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**Title of project:** Pregnancy following bariatric surgery - consequences for offspring and mothers

## ABSTRACT

Obesity, defined as body mass index (BMI) ≥ 30 kg/m2, is an increasing challenge in women of fertile age. Obesity is associated with infertility and adverse pregnancy outcomes like gestational diabetes, pre-eclampsia, Cesarean section, and macrosomia. Bariatric surgery is a successful and long-lasting treatment of severe obesity and obesity-related co-morbidities like type 2 diabetes, hypertension, and female infertility. From 2009-2018 more than 7,800 Danish women aged 18-44 had bariatric surgery, with 500 women aged 18-44 being operated in 2018. Besides the weight loss, bariatric surgery induces alterations in the anatomy of the gastro-intestinal channel leading to malabsorption of vitamins and minerals, prominent excursions in glucose levels, and changes in gut hormones. Pre-pregnancy bariatric surgery seems to impair fetal growth, which could again increase the risk of offspring metabolic disease according to the thrifty phenotype hypothesis. How bariatric surgery affects the long-term morbidity in mothers and offspring and what the optimal interval from bariatric surgery to pregnancy is sparsely investigated.
Our aims are
• To establish the risk factors that drive short- and long-term morbidity and mortality for mother and offspring in pregnancies following bariatric surgery.

• To understand the determinants of short- and long-term health in mothers with pre-pregnancy bariatric surgery and their offspring with a focus on pre-surgery anthropometrics, timing of pregnancy, gestational weight gain, fetal growth, malabsorption in pregnancy, and glucose metabolism in pregnancy.

• To establish the ideal time window to become pregnant following bariatric surgery with regard to fetal and offspring anthropometrics.

Using Danish registries, we will assemble a cohort of Danish women, who have given birth between 2005 and 2018. Some of these women have been exposed to pre-pregnancy bariatric surgery. We will establish the association between pre-pregnancy bariatric surgery and long-term morbidity in mothers. Moreover, the offspring from the above-mentioned mentioned cohort will constitute a new cohort (with 0.5-1% of the offspring exposed to pre-pregnancy bariatric surgery). We will establish the associations between pre-pregnancy bariatric surgery and fetal growth, childhood anthropometrics, and long-term morbidity. Finally, using the cohort of women with pre-pregnancy bariatric surgery we will establish the optimal time of pregnancy following bariatric surgery.
With this project, we will obtain knowledge within the research field of obesity, bariatric surgery and pregnancy that will influence national and international guidelines. Our understanding of long-term risks and benefits of pre-pregnancy bariatric surgery on offspring will enable us to define evidence-based guidance and treatment to obese women of fertile age who are considering or already had bariatric surgery.