9.4, 10.5)	10.4 (9.8, 10.9)	10.2 (9.6, 10.7)	9.6 (9.1, 10.1)	9.3 (8.8, 9.8)	9.4 (8.9, 9.9)
Obese	30.9 (30.2, 31.6)	31.1 (30.5, 31.8)	31.4 (30.7, 32.1)	31.3 (30.7, 32.0)	31.2 (30.6, 31.8)	32.1 (31.5, 32.7)	32.0 (31.4, 32.7)	32.2 (31.6, 32.8)	33.3 (32.7, 33.9)
Overweight or obese	41.6 (40.6, 42.6)	42.0 (41.0, 42.9)	42.0 (41.1, 43.0)	41.2 (40.4, 42.1)	41.5 (40.6, 42.3)	42.2 (41.3, 43.1)	41.6 (40.7, 42.4)	41.5 (40.6, 42.3)	42.6 (41.7, 43.4)
<b>Non-Hispanic Black</b>									
Normal weight	ref	ref	ref	ref	ref	ref	ref	ref	ref
Overweight	12.3 (10.7, 13.8)	9.6 (8.1, 11.1)	9.3 (7.8, 10.7)	10.4 (9.0, 11.7)	9.9 (8.6, 11.2)	9.6 (8.3, 10.8)	10.1 (8.8, 11.3)	10.3 (9.1, 11.6)	9.2 (8.0, 10.4)
Obese	36.3 (34.4, 38.2)	33.7 (31.8, 35.5)	34.0 (32.1, 35.8)	34.3 (32.5, 35.9)	34.9 (33.2, 36.6)	36.0 (34.3, 37.6)	35.6 (33.9, 37.2)	37.2 (35.5, 38.8)	37.9 (36.2, 39.5)
Overweight or obese	48.5 (45.8, 51.1)	43.2 (40.5, 45.8)	43.2 (40.5, 45.7)	44.5 (42.1, 46.9)	44.7 (42.3, 47.1)	45.5 (43.1, 47.7)	45.6 (43.2, 47.9)	47.5 (45.1, 49.7)	47.0 (44.7, 49.2)
<b>Hispanic</b>									
Normal weight	ref	ref	ref	ref	ref	ref	ref	ref	ref
Overweight	12.0 (10.8, 13.2)	11.3 (10.2, 12.5)	12.5 (11.4, 13.7)	12.2 (11.2, 13.3)	12.8 (11.7, 13.8)	12.2 (11.2, 13.2)	11.1 (10.1, 12.1)	10.9 (9.9, 11.8)	11.3 (10.4, 12.3)
Obese	27.2 (26.0, 28.5)	29.1 (27.9, 30.3)	29.2 (28.0, 30.4)	30.1 (29.0, 31.2)	31.4 (30.3, 32.4)	31.8 (30.8, 32.9)	30.8 (29.7, 31.8)	31.6 (30.5, 32.6)	33.3 (32.3, 34.3)
Overweight or obese	39.2 (37.4, 41.0)	40.4 (38.6, 42.1)	41.7 (39.9, 43.4)	42.3 (40.7, 43.9)	44.1 (42.5, 45.6)	44.0 (42.5, 45.5)	41.8 (40.3, 43.4)	42.4 (40.9, 44.0)	44.6 (43.1, 46.1)
<b>Non-Hispanic Asian</b>									
Normal weight	ref	ref	ref	ref	ref	ref	ref	ref	ref
Overweight	12.1 (10.5, 13.6)	13.3 (11.9, 14.7)	12.9 (11.5, 14.3)	13.0 (11.7, 14.3)	13.0 (11.8, 14.3)	12.5 (11.3, 13.6)	12.9 (11.7, 14.0)	11.4 (10.3, 12.6)	11.6 (10.4, 12.7)
Obese	12.2 (11.2, 13.3)	13.1 (12.1, 14.0)	12.3 (11.3, 13.3)	13.2 (12.3, 14.1)	14.0 (13.1, 14.9)	13.8 (12.9, 14.6)	14.6 (13.7, 15.4)	14.6 (13.7, 15.5)	15.4 (14.5, 16.3)
Overweight or obese	24.3 (22.3, 26.2)	26.4 (24.6, 28.1)	25.2 (23.4, 27.0)	26.2 (24.5, 27.8)	27.0 (25.4, 28.6)	26.2 (24.6, 27.7)	27.5 (25.9, 29.0)	26.0 (24.4, 27.6)	26.9 (25.3, 28.5)

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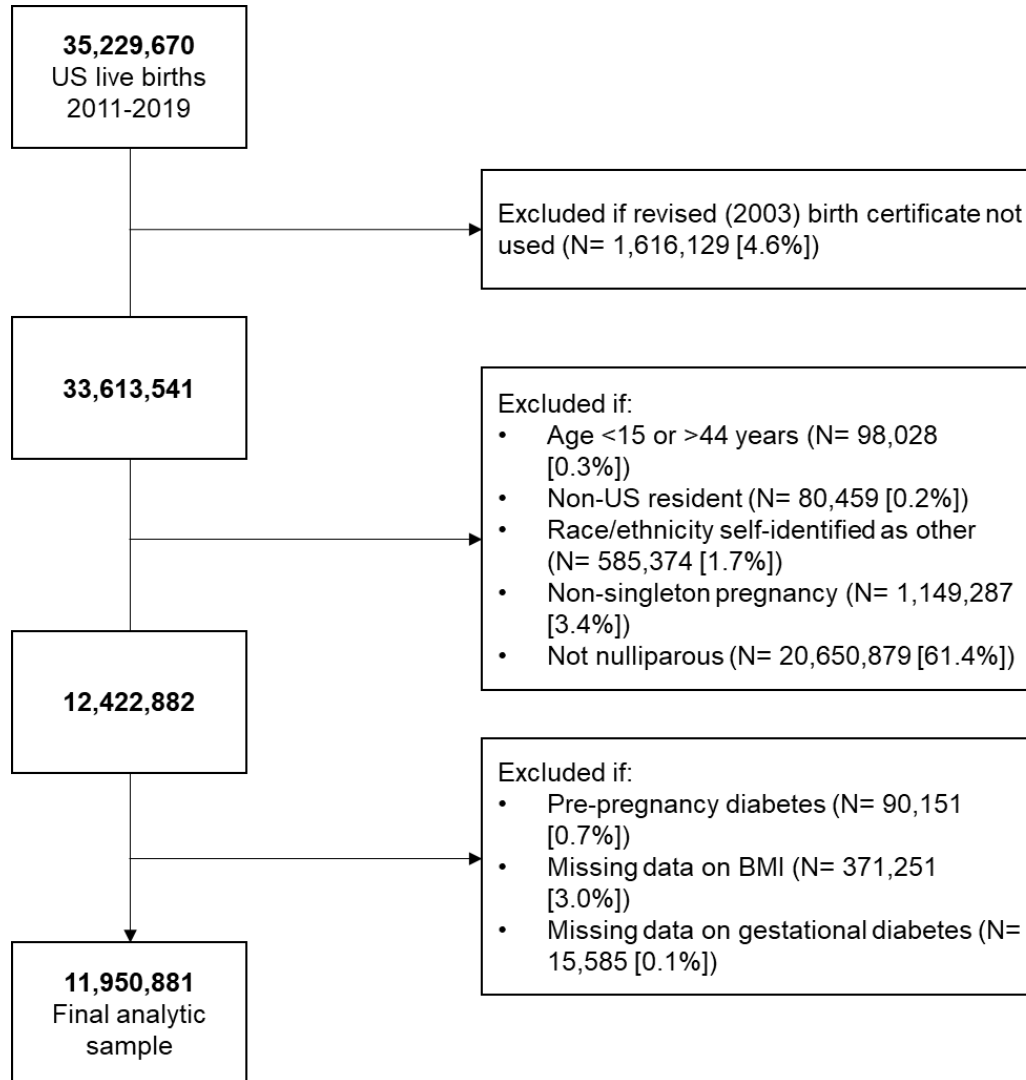
**Appendix Table 4.** Population Attributable Fractions for Gestational Diabetes Associated With Prepregnancy Overweight and Obesity in Racial/Ethnic Subgroups

Race/ethnicity	2011	2015	2019	<i>p</i> -value for difference <sup>a</sup> 2011 vs 2019
	Population attributable fraction, % (95% CI)			
<b>Mexican</b>				
Normal weight	ref	ref	ref	ref
Overweight	11.5 (9.9, 13.0)	13.1 (11.7, 14.4)	12.0 (10.7, 14.4)	0.32
Obese	28.4 (26.8, 30.0)	33.9 (32.5, 35.4)	35.9 (34.4, 35.4)	<b>&lt;0.001</b>
Overweight or obese	39.9 (37.4, 42.2)	47.0 (44.8, 49.0)	47.8 (45.7, 49.0)	<b>&lt;0.001</b>
<b>Puerto Rican</b>				
Normal weight	ref	ref	ref	ref
Overweight	9.1 (5.1, 12.9)	15.3 (11.8, 18.6)	10.9 (8.1, 18.6)	0.23
Obese	32.7 (28.1, 37.1)	38.7 (34.6, 42.6)	39.6 (36.0, 42.6)	<b>0.008</b>
Overweight or obese	41.7 (35.0, 47.8)	53.9 (48.2, 59.1)	50.4 (45.3, 59.1)	<b>0.02</b>
<b>Central or South American</b>				
Normal weight	ref	ref	ref	ref
Overweight	12.2 (8.6, 15.7)	12.7 (9.8, 15.6)	11.8 (9.2, 15.6)	0.42
Obese	17.8 (14.8, 20.7)	20.9 (18.4, 23.4)	23.8 (21.5, 23.4)	<b>&lt;0.001</b>
Overweight or obese	30.1 (25.1, 34.7)	33.6 (29.5, 37.5)	35.6 (31.8, 37.5)	<b>0.04</b>
<b>Asian Indian<sup>b</sup></b>				
Normal weight	ref	ref	ref	ref
Overweight	14.3 (11.0, 17.4)	16.5 (14.0, 19.0)	15.1 (12.9, 19.0)	0.33
Obese	13.1 (11.0, 15.1)	14.9 (13.2, 16.5)	17.7 (16.1, 16.5)	<b>&lt;0.001</b>
Overweight or obese	27.4 (23.1, 31.4)	31.4 (28.0, 34.5)	32.8 (29.6, 34.5)	<b>0.02</b>
<b>Chinese<sup>b</sup></b>				
Normal weight	ref	ref	ref	ref
Overweight	8.5 (5.6, 11.4)	6.4 (4.1, 8.7)	7.0 (4.9, 8.7)	0.21
Obese	4.0 (2.6, 5.5)	5.2 (3.9, 6.4)	5.7 (4.5, 6.4)	<b>0.04</b>
Overweight or obese	12.6 (9.2, 15.9)	11.6 (8.9, 14.3)	12.8 (10.1, 14.3)	0.47
<b>Filipina<sup>b</sup></b>				
Normal weight	ref	ref	ref	ref
Overweight	14.3 (9.7, 18.6)	12.4 (8.6, 16.1)	11.1 (7.2, 16.1)	0.15
Obese	17.8 (14.5, 21.1)	19.9 (16.8, 22.9)	19.4 (16.3, 22.9)	0.25
Overweight or obese	32.1 (26.0, 37.8)	32.3 (26.7, 37.4)	30.6 (24.7, 37.4)	0.35

<sup>a</sup>Boldface indicates statistical significance (*p*<0.05).

<sup>b</sup>Non-Hispanic women were included.

**Appendix Figure 1.** Flow diagram for the final analytic sample representing the study population.



*Notes:* From the initial population of all live births in the U.S. between 2011–2019 (N=35,229,670), we first excluded records that did not use the revised (2003) birth certificate. We then applied the following inclusion criteria: maternal age 15–44 years; U.S. resident; self-identified as non-Hispanic White, non-Hispanic Black, Hispanic, or non-Hispanic Asian; singleton pregnancy; and nulliparous. Finally, we applied the following exclusion criteria: pre-pregnancy diabetes, or missing data on prepregnancy BMI or gestational diabetes. Our final analytic sample contained 11,950,881 live births.