Ōtākou Whakaihu Waka
UNIVERSITY OF OTAGO

Pōneke
Wellington
Campus

Summer Studentships 2026/2027

PROJECT TITLE:
The relationship between interpregnancy weight change and perinatal outcomes in the second pregnancy: a retrospective cohort study

AIM:
To examine the patterns and predictors of inter-pregnancy weight change (IPWC) and its impact on perinatal outcomes in the second pregnancy in a birthing population in AoNZ.

METHODS:
This will be a retrospective review of electronic records for people who have had two singleton pregnancies recorded in the electronic record-keeping system (MCIS) between 2016 and 2021. This data collection is being undertaken as part of the Main Supervisors PhD.

RESEARCH SIGNIFICANCE:

Literature/Background

Overweight/Obesity

People of childbearing age across many European countries have increasing rates of overweight and obesity. The World Health Organisation reports that 23% of adults in the European region have obesity, and more than 20% of women are estimated to be overweight when they become pregnant [1]. In Aotearoa, 34% of adults were predicted to experience obesity in 2021/2022[2], and 29.1% of pregnant people begin their pregnancy with obesity [3].

Obesity in pregnancy is socioeconomically patterned with the most significant burden experienced by communities of lower socioeconomic backgrounds.[4,5] Obesity in pregnancy is associated with an increased risk of miscarriage, excessive gestational weight gain, gestational diabetes, hypertensive disorders of pregnancy, induction of labour, operative mode of delivery, stillbirth, and postpartum hemorrhage.[6]

In Aotearoa, body mass index (BMI) related risk assessment during pregnancy is based on the pre-pregnancy or first-trimester BMI. Ideally, this is calculated using pre-pregnancy height and weight measurements. In practice, first-trimester and self-reported pre-pregnancy measurements are often utilised. Pregnant people with a BMI of >35 to 49kg/m2 are offered a consultation with obstetric services, and those with a BMI >50kg/m2 should have clinical responsibility transferred to obstetric services [7] to discuss potential complications.

Interpregnancy weight change

Interpregnancy weight change (IPWC) is the change in first-trimester or pre-pregnancy weight between one pregnancy and the next. IPWC is expressed in several ways, including absolute change in body weight, percentage change in body weight (kilogram/pounds), change in WHO-defined BMI categories and finally, change in BMI units. Change in BMI units is the most widely adopted measurement to quantify IPWC in current literature.

A growing body of literature examines the relationship between IPWC and pregnancy outcomes in subsequent pregnancies. BMI increase between the first and subsequent pregnancies is associated with adverse maternal and neonatal outcomes in the second recorded pregnancy when using fluctuation of <1kg/m2 around the booking BMI of the index pregnancy as a reference group. A BMI increase of ≥1kg/m2 is associated with gestational diabetes in the second pregnancy [8–12]; gestational hypertension, pre-eclampsia, caesarean section delivery, large for gestational age (LGA) birthweight [8,12,13]. A BMI increase of 3kg/m2 is further associated with adverse outcomes in subsequent pregnancies, including gestational diabetes,[9,10,12,14] pre-eclampsia,[10,12,13] pregnancy-induced hypertension,[8,10,12,13] , cesarean section delivery,[8,10,12,13] LGA birthweight.[12,15–17]

Evidence examining interpregnancy weight loss (IPWL) is less clear. Inconsistently, IPWL has been found to be protective against perinatal complications in the subsequent pregnancy, including GDM (13), pre-eclampsia [16], LSCS delivery [18]and LGA birthweight [12,13]. However, IPWL has been inconsistently linked with preterm birth; Villamor (2016) and McBain (2016) both found no association between weight loss >2 BMI units and preterm delivery [12,19]. In contrast, Benjamin (2019) found a statistically significant correlation between BMI reduction of 1 unit and preterm delivery: aOR 1.74 (95%CI: 1.23-2.47 p= 0.002) [20].

Application to practice

Pregnant people in Aotearoa with a BMI of >35 to 49kg/m2 are offered a consultation with obstetric services, and those with a BMI >50kg/m2 should have clinical responsibility transferred to obstetric services.[7] Currently, no practice guidelines screen for interpregnancy weight change. Following current guidelines, people with a normal BMI in the index pregnancy who have gained ≥3 BMI points (but not exceeded BMI >35 kg/m2) continue to be screened as low risk.

Literature Gap

The first phase of this PhD research project included a retrospective cohort study 856 birthing people from the MidCentral district that was published in 2025[21]. In this population a BMI increase of 1.13kg/m2 occurred between the first and second pregnancy[21]. Furthermore, this study found higher rates of IPWC in at-risk birthing populations as defined by the PMMRC.[22] This was the first study to explore IPWC in AoNZ and highlights the need for further work to be undertaken in this space.

STUDENT'S ROLE AND EXPOSURE TO SCIENTIFIC METHOD:
This project is for a student to contribute to the data collection/entry for the cohort study. Students will be required to: - Undertake data collection and entry from existing data bases - Initiate new data collection and entry from medical records

RELEVANT PREVIOUS EXPERIENCE FOR STUDENTS (Education or Research):
This will provide students an opportunity to undertake data collection and contribute to a dataset that has already resulted in publication of articles in a peer reviewed journal and oral/poster presentations at conferences. This dataset is being developed as part of the Main Supervisor's PhD.

Main supervisor:	Emma Le Lievre	
Email address:	emma.lelievre@postgrad.otago.ac.nz	
Other Supervisor/s:	Emma is a registered midwife and PhD candidate through the University of Otago (Wellington Campus). PhD supervisors include: Associate Professor Rosemary Hall Dr Per Kempe (Medical Lead, Women's Health at MidCentral Health) Dr Robin Croning (Research Midwife, Counties Manukau Health)	
Host Department:	Mid-Central DHB Undergraduate Medical Education Fund	
Location:	Palmerston North	
	Can students work remotely?	Yes / No