



# Planned caesarean section (CS) for second birth following a first vaginal birth (VB)

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## Background

There is international concern over rising rates of CS and its impacts on maternal and neonatal health outcomes. Of interest are the factors driving the increase in primary caesareans in a second birth. The extent to which complications or adverse outcomes following a first vaginal birth may contribute to planned CS in the next birth is not clear.

## Aim

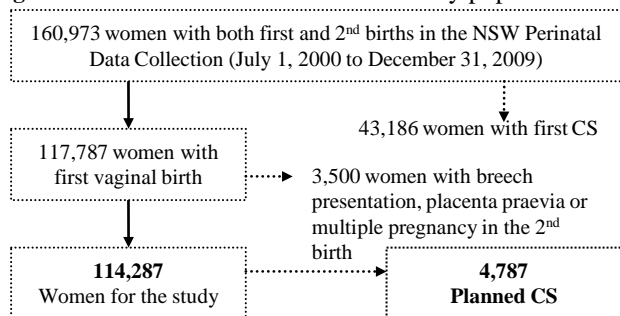
The aim of the study is to specifically examine impacts of obstetric interventions and adverse outcomes in the first birth on planned CS at a second birth among women with a first vaginal birth.

## Methods

Women who had a first vaginal birth were identified from a linked dataset of the New South Wales (NSW) Perinatal Data Collection (birth data) and the NSW Admitted Patient Data Collection (hospital data) from July 1, 2000 to December 31, 2009. Women with both 1st and 2nd births were included and women who had an indisputable indication for CS in the 2nd birth (multiple pregnancy, breech presentation or placenta praevia) were excluded. Figure 1 presents the selection procedure.

Logistic regression was employed to determine the effect size of risk factors. In multivariable analysis, a backwards elimination approach was used to progressively remove the least significant term until all terms remaining were statistically significant ( $P < 0.05$ , two-sided).

**Figure 1** Selection Procedure of the study population



## Results

Compared to women without a planned CS, women having a planned CS at the second birth ( $N = 4,787$ , 4.2% of the study population) were older, had higher rates of hypertension, diabetes, obstetric interventions and adverse outcomes in their first birth.

Table 1 presents odd ratios (ORs) of independent first birth risk factors for planned CS at the second birth after adjusting for second pregnancy factors.

**Table 1** Risk factors for planned CS in the second birth

1st birth variables	Adjusted OR <sup>^</sup> [95%CI]
3 <sup>rd</sup> -4 <sup>th</sup> degree tear	5.00 [4.58, 5.44]
Neonatal morbidity	3.20 [2.87, 3.58]
Perinatal death	3.16 [2.26, 4.41]
Maternal morbidity	2.77 [2.35, 3.26]
Instrumental delivery	1.81 [1.69, 1.94]
Birth weight	
<10 <sup>th</sup> percentile	1.04 [0.94, 1.15]
10 <sup>th</sup> - 90 <sup>th</sup> percentile	1.00 Reference
>90 <sup>th</sup> percentile	1.56 [1.41, 1.73]
Induction	1.45 [1.35, 1.55]
Epidural	1.26 [1.18, 1.35]
Oxytocin for augmentation	1.20 [1.10, 1.31]
Episiotomy	1.12 [1.05, 1.20]

<sup>^</sup> Odds ratio (OR) – adjusted for all other variables in the column and 2nd birth variables such as interval between 1st and 2nd births, year at 2nd birth, maternal age, hospital region, care type, hypertension, diabetes, gestation-adjusted birth weight and antepartum haemorrhage/placental abruption.

## Conclusion

Women who had obstetric interventions and adverse pregnancy outcomes in the first birth were at increased risk of planned CS in the second birth. The results indicate the importance of ‘getting the first birth right’ in reducing CS rate.