

# Weight gain between pregnancies linked to increased risk of stillbirth and infant death

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Mothers of healthy weight during their first pregnancy who gain even a moderate amount of weight (around 6 kg in a woman of average height) between their first and second pregnancies increase the risk of their baby dying in its first year of life, according to new research involving over 450000 Swedish women, published in *The Lancet*.

The findings also reveal an incremental increase in the risk of stillbirth with weight gain between pregnancies, irrespective of a woman's weight during her first [pregnancy](#). Importantly, [weight loss](#) between pregnancies reduced the likelihood of [neonatal death](#) (within 28 days of birth) in babies of [overweight women](#) (BMI 25 kg/m<sup>2</sup> or over).

"The public health implications are profound," says study author Professor Sven Cnattingius from the Karolinska Institutet in Stockholm, Sweden. "Around a fifth of women in our study gained enough weight between pregnancies to increase their risk of stillbirth by 30-50%, and their likelihood of giving birth to babies who die in infancy increased by 27-60%, if they had a [healthy weight](#) during their first pregnancy."

The new study is based on data from the Swedish Medical Birth Register. The researchers analysed more than 450000 women who gave birth to their first and second child between 1992 and 2012 to assess the risk of stillbirth (fetal death at 28 weeks or later) and infant mortality (death within the first year of life) by a change in mother's body mass index (BMI) between the first and second pregnancies. Causes of death included congenital abnormalities, birth asphyxia, infections, and sudden

infant death syndrome (SIDS).

The findings suggest that babies of mothers who gained more than 4 BMI units (around 11 kg in Swedish women of [average height](#)) between pregnancies had about 50% greater risk of their baby dying in the first 4 weeks of life than women who were of stable weight (BMI change from -1 to less than 1 kg/m<sup>2</sup>), even after adjusting for certain factors known to affect the risk of stillbirth including maternal age, educational level, and smoking. Risks of stillbirth increased with increasing weight gain (tables 1-3).

In mothers with a normal BMI during their first pregnancy, the risk of infant mortality increased with weight gain. For example, the risk of infant death was 27% greater for women who gained between 2 and 4 BMI points (6 to 11 kg), and 60% higher for mothers who gained 4 BMI units or more (11 kg or more), compared with mothers of stable weight. The authors suggest that increments in BMI in healthy weight women may reflect a greater increase of fat mass than in obese women, and therefore a greater risk.

In contrast, overweight mothers who lost at least 6 kg before their second pregnancy had about a 50% reduced likelihood of neonatal death.

According to study co-author Eduardo Villamor, Professor of Epidemiology at the University of Michigan School of Public Health, Michigan, USA, "The prevalence of overweight and obesity in pregnant women has reached epidemic levels. More than half of women in the USA and one in three women in Sweden are either overweight or obese at the start of their pregnancy. Our findings highlight the importance of educating women about maintaining a healthy weight during pregnancy and reducing excess weight before becoming pregnant as a way to improve infant survival."

Writing in a linked Comment, Lesley McCowan and Christopher McKinlay from the University of Auckland, Auckland, New Zealand, and Lucilla Poston from King's College London and Kings Health Partners, London, UK say, "Very importantly, we need effective fiscal and [public health](#) strategies to improve the awareness and implementation of the benefits of healthy diets and physical activity in young people. In turn this improvement would reduce obesity and excessive pregnancy [weight gain](#) in pregnant [women](#), mitigate against postpartum [weight](#) retention, and potentially reduce stillbirth and [infant death](#)."

**More information:** *The Lancet*, [www.thelancet.com/journals/lan ...](http://www.thelancet.com/journals/lan...)  
 [\(15\)00990-3/abstract](http://www.thelancet.com/journals/lan...)

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