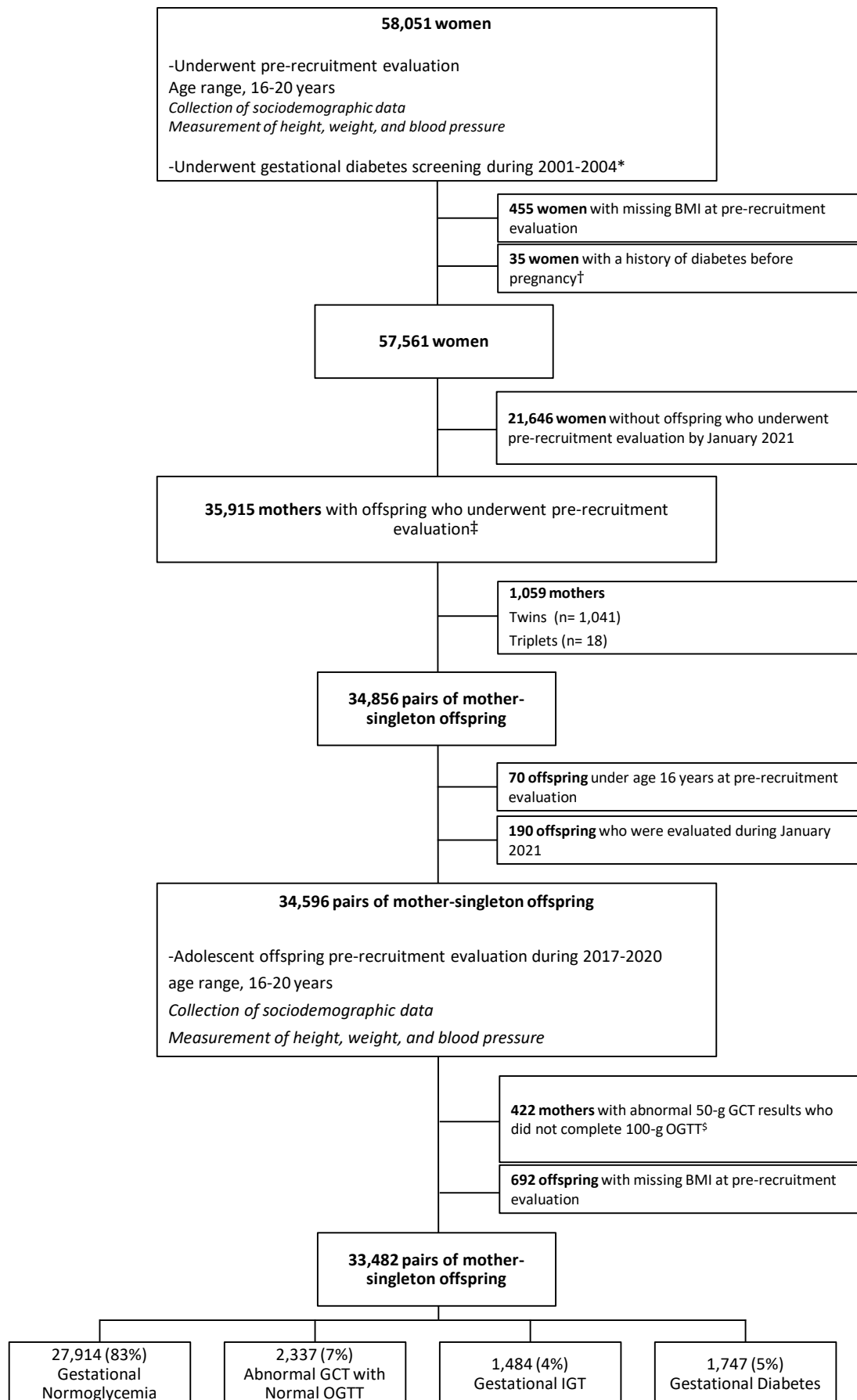


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Supplementary Figure S1: Study sample buildup



In total, 58,051 women underwent pre-recruitment evaluation one-year prior to military conscription (age 16-20 years) and had a documented pregnancy at a single health maintenance organization (Maccabi Healthcare Services; MHS).

* Digital laboratory documentation of glucose screening tests for gestational diabetes was established at MHS in 2001. We included women who were screened for gestational diabetes until 2004, which was the latest year that allowed the minimal possible time interval for the offspring to attend the pre-recruitment medical evaluation (performed at age 16 to 20 years).

† Excluded were women who were diagnosed with diabetes by medical history collected at adolescence (pre-recruitment medical evaluation) or diagnosed with diabetes prior to the GCT date (according to the MHS diabetes registry; See the 'Extended Methods' section).

‡ Matching between mothers and their offspring was based on civilian identification numbers. The suitable offspring for a mother's pregnancy was chosen as the child born up to 6 months after the first recorded GCT, with comprehensive pre-recruitment evaluation. If more than one pregnancy with a suitable offspring was documented, the first pregnancy was chosen. For 21,646 women, we did not identify an offspring who underwent pre-recruitment evaluation by January 2021; these women were thus excluded from the cohort (See Table S1).

\$ Women with GCT ≥ 200 mg/dL were usually not referred to an OGTT, as they were already considered to have gestational diabetes. These women were classified as having gestational diabetes in this study.

GCT, glucose challenge test; OGTT, oral glucose tolerance test; IGT, impaired glucose tolerance

Supplementary Table S1: Characteristics of mothers included in the study compared to women without offspring who completed pre-recruitment evaluation.

	Our cohort	Women without offspring who completed pre-recruitment evaluation
Number of women	33,482	21,362*
Mothers at adolescence		
Age, years	17.4 ± 0.4	17.4 ± 0.4
BMI, kg/m ²	21.3 ± 2.9	21.4 ± 3.1
Overweight or obesity, number (%)	2,803 (8.4)	2,104 (9.8)
Graduated high school, %	97	97
Intelligence score, %		
Low	8	9
High	16	15
Residential socioeconomic position, %		
Low	16	16
High	31	31
Born in Israel, %	90	88
Systolic blood pressure, mmHg	113.6 ± 13.2	113.4 ± 14.0
Diastolic blood pressure, mmHg	71.4 ± 9.2	71.3 ± 9.5
Mothers at gestational diabetes screening		
Age at delivery, years	30.7 ± 4.1	31.2 ± 4.6
Range	18.1 – 47.8	18.1 – 49.0
GCT result, mg/dL	110.9 ± 27.9	112.6 ± 28.6
Gestational glucose intolerance group, %		
Gestational normoglycemia	27,914 (83.4)	17,498 (81.9)
Abnormal GCT with normal OGTT	2,337 (7.0)	1,731 (8.1)
Gestational IGT	1,484 (4.4)	993 (4.6)
Gestational diabetes	1,747 (5.2)	1,140 (5.3)
Gestational diabetes screening year, number (%)		
2001	12,866 (38.4)	1,742 (8.2)
2002	12,406 (37.1)	2,161 (10.1)
2003	7,919 (23.7)	5,601 (26.2)
2004	291 (0.9)	11,858 (55.5)

The data are means ± standard deviations (SD) unless otherwise indicated. For 21,646 women, we could not find a suitable offspring who completed pre-recruitment evaluation by January 2021, and we therefore excluded them from the cohort (Figure S1). The precise reasons for which offspring did not undergo pre-recruitment evaluation were not available to us (i.e., stillborn, death by age 16 years, or exemption from military service, see Table S2). Women without offspring who underwent pre-recruitment evaluation were characterized by higher rates of overweight or obesity at adolescence, higher proportions of gestational glucose intolerance ($P < 0.0001$, for both variables), and similar sociodemographic characteristics. Of note, from data extraction to the completion of preparation of this manuscript, from January 2021 to August 2021, 10,676 offspring completed the pre-recruitment evaluation (Table S2). *284 of 21,646 women had abnormal 50-g GCT but did not complete 100-g OGTT and were thus not included in this Table.

Supplementary Table S2: Mothers with living offspring who completed pre-recruitment evaluations, according to the year at gestational diabetes screening.

Gestational diabetes screening, year	Total number of potential offspring*	Study cohort	Offspring who underwent pre-recruitment evaluation from data extraction to the completion of manuscript preparation
		January 2017 through December 2020, number (%) [†]	January 2021 through August 2021, number (%) [†]
		January 2017 through August 2021, number (%)	
2001-2004	55,128	33,482 (60.7)	10,676 (19.4)
		44,158 (80.1)	
2001	14,608	12,866 (88.1)	730 (5.0)
		13,596 (93.1)	
2002	14,567	12,406 (85.2)	1,030 (7.0)
		13,436 (92.2)	
2003	13,520	7,919 (58.6)	3,894 (28.8)
		11,813 (87.4)	
2004	12,149	291 (2.4)	5,022 (41.3)
		5,313 (43.7)	

* The total number of potential offspring was determined according to the number of pregnant women who underwent gestational diabetes screening in a specific year.

† The percentages presented are the proportions of the total number of potential offspring. As mentioned in the legend of Table S1, for 21,646 women, we did not identify an offspring who underwent pre-recruitment evaluation by January 2021. From data extraction to the completion of preparation of this manuscript, from January 2021 to August 2021, 10,676 offspring underwent the pre-recruitment evaluation. This table presents their distribution according to the year their mothers underwent gestational glucose screening. As expected, the later the year that women underwent gestational diabetes screening, the lower the percent of offspring who underwent pre-recruitment evaluation. As the minimum age for pre-recruitment evaluation is 16 years, with a mean age of 17.4, the observed difference between the years mostly represents differences in offspring age at the end of follow-up. Accordingly, most offspring of pregnancies accounted for in this cohort are expected to attain pre-recruitment evaluations by the end of 2024.

Supplementary Table S3: Characteristics at adolescence of mothers included in the study (insured by Maccabi Healthcare Services) vs. women who were insured by all health maintenance organizations in Israel.

	Women who were insured by MHS (study cohort)	Women who were insured by all HMOs
Number of women	33,482	167,410
Age, years	17.4 ± 0.4	17.4 ± 0.4
BMI, kg/m ²	21.3 ± 2.9	21.6 ± 3.2
BMI status, number (%)		
Underweight	1,446 (4.3)	7,304 (4.4)
Normal BMI	29,233 (87.3)	141,464 (84.5)
Overweight	2,381 (7.1)	14,830 (8.9)
Mild obesity	362 (1.1)	3,271 (2.0)
Severe obesity	60 (0.1)	541 (0.3)
High school graduate, %	97	96
Cognitive performance level, %		
Low	8	9
Medium	75	75
High	16	14
Residential socioeconomic position, %		
Low	16	21
High	30	25
Born in Israel, %	90	91
Systolic blood pressure, mmHg	114 ± 12	114 ± 12
Diastolic blood pressure, mmHg	72 ± 8	72 ± 8

The data are means ± standard deviations (SD) unless otherwise indicated. Israeli citizens who complete their mandatory military service are insured by one of four Israeli Health Maintenance Organizations (HMOs). Maccabi Healthcare Services (MHS) is responsible for insuring 26% of the Israeli population, with 2.5 million members. Women who were insured by all Israeli HMOs and underwent pre-recruitment evaluation were matched by calendar year of pre-recruitment evaluation in a 1:5 ratio to women in the main study cohort. This matching was performed to accurately present the comparison given the secular trend of some of the study variables (such as adolescent BMI¹). For continuous variables, the mean ± SD is given unless specified otherwise. BMI was classified into five groups according to U.S. Center for Disease Control and Prevention percentiles: underweight (<5th), normal BMI (5th through 85th), overweight (85th through 95th), mild obesity (95th through 120% of the 95th), and severe obesity (>120% of the 95th). Women insured in MHS vs. those insured by other HMOs had lower prevalences of adolescent overweight/obesity (8.3% vs. 11.2%, $P<0.0001$) and slightly higher rank in all sociodemographic variables.

¹ Twig, G., et al. "Body mass index and infectious disease mortality in midlife in a cohort of 2.3 million adolescents." *International Journal of Obesity* 42.4 (2018): 801-807.

Supplementary Table S4: Odds ratios of gestational glucose intolerance in a model that adjusted for adolescent BMI of the offspring's fathers.

	Gestational normoglycemia	Abnormal GCT with normal OGTT	Gestational IGT	Gestational diabetes
Main analysis				
Number of mother-offspring pairs	27,484	2,302	1,460	1,706
Number of offspring with overweight or obesity	5,127	505	348	429
OR	1 (reference)	1.24	1.33	1.43
95% CI		1.11 – 1.38	1.17 – 1.51	1.27 – 1.61
Model with adjustment for paternal adolescent BMI of the offspring				
Number of mother-offspring pairs	25,873	2,161	1,367	1,576
Number of offspring with overweight or obesity	4,809	486	328	397
OR	1 (reference)	1.28	1.29	1.40
95% CI		1.15 – 1.43	1.13 – 1.48	1.23 – 1.58

Analyses were adjusted for model 1: mothers' data at adolescence (age, intelligence score, years of education, residential socioeconomic position, birthplace, and BMI) and age at gestational diabetes screening. Data on calculated paternal BMI, based on measured weight and height at pre-recruitment evaluations at adolescence, were available for 94% of the cohort. The main analysis is shown to facilitate comparison.

OR, odds ratio; CI, confidence interval; GCT, glucose challenge test; OGTT, oral glucose tolerance test; IGT, impaired glucose tolerance

Supplementary Table S5: A sensitivity analysis limited to mothers who were screened during the year 2001.

	Gestational normoglycemia	Abnormal GCT with normal OGTT	Gestational IGT	Gestational diabetes
Main analysis				
Number of mother-offspring pairs	27,484	2,302	1,460	1,706
Number of offspring with overweight or obesity	5,127	505	348	429
OR	1 (reference)	1.24	1.33	1.43
95% CI		1.11 – 1.38	1.17 – 1.51	1.27 – 1.61
Mothers who were screened in 2001				
Number of mother-offspring pairs	10,606	837	555	667
Number of offspring with overweight or obesity	2,050	211	142	178
OR	1 (reference)	1.37	1.36	1.45
95% CI		1.16 – 1.63	1.11 – 1.67	1.20 – 1.74

We limited the analysis to include women who were screened for gestational diabetes during 2001, in which 88% (12,866 of 14,608) of the women had offspring with complete pre-recruitment evaluation. The main analysis is shown to facilitate comparison. The analyses were all adjusted for model 1. Point estimates were similar.

OR, odds ratio; CI, confidence interval; GCT, glucose challenge test; OGTT, oral glucose tolerance test; IGT, impaired glucose tolerance

Supplementary Table S6: A sensitivity analysis limited to mothers without overweight/obesity at adolescence.

	Gestational normoglycemia	Abnormal GCT with normal OGTT	Gestational IGT	Gestational diabetes
Main analysis				
Number of mother-offspring pairs	27,484	2,302	1,460	1,706
Number of offspring with overweight or obesity	5,127	505	348	429
OR	1 (reference)	1.24	1.33	1.43
95% CI		1.11 – 1.38	1.17 – 1.51	1.27 – 1.61
Mothers with underweight or normal BMI at adolescence*				
Number of mother-offspring pairs	25,288	2,091	1,313	1,507
Number of offspring with overweight or obesity	4,319	412	260	331
OR	1 (reference)	1.22	1.18	1.40
95% CI		1.09 – 1.37	1.02 – 1.36	1.23 – 1.60
Mothers with low normal BMI at adolescence**				
Number of mother-offspring pairs	13,441	1,087	651	783
Number of offspring with overweight or obesity	1,698	166	103	122
OR	1 (reference)	1.27	1.33	1.31
95% CI		1.07 – 1.51	1.07 – 1.65	1.07 – 1.60

The analyses were adjusted for model 1. * The analysis was limited to mothers with underweight or normal BMI (<85th percentile) at pre-recruitment evaluation. ** The analysis was limited to mothers with low-normal BMI (5-50th percentile) at pre-recruitment evaluation. The main analysis is shown to facilitate comparison.

OR, odds ratio; CI, confidence interval; BMI, body mass index; GCT, glucose challenge test; OGTT, oral glucose tolerance test; IGT, impaired glucose tolerance

Supplementary Table S7: A sensitivity analysis limited to mothers with unimpaired health at adolescence.

	Gestational normoglycemia	Abnormal GCT with normal OGTT	Gestational IGT	Gestational diabetes
Main analysis				
Number of mother-offspring pairs	27,484	2,302	1,460	1,706
Number of offspring with overweight or obesity	5,127	505	348	429
OR	1 (reference)	1.24	1.33	1.43
95% CI		1.11 – 1.38	1.17 – 1.51	1.27 – 1.61
Unimpaired maternal health at pre-recruitment evaluation				
Number of mother-offspring pairs	21,984	1,811	1,177	1,354
Number of offspring with overweight or obesity	4,102	398	283	333
OR	1 (reference)	1.26	1.35	1.39
95% CI		1.12 – 1.42	1.17 – 1.55	1.22 – 1.59

The analysis was adjusted for model 1. Unimpaired health was defined as without any indication of chronic medical treatment, history of major surgery, or cancer². The main analysis is shown to facilitate comparison.

OR, odds ratio; CI, confidence interval; GCT, glucose challenge test; OGTT, oral glucose tolerance test; IGT, impaired glucose tolerance

² Twig, Gilad, et al. "Body-mass index in 2.3 million adolescents and cardiovascular death in adulthood." *New England Journal of Medicine* 374.25 (2016): 2430-2440.

Supplementary Table S8: Odds ratios of gestational glucose intolerance in a model in which the study outcome was defined as a combination of offspring adolescent abnormal blood pressure and overweight/obesity.

	Gestational normoglycemia	Abnormal GCT with normal OGTT	Gestational IGT	Gestational diabetes
Main analysis				
Number of mother-offspring pairs	27,484	2,302	1,460	1,706
Number of offspring with overweight or obesity	5,127	505	348	429
OR	1 (reference)	1.24	1.33	1.43
95% CI		1.11 – 1.38	1.17 – 1.51	1.27 – 1.61
Outcome of overweight/obesity combined with abnormal blood pressure				
Number of mother-offspring pairs	27,421	2,291	1,455	1,701
Number of offspring with overweight or obesity and abnormal blood pressure	1,706	188	108	164
OR	1 (reference)	1.39	1.25	1.66
95% CI		1.18 – 1.64	1.02 – 1.54	1.39 – 1.98

The analysis was adjusted for model 1. Blood pressure was measured as part of the pre-recruitment evaluation at adolescence. The outcome was defined as offspring with overweight/obesity and abnormal blood pressure (systolic blood pressure ≥ 130 mmHg and/or diastolic blood pressure ≥ 80 mmHg) at adolescence. The main analysis is shown to facilitate comparison.

OR, odds ratio; CI, confidence interval; GCT, glucose challenge test; OGTT, oral glucose tolerance test; IGT, impaired glucose tolerance

Supplementary Table S9: Odds ratios of gestational glucose intolerance using WHO definitions for overweight, mild obesity and severe obesity.

	Gestational normoglycemia	Abnormal GCT with normal OGTT	Gestational IGT	Gestational diabetes
CDC definition for overweight or obesity				
OR	1 (reference)	1.24	1.33	1.43
95% CI		1.11 – 1.38	1.17 – 1.51	1.27 – 1.61
WHO definition overweight or obesity				
OR	1 (reference)	1.21	1.25	1.42
95% CI		1.09 – 1.33	1.10 – 1.41	1.27 – 1.59
CDC definition for overweight				
OR	1 (reference)	1.19	1.15	1.21
95% CI		1.05 – 1.36	0.98 – 1.35	1.04 – 1.40
WHO definition for overweight				
OR	1 (reference)	1.17	1.09	1.26
95% CI		1.05 – 1.31	0.95 – 1.26	1.11 – 1.44
CDC definition for mild obesity				
OR	1 (reference)	1.23	1.54	1.79
95% CI		1.03 – 1.48	1.25 – 1.89	1.49 – 2.15
WHO definition for mild obesity				
OR	1 (reference)	1.24	1.56	1.75
95% CI		1.04 – 1.48	1.28 – 1.91	1.46 – 2.09
CDC definition for severe obesity				
OR	1 (reference)	1.66	2.16	1.98
95% CI		1.24 – 2.24	1.56 – 2.99	1.45 – 2.70
WHO definition for severe obesity				
OR	1 (reference)	1.68	2.27	2.36
95% CI		1.18 – 2.41	1.56 – 3.32	1.66 – 3.35

Analyses were adjusted for model 1. Main analyses (CDC definition) are shown to facilitate comparison. WHO definitions for BMI status were as follows: 1 SD above the WHO Growth Reference median for overweight, 2-3 SD for mild obesity and 3 SD for severe obesity.

CDC, centers for disease control; WHO: world health organization; OR, odds ratio; CI, confidence interval

Supplementary Table S10: A sensitivity analysis limited to mothers who were not treated with insulin during pregnancy.

	Gestational normoglycemia	Gestational diabetes
Main analysis		
Number of mother-offspring pairs	27,484	1,706
Number of offspring with overweight or obesity	5,127	429
OR	1 (reference)	1.43
95% CI		1.27 – 1.61
Excluding mothers who were treated with insulin		
Number of mother-offspring pairs	27,484	1,591
Number of offspring with overweight or obesity	5,127	397
OR	1 (reference)	1.43
95% CI		1.26 – 1.62

The analysis was adjusted for model 1. Data regarding insulin treatment were retrieved from Maccabi Healthcare Services. In the adjusted model, we excluded mothers with gestational diabetes who were treated with insulin (n=115 mothers, 7% of those with gestational diabetes). The main analysis is shown to facilitate comparison.

OR, odds ratio; CI, confidence interval

Supplementary Table S11: A sensitivity analysis limited to women who were not diagnosed with type 2 diabetes 2 after delivery and until data extraction.

	Gestational normoglycemia	Abnormal GCT with normal OGTT	Gestational IGT	Gestational diabetes
Diagnosed with type 2 diabetes after pregnancy, number (%)	189 (0.7)	56 (2.3)	95 (6.2)	259 (14.6)
Main analysis				
Number of mother-offspring pairs	27,484	2,302	1,460	1,706
Number of offspring with overweight or obesity	5,127	505	348	429
OR	1 (reference)	1.24	1.33	1.43
95% CI		1.11 – 1.38	1.17 – 1.51	1.27 – 1.61
Mothers who were not diagnosed with type 2 diabetes after delivery				
Number of mother-offspring pairs	27,307	2,251	1,373	1,453
Number of offspring with overweight or obesity	5,067	486	311	347
OR	1 (reference)	1.22	1.27	1.40
95% CI		1.10 – 1.36	1.11 – 1.45	1.23 – 1.60

The analyses were adjusted for model 1. Data regarding the diagnosis of type 2 diabetes were retrieved from Maccabi Healthcare Services until August 20th, 2020. Rates of postpartum type 2 diabetes, diagnosed at least three months after delivery, were 0.7%, 2.3%, 6.2%, and 14.6% among mothers with gestational normoglycemia, abnormal GCT with normal OGTT, gestational IGT, and gestational diabetes, respectively. Excluding these women yielded similar results to the main analysis. The main analysis is shown to facilitate comparison.

OR, odds ratio; CI, confidence interval; GCT, glucose challenge test; OGTT, oral glucose tolerance test; IGT, impaired glucose tolerance