

Supplementary Appendix

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

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WEB SUPPLEMENTAL APPENDIX

Bariatric Surgery and Preterm Birth

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1 Study Population

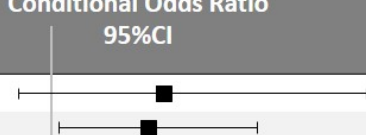
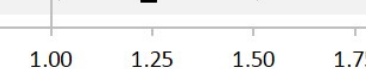
We have previously published data in the *Journal* on pregnancy and perinatal outcomes based on a cohort of 596 post-surgery births and 2356 matched controls between 2006 and 2011, identified from the Scandinavian Obesity Surgery Registry (SOReg) and the Swedish Medical Birth Register.

In our previous *Journal* publication, we analyzed preterm birth among 590 post-surgery singleton live births and 2344 matched control births. We could not detect an increased risk of preterm birth, probably due to insufficient statistical power.

The current cohort of post-surgery and control births was derived from the same data sources, but with the addition of deliveries from 2012 and 2013. Given the large increase in use of bariatric surgery in Sweden during recent years, this resulted in an additional 1351 live singleton births with information on gestational age. The post-surgery births included in the previous publication were also included in our updated analysis of 1941 post-surgery and 6574 matched control births.

The results from the previous and updated cohort are compared in **Table S1** showing similar point estimates for preterm birth but greater precision in the updated cohort based on an approximately 3 times larger sample size.

Table S1 Comparison of previous and current analysis.

	n		Preterm Birth, n (%)		Conditional Odds Ratio 95%CI	P
	Bariatric Surgery	Matched Controls	Bariatric Surgery	Matched Controls		
2006-2011	590	2344	59 (10.0%)	176 (7.5%)		0.15
2006-2013	1941	6574	163 (8.4%)	447 (6.8%)		0.028

The cohorts were similar in terms of maternal age (both 31 ± 5 yrs), pre-surgery BMI (43.7 ± 5.4 vs. 43.5 ± 5.3), and early pregnancy BMI (30.4 ± 4.9 vs. 29.6 ± 4.9). The median surgery to delivery interval was shorter in our previous than the current publication (2.0 ± 0.9 vs. 2.4 ± 1.1 yrs), **Table S2**.

Table S2 Participant characteristics.

	Post-Surgery Births (n=1941)	Matched Control Births (n=6574)
Procedure Type		-
Gastric Bypass, no. (%)	1913 (98.6%)	
Other, no. (%)	28 (1.4%)	
Surgery to Conception Interval, Yrs		
Mean±SD	1.6±1.1	-
Median (p25-p75)	1.4 (0.8-2.2)	-
<1 yr, no. (%)	688 (35.4%)	-
1-2 yrs, no. (%)	656 (33.8%)	-
>2 yrs, no. (%)	597 (30.8%)	-
Maternal Age, Yrs		
Mean±SD	31±5	31±5
Median (p25-p75)	31 (27-35)	31 (27-35)
Pre-Surgery BMI	43.5±5.3	
Early Pregnancy BMI		
Mean±SD	29.6±4.9	41.1±4.8
Median (p25-p75)	28.9 (26.0-32.5)	40.8 (37.5-43.4)
<18.5, no. (%)	1 (0.1%)	
18.5-24.9, no. (%)	312 (16.1%)	
25-29.9, no. (%)	776 (40.0%)	
30-34.9, no. (%)	520 (26.8%)	210 (3.2%)
35-39.9, no. (%)	194 (10.0%)	2206 (33.6%)
≥40, no. (%)	65 (3.3%)	4158 (63.2%)
Missing, no. (%)	73 (3.8%)	-
Smoking Status		
Nonsmoker, no. (%)	1655 (85.3%)	5720 (87.0%)
1-9cig/d, no. (%)	190 (9.8%)	617 (9.4%)
≥10cig/d, no. (%)	63 (3.2%)	192 (2.9%)
Missing, no. (%)	33 (1.7%)	45 (0.7%)
Nulliparous, no. (%)	766 (39.5%)	2505 (38.1%)

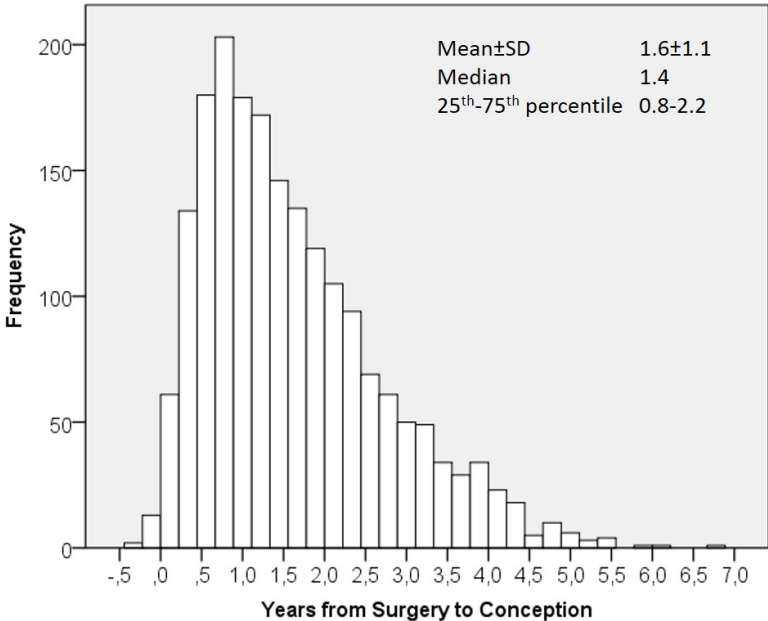
2 Spontaneous and Medically Indicated Preterm Birth

Due to the smaller sample size in our previous *Journal* publication, we did not have the possibility to categorize the outcome into spontaneous and medically indicated preterm birth. In this updated analysis, we used information from checked boxes recorded in the obstetrical record before delivery, and diagnosis at discharge from the delivery hospital, to classify preterm births as spontaneous or medically indicated.

Medically indicated preterm birth was defined as performance of a cesarean delivery before onset of labor or induction of labor without preterm premature rupture of the membranes (ICD-10 code O42).

3 Surgery to Conception Interval and Preterm Birth

In an internal analysis of the post-surgery group, we could not detect any association between surgery to conception interval and risk of preterm birth (**Figure S1**). This was also the case when analyzing surgery to conception interval as a continuous variable (adjusted odds ratio 1.00, 95%CI 0.86-1.16, P=1.00).



Preterm Birth by Time from Surgery to Conception

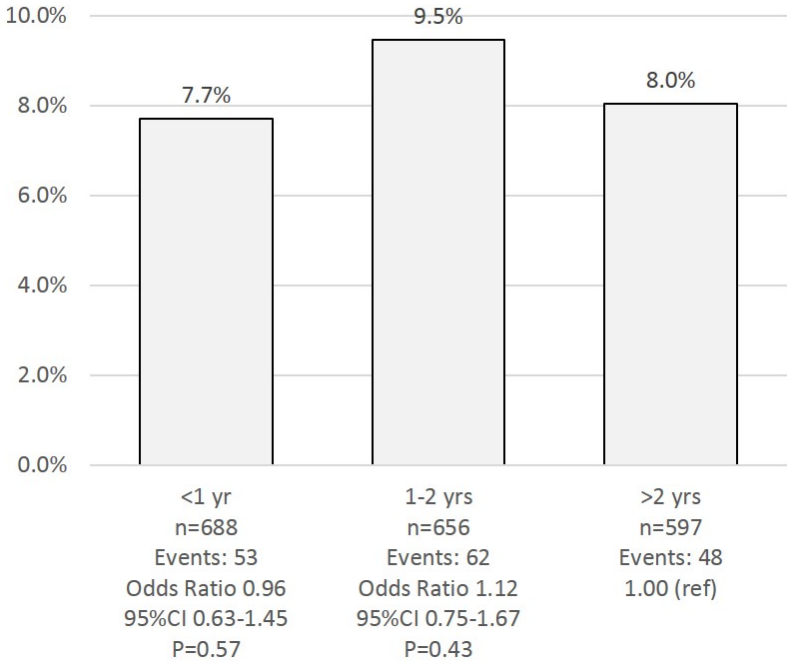


Figure S1 Distribution of time from surgery to conception (top panel) and association with preterm birth (lower panel). Odds ratios adjusted for maternal age, early pregnancy BMI, smoking status and parity.




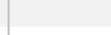

4 Sensitivity Analysis

4.1 GEE

The main analyses were performed on individual pregnancies, which made it possible for a woman to contribute more than one pregnancy. To adjust for the possible dependence in outcome that could be introduced by having repeated pregnancies in the same mother, we did a sensitivity analysis with risk estimation performed by the generalized-estimating-equation (GEE) method with the mother's identification number as a cluster and assuming an independent correlation structure.

The estimates of effect and precision were similar to the main analysis (**Table S3**).

Table S3 Sensitivity analysis: replication of main analysis using GEE.

GEE	n		Events, n (%)		Odds Ratio (95%CI)	P
	Post-Surgery Births	Matched Control Births	Post-Surgery Births	Matched Control Births		
Preterm Birth	1941	6574	163 (8.4%)	447 (6.8%)		0.019
Moderately Preterm	1917	6496	139 (7.3%)	369 (5.7%)		0.013
Very Preterm	1941	6574	24 (1.2%)	78 (1.2%)		0.86
Spontaneous	1937	6553	101 (5.2%)	245 (3.7%)		0.004
Medically Indicated	1937	6553	62 (3.2%)	198 (3.0%)		0.69

0.50 0.75 1.00 1.25 1.50 1.75

Preterm birth after bariatric surgery and in matched control deliveries from the general population.

Data on spontaneous or medically indicated preterm birth were missing on 4 post-surgery births and 21 control births.

4.2 Women without History of Preterm Birth

In order to investigate the potential impact of history of preterm birth, we restricted the cohort to women who were either nulliparous or had no history of preterm birth (from a singleton or multiple birth). This resulted in lower risk estimates in both post-surgery and control births, but the risk remained higher in the post-surgery births (odds ratio 1.27, 95%CI 1.02-1.56, P=0.030).

Table S4 Preterm birth in births to women who were either nulliparous or had no history of preterm birth.

	Preterm Birth			%
	No	Yes	Total	
Matched Control Births	5837	384	6221	6.2%
Post-Surgery Births	1680	140	1820	7.7%
Total	7517	524	8041	