The final version of this paper is published in *Am J Obstet Gynecol* 2012;207:186.e1-8.

**Trends in planned early birth: a population-based study**

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**Disclosure:** The authors report no conflict of interest

**Financial source:** Australian National Health and Medical Research Council (NHMRC) / NSW Department of Health Partnership Grant (#571451). Christine Roberts is supported by a NHMRC Senior Research Fellowship (#457078)

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Reprints are not available from the authors.

**Word count:** Abstract: 149  Text: 3264

**Condensation:**

Planned births prior to the estimated date of birth have increased without evidence of improved perinatal mortality but have been accompanied by increased maternal and neonatal morbidity.

**Short title:** Trends in planned early birth
ABSTRACT

Objective: To describe trends and outcomes of planned births

Study Design: Data from linked birth and hospital records for 779,521 singleton births ≥33 weeks gestation, 2001-2009 were used to determine trends in planned births (prelabor cesarean and labor inductions). Adverse outcomes were composite indicators of maternal and neonatal morbidity/mortality.

Results: From 2001 to 2009 there were increases in labor inductions and prelabor cesareans before 40 weeks but no decrease in the stillbirth rate (trend P=0.34). By 2009, 14.9% of livebirths ≥33 weeks were prelabor cesareans before their due date and 11.4% were inductions. As planned births increased, maternal risks shifted, including a decline in inductions with maternal hypertension from 31.9% to 23.9%. Earlier birth was contemporaneous with increases (trend P<0.001) in neonatal and maternal morbidity from 3.0% to 3.2% and 0.9 % to 1.3%, respectively.

Conclusion: Planned birth before the due date is increasing but without reducing perinatal deaths.

Keywords: trends, labor induction, cesarean section, neonatal morbidity, maternal morbidity
INTRODUCTION

Planned birth is indicated if the perceived risk to the mother or baby of continuing the pregnancy outweighs the risk of early birth.\textsuperscript{1} Planned birth follows considered clinical decision making about both the timing and the method of delivery. There is a widely held perception of a change in obstetric decision making that has lowered the threshold at which and for which planned birth occurs.\textsuperscript{2} In the US, both planned cesarean and induction have increased and mean gestational age has decreased to 39 weeks.\textsuperscript{3-5} At term, there is a consensus that induction before 39 weeks should be minimized because of the attendant increased risk of neonatal respiratory morbidity if performed earlier.\textsuperscript{6} Preterm birth carries even greater short-term and long-term morbidity.\textsuperscript{7-9} Worldwide, preterm birth is increasing and this increase, in some populations, has been attributed to planned preterm birth.\textsuperscript{10} Whether increased planned early birth rates have led to any increases in neonatal morbidity or reductions in stillbirth rates, and the extent to which implementation of restrictions on planned birth before 39 weeks could affect stillbirth rates, is uncertain. Two studies have reported no increase in stillbirth rates after implementation of guidelines which restricted delivery before 39 weeks,\textsuperscript{11, 12} but one hospital reported that a fall in deliveries before 39 weeks from 33\% to 26\% resulted in an increase in stillbirths at 38-39 weeks.\textsuperscript{13}

Clinicians require population-based data in order to more fully assess the tradeoffs in morbidity for both the mother and baby following planned birth. Such data allow for informed decisions and more precisely articulate the risks of birth and the potential benefits of deferring delivery for even a short period. The aim of this study was to inform clinical decision-making about the timing of birth by describing recent trends in
planned births and determining the absolute risk of neonatal and maternal morbidity and mortality by the type of planned birth and gestational age. For the purpose of this study we examined all planned births that occurred after 32 weeks up until the estimated date of birth at 40 weeks gestation.

**METHODS AND MATERIALS**

The study population included all singleton births delivered after 32 completed weeks of gestation in New South Wales (NSW) from 1 January 2001 to 31 December 2009. NSW is the most populous state in Australia with ~7 million people and approximately one-third of all Australian births in over 100 hospitals. During the study period only 0.1% of women had home births. In Australia, guidelines require that wherever possible deliveries <33 weeks are undertaken in tertiary perinatal centres.¹⁴

Data for this study were obtained from two linked population datasets, ‘birth data’ from the NSW Perinatal Data Collection (PDC) and ‘hospital data’ from the NSW Admitted Patients Data Collection (APDC). The PDC is a statutory population-based collection covering all births in NSW of at least 400 grams birth weight, or at least 20 weeks gestation, and includes information on maternal characteristics, pregnancy, labor, delivery, and condition of the infant. The APDC is a census of all admissions in NSW public and private hospitals. Diagnosis and procedures for each admission are coded according to the 10th revision of the International Classification of Diseases, Australian Modification (ICD-10-AM) and the Australian Classification of Health Interventions (ACHI). The NSW Centre for Health Record Linkage performed probabilistic data linkage between the two datasets.¹⁵ The validity of the probabilistic record linkage is
extremely high with less than 1% of records having an incorrect match.\textsuperscript{15} The NSW Ministry of Health provided anonymized data for mothers and babies for the birth admission and any subsequent hospital-to-hospital transfers. Ethics approval for the use of the linked data was obtained from the NSW Population and Health Services Research Ethics Committee.

Planned livebirths were those where the onset of labor was not spontaneous (ie labor induction or prelabor cesarean section) indicating a considered decision was made about the timing of the birth. Births were identified for all gestational weeks prior to the due date (before 40 weeks gestation) and further stratified into births with spontaneous onset of labor or by the method of planned birth: labor induction (regardless of mode of delivery) and prelabor cesarean sections. Onset of labor was reported in the birth data by check-box (spontaneous, induction or no labor) and compared with the medical records, a validation study found 98\% agreement with the medical record (kappa statistic 0.95).\textsuperscript{16} Maternal characteristics, gestational age, mode of delivery, reason for labor induction (check-box), fetal distress as indication for cesarean section, infant characteristics and perinatal deaths were obtained from the birth data, and additional information on maternal conditions (any hypertension, any diabetes, placenta previa, antepartum haemorrhage, rupture of membranes) were obtained from linked maternal hospital data. Gestational age is reported in completed weeks of gestation and as determined by the best clinical estimate including early (<20 week) ultrasound (>97\%) and last menstrual period. Small-for-gestational-age (SGA) and large-for-gestational-age (LGA) were defined as <10th percentile and >90th percentile birthweight for gestational age respectively.\textsuperscript{17} Only factors that are well and accurately reported were
included in the analyses.\textsuperscript{16, 18-22} Missing data were infrequent, only 0.02\% records were missing a gestational age and 0.02\% were missing mode of onset of labor.

Maternal and neonatal morbidity and mortality were assessed on the linked birth-hospital data, from the birth admission record to the first discharge from the hospital system or death (never discharged), thus including diagnoses and procedures that occurred subsequent to maternal or neonatal transfer. The primary outcomes were maternal and neonatal morbidity or mortality as determined by validated composite indicators.\textsuperscript{23, 24} The Neonatal Adverse Outcome Indicator (NAOI) includes mortality and a comprehensive list of procedures and diagnoses indicating severe neonatal morbidity, such as mechanical ventilation, respiratory distress syndrome, parenteral nutrition, sepsis and hypoxic ischemic encephalopathy.\textsuperscript{23} Maternal morbidity and mortality was measured using a similar validated composite indicator relating to serious adverse maternal health outcomes such as transfusion, pulmonary embolism, hysterectomy, and mechanical ventilation.\textsuperscript{24}

**Statistical analyses**

All singleton births >32 weeks were used to test for trends in perinatal deaths (stillbirths and neonatal deaths) over time. Thereafter, analyses were limited to live births as the occurrence of fetal death may be a reason for planned birth.

Trends in the rates of inductions, prelabor cesareans, and in maternal conditions were assessed using a Cochrane-Armitage test for linear trend in proportions with the significance level set at $P<0.01$ because of the large number of births. The list of
maternal conditions associated with planned birth is not intended to be exhaustive, but rather to capture trends in the conditions most usually associated with planned birth. The analysis of changes in maternal conditions associated with prelabor cesarean was limited to nulliparous women as the first birth delivery mode is strongly determinative of subsequent delivery; prelabor cesarean for multiparas is usually elective repeat cesarean.

RESULTS

From 2001 to 2009 there were 779,521 singleton births of ≥33 weeks gestation in NSW, of whom 1,708 (0.22%) were stillborn. Of the 777,813 live births, 403,473 (51.9%) were delivered before 40 weeks gestation (before the due date), including 224,180 births following spontaneous labor. There were 179,206 (23.0%) planned births before the due date including 101,292 (13.0%) prelabor cesarean sections and 77,914 (10.0%) labor inductions; 87 (0.02%) of births before the due date had unknown labor onset.

*Trends over time*

From 2001 to 2009, there was an increase in planned births before 40 weeks, as a proportion of all live singleton births ≥33 weeks. By 2009, 26.2% of all livebirths ≥33 weeks were both planned and before the due date, with 14.9% pre-labor cesarean births, and 11.4% induced (Table 1). During that period there was no significant change in the stillbirth rate for all singletons ≥33 weeks (2.1/1000 births, trend P=0.34) nor in the neonatal death rate (3.7/100 births trend P=0.44).
While the contribution of planned births at the lower gestations was small (Figure 1), planned births at 33-36 weeks increased by 30.4%, from 1.5% in 2001 to 1.9% in 2009. During the later gestational ages, there was a differential increase by type of planned births; induction increased by 24% at 38 weeks (from 3.2 to 4.0%) and by 26% at 39 weeks (from 4.2 to 5.3%), while pre-labor cesareans increased by 25% at 38 weeks (from 4.3 to 5.4%) and by 68% at 39 weeks (from 4.2 to 7.1%).

*Trends across gestational ages*

The rates of planned births by gestational age among all live births at 33-39 weeks are presented in Figure 2. Prior to 37 weeks, 35-40% of births in each gestational age were planned. At 38 weeks there was a sharp increase in both the number and rate of planned births, to 52.5% of births. This increase was driven primarily by a peak in the rate of pre-labor cesarean sections, the majority of which (60.4%) were repeat procedures.

*Maternal and Pregnancy Characteristics*

Table 2 compares pregnancy characteristics of 77,914 women who had labor induction at 33-39 weeks over time, showing increasing rates of nulliparity, age ≥ 35, and of maternal diabetes and PROM. Pregnancy hypertension was the most common complication but the proportion of inductions associated with pregnancy hypertension fell over time, from 31.9% to 23.9%, as the number of inductions increased. This was offset by a rise in inductions associated with diabetes and PROM, resulting in a small rise in the total proportion of labor induction with at least one of the four listed maternal conditions (from 61.7% to 63.5%). The overall rate of vaginal birth following labor induction before the due date was 83.7%, increasing from 74.1% at 33-34 weeks to
84.2% at 38-39 weeks gestation (including for nullipara: 69.2% and 71.5%, respectively; and multipara: 78.3% and 93.2%, respectively). For induction with prostaglandin, the vaginal birth rate was lower overall (80.0% compared with 86.1% when prostaglandin were not used) and at each gestational age.

Overall, the 101,292 women birthing by prelabor cesarean section were older and of higher parity, as most (58.1%) were repeat cesareans. Table 3 shows the characteristics of the subgroup of 26,271 nulliparous women who were delivered by prelabor cesarean section at 33-39 weeks, with fetal distress, placenta praevia and birthweight ≥4000 grams added to the list of conditions. The proportion where fetal distress was an indication declined from 6.2% to 4.7% as the number of prelabor cesareans increased, while the proportion associated with diabetes and PROM rose. The total proportion associated with at least one of the listed conditions rose from 47.2% to 50.2%. The proportion aged ≥35 years (31.9% in 2009) was significantly higher than among nulliparous women who were induced (15.2% in 2009) or who went into spontaneous labor (12.4% in 2009) (P<0.001 for both tests of two proportions).

Neonatal outcomes after planned and spontaneous births

As planned births increased, severe neonatal morbidity/mortality among all live singleton births ≥33 weeks increased from 3.0% in 2001 to 3.2% in 2009 (trend P<0.001). Among the 179,206 planned births at 33-39 weeks, 8107 (4.5%) infants suffered a serious adverse outcome before discharge from the hospital system including 765 (4.3 per 1000) neonatal deaths. For the 224,180 infants born after spontaneous onset of labor before their due date, the morbidity rate was 3.3% and the neonatal death
rate was 4.0 per 1000. When limited to births at 37-39 weeks, there was no increase in neonatal morbidity associated with prelabor cesarean compared with labor induction: RR=0.97 (95% CI 0.91-1.02). For both planned and spontaneous births, there was a steady decrease in morbidity as gestational age advanced (Figure 3a). Not obvious from the figure’s vertical scale is that the rate of neonatal morbidity for planned births continued to drop from 3.0% at 38 weeks to 2.1% at 39 weeks (P<0.001), a relative decrease of 30%.

Maternal morbidity after planned and spontaneous births

Concurrent with the increase from 2001 to 2009 in planned births before 40 weeks, there was a significant increase in maternal morbidity/mortality among all births ≥33 weeks, from 0.9% to 1.3% (trend P<0.001). Severe maternal morbidity did decline with each additional week of gestation (Figure 3b). This decline included a fall in maternal morbidity associated with planned delivery from 1.5% at 38 weeks to 1.2% at 39 weeks, a relative decrease of 20%.

COMMENT

Planned birth is indicated when the perceived risks of continuing the pregnancy for the mother and/or her baby exceed those of birth.¹ Planned birth before the estimated date of birth increased to 26% of all singleton births after 32 weeks in our study population, but there was no accompanying decrease in stillbirth rate. The increase in planned birth was observed at all gestational ages and for both induction of labor and prelabor cesarean section. The proportions of planned births reporting at least one of the common conditions which may predispose to planned delivery did show small increases
over time. However, there was a shift towards a reduced prevalence of definite indications (maternal hypertension, fetal distress) and increased prevalence of conditions where evidence is equivocal (diabetes, PROM). Improvements in neonatal care in the past decade may have changed clinicians’ perceptions about the tradeoff in risk for early delivery, but earlier birth and the complications associated with not reaching full maturity may mitigate the reductions in morbidity that could be expected from improved neonatal care.

An important finding is the increase in births that are both planned and preterm. Preterm birth rates are increasing in many but not all countries. The contribution of planned preterm birth to prematurity has been described in South America, the USA, and France. Despite improvements in outcomes, even late preterm birth is associated with higher short term and long term morbidity and mortality. Our data reflect the findings of others that a significant number of preterm births are planned. Recognized low mortality of late preterm birth may be influencing decision-making to lower the risk-weighting for preterm delivery. The short term complications of late preterm birth are significant with appreciable resource implications. Recent data demonstrate that these increased health care utilization and costs extend throughout the first year of life. Reported longer term associations between late preterm birth and cerebral palsy as well as lower educational attainment should serve to temper what seems to be a growing perception that planned late preterm birth is an intervention with acceptable low risks. Even if preterm birth is unavoidable the measurable benefits of prolonging pregnancy are demonstrated by the step changes in decreased morbidity for the neonate with each week gained in gestational age. Careful consideration to the
safety of pregnancy prolongation has the potential to improve outcomes whilst reducing costs.\textsuperscript{1} Our findings suggest, that if a decision for delivery is made there may be advantages to birth following planned induction of labor compared with planned cesarean section. The association of labor with less respiratory compromise in neonate is well recognised.\textsuperscript{37} Our data that utilize a broader, validated measure of neonatal morbidity support a protective effect of planned labor. Taken together findings about the neonatal and maternal outcomes at each gestational age and according to planned mode of delivery can be useful adjuncts for clinicians to aid more informed decision making with respect to management of pregnancies where there is sufficient concern over maternal or fetal wellbeing so that planned preterm birth is contemplated. Although there may be obstetric antecedents that indicate the need for preterm birth the clear linear relationship between preterm birth and educational outcomes, supports the need for more judicious decision making.\textsuperscript{8, 35, 36} A full consideration of risks could lead to reduced rates of late preterm birth.\textsuperscript{38, 39}

Whilst morbidity is higher at preterm gestations it is noteworthy that the trend towards greater maternal and neonatal morbidity continued into the gestational period considered as term. Even at term there are significant differences in outcomes following planned birth.\textsuperscript{40} Our data support the findings of others that planned term birth prior to 39 weeks is associated with greater neonatal intensive care utilization.\textsuperscript{41} At 39 weeks gestation the rate of neonatal adverse outcomes following both induction of labor and cesarean section fell to approximately 2\%. These data support calls for more discriminate decision making even at term with careful consideration of outcomes at different stages of term.\textsuperscript{42}
Both PROM and maternal diabetes were increasingly associated with planned delivery over time. While there is good evidence that for term PROM early delivery is associated with a lower incidence of maternal infection and increased maternal satisfaction compared with expectant management, trials of optimal management of preterm PROM are still underway. A recent review found insufficient evidence to support planned delivery when maternal diabetes is controlled. Our data did not contain information on diabetes management, but a steep increase in uncontrolled diabetes seems an unlikely explanation for an increasing proportion of planned deliveries associated with diabetes. The increasing prevalence of these conditions in planned births suggest that, in balancing risks, the perceived risk for cesarean section diminished over the study period. The relatively large proportion of women ≥35 years (31.9%) among nulliparous women delivered by cesarean section before their due date also suggest that advanced age increasingly tips the balance towards a decision for planned birth. The apparent increase in placenta praevia with planned cesarean section may also illustrate how risk thresholds can alter. Anecdotally, some cases that would previously have been labeled as low-lying placenta are more recently categorized as placenta praevia, which then becomes the indication for planned cesarean. This scenario could at least partly explain the 53% relative increase in planned cesarean for placenta praevia.

Maternal hypertension decreased among planned births before the due date while the contribution of growth restriction remained unchanged, and it will be of interest to monitor these conditions in light of the DIGITAT and HYPITAT trial results. DIGITAT reported no important differences in outcomes between labor induction and expectant monitoring for women with clinically suspected growth restriction at term. In contrast,
HYPITAT found labor induction for women with gestational hypertension or mild preeclampsia at term improved maternal outcome without increasing cesarean rate.\textsuperscript{47}

Our study has limitations. These include the difficulty in determining both the strength of the need and the appropriateness of the timing of the planned birth. Furthermore, although specific conditions associated with planned birth can be identified, the presence and relative importance of comorbidities is more difficult to articulate.\textsuperscript{1} We report maternal and infant outcomes contemporaneous with trends in planned birth, but these trends did not occur in isolation. As well as for the reported factors such as maternal age, other changes, such as in neonatal care, were also happening. It is not possible to discern to what extent the observed morbidity is iatrogenic, however the increased number of planned births and the shifts in risk profile suggest that clinical practice as regards planned early birth has changed. The single most common reason nominated for induction or cesarean in the NSW birth data was “other”, and other studies report that nearly a quarter of women have no indication for planned preterm birth recorded.\textsuperscript{48} A study which reviewed iatrogenic late preterm births found that 57\% of the deliveries could be categorized as non-evidence-based.\textsuperscript{49} These findings are a reminder that there is an urgent and important need to ascertain the indication for planned preterm birth such that the true longer term sequelae can be ascertained.

In conclusion, planned birth before the due date is increasing with no evidence of offsetting reductions in perinatal mortality, but with small, statistically significant increases in neonatal and maternal morbidity. With the expansion in planned birth
numbers, the proportion associated with less compelling indications for delivery has increased. There is a clear need to review clinical practice regarding the indication, timing and planned mode of planned birth. Such an exercise has the potential to reduce morbidity, healthcare utilization and preterm birth rates whilst ensuring a healthier start to life.
ACKNOWLEDGEMENTS

We thank the NSW Ministry of Health for access to the population health data and the NSW Centre for Health Record Linkage for linking the data sets.
REFERENCES


Figure 1: Trend in planned births at each gestational age as a proportion of all live singleton births ≥33 weeks
Figure 2: Rate* of planned births of liveborn singleton infants at 33-39 weeks gestation, delivered in a NSW hospital 2001-2007

* denominators are all births at each week of gestation
Figures 3a and 3b: Gestation and method of birth specific rates of neonatal and maternal morbidity/mortality
Table 1: Trend* in planned and spontaneous births 33-39 weeks gestation as a proportion of all livebirths ≥33 weeks gestation, by year

<table>
<thead>
<tr>
<th>Year</th>
<th>All live births ≥33 weeks gestation</th>
<th>Planned and spontaneous births 33-39 weeks gestation</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Labor induction (row %)</td>
<td>Prelabor cesarean (row %)</td>
</tr>
<tr>
<td></td>
<td>N=777,813</td>
<td>N=77,914</td>
<td>N=101,292</td>
</tr>
<tr>
<td>2001</td>
<td>81,515</td>
<td>7,283 (8.9)</td>
<td>8381 (10.3)</td>
</tr>
<tr>
<td>2002</td>
<td>81,832</td>
<td>7,513 (9.2)</td>
<td>9025 (11.0)</td>
</tr>
<tr>
<td>2003</td>
<td>82,337</td>
<td>7,489 (9.1)</td>
<td>10,027 (12.2)</td>
</tr>
<tr>
<td>2004</td>
<td>81,605</td>
<td>7,652 (9.4)</td>
<td>10,076 (12.4)</td>
</tr>
<tr>
<td>2005</td>
<td>86,301</td>
<td>8,653 (10.0)</td>
<td>11,468 (13.3)</td>
</tr>
<tr>
<td>2006</td>
<td>88,320</td>
<td>8,700 (9.9)</td>
<td>12,461 (14.1)</td>
</tr>
<tr>
<td>2007</td>
<td>91,575</td>
<td>9993 (10.9)</td>
<td>12,978 (14.2)</td>
</tr>
<tr>
<td>2008</td>
<td>91,801</td>
<td>10,168 (11.1)</td>
<td>13,187 (14.4)</td>
</tr>
<tr>
<td>2009</td>
<td>92,133</td>
<td>10,463 (11.4)</td>
<td>13,689 (14.9)</td>
</tr>
</tbody>
</table>

* P for annual trend <0.001 for labor induction, prelabor cesarean section and births with spontaneous labor
Table 2: Maternal conditions characteristic of inductions at 33-39 weeks, 2001-2009

<table>
<thead>
<tr>
<th>Condition</th>
<th>Percent of inductions 2001</th>
<th>Percent of inductions 2009</th>
<th>P for trend over all nine years</th>
</tr>
</thead>
<tbody>
<tr>
<td>N=7283</td>
<td>N=10,463</td>
<td>N=77,914</td>
<td></td>
</tr>
<tr>
<td>Nulliparous</td>
<td>41.2</td>
<td>45.7</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Maternal age ≥35 yrs</td>
<td>18.7</td>
<td>24.3</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Any hypertension</td>
<td>31.9</td>
<td>23.9</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Any diabetes</td>
<td>10.7</td>
<td>16.7</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Prelabor rupture of membranes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>term</td>
<td>16.3</td>
<td>20.7</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>preterm</td>
<td>2.1</td>
<td>2.7</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>SGA† or suspected fetal growth retardation</td>
<td>12.9</td>
<td>13.2</td>
<td>0.82</td>
</tr>
<tr>
<td>Any of hypertension, diabetes, PROM, or SGA</td>
<td>61.7</td>
<td>63.5</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

† small for gestational age (<10th percentile size)
Table 3: Maternal and fetal conditions characteristic of all nulliparous prelabor cesarean sections at 33-39 weeks, 2001-2009

<table>
<thead>
<tr>
<th>Condition</th>
<th>Percent of prelabor cesareans 2001</th>
<th>Percent of prelabor cesareans 2009</th>
<th>P for trend over all nine years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maternal age ≥35 yrs</td>
<td>24.0</td>
<td>31.9</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Any hypertension</td>
<td>22.2</td>
<td>18.2</td>
<td>0.06</td>
</tr>
<tr>
<td>Any diabetes</td>
<td>8.7</td>
<td>11.2</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Prelabor rupture of membranes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Term</td>
<td>1.5</td>
<td>3.8</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Preterm</td>
<td>1.6</td>
<td>2.1</td>
<td>0.11</td>
</tr>
<tr>
<td>SGA† or suspected fetal growth retardation</td>
<td>13.9</td>
<td>13.1</td>
<td>0.84</td>
</tr>
<tr>
<td>Birthweight ≥ 4000 g</td>
<td>6.4</td>
<td>7.5</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Fetal distress</td>
<td>6.2</td>
<td>4.7</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Placenta praevia</td>
<td>4.3</td>
<td>6.6</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Any of hypertension, diabetes, PROM, SGA,BW ≥4000g, fetal distress, or placenta praevia</td>
<td>47.2</td>
<td>50.2</td>
<td>&lt;0.01</td>
</tr>
</tbody>
</table>

† small for gestational age (<10th percentile size)