1.3.12 Perinatal autopsies:

Just under one-third of babies dying in the perinatal period have an autopsy (32.1% between 2009 and 2011) (see Figure 7 and Table 30). The autopsy rate for stillborn babies has remained relatively constant over the last five years (34.3% to 37.4%), though the rate of neonatal death autopsy has declined in that period from 31.2% to 20.7%.

![Figure 7: Perinatal autopsies by type of death, Queensland 2000 to 2011](see Table 30)

2. Pregnancy and newborn care

In the years 2010 and 2011 in Queensland, 122,150 women gave birth to 124,211 babies—this is the primary focus of this section of the report. Where possible they are compared with the larger cohort of 658,105 women who gave birth to 669,379 babies in Queensland between 2000 and 2011. Data was provided to the PDCT by midwives, under the Perinatal Statistics provisions of the Public Health Act 2005 (Chapter 6, Part 1, s214–228).

2.1 Mode of healthcare delivery

The number of women giving birth per year has risen from 48,524 in 2000 to 61,123 in 2011, an increase of 26.0% over this 12-year period (see Figure 8 and 9, and Table 34). The number of women cared for in the public healthcare sector has increased by 18.8% and the number cared for in the private healthcare sector by 44.1%—there has been little change, however from 2007–08 to the end of 2011.

![Figure 8: Number of births by mode of healthcare delivery, Queensland 2000 to 2011](see Table 35)
From 2001 onwards data relating to intended place of birth and actual place of birth have been collected. Between 2001 and 2011, 601,012 of the 609,581 (98.6%) women intended to give birth in a hospital—of these 601,012 women, 597,726 (99.5%) succeeded, while 171 gave birth at home, 14 gave birth in a birth centre and 3101 gave birth in ‘other’ circumstances (i.e. born before arrival).

In the same period:

- 7326 women intended to give birth in a birth centre—of these 7326 women, 5696 succeeded. Of the remaining women, 1,495 gave birth in hospital, 11 gave birth at home and 124 in ‘other’ circumstances
- 1197 women intended to give birth at home—of these 1197 women, 919 gave birth at home and 249 were transferred for birth elsewhere.

Data was incomplete for 111 women in this period.

### 2.2 Home birth

On average, 80 women per year plan to give birth at home and have done so (see Figure 10). The age profile of these women has slowly changed, with women over 35 years of age increasing from 27.8% to 36.8%.

### 2.3 Gestation at birth

Between 2000 and 2011, the rate of birth at gestations 37 to 39 weeks has increased significantly, from less than 43% to more than 53% (see Figure 11 and Table 36).

There has been a concomitant decrease in births at gestations of 40 weeks or more. Whilst it would be tempting to think that this relates to evidence suggesting that women should be given advice to end their pregnancy by 40 weeks plus 10 days, most of this decrease has been in the 40 to 41 week group, rather than the 42 weeks or more group.
There has been little change in the incidence of birth at less than 37 weeks (see Figure 12 and Table 36).

The changes in gestation at birth of the mothers are mirrored in the changes in gestation of the babies born (see Figures 13 and 14, and Table 38).
Though the overall rate of birth at less than 37 weeks gestation has shown little change, there has been a clear increase in the rate of birth at less than 37 weeks gestation in the private healthcare sector (see Figure 15 and Table 38).

It can be seen from Figure 16 and Table 38 that the gestational pattern of births over 36 weeks gestation differs between public and private healthcare sectors, with a clear peak of birth prior to 40 weeks in the private healthcare sector.
Figure 17 and Table 39 show that the difference in the gestational patterns between public and private healthcare sectors is a marked preponderance for elective caesarean section and, to a lesser degree induction of labour, in the 37 to 39 week gestation period in the private healthcare sector; the public healthcare sector pattern shows a greater preponderance of spontaneous onset of labour with a peak in the 40 to 41 week gestational period.

Table 42 shows that there is a significantly higher perinatal mortality for all gestations below 40 weeks in association with elective birth (i.e. induction of labour or elective caesarean section). Paradoxically there is little difference in the rate of these babies requiring care in neonatal intensive care or special care nurseries.

**Good practice point**

- Elective repeat caesarean section and induction of labour before 39 weeks of gestation are common, yet are associated with respiratory and other adverse neonatal outcomes. Elective intervention in pregnancy before 39 weeks of gestation should be avoided wherever possible.
2.4 Birthweight

Approximately 7% of babies born are low birthweight (less than 2500 grams) as shown in Figure 18 and Table 41, and this rate has not changed significantly between 2000 and 2011.

2.5 Multiple pregnancies

The overall rate of multiple pregnancy has varied between 1.5% and 1.8% over the period covered by this report (see Figure 19 and Table 42). The rate of multiple pregnancy increased significantly with maternal age (maternal age 35+ versus maternal age <35 risk ratio, 2000 to 2011: RR = 1.59, 95% confidence limits = 1.52, 1.66).

It is clear that multiple pregnancy is a powerful predictor of preterm birth, with less than 7% of singleton pregnancies ending before 37 weeks gestation, while between 56% and 62% of multiple pregnancies end before 37 weeks gestation.
Figure 20: Percentage of multiple and singleton pregnancies by gestation at birth, Queensland 2000 to 2011 (see Table 43)

**Good practice point**
- Maternity care providers should provide clear information to women carrying multiple pregnancies regarding the risk of preterm labour, and steps that should be taken in the event that a woman carrying a multiple pregnancy suspects the onset of preterm labour.

### 2.6 Assisted conception

Approximately 4% of births in Queensland are from pregnancies conceived with the aid of assisted conception techniques. Less than 4% of singleton pregnancies have been conceived with the aid of assisted conception techniques, but 28% of multiple pregnancies have been conceived with their aid.

Figure 21: Influence of assisted conception techniques, Queensland 2008 to 2011 (see Table 44)

Multiple pregnancy occurs in 1.1% to 1.3% of pregnancies conceived without any identified assisted conception technique (see Figure 22 and Table 44).

The development of improved extracorporeal techniques for assisted conception (invitro fertilisation, gamete intra-fallopian transfer, intracytoplasmic sperm injection, embryo transfer or related techniques) has resulted in a steady almost 50% fall in the rate of multiple pregnancy between 2000 and 2011 in association with these techniques (23.2% to 12.2%).

The same type of improvement has not been seen in relation to the use of ovulation induction and/or artificial insemination, with the multiple pregnancy incidence persistently in the region of 8%.
2.7 Onset of labour

There has been little change since 2005, with pregnancies ending in spontaneous labour in less than 60% of instances (see Figure 23 and Table 46). The frequency of elective caesarean section (20% to 21%) and induction of labour (22% to 23%) are similar to each other.
There is a statistically significant difference in the pattern of labour onset between public and private hospitals (see Figure 24 and Table 48). Women being cared for in the public healthcare sector labour spontaneously in 63% to 65% of pregnancies, while women being cared for in the private healthcare sector in 39% to 40% (2010 to 2011 private versus public risk ratio: RR = 0.43, 95% confidence limits = 0.43, 0.44).

Figure 24: Spontaneous onset of labour by mode of healthcare delivery, Queensland 2000 to 2011 (see Tables 47 and 48)

This disparity between these modes of healthcare delivery is mirrored in the rate of induction of labour (see Figure 25, and Tables 47 and 48). The private hospital care versus public hospital care risk ratio for induction of labour in 2010 to 2011: RR = 1.24, 95% confidence limits = 1.21, 1.27, and the rate of elective caesarean section (see Figure 26, and Tables 47 and 48) for private hospital care versus public hospital care risk ratio for elective caesarean section in 2010 to 2011: RR = 2.36, 95% confidence limits = 2.31, 2.41.

Figure 25: Induction of labour by mode of healthcare delivery, Queensland 2000 to 2011 (see Tables 47 and 48)

Figure 26: Elective caesarean section by mode of healthcare delivery, Queensland 2000 to 2011 (see Tables 47 and 48)
2.8 Mode of birth

Between 2000 and 2011, the rate of unassisted vaginal birth has progressively fallen from 65% to 56%, with a concomitant rise in the rate of caesarean section birth from 26% to 34%—there has been little change in the overall rate of assisted vaginal birth (see Figure 27, and Tables 50 and 51). The rate of change appears to be slowing.

The method of assisted vaginal birth has changed significantly between 2000 and 2011, with vacuum extraction becoming the clearly favoured methodology (see Figure 28, and Tables 50 and 51).

A marked disparity is seen between care in the public and private healthcare sectors, with the likelihood of a woman giving birth in the public healthcare sector having an unassisted vaginal birth being approximately 50% higher than a woman in the private healthcare sector—see Figure 29, and Tables 52 and 53 (2010 to 2011 private versus public risk ratio: RR = 0.62, 95% confidence limits = 0.61, 0.63).
By 2010 and 2011, almost 50% of women giving birth in the private healthcare sector had a caesarean section birth, while less than one-third of women giving birth in the public healthcare sector had a caesarean section birth—see Figure 30, and Tables 52 and 53 (2010 to 2011 private versus public risk ratio RR = 1.74, 95% confidence limits = 1.72, 1.77).

The difference in the rate of caesarean section between the two hospital systems is explained almost entirely by a highly significant preponderance of elective caesarean section (i.e. caesarean section without labour) in the private healthcare sector—see Figure 31, and Tables 54 and 55 (2010 to 2011 private versus public risk ratio for elective caesarean section RR = 2.30, 95% confidence limits = 2.28, 2.32, and the 2010 to 2011 private versus public risk ratio for non-elective caesarean section RR = 1.13, 95% confidence limits = 1.11, 1.14).
Assisted vaginal birth is also more frequently employed in private hospitals when compared with public hospitals—see Figure 32, and Table 52 and 53 (2010 to 2011 private versus public risk ratio: $RR = 1.44$, 95% confidence limits = 1.39, 1.49).

**Figure 32: Incidence of assisted vaginal birth of babies by mode of healthcare delivery, Queensland 2000 to 2011 (see Tables 52 and 53)**

Most women with breech presentations give birth by caesarean section (see Figure 33 and Table 56). The Term Breech study\(^{20}\) was published in 2000 and, while the significance of the results of that study have been debated by many, the influence is clear with an obvious increase in the caesarean section rate in 2001. The rate has reduced a little to 85% to 87% in public hospitals, but remains in excess of 93% in private hospitals (2010 to 2011 private versus public risk ratio for elective caesarean section for breech presentation $RR = 1.09$, 95% confidence limits = 1.08, 1.09).

A feared consequence of these high caesarean section rates is the diminishing expertise in vaginal breech delivery. The RANZCOG recommends\(^{21}\) that:

*while it is true that women with breech presentation at term will most often be delivered by caesarean section, management should be individualised*.

The American College of Obstetricians and Gynecologists, in light of studies that further clarify the long-term risks of vaginal breech delivery, recommends that the decision regarding mode of delivery should depend on the experience of the health care provider\(^{22}\).

**Figure 33: Incidence of caesarean section birth of babies when there is a breech presentation, by mode of healthcare delivery, Queensland 2000 to 2011 (see Table 56)**

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Recommendation

- That the SMNCN seeks assistance from the RANZCOG and other relevant professional bodies to examine the possible development of a small number of obstetric services which retain, preserve and teach the obstetric skill of vaginal breech birth.

Women with multiple pregnancies are most likely to give birth by caesarean section, with the rate steadily increasing between 2000 and 2011—see Figure 34 and Table 57 (2010 to 2011 private versus public risk ratio for elective caesarean section for multiple pregnancy RR = 1.12, 95% confidence limits = 1.07, 1.18).

Figure 34: Incidence of caesarean section for multiple births by mode of healthcare delivery, Queensland 2000 to 2011
(see Table 57)

2.9 Indigenous mothers and their babies

Between 2009 and 2011, 10,486 Indigenous women gave birth in Queensland (5.7% of the total of 183,174 women giving birth). Of these women, 10,273 (97.9%) were cared for in the public healthcare sector, compared with 68.3% of non-Indigenous women who accessed public hospital care (see Table 58 and 59).

Just over 80% of Indigenous women giving birth are 20 or more years of age, whilst approximately 95% of non-Indigenous women giving birth are 20 or more years of age (see Figure 35, and Table 58 and 59).

Figure 35: Incidence of maternal age groups by maternal Indigenous status, Queensland 2000 to 2011
(see Tables 58 and 59)
As seen in Figures 36 to 39, and Tables 61 and 62, Indigenous women are more likely than non-Indigenous women to give birth at lower gestations (the Indigenous versus non-Indigenous risk ratio for birth at gestations of 33 weeks or less RR = 1.77, 95% confidence limits = 1.69, 1.86). This difference in gestational pattern has remained constant between 2000 and 2011.

Figure 36: Percentage of women giving birth, by maternal Indigenous status and gestational age, Queensland 2000 to 2011 (see Tables 61 and 62)

Figure 37: Incidence of women giving birth by gestational groups and maternal Indigenous status, Queensland 2000 to 2011 (see Tables 61 and 62)

Figure 38: Incidence of birth by gestation at birth and maternal Indigenous status, Queensland 2000 to 2011 (see Table 62)
Figure 39: Incidence of birth at or below 36 weeks gestation by maternal Indigenous status, Queensland 2000 to 2011, detail from Figure 38

(see Table 62)

Gestational age-specific birthweights are similar for Indigenous and non-Indigenous babies (see Figure 40 and Table 62).

Figure 40: Mean birthweight by gestational age and maternal Indigenous status, Queensland 2000 to 2011

(see Table 61 and 62)

The different gestational patterns between Indigenous and non-Indigenous pregnancies means that the rate of low birthweight Indigenous babies being born is significantly higher than for non-Indigenous babies—see Figure 41 and Table 62 on the following page (the Indigenous versus non-Indigenous risk ratio for birthweight less than 2500 grams: RR = 1.81, 95% confidence limits = 1.76, 1.87).
2.9.1 Department of Health performance indicators in Aboriginal and Torres Strait Islander health related to maternity and newborn care

In 2007, the Department of Health committed to establish measurable accountabilities, starting with key areas of chronic disease, maternal and child health. This set of statewide indicators is drawn principally from Queensland Hospital Admitted Patient Data Collection and the Queensland Perinatal Data Collection. Four indicators, reported here, relate to maternity and newborn care in public healthcare.

**Aboriginal and Torres Strait Islander women who smoked after 20 weeks gestation**

This indicator is defined as:

*the proportion of Aboriginal and Torres Strait Islander women who smoked after 20 weeks gestation.*

**Aboriginal and Torres Strait Islander women who smoked at any time during pregnancy**

This indicator is defined as:

*the proportion of Aboriginal and Torres Strait Islander women who smoked at any time during pregnancy.*

The perinatal data collection includes data items of smoking at less than 20 weeks gestation during pregnancy and smoking after 20 weeks gestation during pregnancy. The statewide data collection allowing calculation of these indicators commenced in mid–2009. Using these two data items (see Tables 63 and 64) the 2010 to 2011 rate of women who identified as Aboriginal and/or Torres Strait Islander smoking:

- at less than 20 weeks gestation during pregnancy was 51.3%
- after 20 weeks gestation during pregnancy was 45.4%.

The relevant incidence in non-Indigenous women was 14.4% and 11.6%.

**Aboriginal and Torres Strait Islander women who attended five or more antenatal visits during pregnancy**

This indicator is defined as:

*the number of Aboriginal and Torres Strait Islander women who attended at least five antenatal visits and gave birth at 32 weeks or more gestation to a live or stillborn baby as a proportion of Aboriginal and Torres Strait Islander women who gave birth at 32 weeks or more gestation resulting in at least one live born or still born baby.*
Between 2008 and 2011, 78.9% of women identifying as Aboriginal and/or Torres Strait Islander attended five or more antenatal visits (see Table 65), with an increase from 76.3% to 83.4%. The relevant rate in non-Indigenous women was 94.4%.

**Low birthweight babies (weighing less than 2500 grams at birth) born to Aboriginal and Torres Strait Islander women**

This indicator is defined as:

*the rate of low birthweight among liveborn babies, of Aboriginal and Torres Strait Islander mothers as a proportion of liveborn babies, of Aboriginal and Torres Strait Islander mothers. Low birthweight is defined as less than 2500 grams.*

Between 2008 and 2011, 11.4% of babies of women identifying as Aboriginal and/or Torres Strait Islander (see Table 66) weighed less than 2500 grams. The relevant rate in the babies of non-Indigenous women was 6.5%.

Given the information provided in Figures 36 to 41, and Tables 61 and 62, detailed in Section 2.9 above (Indigenous mothers and their babies), it would be relevant to consider basing an indicator on gestation as well as the current indicator based on birthweight.

### Recommendation
- That the HSU consider progressing a recommendation through the appropriate mechanisms of government to COAG, to develop an indicator relating to gestation at birth (e.g. less than 37 weeks gestation) in addition to the indicator relating to Indigenous baby birthweight. The Indigenous baby birthweight indicator may be more valuable if calculated for gestation equal to 37 or more weeks, tracking near-term intrauterine growth restriction.

### 2.10 Influence of maternal risk factors

Risk assessment is an important element of care provision, matching likely care requirements to that available in different facilities. This section seeks to clarify the current evidence in Queensland regarding the importance of a number of the known ‘risk factors’ for all pregnant women.

#### 2.10.1 Effect of previous pregnancy on mode of birth

Previous pregnancy (without considering the previous mode of birth) does provide a degree of prediction regarding likely mode of vaginal birth (unassisted versus assisted), but does not significantly predict the likelihood of caesarean section birth (see Figure 42, and Tables 67 and 68). Women who have had a previous pregnancy are more likely to have an unassisted vaginal birth than women who have not had a previous pregnancy (63.8% versus 50.9%). The 2000 to 2011 previous pregnancy versus no previous pregnancy risk ratio for unassisted vaginal birth: RR = 1.25, 95% confidence limits = 1.25, 1.26.
2.10.2 Effect of previous caesarean section on mode of birth

Almost 78% of women who have not had a previous caesarean section give birth by the vaginal route (unassisted or assisted), compared with 21% who have had one previous caesarean section and less than 3% who have had more than one previous caesarean section—see Figure 43, and Tables 69 and 70 (2001 to 2011 one previous caesarean section versus no previous caesarean section risk ratio for vaginal birth: RR = 0.27, 95% confidence limits = 0.266, 0.274).

Figure 43: Incidence of mode of birth by previous caesarean sections, Queensland 2001 to 2011—number of previous caesarean sections completely collected since 2001 (see Tables 69 and 70)
2.10.3 Maternal age

Between 2000 and 2011, the rate of birth for women over the age of 35 years has increased from 15% to 20% (see Figure 44 and Table 71), with concomitant decreases in the rate of birth to women in the 20 to 34 years and less than 20 years age groups (maternal age 35 years or more 2010–2011 versus 2000–2001: RR = 1.33, 95% confidence limits = 1.30, 1.35).

Almost all women aged 20 years or less are cared for in the public healthcare sector, (see Figure 45 and Table 71). Approximately one-quarter of women aged 20 to 34 years and almost one-half of women aged 35 years or more are cared for in the private healthcare sector (see Figures 46 and 47, and Table 72).
There is an almost linear increase in the rate of multiple birth as the age of women increases—see Figure 48 and Table 73 (2008 to 2011 maternal age 31 years or more versus maternal age 25 or less risk ratio for multiple pregnancy: RR = 2.15, 95% confidence limits = 2.04, 2.26). It is unclear as to how much of this difference in incidence relates to the use of assisted reproduction technologies.
Older women are more likely than younger women to give birth between 34 and 38 weeks gestation, rather than 39 weeks or more—see Figure 49 and Table 74 (2000 to 2011, maternal age 31 years or more versus maternal age 25 or less risk ratio for birth between 34 and 38 weeks gestation: RR = 1.34, 95% confidence limits = 1.33, 1.36).

Babies of women 36 or more years of age and women 20 or less years of age are most likely to need newborn care in NICU and/or a SCN—see Figure 50 and Table 75 (2000 to 2011, maternal age 36 years or more versus maternal age 35 years or less risk ratio for NICU and/or SCN care: RR = 1.16, 95% confidence limits = 1.15, 1.18, and 2000 to 2011, maternal age 20 years or less versus maternal age 21 years or more risk ratio for NICU and/or SCN care: RR = 1.09, 95% confidence limits = 1.07, 1.11).
2.10.4 Maternal obesity

Maternal height and weight collection began in mid–2007—data and comments in this section relate to the four-year period 2008 to 2011. Overweight and obesity are defined by body mass index (BMI = kg/m²).

A person with a BMI of:
- 25.0–29.9 is classified as overweight
- ≥ 30.0 is classified as obese
- <18.5 is classified as underweight.

One in five women pregnant between 2008 and 2011 (20.9%) were obese, and a further 26.6% were overweight (see Tables 77 to 79). Women in the overweight and obese categories were more likely to be cared for in the public healthcare sector than in the private healthcare sector or homebirth (see Table 77). Women over the age of 20 years were more likely to be obese when compared with women less than 20 years of age (see Table 78).

The likelihood of a woman having a caesarean section birth increased progressively with increasing BMI (see Figure 51 and Table 79). The caesarean section rate for obese women was 39.8%, compared with 30.2% for women with a BMI considered to be within the normal range. In 2008 to 2011, the BMI 30 or more versus 18.5 to 24.9 risk ratio for caesarean section birth: RR = 1.27, 95% confidence limits = 1.25, 1.28). Both unassisted vaginal birth rate and assisted vaginal birth rate showed a concomitant progressive decrease.
Obesity does not appear to have any significant influence on gestation at birth (see Figure 52 and Table 80). Obese women are more likely to have a baby weighing more than 4000 grams when compared with lighter women, and underweight women are more likely than heavier women to have a baby weighing less than 2500 grams (see Figure 53 and Table 81).

**Figure 52: BMI versus gestation at birth, Queensland 2008 to 2011 (see Table 80)**

**Figure 53: BMI versus birthweight, Queensland 2008 to 2011 (see Table 81)**

Obesity is associated with an excessive incidence of perinatal death (25% more likely than in woman with a BMI less than 30 (2008 to 2011 BMI 30 or more versus BMI less than 30 risk ratio for perinatal death: RR = 1.33, 95% confidence limits = 1.21, 1.47). Both fetal death and neonatal death rates are increased in this obese group (see Figure 54 and Table 82).

**Figure 54: BMI versus perinatal mortality rates (per 1,000 births), Queensland 2008 to 2011 (see Table 82)**
2.10.5 Maternal smoking

Smoking status before and after 20 weeks gestation has been collected since mid-2009. Younger women are more likely to smoke than older women (see Table 83). The rate of smoking after 20 weeks gestation is 13.6%, compared with 16.6% before 20 weeks gestation.

Women who smoke are more likely to give birth preterm. Smoking after 20 weeks gestation is associated with a rate of preterm birth (less than 37 weeks gestation) of 20.9%, compared with 18.1% for women who do not smoke after 20 weeks gestation—see Figure 55 and Table 84 (2010 to 2011 smoking after 20 weeks gestation versus not smoking after 20 weeks gestation risk ratio for birth at gestations less than 37 weeks: RR = 1.42, 95% confidence limits = 1.36, 1.49).

Cigarette smoking is associated with a significantly higher incidence of birth of babies with birthweight less than 2500 grams, and a lower incidence of birth of babies with birthweight 4000 grams or more—see Figure 56 and Table 85 (2010 to 2011 smoking after 20 weeks gestation versus not smoking after 20 weeks gestation risk ratio for birthweight less than 2500 grams: RR = 1.93, 95% confidence limits = 1.84, 2.02). The birthweight distribution appears similar for women who smoke before 20 weeks and those who continue to smoke after 20 weeks gestation.

Smoking in pregnancy, whether before or after 20 weeks gestation, is associated with a more than 50% increase in the risk of perinatal death (see Figure 57 and Table 86). Women who smoke before 20 weeks gestation have a perinatal mortality rate of 14.2 per 1000 births, compared with 9.1 per 1000 births for women who do not smoke before 20 weeks gestation. The risk of perinatal death rises marginally for women who continue to smoke after 20 weeks gestation—14.5 per 1000 births (2010 to 2011 smoking after 20 weeks gestation versus not smoking after 20 weeks gestation risk ratio for perinatal death: RR = 1.57, 95% confidence limits = 1.37, 1.81).
Figure 57: Smoking versus perinatal mortality rates (per 1,000 births), Queensland 2010 to 2011
(see Table 86)

Good practice point

- Smoking cessation programs as part of routine antenatal care reduce fetal exposure to cigarette smoke, low birthweight and preterm birth, and should form part of routine antenatal care. Specialised programs to assist Indigenous women to stop smoking before and during pregnancy should be prioritised.

2.10.6 Remoteness of residence

The Accessibility/Remoteness Index of Australia (ARIA) is an index of the accessibility of places to service centres, or conversely of remoteness of places. Geographical areas are given a score (continuous between zero and 15) based on the road distance to service towns of different sizes. Scores for regions are derived by averaging scores of 1 km² grid.

This section examines the relationship between remoteness classes of the primary residence of the mothers and some outcomes. The index scores can be classified into various categories—five remoteness classes are used:

- Highly accessible (ARIA score 0 to <0.20)—relatively unrestricted accessibility to a wide range of goods and services and opportunities for social interaction.
- Accessible (ARIA score 0.20 to <2.40)—some restrictions to accessibility of some goods, services and opportunities for social interaction.
- Moderately accessible (ARIA score 2.40 to <5.95)—significantly restricted accessibility of goods, services and opportunities for social interaction.
- Remote (ARIA score 5.95 to <10.5)—very restricted accessibility of goods, services and opportunities for social interaction.
- Very remote (ARIA score 10.5 to <15)—very little accessibility of goods, services and opportunities for social interaction.

Women living in highly accessible and accessible areas (Class 1 and 2; ARIA score 0 to <2.40) are more likely to give birth at or after 37 weeks gestation (92.3%) than women who live in remote and very remote areas (89.9%) (Class 4 and 5; ARIA score 5.95 to <15) (Figure 58 and Table 87) (2010 to 2011 ARIA class 1 and 2 versus ARIA Class 4 and 5 risk ratio for birth at or after 37 weeks: RR = 1.03, 95% confidence limits = 1.02, 1.04).

Remote of residence appears to have little effect on the likelihood of non-Indigenous women having a preterm birth (risk ratio confidence limits include unity), but the likelihood of preterm birth rises with remoteness for Indigenous women—see Figure 59 and Table 87 (2010 to 2011 ARIA Class 1 and 2 versus ARIA Class 4 and 5 risk ratio for birth at or after 37 weeks: RR = 1.05, 95% confidence limits = 1.02, 1.07).

Women living in highly accessible and accessible areas (Class 1 and 2; ARIA score 0 to <2.40) are less likely to give birth to low birthweight babies (6.8%) than women who live in remote and very remote areas (8.9%) (Class 4 and 5; ARIA score 5.95 to <15)—see Figure 60 and Table 88 (2010 to 2011 ARIA class 1 and 2 versus ARIA class 4 and 5 risk ratio for birthweight <2500 grams: RR = 1.31, 95% confidence limits = 1.18, 1.45).
The likelihood of low birthweight birth rises with remoteness for Indigenous women—13.6% of Indigenous women who live in remote and very remote areas gave birth to low birthweight babies versus 10% of Indigenous women living in highly accessible and accessible areas—see Figure 61 and Table 88 (2010 to 2011 ARIA Class 1 and 2 versus ARIA Class 4 and 5 risk ratio for Indigenous birthweight <2500 grams: RR = 1.36, 95% confidence limits = 1.16, 1.60). Paradoxically, 5.2% of non-Indigenous women who live in remote and very remote areas gave birth to low birthweight babies versus 6.7% of non-Indigenous women living in highly accessible and accessible areas (2010 to 2011 ARIA Class 1 and 2 versus ARIA Class 4 and 5 risk ratio for non-Indigenous birthweight <2500 grams: RR = 0.78, 95% confidence limits = 0.65, 0.93).

Overall, women living in highly accessible and accessible areas (Class 1 and 2; ARIA score 0 to <2.40) have similar perinatal mortality rates to women who live in remote and very remote areas (Class 4 and 5; ARIA score 5.95 to <15) 10 per 1000 births versus 10.1 per 1000 births—see Figure 62 and Table 89 (risk ratio confidence limits include unity, and hence the difference is not statistically significant).

The perinatal mortality rate for babies of Indigenous women who live in remote and very remote areas was 16.1 per 1000 births versus 13.8 per 1000 births for babies of Indigenous women living in highly accessible and accessible areas—see Figure 63 and Table 89 (risk ratio confidence limits include unity). On the other hand, babies of non-Indigenous women who live in remote and very remote areas had a lower perinatal mortality rate (5.4 per 1000 births) than babies of non-Indigenous women living in highly accessible and accessible areas (9.9 per 1000 births)—2010 to 2011 ARIA Class 4 and 5 versus ARIA Class 1 and 2 risk ratio for non-Indigenous perinatal death: RR = 0.54, 95% confidence limits = 0.31, 0.96.
2.10.7 Socio-economic disadvantage

SEIFA are summary measures of a number of variables that represent different aspects of relative socio-economic disadvantage and/or advantage in a geographic area. The SEIFA indexes are created by combining information collected regarding economic and social resources of people and households within an area in the five-yearly Census of Population and Housing. This section examines the index of relative socio-economic advantage and disadvantage in relation to selected outcomes. This SEIFA index ranks different geographic areas of Australia according to a ‘score’ that is created for the area based on characteristics of people, families and dwellings within that area. For the purposes of this report the SEIFA index of relative socio-economic advantage and disadvantage is divided into five percentage-based groups (quintiles), producing a continuum of advantage (high values—quintiles five and four) to disadvantage (low values—quintiles one and two).

Women who were in the more disadvantaged groups (SEIFA quintiles one and two) were more likely to give birth before 37 weeks gestation (8.5%) than women who were in the more advantaged groups (7.2%) (SEIFA quintiles four and five)—see Figure 64 and Table 90 (2010 to 2011 SEIFA quintiles one and two versus SEIFA quintiles four and five risk ratio for birth before 37 weeks: RR = 1.18, 95% confidence limits = 1.13, 1.24).

Women who were in the more disadvantaged groups (SEIFA quintiles one and two) were more likely to give birth before 37 weeks gestation (8.5%) than women who were in the more advantaged groups (7.2%) (SEIFA quintiles four and five)—see Figure 64 and Table 90 (2010 to 2011 SEIFA quintiles one and two versus SEIFA quintiles four and five risk ratio for birth before 37 weeks: RR = 1.18, 95% confidence limits = 1.13, 1.24).

There is little difference in the incidence of preterm birth before 37 weeks gestation between Indigenous women in the more disadvantaged groups (12.6%) and the more advantaged groups (11.2%)—see Figure 65 and Table 91 (risk ratio confidence limits include unity). The likelihood of preterm birth rises with disadvantage for non-Indigenous women (2010 to 2011 SEIFA quintiles one and two versus SEIFA quintiles four and five risk ratio for birth before 37 weeks: RR = 1.12, 95% confidence limits = 1.07, 1.18).

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Women who are more disadvantaged (SEIFA quintiles one and two) were more likely to give birth to low birthweight babies less than 2500 grams (7.6%) than women who were more advantaged (6.4%) SEIFA quintiles four and five—see Figure 66 and Table 91 (2010 to 2011 SEIFA quintiles one and two versus SEIFA quintiles four and five risk ratio for birthweight <2500 grams: RR = 1.18, 95% confidence limits = 1.12, 1.23).

The difference in the rate of low birthweight between the more disadvantaged groups and the more advantaged groups is seen in both Indigenous and non-Indigenous babies (see Figure 67 and Table 91). Indigenous babies in the more disadvantaged groups have a rate of 12.4% of low birthweight whilst the more advantaged groups have a rate of 11.1% (risk ratio confidence limits include unity). The likelihood of low birthweight birth for non-Indigenous babies in the more disadvantaged groups is 7.0% and in the more advantaged groups is 6.3% (2010 to 2011 SEIFA quintiles one and two versus SEIFA quintiles four and five risk ratio for low birthweight birth: RR = 1.10, 95% confidence limits = 1.05, 1.16).
Disadvantage is associated with a significant increase in the risk of perinatal death (both stillbirth and neonatal death). Women who are more disadvantaged (SEIFA quintiles one and two) were more likely to have a perinatal death (12.1 per 1000 births) than women who were more advantaged (8.2 per 1000 births) SEIFA quintiles four and five—see Figure 68 and Table 92 (2010 to 2011 SEIFA quintiles one and two versus SEIFA quintiles four and five risk ratio for perinatal death: RR = 1.47, 95% confidence limits = 1.29, 1.67).

The higher risk of perinatal death in the more disadvantaged groups is seen in both Indigenous and non-Indigenous babies (see Figure 69 and Table 92). Indigenous babies in the more disadvantaged groups had a perinatal mortality rate of 19.1 per 1000 births whilst the more advantaged groups had a perinatal mortality rate of 9.5 per 1000 births (risk ratio confidence limits include unity, the numbers are small in some cells). There were no perinatal deaths in the SEIFA quintile five Indigenous group, reflecting the small numbers in this group of women and babies. The likelihood of perinatal death for non-Indigenous babies in the more disadvantaged groups was 11.3 per 1000 births and in the more advantaged groups was 8.3 per 1000 births (2010 to 2011 SEIFA quintiles one and two versus SEIFA quintiles four and five risk ratio for perinatal death: RR = 1.37, 95% confidence limits = 1.19, 1.57).

Good practice point

- Where maternal risk factors such as advanced maternal age, obesity and smoking are identified, clinicians should provide clear information to the woman regarding those risks and their implications. Whilst specific recommendations may be required regarding an appropriate level of facility care, such recommendations must be consistent with continuing provision of non-fragmented models of care with a defined primary care giver.