2.0 Pregnancy and newborn care

2.1 Care mode

Over the decade 2000 to 2009, 535,955 women gave birth to 545,168 babies in Queensland. During this period, the total number of births per year increased by 25.8%; there was an 18.3% increase in Public hospital births and 47.6% increase in Private hospital births (Figure 8, Table 28).

The increasing uptake of Private versus Public hospital care by women between 1988 and 2007, as noted in the 2010 report, has not persisted. Public hospital care is relatively stable at approximately 70% of women giving birth and Private hospital care relatively stable at approximately 30% of women giving birth (Figure 9, Table 28).
From 2000 onwards data relating to intended place of birth and actual place of birth have been collected, with data collection from 2001 onwards being complete.

In the nine years from 2001 to 2009, 481,198 of the 487,431 (98.7%) women intended to give birth in a hospital; 478,691 of the 486,402 (98.4%) women who intended to give birth in hospital achieved that aim, with 170 giving birth at home, 13 giving birth in a Birth Centre, and the remaining 2324 (0.5%) giving birth in “other” circumstances (i.e. “Born before arrival”).

In the same period, 5,226 women intended to give birth in a Birth Centre (1.1%); 4,166 (79.7%) achieved that aim, with 964 (18.4%) giving birth in hospital, 11 giving birth at home, and 85 in “other” circumstances.

2.2 Home birth

Eight hundred and sixteen (816) women are recorded as having a planned home birth between 2000 and 2009 (Tables 28 and 29). This number represents 0.15% of the total births in Queensland in that period. The number of home births per year continues to fluctuate widely, (Table 28). For most of the period 65-70% percentage of the women giving birth at home were in the age group 20 to 34 years, and 30-35% were in the 35 years and over age group (Figure 10, Table 29).

![Figure 10: Percentage of home births Queensland 2000 to 2009, by maternal age group (refer Table 28)](image)

In both 2008 and 2009 approximately 78% of women who intended to have a home birth achieved this aim (110 of 141 in 2008 and 123 of 158 in 2009).

2.3 Maternal age

The majority of births (409,991 of 535,955; 76.6%) were to women aged 20-34 years (Figure 11, Table 30). However, the percentage of women 35 years or more giving birth continues to increase significantly, from 14.8% to 19.9% during this decade (35+ vs <35; odds ratio 1.43; 95% confidence limits 1.39, 1.48)(Figure 12, Table 30).
The majority of women aged less than 20 years (30,700 of 31,658, 97.0%) gave birth in Public hospitals during this decade. In contrast, 290,957 women aged 20-34 years (70.1% of 409,980) and 51,015 women aged 35 or more (54.1% of 94,300) gave birth in Public hospitals (Figures 13 to 15, Table 31).
The incidence of multiple birth is seen to increase with maternal age (Figure 16, Table 32).
The incidence of low birth weight births, birth at 36 weeks gestation or less, and birth of babies requiring admission to a Neonatal Intensive Care Unit (NICU) or a Special Care Nursery (SCN) was lowest in women giving birth at a maternal age of 20 to 34 years (Figures 17 to 19, Tables 33 to 35).

![Figure 17: Incidence of birth of babies weighing less than 1500g by maternal age, Queensland 2000 to 2009 (refer Table 33)](image1)

![Figure 18: Incidence of birth at or before 36 weeks gestation by maternal age, Queensland 2000 to 2009 (refer Table 34)](image2)

![Figure 19: Incidence of birth of babies requiring admission to a neonatal intensive care unit (NICU) or a special care nursery (SCN) by maternal age, Queensland 2000 to 2009 (refer Table 35)](image3)
2.4 Gestation at birth

In the decade 2000 to 2009, 26,630 women (5.0%) gave birth at less than 36 weeks gestation (Tables 36 and 37). Though this overall incidence of pre-36 week birth remained relatively constant, there was a noticeable increase in the 36-38 week cohort, and an associated decrease in the 39+ week cohort in this time period (Figures 20 and 21, Tables 36 and 37). The trend to a reduction in pregnancies proceeding past 41 weeks gestation, noted in the 2010 report of this Council, continued to be seen.
Consistent with the changes seen in Figure 13, the distribution of babies born at 36 weeks gestation or more has seen some change over the decade; 515,462 of the 545,168 (94.4%) babies were born in this gestational cohort, but there was an increase in the percentage born between 36 and 38 weeks and a reduction in the more mature group born at 39 weeks or more (39+ vs 36-38; odds ratio 1.20; 95% confidence limits 1.17, 1.23) (Figure 22, Table 38 and 39).

The gestational distribution of babies being born at less than 36 weeks gestation has remained stable throughout most of the decade (Figure 23, Table 39).
The incidence of birth at gestations less than 37 weeks was lower in Private hospitals than Public hospitals over this decade (Figure 24, Table 40), consistent with the higher level of neonatal care available within the Public hospital system. Whilst the incidence of birth at less than 37 weeks remained relatively stable in the Public hospitals, it was seen to rise from 6.5% to 7.3% in Private hospitals in this period.

**Figure 24: Percentage of babies born at less than 37 weeks gestation in Queensland 2000 to 2009 by mode of care (refer Table 40)**

Women in the age group 20 to 34 years of age had a higher incidence of birth occurring in the gestational period 37 to 41 weeks, when compared with their older and younger counterparts (Figure 25, Table 41). It is not clear whether there is adequate community awareness of these differential outcomes in the community.

**Figure 25: Percentage of babies born at less than 37 weeks gestation in Queensland 2000 to 2009 by maternal age (refer Table 41)**
Women having their first birth were more likely to give birth to their babies close to term (40 weeks); women who had given birth previously had an increased incidence of giving birth to their babies in the period 37 to 39 weeks gestation (Figure 26, Table 42). This data was not available for the year 2000.

Women in Private hospital care had an increased incidence of giving birth to a baby in the 36 to 39 week gestational period when compared with women in Public hospital care (Figure 27, Table 43). This difference relates almost entirely to the high elective caesarean section rate in Private care and the strong likelihood that such elective caesarean sections are performed prior to 39 weeks gestation (Figure 28, Table 43).
Figure 28: Number of babies born in Queensland 2000 to 2009 by mode of care, gestation, and onset of labour (refer Table 43)

Babies born at 36-38 weeks gestation are almost 2.5 times more likely to require admission to a neonatal intensive care unit or a special care nursery than babies born at 39 weeks or more (20.8% compared with 8.7%) and more than 2 times as likely to die in the perinatal period (4.75 perinatal deaths per 1,000 births compared with 2.05 perinatal deaths per 1,000 births) (Table 44). The higher incidence of need for neonatal intensive care unit or a special care nursery admission and of perinatal death is most marked in babies born electively (elective caesarean section or induced labour).
2.5 Birth weight

The distribution of birth weights remained constant over this decade, with 80.3% of the babies born in this period weighing 2,500 to 3,999g (Figure 29, Table 45). Seven per cent (7.0%) of the babies weighed less than 2,500g (1.6% less than 1500g and 5.4% between 1,500 and 2,499g) (Figure 30, Table 45). Babies weighing 4,000g or more made up 12.7% of the cohort. These data do not support a belief in some sectors of the maternity health care community that birth weights in Queensland are increasing.
2.6 Multiple pregnancies

Eight thousand, nine hundred and eighty women (8,980) had multiple pregnancies during this decade (1.7% of 535,955 pregnancies) (Table 46). There was a clear age differential in the incidence of multiple pregnancy, with 2.4% of pregnancies in women over the age of 35 being multiple, compared with 1.6% in women aged 20 to 34, and 0.7% in women aged less than 20 (Figure 31, Tables 47 and 48).

Preterm birth remains a major issue in multiple pregnancies, with 59.5% of multiple births occurring before 37 weeks gestation, while only 7.3% of singleton births occur before 37 weeks (Figure 32, Table 49). This difference has remained stable over the decade.
2.7 Assisted conception

The influence of assisted conception techniques on the incidence of multiple pregnancies remains marked, with 13.8 times as many pregnancies conceived with the aid of such technologies being multiple when compared with pregnancies not conceived with such technologies (Figure 33, Table 50). Over this period, 8.6% of pregnancies conceived with the aid of AIH/AID +/or ovulation induction and 17.8% of pregnancies conceived with the aid of extracorporeal techniques were multiple, compared with 1.2% of pregnancies conceived without the assistance of any reproductive technologies (Figure 33, Tables 50 and 51). The incidence of multiple pregnancy in pregnancies conceived with the aid of extracorporeal techniques has decreased by more than 40% over this decade, from 23.2% to 13.5%.\footnote{The data collection techniques have combined artificial insemination techniques with ovulation induction techniques since 1999, so they are combined in this report. In-vitro fertilisation and related extracorporeal techniques are also combined. The data field is a multiple reporting field and only the first reported method is able to be extracted.}

Figure 33: Percentage of multiple births in pregnancies conceived with and without the use of assisted conception techniques in Queensland 2000 to 2009 (refer Table 51). [AIH/AID +/or ovulation induction = artificial insemination and/or ovulation induction processes; extracorporeal techniques = invitro fertilisation, gamete intrafallopian transfer, intracytoplasmic sperm injection, embryo transfer or related techniques.]

When compared with pregnancies conceived without the aid of assisted conception techniques, pregnancies conceived with the aid of assisted conception techniques are more likely to be multiple, and the babies born from such pregnancies are more likely to be of low birth weight and need Neonatal Intensive Care Unit (NICU) and/or Special Care Nursery (SCN) admission (Figures 34 and 35, Table 50 to 53). Data shown in these figures and tables is from 2008 and 2009 only.

Figure 34: Influence of assisted conception techniques in Queensland 2008 to 2009 (refer Tables 50 and 51)
When the influence of multiple pregnancy is removed and only singleton births from pregnancies conceived with and without the aid of assisted conception techniques are examined, the incidence of babies born with birth weight between 2,500g and 3,999g are found to be equivalent in the two groups (Figure 36, Tables 54 and 55). Though there are differences in the incidence of birth weight less than 2,500g (Figure 37, Tables 54 and 55) and 4,000g or more (Figure 36, Tables 54 and 55), these differences are small when compared with the overall differences found in the total number of assisted conception pregnancies. Thus, the majority of the difference in the incidence of low birth weight babies in pregnancies conceived with the aid of assisted conception techniques relates to the high incidence of multiple pregnancies with assisted conception techniques.

Figure 36: Incidence of birth weight categories 2,500g or more of babies born in singleton pregnancies conceived with assisted conception and without assisted conception (refer Tables 54 and 55)
2.8 Onset of labour

During the decade 2000 to 2009 56% to 58% of women laboured spontaneously (Figure 38, Table 56). The incidence of induction of labour has decreased over this period of time from 25.1% to 22.4%, while the incidence of elective caesarean section without labour increased significantly, from 14.4% to 20.5% (Odds ratio 1.54, 95% Confidence limits 1.49, 1.59).
The incidence of spontaneous onset of labour has decreased significantly from 46.7% to 40.2% in Private hospitals (spontaneous onset of labour vs rest; Odds ratio 0.76, 95% Confidence limits 0.73, 0.80), while remaining relatively constant at approximately 64% in Public hospitals (Figure 39, Tables 57 and 58). Labour remains at or near 100% spontaneous in onset in home births.

Figure 39: Spontaneous onset of labour by care mode, Queensland 2000 to 2009 (refer Tables 57 and 58)

The incidence of induction of labour has decreased significantly in both Public and Private hospitals over this period (Public Hospitals: Induction of labour vs rest; Odds ratio 0.85, 95% Confidence limits 0.82, 0.88; Private Hospitals: Induction of labour vs rest; Odds ratio 0.84, 95% Confidence limits 0.80, 0.88) (Figure 40, Tables 57 and 58).

Figure 40: Induction of labour by care mode, Queensland 2000 to 2009 (refer Tables 57 and 58)
The incidence of elective caesarean section birth has increased significantly during this period (from 11.0% to 14.6%) in Public hospitals (elective caesarean section vs rest; Odds ratio 1.38, 95%, Confidence limits 1.32, 1.44), and highly significantly (from 24.2% to 34.3%) in Private hospitals (elective caesarean section vs rest; Odds ratio 1.64, 95% Confidence limits 1.55, 1.72) (Figure 41, Tables 57 and 58).

Figure 41: Elective caesarean section by care mode, Queensland 2000 to 2009
(refer Tables 57 and 58)

The pattern of labour onset, in relation to gestation, is quite different between Public hospital and Private hospital care (Figure 42, Table 59). At all gestations the proportion of women having elective caesarean section (ie caesarean section without labour) in Private hospitals is significantly higher than the percentage of women having elective caesarean section in Public hospitals. The clinical reasons for this variation are unclear, with particular reference to more preterm gestations when intervention should occur in a facility with a neonatal intensive care unit.

Figure 42: Onset of labour / elective caesarean section by gestation and care mode, Queensland 2000 to 2009
(refer Table 59)
2.9 Mode of birth

The incidence of unassisted vaginal birth has decreased significantly in Queensland over this decade, from 65.2% to 56.9% (unassisted vaginal birth vs rest; Odds ratio 0.71, 95% Confidence limits 0.69, 0.72) (Figure 43, Tables 60 and 61). During this period, the incidence of assisted vaginal birth (forceps assistance and vacuum extraction) has remained relatively constant between 7.8% and 9.1%, while the incidence of caesarean section has increased significantly from 26.2% to 34.0% (Caesarean section vs rest; Odds ratio 1.45, 95% Confidence limits 1.41, 1.49).

![Figure 43: Mode of birth of babies born in Queensland 2000 to 2009 (percentage of births) (refer Tables 60 and 61)](image1)

The techniques employed for assisted vaginal birth have continued to diverge, with vacuum extraction the preferred option for the majority of cases (Figure 44, Tables 60 and 61).

![Figure 44: Mode of assisted vaginal birth of babies born in Queensland 2000 to 2009 (percentage of births) (refer Tables 60 and 61)](image2)
The decline in the incidence of unassisted vaginal birth has been most obvious in the setting of Private hospital care (48.2% to 39.7%), when compared with Public hospital care (71.0% to 64.3%) (Figure 45, tables 62 and 63). The decline is statistically significant in both care modes (Private hospital care unassisted vaginal birth vs rest; Odds ratio 0.71, 95% Confidence limits 0.68, 0.74; Public hospital care unassisted vaginal birth vs rest; Odds ratio 0.73, 95% Confidence limits 0.71, 0.75).

The increasing incidence of caesarean section birth has been more obvious in the setting of Private hospital care (37.9% to 48.6%), when compared with Public hospital care (22.2% to 27.7%) (Figure 46, tables 62 and 63). Again, the change is statistically significant in both care modes (Private hospital caesarean section vs rest Odds ratio 1.55, 95% Confidence limits 1.48, 1.62; Public hospital caesarean section vs rest Odds ratio 1.34, 95% Confidence limits 1.30, 1.48).

There has been an increase in the incidence of both elective (without labour) and non-elective (with labour) caesarean section in both the Public and Private sectors. The standout change has been the large increase in the incidence of elective caesarean section before labour in the Private sector (an increase over the period 2000 to 2009, from 24.2% to 33.5% of all births; Odds ratio 1.56, 95% Confidence limits 1.50, 1.66) (Figure 47, Tables 64 and 65).
The incidence of assisted vaginal birth has increased in Public hospitals (6.65% to 8.0%) whilst decreasing in the Private hospital care mode (13.9% to 11.7%) (Figure 48, Tables 62 and 63).

**Figure 47**: Incidence of caesarean section birth, before and in labour, of babies born in Queensland 2000 to 2009 in Public and Private hospitals (refer Tables 64 and 65)

**Figure 48**: Incidence of assisted vaginal birth of babies born in Queensland 2000 to 2009 by care provider (refer Tables 62 and 63)
The change in the incidence of assisted vaginal birth has been a combination of a fall in the use of obstetric forceps and a rise in the use of vacuum extraction (Figure 49, Tables 62 and 63).

Figure 49: Incidence of assisted vaginal birth, by forceps and vacuum extraction, of babies born in Queensland 2000 to 2009 by care provider (percentage of births) (refer Tables 62 and 63)

Approximately 90% of women with a breech presentation had caesarean section births during this decade (86.7% to 89.8% in Public hospitals and 90.5% to 97.1% in Private hospitals) (Figure 50, Table 66).

Figure 50: Incidence of caesarean section birth of babies born in Queensland 2000 to 2009, when there is a breech presentation, by care provider (refer Table 66)

There has been a steady rise in caesarean section birth in multiple pregnancies, with the increase in both Public hospitals and Private hospitals being of the order of 15 percentage points (Public hospital care caesarean section vs Public hospital care non-caesarean section Odds ratio 1.58, 95% Confidence limits 1.24, 2.02; Private hospital care caesarean section vs Private hospital care non-caesarean section Odds ratio 1.64, 95% Confidence limits 1.16, 2.32) (Figure 51, Table 67).
2.10 Effect of previous pregnancy on mode of birth

Mode of vaginal birth (unassisted versus assisted) was affected by whether or not a woman has previously had one or more pregnancies resulting in a birth, but the incidence of caesarean section was not so affected (Figure 52, Tables 68 and 69). Women who have previously had one or more pregnancies were more likely to have an unassisted vaginal birth by approximately 13 percentage points, when compared with women who have not previously had a pregnancy, and less likely to have an assisted vaginal birth by a similar margin. Overall, the incidence of vaginal birth (unassisted and assisted) fell significantly. The rising caesarean section rate in both groups of women was similar.
2.11 Effect of previous caesarean section on mode of birth

Mode of previous birth data has been collected since mid-2000, so full year data is available for the nine years 2001 to 2009. These data show that, in relation to future birth outcomes, the decision to undertake a first caesarean section is a crucial event in a woman’s reproductive career. Women who had not had a previous caesarean section had a 78.5% to 80% likelihood of having an unassisted vaginal birth (slowly dropping by 2.5 percentage points over the period 2001 to 2009) and 14% to 16% likelihood of a caesarean section birth (Figure 53, Tables 70 and 71).

In contrast, women who had one or more previous caesarean sections had a 15% to 23% likelihood of having a vaginal birth (unassisted and assisted), dropping significantly over the period 2001 to 2009 (Odds ratio 0.62, 95% Confidence limits 0.52, 0.67), and rising incidence of 77% to 85% over this period of the likelihood of a caesarean section birth (Odds ratio 1.62, 95% Confidence limits 1.50, 1.76).

2.12 Indigenous mothers and their babies

Indigenous mothers made up 5.5% of the 2000 to 2009 birthing cohort (29,723 of 535,955) and these women gave birth to 29,798 of the 545,168 babies in that period. During this period there was a constant difference in age distribution, with Indigenous mothers more likely to be less than 20 years of age (Figure 54, Table 72 and 73).
Ninety-eight per cent (98%) (range 97.7% – 98.2% over the decade) of Indigenous women were cared for in the Public hospital system in Queensland, while 67.9% (range 66.4% – 72.6% over the decade) of non-Indigenous women received Public hospital maternity care (Table 74).

Indigenous women were significantly more likely to give birth at gestations less than 37 weeks (12.5% of Indigenous women versus 7.5% of non-Indigenous women; odds ratio 1.71; 95% confidence limits 1.65, 1.77) and less likely to give birth in the gestational period 37 to 41 weeks (86.5% of Indigenous women versus 91.6% of non-Indigenous women; odds ratio 0.59; 95% confidence limits 0.57, 0.61). The difference at 42 weeks or more was less obvious but also statistically significant (1.3% of Indigenous versus 0.9% of non-Indigenous women; odds ratio 1.44; 95% confidence limits 1.30, 1.60) (Figure 55, Table 75 and 76).
Over this decade, the incidence of pre-term birth (36 weeks or less) in Indigenous women has dropped from 13.1% to 11.6% (Figure 56, Table 75 and 76).

![Figure 56: Incidence of women giving birth at and below 36 weeks gestation in Queensland 2000 to 2009 by maternal Indigenous status (refer Tables 75 and 76)](image)

Figures 57 and 58 detail the changing incidence of gestation in Indigenous and non-Indigenous births, with Indigenous babies being more likely to be born preterm (less than 37 weeks) and non-Indigenous babies being more likely to be born near term (38 weeks and more) (Tables 75 and 76).

![Figure 57: Incidence of birth in Queensland 2000 to 2009 by gestation at birth and maternal Indigenous status (refer Tables 75 and 76)](image)
The pattern of birth weight to gestation is different for Indigenous and non-Indigenous babies, with Indigenous babies being smaller for gestational age than non-Indigenous babies. Figures 59 to 62 show analysis of these data for the years 2000 to 2009 (Tables 75 and 76).

Linear regression analysis of birth weight data for the decade 2000 to 2009 shows that maternal age and Indigenous status, as well as gestational age, have a statistically significantly influence on the birth weight of babies (maternal age: Regression coefficient [B statistic] 20.31; 95% Confidence limits 11.88, 28.74; p<0.001) (Indigenous status: Regression coefficient [B statistic] -32.95; 95% Confidence limits -47.51, -18.39; p<0.001) (gestation: Regression coefficient [B statistic] 1136.92; 95% Confidence limits 1128.62, 1145.19; p<0.001).
Figure 60: Percentage of babies weighing between 1,500g and 2,499g in Queensland 2000 to 2009 by gestation and maternal Indigenous status (refer Table 75 and 76)

Figure 61: Percentage of babies weighing between 2,500g and 3,999g in Queensland 2000 to 2009 by gestation and maternal Indigenous status (refer Table 75 and 76)

Figure 62: Percentage of babies weighing 4,000g or more in Queensland 2000 to 2009 by gestation and maternal Indigenous status (refer Table 75 and 76)