

# Study debunks notion that C-section would increase risk of obesity in the child

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Women who have C-sections are no more likely to have children who develop obesity than women who give birth naturally, according to a large study by researchers at Karolinska Institutet in Sweden, published in the journal *PLOS Medicine*. The findings contradict several smaller studies that did find an association between C-section deliveries and offspring obesity but did not consider the numerous maternal and

prenatal factors that the researchers did in this study.

Cesarean or C-section deliveries have soared in recent years, from 6.7 percent globally in 1990 to around 19.1 percent in 2014, according to earlier reports. The jump has sparked intense research into the long-term consequences of C-section on [offspring](#) health, and several studies have linked cesarean deliveries with increased risks for asthma, various allergies and [obesity](#). The association with obesity has, however, mainly been confirmed in smaller studies that were unable to account for a wide array of possible confounders or differentiate between types of C-sections.

The researchers in this study set out to investigate if indeed increased C-section births could explain part of the rise in obesity also seen in the last decades, and whether this potential association held true once they accounted for maternal and prenatal factors known to impact offspring weight. They compared the body-mass index (BMI) of nearly 100,000 male 18-year-olds and divided them into categories depending on whether they were born through vaginal delivery, elective C-section or non-elective C-section.

According to the data, 5.5 and 5.6 percent of the men delivered through elective and non-elective C-section, respectively, were obese compared to 4.9 percent of the men delivered vaginally. But after accounting for other factors known to impact offspring weight—including prepregnancy BMI, maternal and gestational age and the presence of diabetes, hypertension, smoking and preeclampsia in the mother—the researchers concluded that the method of childbirth did not play a significant role in determining the risk of obesity in the offspring.

"We found no evidence to support a link between C-sections and the development of obesity," says Daniel Berglind, researcher at the Department of Global Public Health at Karolinska Institutet. "This tells

us that how women give birth may not be an important factor in the origins of the global obesity epidemic."

The researchers also identified nearly 10,000 full brothers and concluded that sibling analysis, accounting for genetic and [environmental factors](#), did not alter the overall findings.

The strongest confounder in the association between mode of delivery and obesity was how much the mother weighed before she became pregnant. This is consistent with previous reports on the heritability of obesity and the influence of maternal obesity on fetal health.

"Most of the association between C-section and obesity could be explained by maternal pre-pregnancy BMI," says Viktor H. Ahlqvist, researcher at the Department of Global Public Health. "This suggests that heritability and fetal exposure to obese-causing factors in the womb are more important when assessing the risk of obesity in the offspring than the mode of [delivery](#)."

**More information:** "Elective and nonelective cesarean section and obesity among young adult male offspring: a Swedish population-based cohort study," Viktor H. Ahlqvist, Margareta Persson, Cecilia Magnusson, Daniel Berglind, *PLOS Medicine*, Dec. 6, 2019, [DOI: 10.1371/journal.pmed.1002996](https://doi.org/10.1371/journal.pmed.1002996)

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