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# Western Australia's Mothers and Babies, 2013

**31<sup>st</sup> Annual Report of the Western Australian  
Midwives' Notification System**

**September 2016**



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Maternal and Child Health Unit  
Data Collections Directorate  
Purchasing and System Performance  
Department of Health, Western Australia

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## 1.1. Executive summary

This 31<sup>st</sup> annual report contains information on women who gave birth in Western Australia in 2013, and their infants. In January 2013, the data collection was expanded (see section 2.1). This report includes these new data.

Permission has been received from health services to publish data at a hospital level in this report. These data were first presented for 2010 births and describe percentage rates for induction of labour, caesarean section and spontaneous vaginal birth for infants with a vertex presentation.

### 1.1.1. Maternal demographics

In 2013, there were 33,928 women who gave birth in WA. In this group of women:

- the average age was 29.8 years
- teenage women represented 3.6 per cent, the lowest proportion in 34 years
- women aged 35 years or older represented 20.5 per cent
- those that resided in metropolitan health regions were the largest group (78.6 per cent)
- the largest rural residential group were those living in the southwest region (6.4 per cent)
- women born in Australia comprised 63.0 per cent, 14.3 per cent were born in Asian countries and 10.0 per cent in European countries.

Trends in age-specific birth rates for women of childbearing age have changed in the period from 1983 to 2013. In 2013:

- for all women the birth rate was 63.4 per 1,000 women. This continued the downward trend observed since 2007 when the rate was 66.5 per 1000
- for teenage women the birth rate was 16.0 per 1,000, the lowest in 31 years
- for women aged 35 years or older the birth rate was 39.4 per 1,000 and was similar to the annual birth rate for this age group since 2007.

### 1.1.2. Place of birth

The majority (98.3 per cent) of women gave birth in hospitals. Non-hospital births (1.6 per cent) included women who gave birth at a birth centre (1.0 per cent) and at home (0.6 per cent).

Of women resident in the metropolitan regions, 74.1 per cent gave birth in hospitals in their own health areas and 19.1 per cent gave birth in the tertiary hospital.

In country regions, 76.8 per cent of women gave birth in their own region and 8.8 per cent gave birth in the tertiary hospital.

### 1.1.3. Tobacco smoking during pregnancy

The proportion of women who reported smoking tobacco during pregnancy was 10.7 per cent. Among teenage women the smoking proportion was 32.8 per cent.

By country of birth, the highest proportions of women who reported smoking tobacco were born in New Zealand (19.9 per cent) and Australia (14.1 per cent).

### 1.1.4. Pregnancy Profile

Women who gave birth for the first time (primiparous women) represented 42.6 per cent of all women who gave birth. Their mean age was 28.2 years.

For women aged 35 years or over, 26.4 per cent had their first baby.



There were 20.6 per cent of women with a body mass index (BMI) of 30 or more in early pregnancy. A BMI of 40 or greater was reported for 2.4 per cent and the proportion of women who were underweight in early pregnancy comprised 3.0 per cent.

Antenatal care in early pregnancy occurred for 62.1 per cent. A further 31.3 per cent had late antenatal care before birth. A small proportion of women did not attend antenatal care (0.2 per cent).

Four out of five women (83.4 per cent) attended five or more antenatal care visits.

Two out of five women (42.3 per cent) had pregnancies affected by a pre-existing medical condition. The most common condition was asthma (10.2 per cent). For women who were obese in pregnancy, the proportion with asthma was 14.1 per cent.

One third of women (32.1 per cent) were affected by a complication of pregnancy. The most common condition was gestational diabetes (7.4 per cent). For women who were obese in pregnancy, the proportion with gestational diabetes was 11.8 per cent.

### **1.1.5. Labour and Birth**

Spontaneous onset of labour occurred for 50.0 per cent of pregnant women whilst 29.3 per cent had labour induced. The remaining women (20.7 per cent) did not experience labour prior to birth by caesarean section.

Of women who had spontaneous onset of labour, 36.0 per cent had their labour augmented.

There was wide variation in the rate of induction of labour across maternity sites. The range was from 19.6 to 39.0 per cent.

Epidural and/or spinal analgesia was used by 47.8 per cent of women during labour.

For women with a vertex fetal presentation, a spontaneous vaginal birth occurred for 53.4 per cent. Within individual maternity sites, this proportion ranged between 30.8 and 73.8 per cent.

The caesarean section rate in 2013 was 34.3 per cent (11,648 women). There was wide variation in the proportion for caesarean section across maternity sites. The range was from 16.3 to 55.2 per cent.

Complications of labour and birth, including reasons for caesarean section, were reported for two thirds of women giving birth (62.2 per cent). The most common complications reported were primary postpartum haemorrhage (19.2 per cent), previous caesarean section (17.2 per cent), and suspected fetal compromise (9.9 per cent).

The rate of primary postpartum haemorrhage escalated in the past ten years from 8.2 to 19.2 per cent of women.

Complications of labour and birth were reported for 70.6 per cent of obese women. These women had higher proportions of primary postpartum haemorrhage (25.4 per cent) and previous caesarean section (23.3 per cent) than did all women.

### **1.1.6. Aboriginal Mothers**

Aboriginal women represented 5.1 per cent of those who gave birth in WA. They were younger and had a higher age specific birth rate (81.5 per 1000) than non-Aboriginal women (62.4 per 1000).

The age specific birth rate for Aboriginal teenagers (78.3 per 1000) was more than six times the rate for non-Aboriginal teenage mothers (12.1 per 1000).

More than half the Aboriginal women (62.1 per cent) lived in rural WA.

More than half of the Aboriginal women (51.2 per cent) gave birth in public hospitals in rural regions and one quarter (24.1 per cent) gave birth in the tertiary hospital.

Aboriginal women were less likely (Relative Risk (RR) 0.8) to attend antenatal care early and nine times as likely (RR 8.9) to never attend than non-Aboriginal women.

Aboriginal women were twice as likely to have a history of stillbirth or children who had died than non-Aboriginal women.

Nearly half of the Aboriginal women reported smoking tobacco during pregnancy (48.7 per cent). One in five changed their smoking habits during pregnancy. Less Aboriginal women who lived in Perth (44.6 per cent) smoked than those who lived in the country (51.2 per cent).

Slightly more Aboriginal women had complications of pregnancy (36.5 per cent) than did non-Aboriginal women (31.8 per cent). The proportion of Aboriginal women with gestational diabetes (6.8 per cent) was lower than for non-Aboriginal women (7.5 per cent). However, the rate of pre-existing diabetes in pregnant Aboriginal women (2.5 per cent) was four times the rate in non-Aboriginal woman (0.6 per cent).

Aboriginal women were more likely to have a vaginal birth and half as likely to have an elective caesarean section as non-Aboriginal women.

Following vaginal birth, Aboriginal women were twice as likely to have an intact perineum and half as likely to have an episiotomy as non-Aboriginal women.

#### **1.1.7. Aboriginal infants**

Of infants born to Aboriginal women, 1.3 per cent were stillborn compared to 0.6 per cent of those born to non-Aboriginal women. The proportion of fetal death that occurred during labour was similar for both Aboriginal and non-Aboriginal women.

One in seven infants born to Aboriginal women had low birthweight compared to one in fifteen infants of non-Aboriginal women.

#### **1.1.8. All Infants**

In 2013, there were 34,404 infants born in Western Australia. Of these, 99.4 per cent were born alive and 210 were stillborn.

There were 542 (1.6 per cent) more infants born in WA in 2013 than there were in 2012. However for the same periods, the crude birth rate decreased from 13.8 to 13.6 per 1,000 total population.

There were 33,458 singleton infants born, representing 97.3 per cent of total infants born.

Multiple births comprised 2.8 per cent of infants born and consisted of 464 sets of twins and 6 of triplets. There were no births of higher order than triplet.

The proportion of births that were preterm was 9.1 per cent. Of all preterm infants, 94.1 per cent were born alive.

The majority (75.3 per cent) of stillborn preterm infants were born before 28 weeks gestation.



Of very preterm liveborn infants, 88.7 per cent were born in the tertiary hospital.

An Apgar score between 8 and 10 at one minute of age occurred for 86.1 per cent of liveborn infants. At five minutes of age the proportion was 96.6 per cent.

Of liveborn infants, 19.5 per cent received some form of resuscitation at birth.

Of liveborn infants, 11.4 per cent were admitted to a Special Care Nursery at the birth site for at least one day. Length of stay in Special Care Nursery exceeded 7 days for 27.1 per cent of these infants.

Since 1980, the proportion of infants discharged home within one day of birth increased. Since 2006 there has been an increase from one in 10 infants (9.5 per cent) to two in 10 infants (19.6 per cent) in 2013.

### **1.1.9. Perinatal Mortality**

Among infants born in 2013 there were 210 fetal deaths and 59 neonatal deaths, a perinatal mortality rate of 7.8 per 1,000 infants born.

The perinatal mortality rate for infants of Aboriginal mothers was 20.5 per 1,000 infants born compared to 7.1 per 1000 infants of non-Aboriginal mothers.

The perinatal mortality rate for infants of multiple births (30.7 per 1,000 infants born) was four times the rate for singleton infants (7.2 per 1000).

Cause of death for most stillborn infants was either extremely low birthweight (41.4 per cent) or lethal birth defects (37.6 per cent).

The majority of liveborn infants who died in the neonatal period had a cause of death of either extremely low birthweight (33.9 per cent) or lethal birth defects (39.0 per cent).

## 2. Introduction

This is the 31<sup>st</sup> annual report on perinatal statistics in Western Australia (WA) from the Midwives' Notification System (MNS).

The report contains information on women who gave birth in WA in 2013 and their infants. Pregnancies that resulted in an infant born at a gestation of at least 20 weeks or a birthweight of at least 400 grams have been included. These criteria are in accordance with national reporting methods (AIHW 2009).

The report presents an overview of data about births in 2013 using maternal demography, procedures and infant outcomes. It also describes trends over the collection period from 1980 to 2013 where available. Information on women resident in this state who gave birth outside WA is not included in this report.

To ensure complete ascertainment of all records relevant to births and perinatal deaths within WA, information is collated from the WA MNS, the WA Hospital Morbidity Data Collection and the WA Registry of Births, Deaths and Marriages. These data are maintained separately as state-wide data collections.

This report includes some hospital level data with the permission of the Chief Executive Officers of maternity services in Western Australia. The WA Country Health Service data is presented by region in the tables to more appropriately reflect the service model provided in those regions.

Aboriginal women, their pregnancies, births and infants are described in a dedicated section of this report.

### 2.1. Changes to report format and content

Changes were introduced to notification of birth data required of midwives. Three changes commenced for births from 1<sup>st</sup> January 2013. These additional data have been used in this report to describe births in 2013. The changes were:

- revision of "maternal ethnic origin" to enable reporting of one of three values to describe Aboriginal and/or Torres Strait Islander, to conform with national standards
- revision of "expected due date based on" that only enabled reporting of "clinical signs/dates" or "ultrasound at gestation less than 20 weeks" as a basis for estimating the due date. The item "ultrasound at gestation of 20 weeks or more" was added
- revision of "analgesia during labour" values to change from reporting intramuscular narcotics to all narcotics
- revision of "perineal status" to enable reporting of multiple values like episiotomy and third degree tear.

### 2.2. Legal status of perinatal statistics in Western Australia

Western Australia's statutory reporting requirements are outlined in the *Health Act 1911*, Section 335(1): "It shall be the duty of every midwife to furnish to the Executive Director, Public Health and to the medical officer of health of the district in which she practises a report in writing in the manner and at the time and in the form prescribed of every case attended by her, whether of living, premature or full term birth, or stillbirth, or abortion."

The birth notification report should be submitted within 48 hours of the birth. This enables the Community Child Health Nurse to monitor the health and welfare of the mother and her infant.

A more comprehensive Notification of Case Attended (NOCA) (Appendix C) form is also to be submitted as required by the Health (Notifications by Midwives) Regulations 1994. The submission of data should happen after the infant has been discharged from hospital, or in the case of home birth, when the midwife is satisfied the birth event has been completed.

The NOCA form can be updated without amendments to the Act. The last update to include new variables and values was in May 2016.

A midwife who enters into private practice must notify the Executive Director of Public Health of this intention. Initial contact should be made to the Principal Midwifery Adviser to the Chief Nurse and Midwifery Officer to formalise the process. The Midwifery Adviser to the Chief Nursing Officer is now the delegate for the Executive Director of Public Health for receiving notice from midwives to undertake private practice.

### **2.3. Midwives' Notification System**

The MNS contains data from notifications of births that have occurred since 1980. Data are submitted electronically from a number of feeder systems or manually in paper forms. The main electronic feeder systems providing birth data in 2013 were Stork, the Midwives' Data Entry Package (MDEP), the IBA system from the Ramsay Group hospitals and the Midwives System from the SJOG Group. Stork is managed by the Department of Health's Health Information Network and the MDEP is maintained by the Maternal and Child Health Unit.

### **2.4. Aboriginal status**

Within Western Australia, the term Aboriginal is used in preference to Aboriginal and Torres Strait Islander, in recognition that Aboriginal people are the original inhabitants of Western Australia. No disrespect is intended to our Torres Strait Islander colleagues and community.

Reporting Aboriginal status for women included in this report relied on multi-step processes in place at health services. Usually, women completed a "Patient Registration" health record form which included a requirement to respond to a question about whether or not they are of Aboriginal or Torres Strait Islander descent. This form is usually completed at every presentation to a health service with most women expected to confirm the content multiple times during a pregnancy and birth admission. When notifying a birth to the MNS, the midwife would have referred to this health record form to complete the ethnic origin data item. The relationship between the midwife and the woman could have provided knowledge and opportunity to report a different ethnic origin to MNS than that recorded on the health record form.

A WA Department of Health Audit conducted in 2001 found that Aboriginal status was under ascertained in WA hospitals with 85.8 per cent of Aboriginal people found to be accurately reported in the hospital morbidity data. There was a range across health regions of 78.3 to 93.5 per cent. A recommendation of the audit was for a correction factor to be used when reporting health data to overcome under-ascertainment of Aboriginal status (Young, M, 2001). This report has not employed the correction factor, nor have previous reports in this series.

A Commonwealth report of "quality of Indigenous identification in records of hospitalisations in public hospitals in Australia" found that weighted completeness (and confidence intervals) of Indigenous identification for WA events was 91 per cent (85-95 per cent) (AIHW, 2013).

A validation of MNS data was last conducted in 2007 on data for the calendar year 2005. A review of the medical records for 525 (2%) randomly selected midwives' birth reports received to the MNS was conducted where data received was compared to the physical medical record.

## 2.5. Presentation of data in report

All data presented here are in statistical form with values less than 5 suppressed and suppression indicated with \*\*\*. There is no identification of individual patients, midwives or doctors. Some data identifies hospitals when permitted. Readers requiring suppressed values can request these data directly from the Maternal and Child Health Unit.

## 2.6. Data sources for the 2013 birth data

1	Stork	Albany, Armadale Kelmscott Memorial, Bentley Health Service, Bridgetown, Broome, Bunbury Regional, Busselton, Carnarvon, Collie, Community Midwife Program, Derby, Esperance, Geraldton, Hedland Health Campus, Kaleeya, Kalgoorlie, Katanning, King Edward Memorial, Kununnurra, Margaret River, Narrogin, Northam, Nickol Bay, Osborne Park, Rockingham General, Swan District, Warren.
2	Midwives Data Entry Package	Peel Health Campus
3	Ramsay Group IBA	Attadale Hospital, Glengarry Hospital, Joondalup Health Campus.
2/4	Data Entry Package/SJOG	Mercy Hospital moved to St John of God systems April 2013.
4	SJOG Group Midwives system	St John of God – Murdoch, St John of God – Subiaco, St John of God – Geraldton, St John of God – Bunbury, St John of God – Mt Lawley from April 2013 .
5	Paper Forms	Private Practice Midwives and unplanned births at non-maternity sites.

## 3. Mothers

In 2013, there were 33,928 women who gave birth in WA (Table 1). This was an increase of 535 women (1.6 per cent) from 2012 and from data available was the highest annual number of women giving birth since 1974. Of women who gave birth, 5.1 per cent were Aboriginal. The remainder included those reported as Caucasian, Asian, African, Indian, Maori or Other (Table 1).

**Table 1: Aboriginal status of women who gave birth in WA, 2013**

Aboriginal Status	Number	Percentage
Aboriginal	1,739	5.1
Non-Aboriginal	32,189	94.9
<b>Total</b>	<b>33,928</b>	<b>100.0</b>

Extracted from Midwives' Notification System on 15 September 2015.

### 3.1. Maternal demographics

#### 3.1.1. Maternal age

The age of women who gave birth in 2013 ranged from 13 to 51 years with a mean of 29.8 years and a median and mode of 30 years.

Over the past three decades, the proportion of women who gave birth that were teenaged declined from 8.2 per cent in 1980 to 3.6 per cent in 2013. The number decreased by 462 from 1,698 in 1980 to 1,236 in 2013.

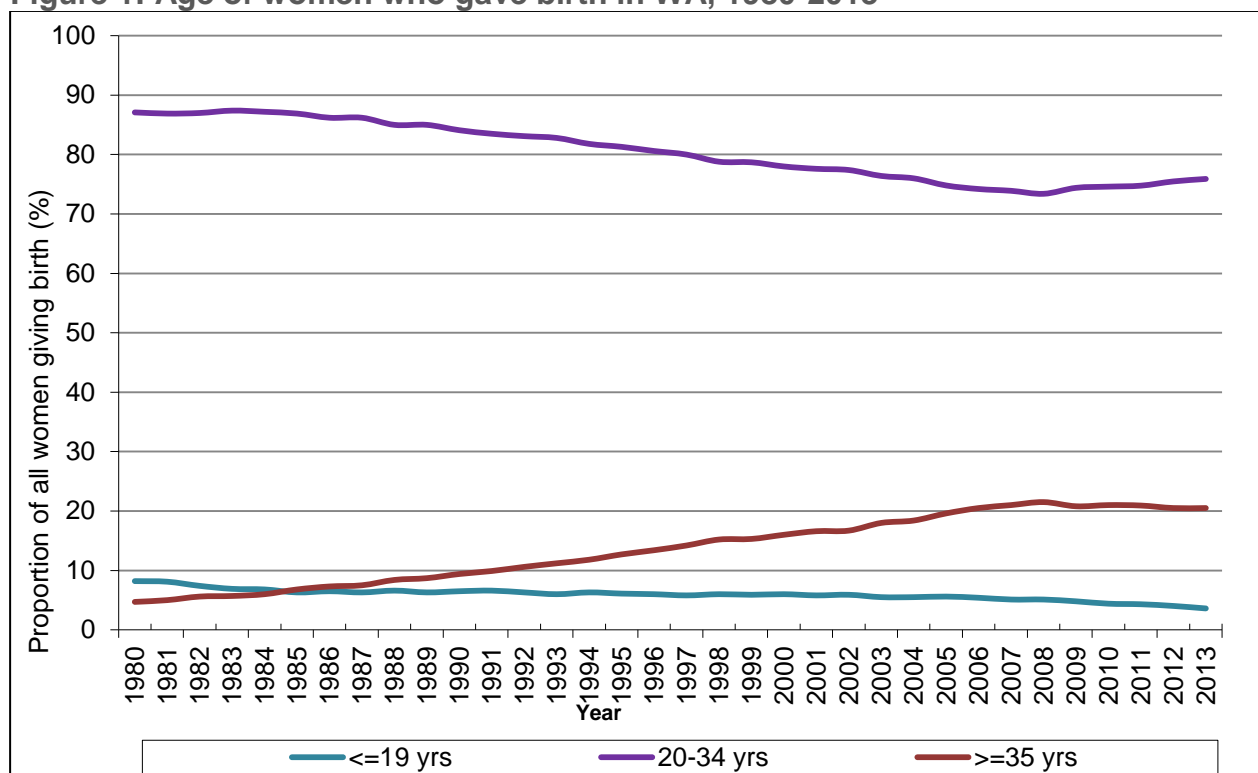
The proportion of women aged 20 to 34 years decreased from 87.4 per cent in 1983 to 73.4 per cent in 2008. This proportion increased to 75.9 per cent by 2013.

In the same period, the proportion of women aged 35 years or older increased each year, from 1980 to 2008; 4.7 per cent in 1980 to 21.5 per cent in 2008 (Table 2, Figure 1). From 2008 to 2013 the percentage has remained around 21 per cent with 20.5 per cent recorded in 2013.

**Table 2: Age of women who gave birth in WA, 1980-2013**

Year of Birth	Maternal Age						Total No.
	≤19		20-34		≥ 35		
	No.	%	No.	%	No.	%	
1980	1,698	8.2	17,928	87.1	969	4.7	20,595
1981	1,770	8.1	19,110	86.9	1,100	5.0	21,980
1982	1,643	7.4	19,271	87.0	1,238	5.6	22,152
1983	1,577	6.9	19,955	87.4	1,294	5.7	22,826
1984	1,542	6.8	19,807	87.2	1,354	6.0	22,703
1985	1,455	6.3	20,062	86.9	1,559	6.8	23,076
1986	1,535	6.5	20,344	86.2	1,724	7.3	23,603
1987	1,494	6.3	20,597	86.2	1,804	7.5	23,895
1988	1,635	6.6	21,084	85.0	2,083	8.4	24,802
1989	1,586	6.3	21,372	85.0	2,199	8.7	25,157
1990	1,662	6.5	21,617	84.1	2,423	9.4	25,702
1991	1,639	6.6	20,599	83.5	2,440	9.9	24,678
1992	1,574	6.3	20,756	83.1	2,639	10.6	24,969
1993	1,496	6.0	20,670	82.8	2,807	11.2	24,973
1994	1,592	6.3	20,515	81.8	2,964	11.8	25,071
1995	1,521	6.1	20,391	81.3	3,176	12.7	25,088
1996	1,521	6.0	20,298	80.6	3,374	13.4	25,193
1997	1,446	5.8	19,898	80.0	3,524	14.2	24,868
1998	1,520	6.0	19,926	78.8	3,846	15.2	25,292
1999	1,509	5.9	19,977	78.7	3,891	15.3	25,377
2000	1,479	6.0	19,366	78.0	3,972	16.0	24,817
2001	1,423	5.8	19,007	77.6	4,065	16.6	24,495
2002	1,438	5.9	18,874	77.4	4,084	16.7	24,396
2003	1,338	5.5	18,557	76.4	4,380	18.0	24,275
2004	1,390	5.5	19,092	76.0	4,630	18.4	25,112
2005	1,484	5.6	19,849	74.8	5,192	19.6	26,525
2006	1,514	5.4	20,960	74.2	5,780	20.5	28,254
2007	1,512	5.1	21,900	73.9	6,217	21.0	29,629
2008	1,534	5.1	22,188	73.4	6,509	21.5	30,231
2009	1,468	4.8	22,880	74.4	6,400	20.8	30,748
2010	1,351	4.4	22,998	74.6	6,486	21.0	30,835
2011	1,367	4.3	23,727	74.8	6,640	20.9	31,734
2012	1,342	4.0	25,206	75.5	6,845	20.5	33,393
2013	1,236	3.6	25,746	75.9	6,946	20.5	33,928

Extracted from Midwives' Notification System on 15 September 2015.

**Figure 1: Age of women who gave birth in WA, 1980-2013**


### 3.1.2. Place of Residence

In 2013, the state of Western Australia was divided geographically into three health areas (north metro, south metro and country) and nine health regions. The metropolitan areas are also the north and south metro regions while the country area has seven regions<sup>1</sup>.

The majority of women who gave birth in WA in 2013 (78.6 per cent) resided in the metropolitan health regions. Of the country health regions, the Southwest had the largest proportion (6.4 per cent) of the women giving birth (Table 3).

**Table 3: Place of residence of women who gave birth in WA, 2013**

Region of residence by postcode	Total	
	No.	%
<b>Metropolitan Health Regions</b>	<b>26,659</b>	<b>78.6</b>
North	13,416	39.5
South	13,243	39.0
<b>Country Health Regions</b>	<b>7,198</b>	<b>21.2</b>
Goldfields	931	2.7
Great Southern	740	2.2
Kimberley	706	2.1
Midwest	888	2.6
Pilbara	854	2.5
Southwest	2,182	6.4
Wheatbelt	897	2.6
Not resident in a WA health region	71	0.2
<b>Total</b>	<b>33,928</b>	<b>100.0</b>

Extracted from Midwives' Notification System on 15 September 2015.

<sup>1</sup> See Glossary for description of Health Service Area and Health Region

### 3.1.3. Country of birth

The maternal country of birth was recorded in the Hospital Morbidity Data Collection (HMDC) for 97.6 per cent of the 33,928 women who gave birth in WA in 2013 (Table 4).

Of these women, more than one-third (37 per cent) were born in countries other than Australia. Those born in the United Kingdom accounted for a relatively high proportion (7.3 per cent). New Zealand-born women constituted 4.6 per cent of all women giving birth. Those born in Asian countries represented the highest proportion (14.3 per cent) of women with non-Australian birthplaces (Table 4).

**Table 4: Country of birth of women who gave birth in WA, 2013**

Country of birth	Maternal age						Total	
	≤ 19		20–34		≥ 35		No.	%
	No.	%	No.	%	No.	%	No.	%
<b>Oceania</b>								
Australia	1,055	87.2	15,956	63.4	3,855	57.0	20,866	63.0
New Zealand	59	4.9	1,192	4.7	264	3.9	1,515	4.6
<b>Europe</b>								
United Kingdom and Ireland	28	2.3	1,632	6.5	757	11.2	2,417	7.3
Other Europe	***	***	619	2.5	269	4.0	***	2.7
<b>Asia</b>								
Vietnam	***	***	204	0.8	105	1.6	***	0.9
Malaysia	-	-	282	1.1	109	1.6	391	1.2
Other SE Asia	11	0.9	961	3.8	342	5.1	1,314	4.0
Other Asia	6	0.5	2,286	9.1	424	6.3	2,716	8.2
<b>Africa</b>								
South Africa and Zimbabwe	10	0.8	577	2.3	190	2.8	777	2.3
Other Africa and Middle East	34	2.8	1,027	4.1	241	3.6	1,302	3.9
<b>Americas</b>								
North America	***	***	184	0.7	92	1.4	***	0.8
South and Central America	-	-	170	0.7	84	1.2	254	0.8
Other Pacific	***	***	58	0.2	33	0.5	***	0.3
<b>Total</b>	<b>1,210</b>	<b>100.0</b>	<b>25,148</b>	<b>100.0</b>	<b>6,765</b>	<b>100.0</b>	<b>33,123</b>	<b>100.0</b>

Extracted from Midwives' Notification system 15 September 2015 with country of birth data provided from the Hospital Morbidity Data Collection.

There were 805 cases (2.4 per cent) where the mother's county of birth was unable to be ascertained.

Values <5 are suppressed and indicated with \*\*\*, values in the same row are provided as a range to prevent calculation of the suppressed value.



In the 5-year period 2009 to 2013 there was a steady decline of the proportion of Australian born women. By 2013, 66.2 per cent of women were born in Australia (Table 5).

**Table 5: Trend of country of birth of women who gave birth in WA, 2009-2013**

Country groups	2009		2010		2011		2012		2013		Total %
	No.	%	No.	%	No.	%	No.	%	No.	%	
<b>Oceania</b>											
Australia	21,035	70.1	20,565	68.3	20,366	66.0	20,848	64.1	20,866	63.0	66.2
New Zealand	1,155	3.9	1,156	3.8	1,196	3.9	1,418	4.4	1,515	4.6	4.1
<b>Europe</b>											
UK & Ireland	2,168	7.2	2,173	7.2	2,229	7.2	2,366	7.3	2,417	7.3	7.2
Other Europe	712	2.4	740	2.5	801	2.6	851	2.6	889	2.7	2.6
<b>Asia</b>											
Vietnam	298	1.0	268	0.9	277	0.9	381	1.2	311	0.9	1.0
Malaysia	316	1.1	334	1.1	407	1.3	438	1.3	391	1.2	1.2
Other SE Asia	991	3.3	1,044	3.5	1,216	3.9	1,343	4.1	1,314	4.0	3.8
Other Asia	1,229	4.1	1,603	5.3	1,910	6.2	2,303	7.1	2,716	8.2	6.2
<b>Africa</b>											
South Africa & Zimbabwe	640	2.1	654	2.2	687	2.2	738	2.3	777	2.3	2.2
Other Africa & Middle East	977	3.3	1,099	3.6	1,193	3.9	1,254	3.9	1,302	3.9	3.7
<b>Americas</b>											
North America	231	0.8	211	0.7	255	0.8	266	0.8	278	0.8	0.8
South & Central America	177	0.6	173	0.6	203	0.7	208	0.6	254	0.8	0.6
Other Pacific	69	0.2	90	0.3	99	0.3	95	0.3	93	0.3	0.3
<b>Total</b>	<b>29,998</b>	<b>100</b>	<b>30,110</b>	<b>100</b>	<b>30,839</b>	<b>100</b>	<b>32,509</b>	<b>100</b>	<b>33,123</b>	<b>100</b>	<b>100</b>

Extracted from Midwives' Notification System on 15 September 2015.

There were 4,081 cases (756, 721, 906, 893 and 805 by year) where the mother's country of birth was unable to be ascertained.

### 3.1.4. Marital status

At the time they gave birth, 83.3 per cent of women in WA were reported as being in a married or defacto relationship. Women who were never married (single) represented 14.6 per cent and the remaining women (2.1 per cent) were either separated, divorced, widowed or had no status reported (Table 6).

**Table 6: Marital status and plurality of women who gave birth in WA, 2013**

Marital status	Plurality				Total	
	Single		Multiple		No.	%
	No.	%	No.	%		
Single	4,897	14.6	57	12.1	4,954	14.6
Married/Defacto	27,860	83.3	403	85.7	28,263	83.3
Other <sup>2</sup>	701	2.1	10	2.1	711	2.1
<b>Total</b>	<b>33,458</b>	<b>100.0</b>	<b>470</b>	<b>100.0</b>	<b>33,928</b>	<b>100.0</b>

Extracted from Midwives' Notification System on 15 September 2015.

<sup>2</sup> "Other" marital status included separated, divorced, widowed and unknown.

### 3.1.5. Place of birth

Among women resident in the metropolitan north and south health areas, the majority gave birth in hospitals within their own health area (74.1 per cent) or at the tertiary maternity service (19.1 per cent). Some gave birth in one of the regions of the country health area (Table 7 and Figure 2).

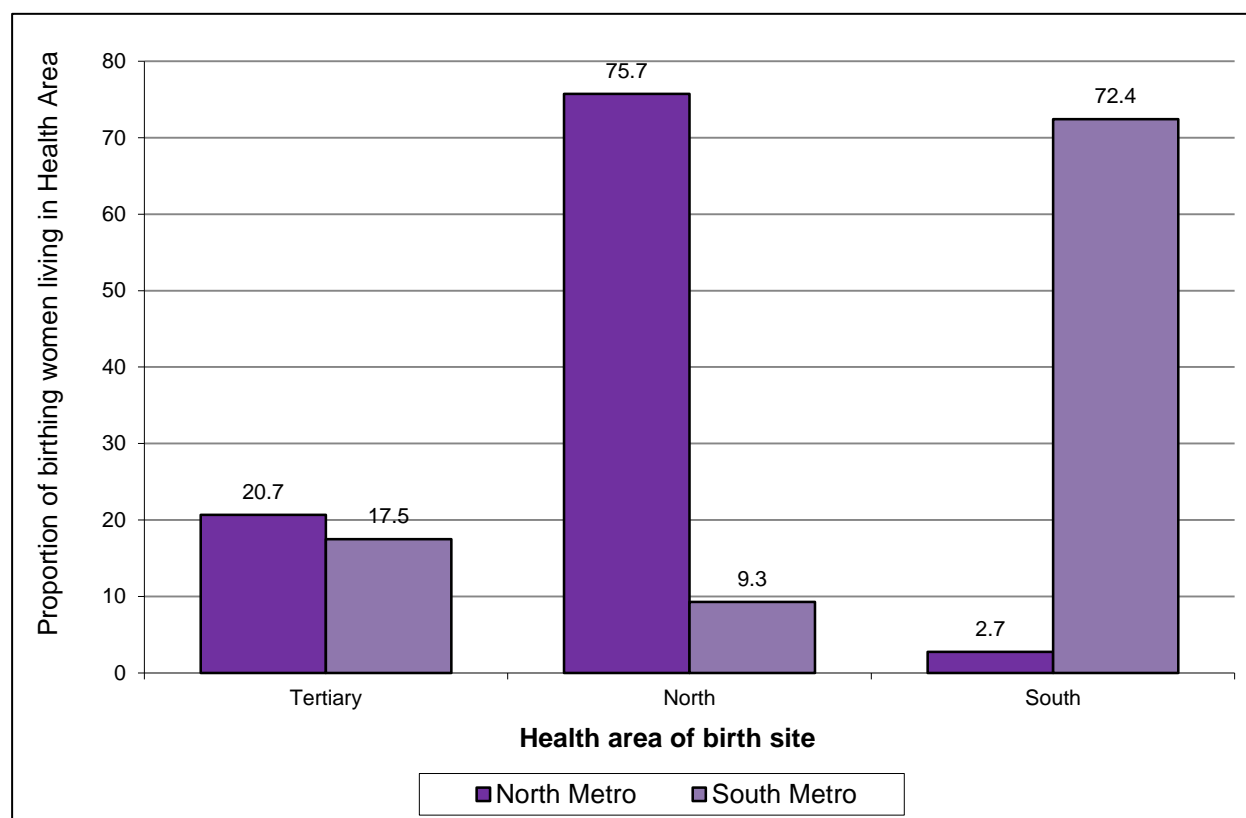
**Table 7: Place of birth of metropolitan women who gave birth in WA, 2013**

Health area of residence	Health area of birth site					Total
	Own area	Other metro area	Tertiary	Country area	Homebirths	
<b>Number</b>						
North Metro	10,162	366	2,772	12	104	13,416
South Metro	9,592	1,231	2,315	27	78	13,243
<b>Total</b>	<b>19,754</b>	<b>1,597</b>	<b>5,087</b>	<b>39</b>	<b>182</b>	<b>26,659</b>
<b>Row Percentage</b>						
North Metro	75.7	2.7	20.7	0.1	0.8	100.0
South Metro	72.4	9.3	17.5	0.2	0.6	100.0
<b>Total</b>	<b>74.1</b>	<b>6.0</b>	<b>19.1</b>	<b>0.1</b>	<b>0.7</b>	<b>100.0</b>
<b>Column Percentage</b>						
North Metro	51.4	22.9	54.5	30.8	57.1	51.0
South Metro	48.6	77.1	45.5	69.2	42.9	49.0
<b>Total</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>

Extracted from Midwives' Notification System on 15 September 2015.

Homebirths are allocated to the health area of the woman's residence.

**Figure 2: Place of birth of metropolitan women who gave birth in WA, 2013**



Women living in North Metro area also gave birth in the country or at home (0.9 per cent)

Women living in South Metro area also gave birth in the country or at home (0.8 per cent).

Among women who were resident in the country health area, 76.8 per cent gave birth in their own region. A further 2.0 per cent gave birth in another country region. A small proportion of country women had homebirths (0.4 per cent).

Of women living in the country, 8.8 per cent gave birth at the tertiary maternity service and 12.0 per cent birthed at another metropolitan health service (Table 8).

**Table 8: Place of birth of country women who gave birth in WA, 2013**

Health region of residence	Birth hospital health region						Total
	Own Region	Other WACHS	Tertiary	North Metro	South Metro	Home	
<b>Number</b>							
Goldfields	833	9	53	26	10	-	931
Great Southern	599	38	58	20	***	***	740
Kimberley	627	6	55	14	***	***	706
Midwest	722	21	91	33	21	-	888
Pilbara	572	34	89	107	***	***	854
Southwest	1,991	7	106	36	22	20	2,182
Wheatbelt	184	30	180	372	***	***	897
<b>Total</b>	<b>5,528</b>	<b>145</b>	<b>632</b>	<b>608</b>	<b>257</b>	<b>28</b>	<b>7,198</b>
<b>Row Percentage</b>							
Goldfields	89.5	1.0	5.7	2.8	1.1	-	100.0
Great Southern	80.9	5.1	7.8	2.7	2.8	0.5	100.0
Kimberley	88.8	0.8	7.8	2.0	0.4	0.1	100.0
Midwest	81.3	2.4	10.2	3.7	2.4	-	100.0
Pilbara	67.0	4.0	10.4	12.5	5.9	0.2	100.0
Southwest	91.2	0.3	4.9	1.6	1.0	0.9	100.0
Wheatbelt	20.5	3.3	20.1	41.5	14.5	0.1	100.0
<b>Total</b>	<b>76.8</b>	<b>2.0</b>	<b>8.8</b>	<b>8.4</b>	<b>3.6</b>	<b>0.4</b>	<b>100.0</b>

Extracted from Midwives' Notification System on 15 September 2015.

Homebirths are allocated to a health area of birth site by assuming the birth took place in woman's own home.

Values <5 are suppressed and indicated with \*\*\*, values in the same row are provided as a range to prevent calculation of the suppressed value.

### 3.1.6. Place of birth event

As well as the actual place of birth of an infant, midwives reported the intended place of birth at the time of onset of labour.

Fifty-three of the 33,928 (0.2 per cent) women who gave birth in WA in 2013 had no intended place of birth at onset of labour recorded. Of the remaining women, 97.8 per cent intended to give birth in a hospital, 1.4 per cent in a birth centre and 0.7 per cent at home.

Of the 485 women who intended to give birth in a birth centre, 306 (63.2 per cent) achieved this goal. For women who intended to have their birth at home, 78.5 per cent achieved a birth at home.

The tertiary maternity service reported births for 166 women who did not intend to give birth in a hospital. These comprised 2.9 per cent (birth centre) and 0.2 per cent (homebirth) of the total women giving birth at the tertiary hospital (Table 9).

**Table 9: Place of birth and intended place of birth of women who gave birth in WA, 2013**

Actual place of birth	Intended place of birth			Total
	Hospital	Birth Centre	Home	
<b>Number</b>				
Tertiary hospital	5,199	157	9	5,365
Public hospital <sup>3</sup>	14,214	***	41	***
Private hospital <sup>4</sup>	13,688	12	***	***
Birth centre	41	306	-	347
Home	3	7	193	203
<b>Total</b>	<b>33,145</b>	<b>***</b>	<b>***</b>	<b>33,875</b>
<b>Percentage by actual place of birth</b>				
Tertiary hospital	96.9	2.9	0.2	100.0
Public hospital	99.7	***	0.3	100.0
Private hospital	99.9	0.1	***	100.0
Birth centre	11.8	88.2	0.0	100.0
Home	1.5	3.4	95.1	100.0
<b>Total</b>	<b>97.8</b>	<b>1.4</b>	<b>0.7</b>	<b>100.0</b>
<b>Percentage by intended place of birth at onset of labour</b>				
Tertiary hospital	15.7	32.4	3.7	15.8
Public hospital	42.9	***	16.7	42.1
Private hospital	41.3	2.5	***	40.4
Birth centre	0.1	63.2	-	1.0
Home	0.0	1.4	78.5	0.6
<b>Total</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>

Extracted from Midwives' Notification System on 22 September 2015.

Excluded are 53 cases did not have one of the three intended places of birth specified.

Included are 140 cases that were reported as Born Before Arrival to reporting site.

Birth Centre births include those at the freestanding birth centre at Kalamunda Hospital.

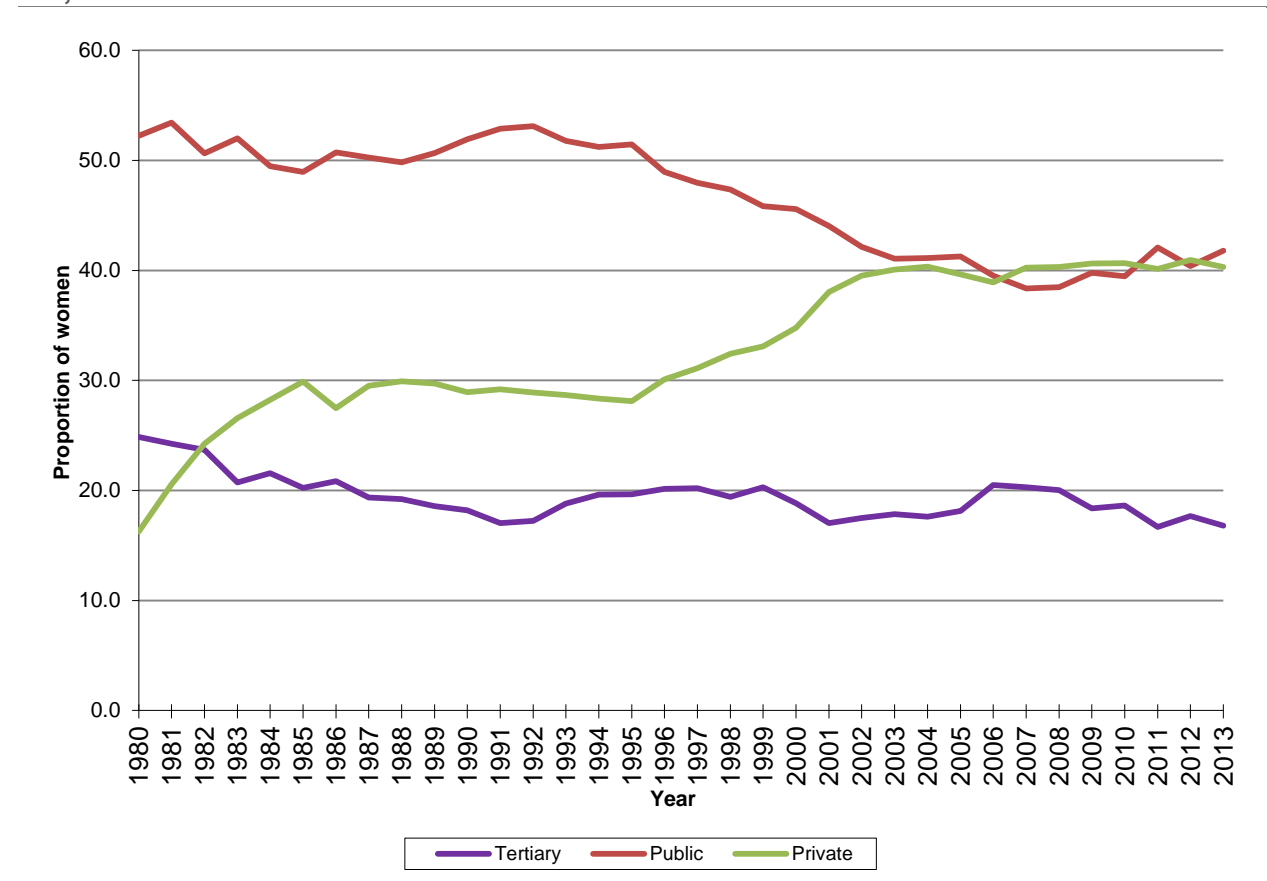
Values <5 are suppressed and indicated with \*\*\*, other values were suppressed to prevent calculation.

<sup>3</sup> Includes all maternity services located at public hospitals in Western Australia

<sup>4</sup> Includes private and public admissions at private hospitals in Western Australia

Trend data indicate that the proportion of births at private hospitals increased over the past 30 years from 16.3 to 40.3 per cent in 2013. This increase mostly occurred in the period 1997 to 2001. In 2013, this proportion was similar to the proportion that occurred in public hospitals, excluding the tertiary hospital. Since 1980 the proportion of births at the tertiary hospital has decreased from one quarter of women who gave birth (24.9 per cent) to one in six women (16.8 per cent) in 2013 (Figure 3, Table 113).

**Figure 3: Trend in use of public and private hospitals by women who gave birth in WA, 1980-2013**



Women who gave birth in private hospitals with an admission type of public are presented in private hospital totals.

Plurality of pregnancy was assessed by place of birth. The metropolitan tertiary hospital was the place of birth for 47.0 per cent of women with multiple pregnancy and 16.5 per cent of those with a singleton pregnancy.

Private hospitals in metropolitan and country areas were the location for 34.2 per cent of multiple births. The remaining women with multiple pregnancies gave birth at metropolitan public hospitals (12.3 per cent) or rural maternity services (5.7 per cent) and a small number at other public country hospitals (Table 10).

**Table 10: Place of birth and plurality of women who gave birth in WA, 2013**

Place of birth	Plurality				Total	
	Single		Multiple		No.	%
	No.	%	No.	%		
<b>Metropolitan</b>	<b>27,568</b>	<b>82.4</b>	<b>431</b>	<b>91.7</b>	<b>27,999</b>	<b>82.5</b>
Tertiary hospital	5,513	16.5	221	47.0	5,734	16.9
Public hospital	9,309	27.8	58	12.3	9,367	27.6
Private hospital	12,746	38.1	152	32.3	12,898	38.0
<b>Country</b>	<b>5,680</b>	<b>17.0</b>	<b>39</b>	<b>8.3</b>	<b>5,719</b>	<b>16.9</b>
Regional hospital <sup>5</sup>	3,422	10.2	27	5.7	3,449	10.2
Private hospital	797	2.4	9	1.9	806	2.4
Other <sup>6</sup>	1,461	4.4	***	***	***	***
<b>Homebirths</b>	210	0.6	-	-	***	***
<b>Grand Total</b>	<b>33,458</b>	<b>100.0</b>	<b>***</b>	<b>***</b>	<b>33,928</b>	<b>100.0</b>

Extracted from Midwives' Notification System on 22 September 2015.

154 cases that were reported as Born Before Arrival were included for reporting site's place of birth type.

Values <5 are suppressed and indicated with \*\*\*, other values were suppressed to prevent calculation.

### 3.1.7. Smoking tobacco during pregnancy

Smoking tobacco during pregnancy is associated with low birth weight, premature birth and perinatal death (Laws, Grayson, & Sullivan, 2006).

From January 2010, the method for reporting tobacco smoking during pregnancy changed from a Yes or No response to providing the average number of tobacco cigarettes smoked each day before 20 weeks of pregnancy and after 20 weeks of pregnancy.

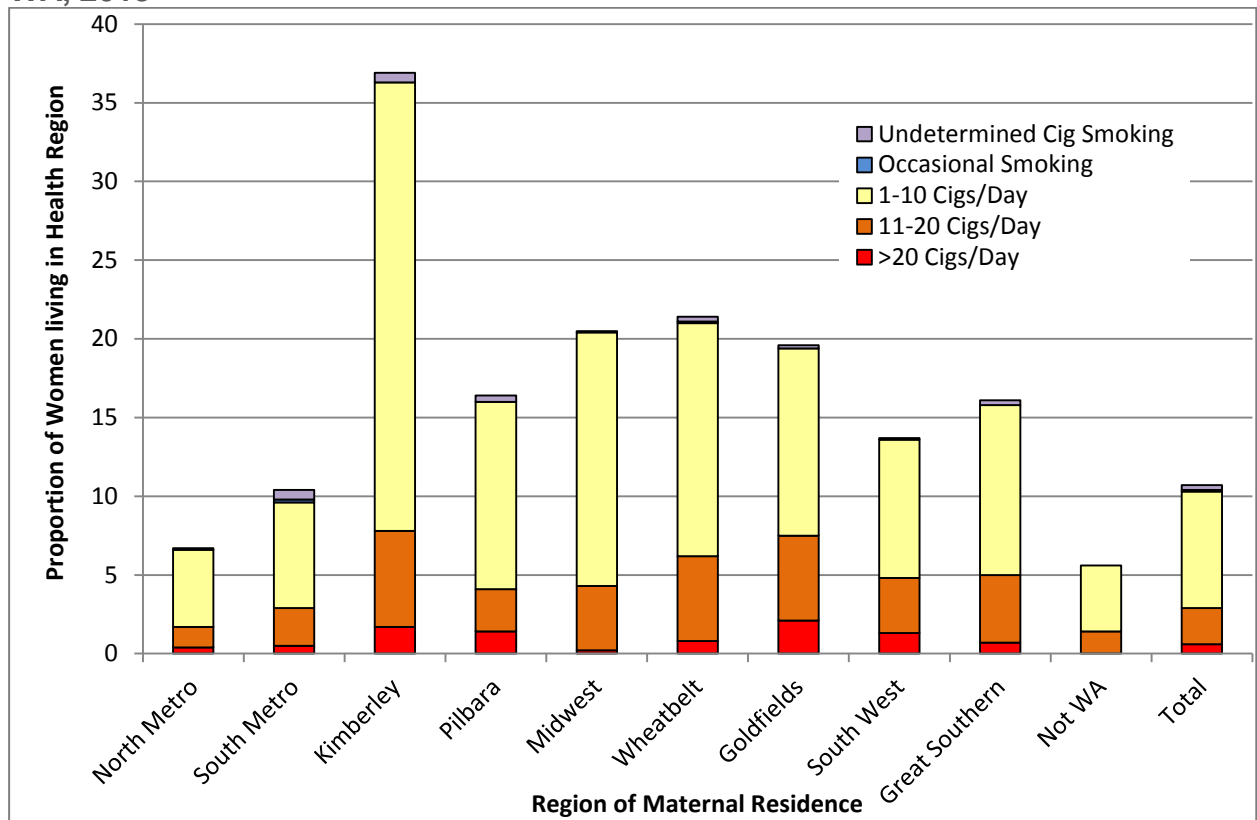
When these two data values self-reported for tobacco smoking were combined, they were used to indicate if the woman smoked tobacco in pregnancy. These combined data are presented below to enable comparison with data published in previous annual reports. This data should be interpreted with caution because of the change in method of reporting between 2009 and 2010.

Data presented in Figure 4 and Figure 5 presents the variation in the self-reported rate of tobacco smoking across health regions by maternal residence. Many country regions had a higher proportion of women who reported smoking or occasionally smoking than those women living in the metropolitan regions. For WA in 2013, the proportion of women who reported not smoking tobacco, increased after 20 weeks gestation by 1.5 per cent (515 women). There was no change after 20 weeks gestation in the proportion of women where smoking status was undetermined.

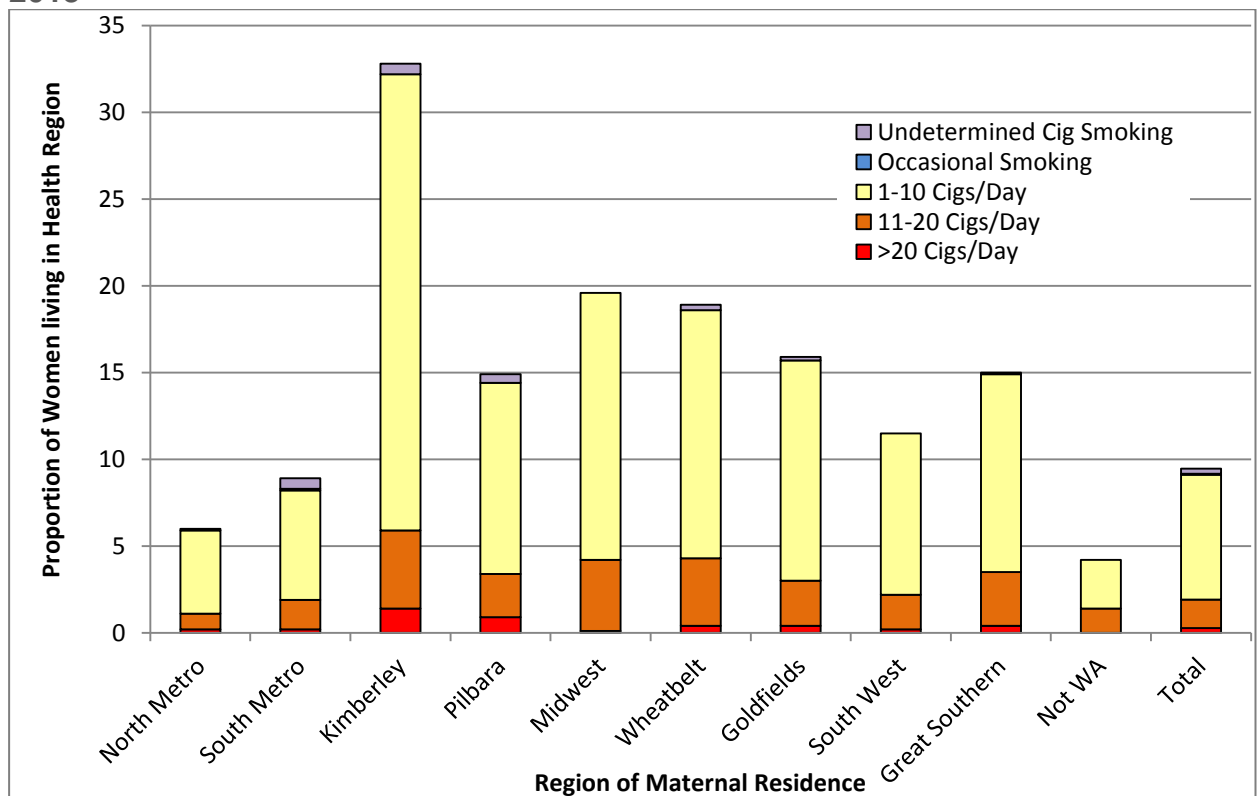
<sup>5</sup> Country regional hospital – public hospital in regional centre.

<sup>6</sup> Other Country hospital – public hospital in the country but not in a regional centre.

**Figure 4: Proportion of women smoking tobacco in first 20 weeks of pregnancy in WA, 2013**



**Figure 5: Proportion of women smoking tobacco after 20 weeks gestation in WA, 2013**



In 2013, 32.8 per cent of teenage mothers reported smoking during pregnancy. As maternal age increased the proportion of women who reported smoking tobacco decreased. The lowest proportion of 6.3 per cent was for women who were aged 40 years or older. Women aged 20 to 24 years had the second highest proportion smoking tobacco (20.7 per cent). Overall, 10.7 per cent of women reported smoking tobacco during pregnancy (Table 36).

**Table 11: Smoking and age of women who gave birth in WA, 2013**

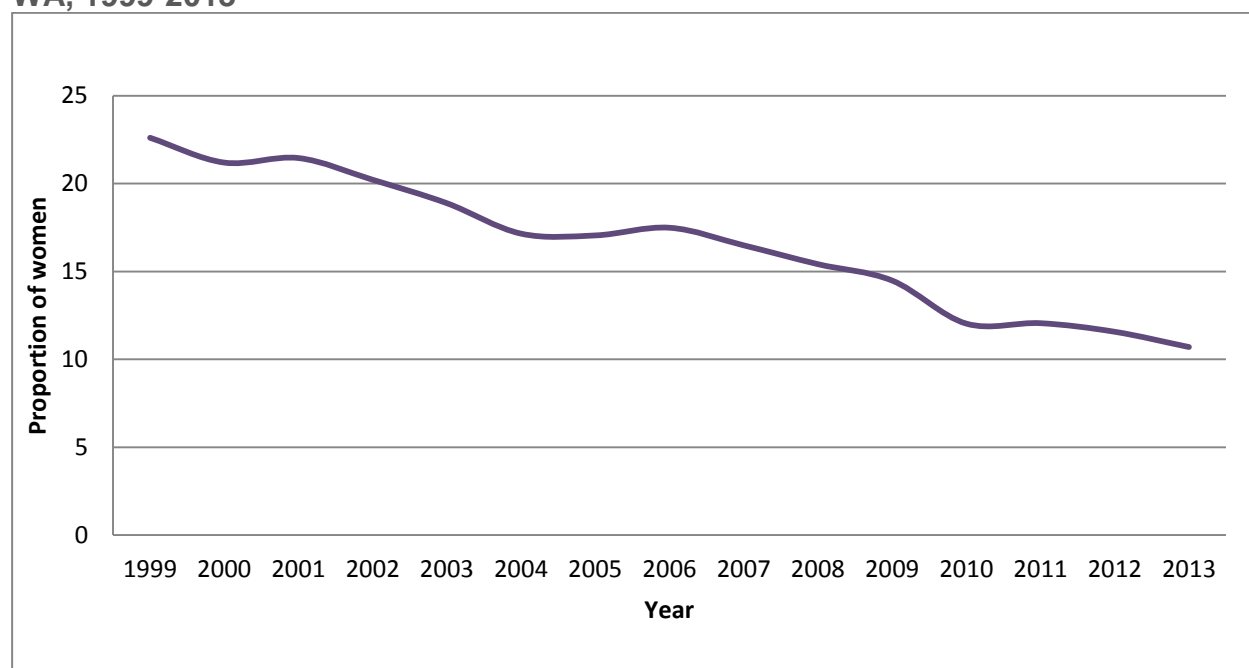
Age	Smoking in pregnancy				Total	
	Smoking		Non-smoking			
	No.	%	No.	%	No.	%
<=15	16	30.8	36	69.2	52	100.0
16	29	30.5	66	69.5	95	100.0
17	77	33.8	151	66.2	228	100.0
18	114	35.4	208	64.6	322	100.0
19	169	31.4	370	68.6	539	100.0
<b>≤19</b>	<b>405</b>	<b>32.8</b>	<b>831</b>	<b>67.2</b>	<b>1,236</b>	<b>100.0</b>
20-24	1,017	20.7	3,906	79.3	4,923	100.0
25-29	1,014	10.6	8,584	89.4	9,598	100.0
30-34	735	6.5	10,490	93.5	11,225	100.0
35-39	390	6.9	5,224	93.1	5,614	100.0
>=40	84	6.3	1,248	93.7	1,332	100.0
<b>Total</b>	<b>3,645</b>	<b>10.7</b>	<b>30,283</b>	<b>89.3</b>	<b>33,928</b>	<b>100.0</b>

Extracted from Midwives' Notification System on 22 September 2015,

62 women were aged 45 years or more.

The proportion of women who reported smoking tobacco during pregnancy declined from 22.6 per cent in 1999, when data was first collected in WA, to 10.7 per cent in 2013 (Figure 6 and Table 114).

**Figure 6: Trend in smoking tobacco during pregnancy for women who gave birth in WA, 1999-2013**



The method of reporting tobacco smoking in pregnancy changed in 2010. The change in trend seen in 2010 in this graph should be interpreted with caution.



In 2013, smoking tobacco during pregnancy was more likely to be reported by mothers born in New Zealand (19.9 per cent) and Australia (14.1 per cent) (Table 37). Mothers born in Asian or African countries were least likely to report smoking tobacco during pregnancy.

**Table 12: Smoking tobacco and country of birth of women who gave birth in WA, 2013**

Country of birth	Smoking in pregnancy				Total	
	Smoking		Non-smoking		No.	%
	No.	%	No.	%		
<b>Oceania</b>						
Australia	2,935	14.1	17,931	85.9	20,866	100.0
New Zealand	302	19.9	1,213	80.1	1,515	100.0
<b>Europe</b>						
UK & Ireland	178	7.4	2,239	92.6	2,417	100.0
Other Europe	42	4.7	847	95.3	889	100.0
<b>Asia</b>						
Vietnam	***	***	307	98.7	***	100.0
Malaysia	***	***	387	99.0	***	100.0
Other SE Asia	23	1.7	1,291	98.3	1,314	100.0
Other Asia	15	0.6	2,7022	99.4	2,716	100.0
<b>Africa</b>						
South Africa & Zimbabwe	36	4.6	741	95.4	777	100.0
Other Africa & Middle East	17	1.3	1,285	98.7	1,302	100.0
<b>America</b>						
North America	13	4.7	265	95.3	278	100.0
Other Pacific	8	8.6	85	91.4	93	100.0
South & Central America	5	2.0	249	98.0	254	100.0
<b>Total</b>	<b>3,582</b>	<b>10.8</b>	<b>29,541</b>	<b>89.2</b>	<b>33,123</b>	<b>100.0</b>

Extracted from Midwives' Notification System on 22 September 2015.

805 women excluded in table as their country of birth was not reported.

Values <5 are suppressed and indicated with \*\*\*, other values were suppressed to prevent calculation.

### 3.1.8. Socio-economic status

Socio-economic status was assessed for residential area of all women who gave birth in WA in 2013. ABS assigned Statistical Area Level 2 (SA2) were used to determine socio-economic status for each woman giving birth. A proportion of women who gave birth in 2013 were unable to be assigned an SA2 (2,592 or 7.6 per cent) and are excluded from the table below.

The Index of Relative Socio-Economic Disadvantage (IRSD) from the Socio-Economic Index for Areas (SEIFA) determined from the 2011 Australian Census data was used<sup>7</sup>. The Index summarises different measures like low income, education, and unemployment to obtain a ranking of each area's disadvantage called the index value. These index values are divided into five equal parts referred to as quintiles of I, II, III, IV and V with the higher index value or quintile indicating the least disadvantage in socioeconomic status.

In the quintiles presented below in Table 13, "I quintile" indicates women who gave birth while living in areas in the 20<sup>th</sup> percentile or most disadvantaged. While "V quintile" indicates women who gave birth while living in areas within the 80<sup>th</sup> percentile of IRSD (least disadvantaged) in WA.

In women aged 19 years or less, most (58.7 per cent) had an IRSD value in the first and second quintiles, indicating most of these women live in areas that are disadvantaged. In women aged 20 to 34 years, the largest proportion (25.1 per cent) were in the fourth quintile indicating residence in areas of less disadvantage. For older women aged 35 years or more, the largest proportion (26.1 per cent) were also in the fourth quintile.

When comparing contribution by age group in each quintile, women aged 35 years and older had their highest proportion in the fifth quintile or least disadvantaged group for residential area (30.6 per cent), while teenaged women had their highest proportion in the first quintile or most disadvantaged group (7.0 per cent).

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<sup>7</sup> For more information on the Disadvantage Index from SEIFA go to <http://www.abs.gov.au/AUSSTATS/abs@.nsf/Lookup/2033.0.55.001Main+Features12012?OpenDocument>.

**Table 13: Socio-economic status and age of women who gave birth in WA, 2013**

Disadvantage <sup>7</sup>	Maternal age (years)			Total
	≤ 19	20–34	≥ 35	
<b>Number</b>				
I	404	4,574	801	5,779
II	268	4,219	996	5,483
III	242	5,424	1,388	7,054
IV	156	5,953	1,687	7,796
V	73	3,554	1,597	5,224
<b>Total</b>	<b>1,143</b>	<b>23,724</b>	<b>6,469</b>	<b>31,336</b>
<b>Column Percentage</b>				
I	35.3	19.3	12.4	18.4
II	23.4	17.8	15.4	17.5
III	21.2	22.9	21.5	22.5
IV	13.6	25.1	26.1	24.9
V	6.4	15.0	24.7	16.7
<b>Total</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>
<b>Row Percentage</b>				
I	7.0	79.1	13.9	100.0
II	4.9	76.9	18.2	100.0
III	3.4	76.9	19.7	100.0
IV	2.0	76.4	21.6	100.0
V	1.4	68.0	30.6	100.0
<b>Total</b>	<b>3.6</b>	<b>75.7</b>	<b>20.6</b>	<b>100.0</b>

Extracted from Midwives' Notification System on 22 September 2015.

IRSD values were determined from maternal address using the Statistical Area 2 value (SA2).

2,592 cases were excluded as there were no SA2 values assigned.

## 3.2. Pregnancy profile

### 3.2.1. Maternal Weight

The Australian Department of Health (DoHA 2009) reported that a healthy Body Mass Index (BMI) is between 18.5 and 24.99. A BMI of 25 or more indicates a person is overweight. A BMI of 30 or more is categorised as obese classes 1 to 3.

BMI Category	BMI	Risk of health consequences
Underweight	Less than 18.5	Low - possibly increased risk of other clinical problems
Healthy weight	18.50 to 24.99	Average
<b>Overweight:</b>		
Pre-obese	25.00 to 29.99	Increased
Obese class 1	30.00 to 34.99	Moderate
Obese class 2	35.00 to 39.99	Severe
Obese class 3	40 or more	Very severe

Of the women who gave birth in 2013, 92.6 per cent had weight reported. Both weight and height were available to calculate a BMI for 91.6 per cent of the women who gave birth.

Of women who gave birth in 2013, 48.0 per cent had a healthy BMI. More than one quarter of women (28.4 per cent) were pre-obese (Table 14).

Obese women comprised 20.6 per cent of the women. A severe to very severe risk of health consequences related to obesity classes 2 and 3 was possible for 7.7 per cent of the women who gave birth. A small proportion of women were reported as underweight (3.0 per cent). More teenage women were underweight (9.6 per cent) than women in age groups (2.9 and 2.2 per cent respectively).

**Table 14: Body mass index and age of women who gave birth WA, 2013**

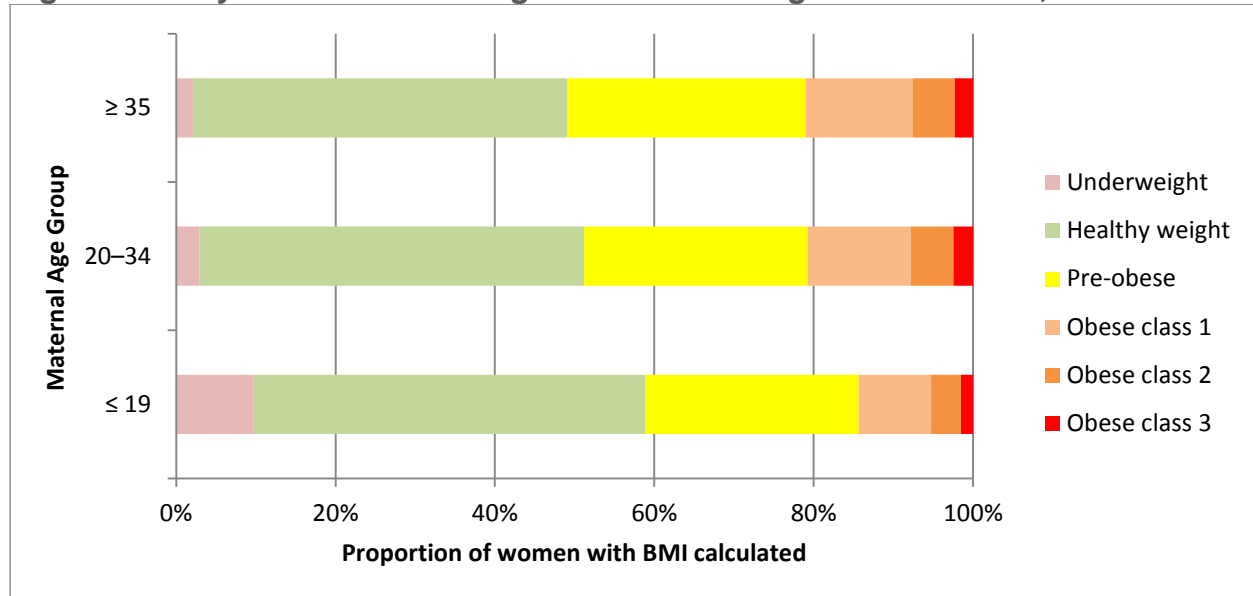
BMI Category	Maternal age (years)			Total
	≤ 19	20–34	≥ 35	
<b>Number</b>				
Underweight	108	704	142	954
Healthy weight	552	11,561	3,021	15,134
Pre-obese	300	6,716	1,927	8,943
Obese class 1	102	3,103	866	4,071
Obese class 2	42	1,284	342	1,668
Obese class 3	17	585	147	749
<b>Total</b>	<b>1,121</b>	<b>23,953</b>	<b>6,445</b>	<b>31,519</b>
<b>Column Percentage</b>				
Underweight	9.6	2.9	2.2	3.0
Healthy weight	49.2	48.3	46.9	48.0
Pre-obese	26.8	28.0	29.9	28.4
Obese class 1	9.1	13.0	13.4	12.9
Obese class 2	3.7	5.4	5.3	5.3
Obese class 3	1.5	2.4	2.3	2.4
<b>Total</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>
<b>Row Percentage</b>				
Underweight	11.3	73.8	14.9	100.0
Healthy weight	3.6	76.4	20.0	100.0
Pre-obese	3.4	75.1	21.5	100.0
Obese class 1	2.5	76.2	21.3	100.0
Obese class 2	2.5	77.0	20.5	100.0
Obese class 3	2.3	78.1	19.6	100.0
<b>Total</b>	<b>3.6</b>	<b>76.0</b>	<b>20.4</b>	<b>100.0</b>

Extracted from Midwives' Notification System on 22 September 2015.

2,409 cases were excluded as there was either no weight or height available to calculate BMI.

Less than half of teenage women were overweight (41.1 per cent) compared to more than half of women 35 years or older (50.9 percent) (Figure 7).

**Figure 7: Body mass index and age of women who gave birth in WA, 2013**



### 3.2.2. Parity

Data collected in WA reported parity as number of infants born from previous pregnancies rather than number of previous pregnancies resulting in birth.

Forty-two point six per cent of women who gave birth in 2013 gave birth to their first infant.

Of these 14,462 women who gave birth to their first infant:

- 7.3 per cent were teenaged (19 years or younger)
- 80.0 per cent were aged 20 to 34 years
- 12.7 per cent were aged 35 years or older
- Their mean age was 28.2 years (range 13-50)
- Their median age was 28 years, and
- Their age mode (most commonly occurring) was 29 years.

Of the 16,695 women who gave birth to their second or third infant in 2013:

- 1.1 per cent were teenaged
- 74.5 per cent were aged 20 to 34 years
- 24.5 per cent were women aged 35 years or more
- Their mean age was 30.7 years (range 14-50)
- Their median age was 31 years, and
- Their age mode (most commonly occurring) was 31 years.

Among the 6,946 women aged 35 years or more, 26.4 per cent gave birth to their first infant.

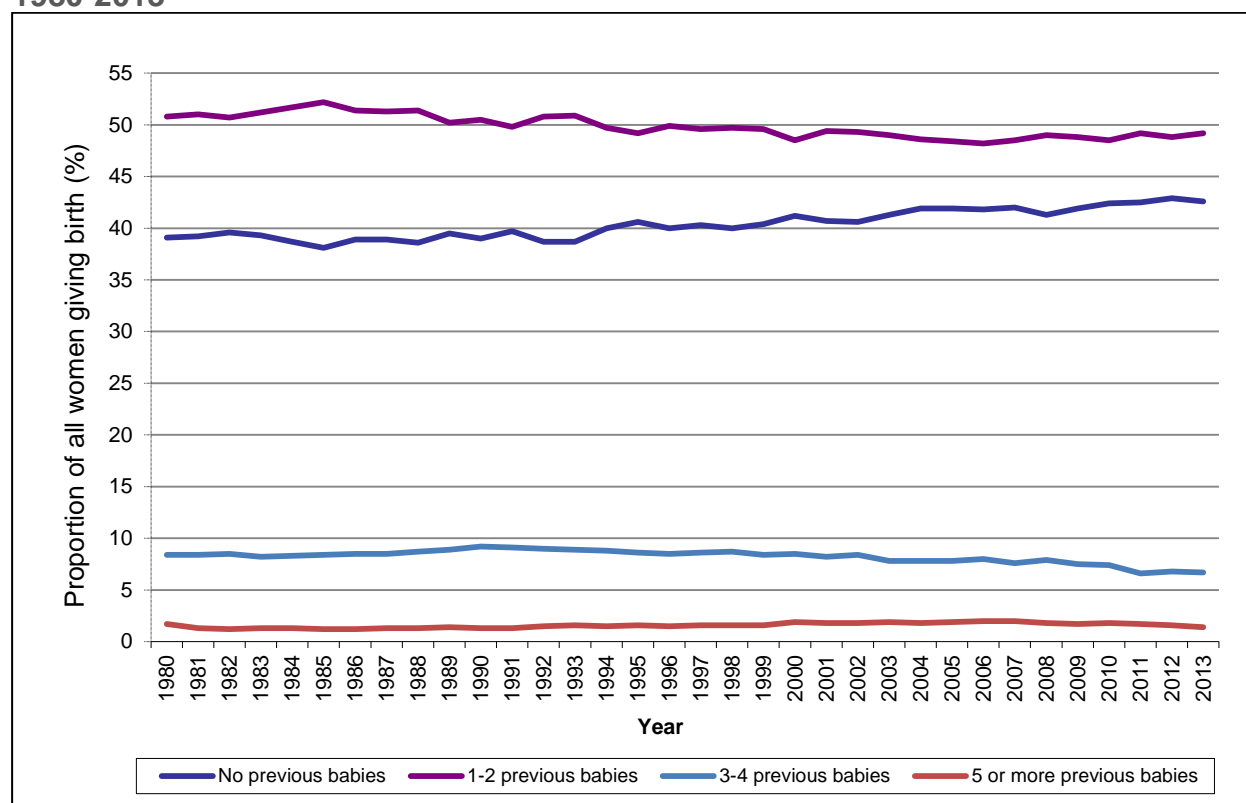
**Table 15: Previous infants and age of women who gave birth in WA, 2013**

Number of Previous Infants	Maternal age						Total	
	≤ 19		20–34		≥ 35		No.	%
	No.	%	No.	%	No.	%		
Nil	1,058	85.6	11,571	44.9	1,833	26.4	14,462	42.6
<b>% of Total</b>	<b>7.3</b>		<b>80.0</b>		<b>12.7</b>		<b>100.0</b>	
One or two	176	14.2	12,437	48.3	4,082	58.8	16,695	49.2
<b>% of Total</b>	<b>1.1</b>		<b>74.5</b>		<b>24.5</b>		<b>100.0</b>	
Three or four	2	0.2	1,497	5.8	784	11.3	2,283	6.7
<b>% of Total</b>	<b>0.1</b>		<b>65.6</b>		<b>34.3</b>		<b>100.0</b>	
Five or more	-	-	241	0.9	247	3.6	488	1.4
<b>% of Total</b>	<b>-</b>		<b>49.4</b>		<b>50.6</b>		<b>100.0</b>	
<b>Total</b>	1,236	100.0	25,746	100.0	6,946	100.0	33,928	100.0
<b>% of Total</b>	<b>3.6</b>		<b>75.9</b>		<b>20.5</b>		<b>100.0</b>	

Extracted from Midwives' Notification System on 22 September 2015.

Trend data shows that the proportion of women who gave birth to their first infant increased since 2002 from 40.6 per cent to 42.6 per cent in 2013. The proportion of women who had their fourth and fifth infants declined from 8.4 per cent in 2002 to 6.7 per cent in 2013 (Figure 8).

**Figure 8: Trend of number of previous infants of women who gave birth in WA, 1980-2013**



### 3.2.3. Pregnancy gestation at first antenatal care visit

In 2013, the largest proportion of women had their first antenatal care in the first trimester of pregnancy (62.1 per cent). A small number of women received no antenatal care (0.2 per cent).

Women who lived in the Great Southern health region had the highest proportion (75.5 per cent) that received antenatal care in the first trimester of all health regions. Women who resided in the Pilbara region had the lowest proportion who began antenatal care in first trimester (45.1 per cent). Goldfields and Southwest health regions had the highest proportions for antenatal care attendance not being determined (25.5 and 20.6 per cent). The health region of residence with the lowest "not determined" rate was the Kimberley at 0.4 per cent (Table 16).

**Table 16: Gestation at first antenatal care visit of women who gave birth in WA, 2013**

Health Region of maternal residence	Gestational Age Groups (weeks)			Did not Attend	Not Determined	Total
	1-13	14-19	20+			
	<b>Number</b>					
North Metropolitan	8,133	2,021	3,031	22	209	<b>13,416</b>
South Metropolitan	8,209	1,812	2,045	28	1,149	<b>13,243</b>
Goldfields	560	56	74	***	237	<b>***</b>
Great Southern	559	80	69	***	30	<b>***</b>
Kimberley	521	86	93	***	***	<b>706</b>
Midwest	612	100	131	***	44	<b>***</b>
Pilbara	385	178	265	***	24	<b>***</b>
Southwest	1,510	100	119	***	450	<b>***</b>
Wheatbelt	545	106	219	5	22	<b>897</b>
Outside WA	28	9	29	***	***	<b>71</b>
<b>Total</b>	<b>21,062</b>	<b>4,548</b>	<b>6,075</b>	<b>71</b>	<b>2,172</b>	<b>33,928</b>
	<b>Row Percentage</b>					
North Metropolitan	60.6	15.1	22.6	0.2	1.6	<b>100.0</b>
South Metropolitan	62.0	13.7	15.4	0.2	8.7	<b>100.0</b>
Goldfields	60.2	6.0	7.9	***	25.5	<b>100.0</b>
Great Southern	75.5	10.8	9.3	***	4.1	<b>100.0</b>
Kimberley	73.8	12.2	13.2	***	***	<b>100.0</b>
Midwest	68.9	11.3	14.8	***	5.0	<b>100.0</b>
Pilbara	45.1	20.8	31.0	***	2.8	<b>100.0</b>
Southwest	69.2	4.6	5.5	***	20.6	<b>100.0</b>
Wheatbelt	60.8	11.8	24.4	0.6	2.5	<b>100.0</b>
Outside WA	39.4	12.7	40.8	***	***	<b>100.0</b>
<b>Total</b>	<b>62.1</b>	<b>13.4</b>	<b>17.9</b>	<b>0.2</b>	<b>6.4</b>	<b>100.0</b>

Extracted from Midwives' Notification System on 22 September 2015.

Values <5 are suppressed and indicated with \*\*\*, other values were suppressed to prevent calculation.

For 2013, data collection improved regarding gestational age at first visit. There was a decrease in the proportion of women with gestation at first antenatal care visit not determined from 24.3 per cent in 2010 to 6.4 percent in 2013 (Table 17).

**Table 17: Trends for gestation at first antenatal care visit for women who gave birth in WA, 2010-2013**

Year	Gestational age groups (weeks)					Total
	1-13	14-19	>=20	Did not attend	Not determined	
<b>Number</b>						
2010	12,847	4,272	6,067	169	7,479	30,834
2011	16,162	4,906	6,879	129	3,660	31,736
2012	19,521	5,106	6,058	69	2,639	33,393
2013	21,062	4,548	6,075	71	2,172	33,928
<b>Row Percentage</b>						
2010	41.7	13.9	19.7	0.5	24.3	100.0
2011	50.9	15.5	21.7	0.4	11.5	100.0
2012	58.5	15.3	18.1	0.2	7.9	100.0
2013	62.1	13.4	17.9	0.2	6.4	100.0

Extracted from Midwives' Notification System on 22 September 2015.

This data first collected in 2010.

### 3.2.4. Number of antenatal care visits during pregnancy

Of women who gave birth in 2013, 88.9 per cent had reported the number of antenatal care visits they attended during pregnancy.

The majority of women attended more than five antenatal care visits (83.4 per cent) and 51.6 per cent attended more than eight visits. A small proportion of women (0.2 per cent) did not attend any antenatal visits. For women who had homebirths, 79.5 per cent attended more than eight antenatal care visits. The midwife was unable to determine the number of antenatal visits attended by 27.4 per cent of women who gave birth in private hospitals (Table 18).



**Table 18: Number of antenatal care visits attended by women who gave birth in WA, 2013**

Birth Site	Number of antenatal care visits					Total
	Nil	1-4	5-8	>8	Not Determined	
<b>Number</b>						
Tertiary	34	289	2,290	3,121	-	5,734
Metro Public	***	782	4,213	4,352	***	9,367
Country Public	12	354	1,415	3,127	5	4,913
Private	7	345	2,847	6,747	3,758	13,704
Homebirths	-	***	33	167	***	210
<b>Total</b>	<b>***</b>	<b>***</b>	<b>10,798</b>	<b>17,514</b>	<b>3,773</b>	<b>33,928</b>
<b>Row Percentage</b>						
Tertiary	0.6	5.0	39.9	54.4	-	100.0
Metro Public	0.2	8.3	45.0	46.5	0.0	100.0
Country Public	0.2	7.2	28.8	63.6	0.1	100.0
Private	0.1	2.5	20.8	49.2	27.4	100.0
Homebirths	-	1.0	15.7	79.5	3.8	100.0
Total	0.2	5.2	31.8	51.6	11.1	100.0
<b>Column Percentage</b>						
Tertiary	47.9	16.3	21.2	17.8	-	16.9
Metro Public	25.4	44.1	39.0	24.8	0.0	27.6
Country Public	16.9	20.0	13.1	17.9	0.1	14.5
Private	9.9	19.5	26.4	38.5	99.6	40.4
Homebirths	-	0.1	0.3	1.0	0.2	0.6
<b>Total</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>

Extracted from Midwives' Notification System on 22 September 2015.

Values <5 are suppressed and indicated with \*\*\*, other values were suppressed to prevent calculation.

### 3.2.5. Medical conditions

Four medical conditions were specified for reporting. A fifth option was "Other" described with ICD-10 codes. Forty-two point three per cent of women who gave birth during 2013 had one or more pre-existing medical conditions. Women with no pre-existing medical condition totalled 19,586 (57.7 per cent).

The most frequently occurring medical condition was asthma (10.2 per cent) (Table 19).

**Table 19: Selected pre-existing medical conditions by plurality of pregnancy of women who gave birth in WA, 2013**

Medical Conditions <sup>8</sup>	Plurality		Total	
	Single No.	Multiple No.	No.	%
Essential Hypertension	369	***	***	1.1
Pre-existing diabetes	241	***	***	0.7
Asthma	3,388	62	3,450	10.2
Genital Herpes	635	7	642	1.9
Other	11,430	174	11,604	34.2
One or more medical conditions	14,120	222	14,342	42.3
No Medical Conditions	19,338	248	19,586	57.7
<b>Total Women</b>	<b>33,458</b>	<b>470</b>	<b>33,928</b>	<b>100.0</b>

Extracted from Midwives' Notification System on 22 September 2015.

Values <5 are suppressed and indicated with \*\*\*, other values were suppressed to prevent calculation.

Six women who gave birth to triplets have been included with mothers of twins in the "Multiple" column.

<sup>8</sup> A woman may have more than one pre-existing medical condition.

### 3.2.6. Medical conditions and obesity

If reported, maternal weight was used with height to calculate a BMI for each woman who gave birth in WA in 2013. Women with a BMI of 30 or more were categorised as obese and these comprised 20.5 per cent of women with a BMI calculated (Table 14).

At least one pre-existing medical condition was reported for a higher proportion of obese women (51.6 per cent) than women with a low or healthy BMI (40.9 per cent).

The proportion of obese women with essential hypertension (2.7 per cent) was four times that in other women (0.7 per cent).

The proportion of obese women with pre-existing diabetes (1.4 per cent) was three times that of other women (0.5 per cent) (Table 20).

**Table 20: Selected pre-existing medical conditions by obesity of women who gave birth in WA, 2013**

Medical Conditions	Obese				Total	
	No		Yes		No.	%
	No.	%	No.	%		
Essential Hypertension	166	0.7	174	2.7	340	1.1
Pre-Existing diabetes	134	0.5	91	1.4	225	0.7
Asthma	2,345	9.4	915	14.1	3,260	10.3
Genital Herpes	508	2.0	96	1.5	604	1.9
Other	8,342	33.3	2,699	41.7	11,041	35.0
One or more medical conditions	10,253	40.9	3,336	51.6	13,589	43.1
No medical conditions	14,796	59.1	3,134	48.4	17,930	56.9
<b>Total Women</b>	<b>25,049</b>	<b>100.0</b>	<b>6,470</b>	<b>100.0</b>	<b>31,519</b>	<b>100.0</b>

Extracted from Midwives' Notification System on 22 September 2015.

Excludes 2409 women with no BMI able to be calculated.

Obese women included those that had a BMI of 30 or more.

### 3.2.7. Complications of pregnancy

There were nine complications of pregnancy specified for reporting. A tenth option was "Other" described with ICD-10 codes. Almost one-third (32.1 per cent) of women who gave birth during 2013, had one or more complication during pregnancy.

The most common complications were gestational diabetes (7.4 per cent), premature rupture of membranes<sup>9</sup> (3.7 per cent), urinary tract infection (3.2 per cent), and threatened preterm labour (2.4 per cent).

For women who gave birth to twins or higher multiples the most common complications were threatened preterm labour<sup>9</sup> (14.5 per cent), gestational diabetes (12.3 per cent), premature rupture of membranes (11.1 per cent) and Pre-eclampsia (8.5 per cent) (Table 21).

**Table 21: Selected complications of pregnancy by plurality of birth for women who gave birth in WA, 2013**

Complications of pregnancy <sup>10</sup>	Plurality				Total	
	Single		Multiple		No.	% <sup>13</sup>
	No.	% <sup>11</sup>	No.	% <sup>12</sup>	No.	% <sup>13</sup>
Threatened miscarriage	669	2.0	11	2.3	680	2.0
Threatened preterm labour	731	2.2	68	14.5	799	2.4
Urinary tract infection	1,069	3.2	12	2.6	1,081	3.2
Pre-eclampsia	718	2.1	40	8.5	758	2.2
Antepartum haemorrhage						
— placenta praevia	118	0.4	***	***	***	0.4
— abruption	73	0.2	***	***	***	0.2
— other	742	2.2	22	4.7	764	2.3
Premature rupture of membranes <sup>9</sup>	1,215	3.6	52	11.1	1,267	3.7
Gestational diabetes	2,467	7.4	58	12.3	2,525	7.4
Other	4,876	14.6	388	82.6	5,264	15.5
<b>One or more complications</b>	<b>10,473</b>	<b>31.3</b>	<b>414</b>	<b>88.1</b>	<b>10,887</b>	<b>32.1</b>
No complications of pregnancy	22,985	68.7	56	11.9	23,041	67.9
<b>Total</b>	<b>33,458</b>	<b>100.0</b>	<b>470</b>	<b>100.0</b>	<b>33,928</b>	<b>100.0</b>

Extracted from Midwives' Notification System on 22 September 2015.

Values <5 are suppressed and indicated with \*\*\*, other values were suppressed to prevent calculation.

Six women who gave birth to triplets have been included with mothers of twins in the "Multiple" column.

<sup>9</sup> Prelabour rupture of membranes at any gestation, not preterm rupture of membranes

<sup>10</sup> A woman may have more than one complication during pregnancy.

<sup>11</sup> Percentage of women with a singleton birth (n=33,458).

<sup>12</sup> Percentage of women with a multiple birth (n= 470).

<sup>13</sup> Percentage of women who gave birth (n=33,928).

### 3.2.8. Complications of pregnancy and obesity

A higher proportion of obese women had at least one pregnancy complication (37.8 per cent) than did women with a low or healthy BMI (30.9 per cent).

The proportion of obese women with pre-eclampsia (3.5 per cent) was almost twice that in other women (1.9 per cent) and gestational diabetes (11.8 per cent) in obese women was also almost twice that in other women (6.5 per cent) (Table 22).

**Table 22: Selected pregnancy complications by obesity in women who gave birth in WA, 2013**

Complications of pregnancy <sup>14</sup>	Obese				Total	
	No		Yes		No.	%
	No.	%	No.	%		
Threatened miscarriage	548	2.2	105	1.6	653	2.1
Threatened preterm labour	609	2.4	118	1.8	727	2.3
Urinary tract infection	772	3.1	239	3.7	1,011	3.2
Pre-eclampsia	475	1.9	227	3.5	702	2.2
Antepartum haemorrhage						
— placenta praevia	90	0.4	19	0.3	109	0.3
— abruption	49	0.2	16	0.2	65	0.2
— other	567	2.3	140	2.2	707	2.2
Premature rupture of membranes	916	3.7	251	3.9	1,167	3.7
Gestational diabetes	1,631	6.5	761	11.8	2,392	7.6
Other	3,777	15.1	1,152	17.8	4,929	15.6
<b>One or more complications</b>	<b>7,745</b>	<b>30.9</b>	<b>2,446</b>	<b>37.8</b>	<b>10,191</b>	<b>32.3</b>
<b>No complications of pregnancy</b>	<b>17,304</b>	<b>69.1</b>	<b>4,024</b>	<b>62.2</b>	<b>21,328</b>	<b>67.7</b>
<b>Total Women</b>	<b>25,049</b>	<b>100.0</b>	<b>6,470</b>	<b>100.0</b>	<b>31,519</b>	<b>100.0</b>

Extracted from Midwives' Notification System on 22 September 2015.

Obese women included those that had a BMI of 30 or more.

Excludes 2,409 women with no BMI able to be calculated.

<sup>14</sup> A woman may have more than one complication during pregnancy

### 3.2.9. Procedures and treatments

In 2013, 97.4 per cent of women had a procedure or treatment in pregnancy reported. The most common procedure was ultrasound examination, with 95.0 per cent of women having at least one. Intrapartum cardiotocograph was used to monitor 56.7 per cent of women labouring.

Reporting about fertility treatment commenced in 1994. The proportion increased from 1.2 per cent of women in 1994 to 3.3 per cent in 2013. For women who had multiple births, 13.8 per cent had fertility treatment reported (Table 23).

**Table 23: Procedures and treatments by plurality of birth of women who gave birth in WA, 2013**

Procedures and Treatments <sup>15</sup>	Plurality				Total	
	Single		Multiple		No.	%
	No.	%	No.	%	No.	%
Fertility treatments	1,063	3.2	65	13.8	1,128	3.3
Cervical suture	81	0.2	***	***	***	***
CVS (placental biopsy)	118	0.4	***	***	***	***
Amniocentesis	824	2.5	27	5.7	851	2.5
Ultrasound	31,776	95.0	459	97.7	32,235	95.0
CTG antepartum	7,618	22.8	222	47.2	7,840	23.1
CTG intrapartum	19,017	56.8	224	47.7	19,241	56.7
<b>One or more procedures</b>	<b>32,565</b>	<b>97.3</b>	<b>465</b>	<b>98.9</b>	<b>33,030</b>	<b>97.4</b>
No procedures	893	2.7	5	1.1	898	2.6
<b>Total Women</b>	<b>33,458</b>	<b>100.0</b>	<b>470</b>	<b>100.0</b>	<b>33,928</b>	<b>100.0</b>

Extracted from Midwives' Notification System on 22 September 2015.

A small number of women gave birth to triplets and were included in "Multiple" with twins.

Values <5 are suppressed and indicated with \*\*\*, other values were suppressed to prevent calculation.

<sup>15</sup> A woman may have more than one treatment or procedure during the pregnancy.

### 3.3. Labour

#### 3.3.1. Onset of labour

Labour is defined as painful, regular uterine contractions that dilate the cervix. The first stage of labour begins when dilatation of the cervix commences as a result of painful, regular uterine contractions and ends when cervix is fully dilated. The second stage of labour begins when the cervix is fully dilated and ends with the complete expulsion of the final infant of the pregnancy.

If labour occurs, onset can be spontaneous or induced. Spontaneously occurring labour can be augmented with medical or surgical procedures. A spontaneous onset of labour occurred for 50.0 per cent of women who gave birth in WA in 2013. Labour was induced for 29.3 per cent. Women who did not experience labour comprised 20.7 per cent (Table 24).

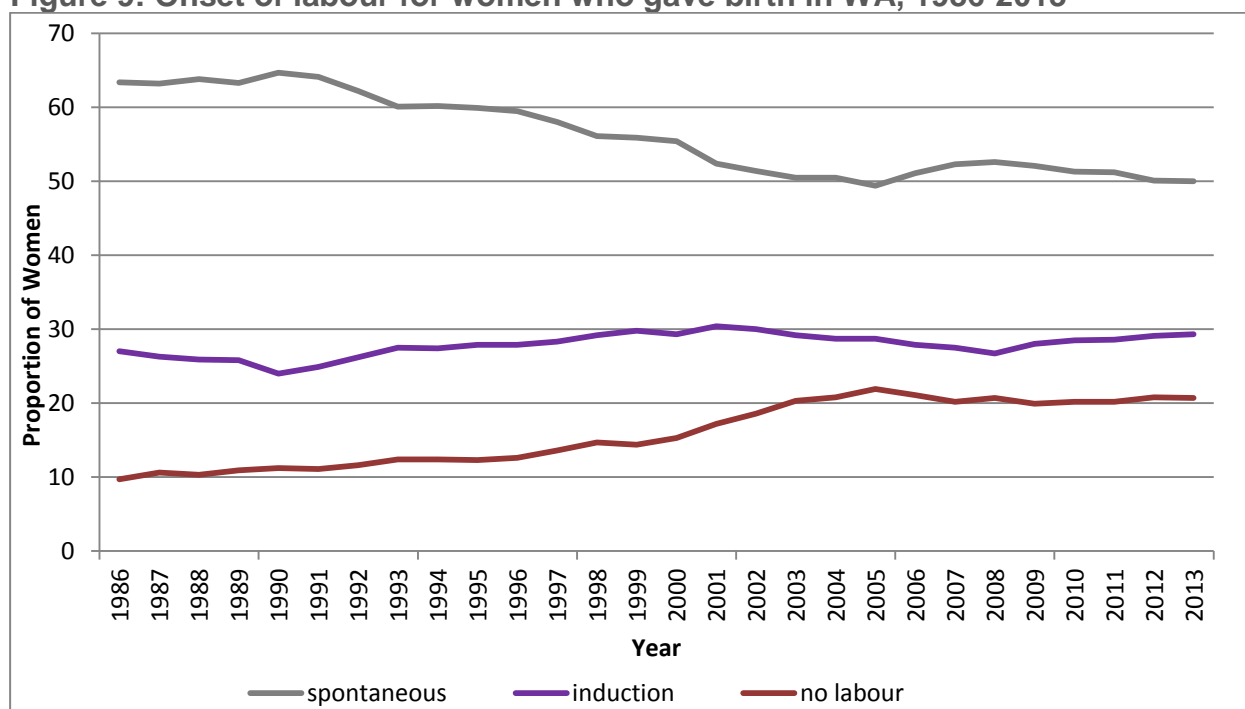
**Table 24: Onset of labour and plurality of birth for women who gave birth in WA, 2013**

Onset of labour	Plurality				Total	
	Single		Multiple		No.	%
	No.	%	No.	%		
Spontaneous	16,834	50.3	142	30.2	16,976	50.0
Induced	9,831	29.4	108	23.0	9,939	29.3
No labour	6,793	20.3	220	46.8	7,013	20.7
<b>Total</b>	<b>33,458</b>	<b>100.0</b>	<b>470</b>	<b>100.0</b>	<b>33,928</b>	<b>100.0</b>

Extracted from Midwives' Notification System on 22 September 2015.

Generally, there was a decrease in the proportion of women with spontaneous onset of labour from 63.4 per cent in 1986 to 49.4 per cent in 2005. The proportion of women who did not labour has been similar each year since 2003 (20.3 per cent) (Figure 9 and Table 116).

**Figure 9: Onset of labour for women who gave birth in WA, 1986-2013**



### 3.3.2. Augmentation of labour

Augmentation of labour is the use of a medication or procedure to improve the strength, efficiency and frequency of uterine contractions to enhance cervical dilatation. The effect of augmentation is desired particularly if the health of the mother or infant require a shorter period of labour.

Augmentation by surgical and/or medical intervention was administered to 36.0 per cent women who established labour spontaneously. Of the women who had labour augmented, 55.2 per cent progressed to a spontaneous birth, 28.6 per cent had an assisted vaginal birth and 16.2 per cent required delivery by caesarean section<sup>16</sup>.

Of the women who had spontaneous onset of labour without augmentation, 75.3 per cent had a spontaneous vaginal birth (Table 25).

**Table 25: Labour, augmentation and method of birth for women who gave birth in WA, 2013**

Augmentation of Spontaneous Labour	Method of birth for first or only infant of pregnancy			Total
	Spontaneous vertex	Assisted vaginal	Emergency caesarean	
<b>Numbers</b>				
No augmentation	8,186	1,189	1,490	10,865
Augmentation	3,374	1,748	989	6,111
<b>Total</b>	<b>11,560</b>	<b>2,937</b>	<b>2,479</b>	<b>16,976</b>
<b>Row Percentage</b>				
No augmentation	75.3	10.9	13.7	100.0
Augmentation	55.2	28.6	16.2	100.0
<b>Total</b>	<b>68.1</b>	<b>17.3</b>	<b>14.6</b>	<b>100.0</b>
<b>Column Percentage</b>				
No augmentation	70.8	40.5	60.1	64.0
Augmentation	29.2	59.5	39.9	36.0
<b>Total</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>

Extracted from Midwives' Notification System on 22 September 2015.

Assisted vaginal births include all breech vaginal births, vacuum extraction and forceps delivery.

Excludes 16,952 women who had induced onset of labour or did not labour.

<sup>16</sup> Women with multiple births were classified by the birth method of the first infant born.

### 3.3.3. Methods of augmentation

Among women who had an augmentation of spontaneous labour in 2013, artificial rupture of membranes (ARM) was reported for 42.9 per cent, and oxytocin for 31.8 per cent. A further 25.0 per cent had a combination of oxytocin and ARM reported.

Methods of birth after spontaneous onset of labour included Caesarean Section and birth may have been before full cervical dilatation.

Of women with augmentation of spontaneous labour, 82.0 per cent gave birth in less than 12 hours while 94.3 per cent of women without augmentation achieved birth in less than 12 hours.

The highest proportion of women with augmented labour (53.5 per cent) gave birth between five and 12 hours of onset of labour.

Of the women who had a spontaneous onset of labour and a labour duration of 12 hours or more, 64.2 per cent had labour augmented and of these 99.6 per cent had augmentation with oxytocin, or ARM, or both in combination (Table 26).

**Table 26: Augmentation of spontaneous labour and hours of labour for women who gave birth in WA, 2013**

Type of augmentation	Hours of labour <sup>17</sup>				Total
	Less than 1 hr	1 hr to less than 5 hrs	5 hrs to less than 12 hrs	12 hrs or more	
<b>Number</b>					
None	295	5,467	4,106	595	10,463
Oxytocin	13	486	1,016	376	1,891
Artificial rupture membranes (ARM)	29	866	1,378	283	2,556
Oxytocin and ARM	11	287	783	406	1,487
Prostaglandin or Other	***	7	7	***	20
<b>Total Augmented</b>	<b>***</b>	<b>1,646</b>	<b>3,184</b>	<b>***</b>	<b>5,954</b>
<b>Row Percentage</b>					
None	2.8	52.3	39.2	5.7	100.0
Oxytocin	0.7	25.7	53.7	19.9	100.0
ARM	1.1	33.9	53.9	11.1	100.0
Oxytocin and ARM	0.7	19.3	52.7	27.3	100.0
Prostaglandin or Other	10.0	35.0	35.0	20.0	100.0
<b>Total Augmented</b>	<b>0.9</b>	<b>27.6</b>	<b>53.5</b>	<b>18.0</b>	<b>100.0</b>
<b>Column Percentage</b>					
None					
Oxytocin	23.6	29.5	31.9	35.2	31.8
ARM	52.7	52.6	43.3	26.5	42.9
Oxytocin and ARM	20.0	17.4	24.6	38.0	25.0
Prostaglandin Alone or Other	***	0.4	0.2	0.4	0.3
<b>Total Augmented</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>

Extracted from Midwives' Notification System on 22 September 2015.

Women who had prostaglandin combined with oxytocin were reported in "oxytocin" groups. Women who had prostaglandin combined with ARM or other were reported in the "prostaglandin or other" group.

Prostaglandin reported for augmentation was not prevented by validations of data for 2013 data.

Excludes 2 cases where duration of labour after spontaneous onset was not reported.

Excludes 157 cases where duration of labour was less than 10 minutes and method of birth was by caesarean section.

Values <5 are suppressed and indicated with \*\*\*, other values were suppressed to prevent calculation.

<sup>17</sup> Hours of labour include total of first and second stage, and include labours interrupted by Caesarean Section.



### 3.3.4. Induction of labour

Induction of labour is the process of using medications or procedures to start labour. Induction is performed to initiate labour and the birth of the infant/s where maternal or fetal health would be compromised if the birth awaited spontaneous onset of labour.

In 2013, labour was induced by medical and/or surgical means for 29.3 per cent of women (Table 24).

The methods of induction used were usually combined. Prostaglandin was used for 9.3 per cent of women induced and it was used in combination with other named methods for a further 19.3 per cent of women who had labour induced.

ARM combined with an oxytocin infusion was recorded for 39.8 per cent of the women whose labour was induced. ARM or oxytocin infusion with or without "other" method was recorded for 5.4 per cent and 9.3 per cent of women induced, respectively (Table 27).

**Table 27: Induction method, birth method for women who gave birth in WA, 2013**

Induction Method	Method Birth <sup>18</sup>			Total
	Spontaneous vaginal	Assisted vaginal	Emergency caesarean	
<b>Number</b>				
Oxytocin	504	211	206	921
Prostaglandin	477	179	269	925
ARM	403	71	67	541
Oxytocin and ARM	2,606	836	510	3,952
Prostaglandin and ARM	265	77	74	416
Prostaglandin and Oxytocin	95	88	77	260
Prostaglandin, Oxytocin and ARM	543	350	347	1,240
Other Only <sup>19</sup>	708	370	606	1,684
<b>Total</b>	<b>5,601</b>	<b>2,182</b>	<b>2,156</b>	<b>9,939</b>
<b>Row Percentage</b>				
Oxytocin	54.7	22.9	22.4	100.0
Prostaglandin	51.6	19.4	29.1	100.0
ARM	74.5	13.1	12.4	100.0
Oxytocin and ARM	65.9	21.2	12.9	100.0
Prostaglandin and ARM	63.7	18.5	17.8	100.0
Prostaglandin and Oxytocin	36.5	33.8	29.6	100.0
Prostaglandin, Oxytocin and ARM	43.8	28.2	28.0	100.0
Other Only	42.0	22.0	36.0	100.0
<b>Total</b>	<b>56.4</b>	<b>22.0</b>	<b>21.7</b>	<b>100.0</b>
<b>Column Percentage</b>				
Oxytocin	9.0	9.7	9.6	9.3
Prostaglandin	8.5	8.2	12.5	9.3
ARM	7.2	3.3	3.1	5.4
Oxytocin and ARM	46.5	38.3	23.7	39.8
Prostaglandin and ARM	4.7	3.5	3.4	4.2
Prostaglandin and Oxytocin	1.7	4.0	3.6	2.6
Prostaglandin, Oxytocin and ARM	9.7	16.0	16.1	12.5
Other Only	12.6	17.0	28.1	16.9
<b>Total</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>

Extracted from Midwives' Notification System on 22 September 2015.

Assisted vaginal births include all breech vaginal births, vacuum extraction and forceps delivery.

<sup>18</sup> Women with multiple births were classified by the method of birth of the first infant born.

<sup>19</sup> Women with multiple methods of induction that included "Other" were counted in "Other" totals in previous annual reports. In this report these women are included in counts for the named method/s.

The proportion of women with labour induced with prostaglandin has varied since reporting began in 1998. Since 1999, the proportion decreased from 38.9 per cent to 31.3 per cent in 2013 (Table 28).

**Table 28: Trend of prostaglandin as induction method and hours of labour for women who gave birth in WA, 1998 - 2013**

Year	Hours of labour <sup>20</sup>			Total	Induced Labour	Prostaglandin % of Inductions
	Less than 5 hrs	5 hrs to 12:00	More than 12 hrs			
Number						
1998	1,245	255	1,214	2,714	7,394	36.7
1999	1,333	310	1,293	2,936	7,552	38.9
2000	1,353	233	1,190	2,776	7,266	38.2
2001	1,434	223	1,170	2,827	7,449	38.0
2002	1,459	230	1,129	2,818	7,314	38.5
2003	1,353	201	1,062	2,616	7,090	36.9
2004	1,303	192	1,001	2,496	7,210	34.6
2005	1,525	200	1,130	2,855	7,617	37.5
2006	1,565	223	1,166	2,954	7,873	37.5
2007	1,577	239	1,139	2,955	8,157	36.2
2008	1,600	157	1,046	2,803	8,058	34.8
2009	1,814	179	1,031	3,024	8,606	35.1
2010	1,857	207	1,121	3,185	8,788	36.2
2011	1,930	159	1,221	3,310	9,068	36.5
2012	1,738	186	1,152	3,076	9,720	31.6
2013	1,785	190	1,139	3,114	9,939	31.3

Extracted from Midwives' Notification System on 22 September 2015.

<sup>20</sup> Hours of labour include total of first and second stage, and includes labours interrupted by Caesarean Section.

### 3.3.5. Induction of labour by maternity service

In WA in 2013, 29.2 per cent of women had an induction of labour. The tertiary maternity service, King Edward Memorial Hospital for Women (KEMH) had a slightly higher proportion (35.0 per cent) than the whole of WA. Rates at other health services ranged from 19.6 to 39.0 per cent (Table 29).

**Table 29: Induction of labour by maternity service of women who gave birth in WA, 2013**

Maternity service	Onset of labour				Total	
	Induced		Other <sup>21</sup>		No.	%
	No.	%	No.	%		
Armadale Kelmscott	567	24.0	1,793	76.0	2,360	100.0
Bentley	193	21.0	728	79.0	921	100.0
Glengarry	364	36.1	645	63.9	1,009	100.0
Goldfields	267	31.4	582	68.6	849	100.0
Great Southern	135	21.9	481	78.1	616	100.0
Home Births	0	0.0	210	100.0	210	100.0
Joondalup HC - public	778	33.2	778	66.8	2,341	100.0
Kaleeya	348	24.5	1,074	75.5	1,422	100.0
KEMH	2,006	35.0	3,728	65.0	5,734	100.0
Kimberley	165	25.7	477	74.3	642	100.0
Mercy	582	39.0	911	61.0	1,493	100.0
Midwest	139	25.8	400	74.2	539	100.0
Osborne Park	439	28.6	1,095	71.4	1,534	100.0
Peel HC	229	21.5	835	78.5	1,064	100.0
Pilbara	116	19.6	476	80.4	592	100.0
Rockingham Kwinana	485	27.2	1,299	72.8	1,784	100.0
SJOG Bunbury	158	26.7	434	73.3	592	100.0
SJOG Geraldton	65	30.4	149	69.6	214	100.0
SJOG Murdoch	599	27.5	1,581	72.5	2,180	100.0
SJOG Subiaco	1,217	35.0	2,259	65.0	3,476	100.0
Southwest	345	23.5	1,121	76.5	1,466	100.0
Swan	271	20.1	1,075	79.9	1,346	100.0
Wheatbelt	42	20.1	167	79.9	209	100.0
<b>Total</b>	<b>9,510</b>	<b>29.2</b>	<b>23,083</b>	<b>70.8</b>	<b>32,593</b>	<b>100.0</b>

Extracted from Midwives' Notification System on 22 September 2015.

Excludes private women at two sites.

<sup>21</sup> Other labour onsets included spontaneous labour and no labour.

### 3.3.6. Analgesia

Analgesia is often administered during labour to reduce the pain experienced while enabling mobility and sensations of touch and pressure. Anaesthesia provided at time of birth to block sensation is described in section 3.4.

Of the 33,928 women who gave birth, 79.3 per cent experienced labour (Table 24). Of those women who laboured, 80.3 per cent received single or multiple types of analgesia during labour. Analgesia via the epidural and/or spinal route was received by 47.8 per cent of women with or without other analgesia.

Inhalation of a mix of Nitrous Oxide without intramuscular, epidural or spinal analgesia was used by 22.5 per cent of women. Systemic opioids without epidural or spinal analgesia were used by 9.0 per cent of women (Table 30).

**Table 30: Analgesia during labour by method of birth for women who laboured in WA, 2013**

Type of Analgesia <sup>22</sup>	Method of Birth <sup>23</sup>						Total	
	Spontaneous vertex		Assisted vaginal		Emergency caesarean		No.	%
	No.	%	No.	%	No.	%		
Nitrous oxide	5,221	30.4	628	12.3	215	4.6	6,064	22.5
Systemic opioids	1,849	10.8	372	7.3	203	4.4	2,424	9.0
<b>Epidural and/or spinal<sup>24</sup></b>	5,857	34.1	3,804	74.3	3,201	69.1	12,862	47.8
Epidural	5,606	32.7	3,574	69.8	2,765	59.7	11,945	44.4
Spinal	46	0.3	57	1.1	233	5.0	336	1.2
Combined spinal epidural	240	1.4	221	4.3	270	5.8	731	2.7
Other	198	1.2	31	0.6	43	0.9	272	1.0
Women with any analgesia	13,125	76.5	4,835	94.5	3,662	79.0	21,622	80.3
Women with no analgesia	4,036	23.5	284	5.5	973	21.0	5,293	19.7
<b>Total women who laboured</b>	<b>17,161</b>	<b>100.0</b>	<b>5,119</b>	<b>100.0</b>	<b>4,635</b>	<b>100.0</b>	<b>26,915</b>	<b>100.0</b>

Extracted from Midwives' Notification System on 22 September 2015.

Assisted vaginal births include all breech vaginal births, vacuum extraction and forceps delivery.

Among the 22,280 women who gave birth vaginally, 43.4 per cent had an epidural, spinal or combined spinal epidural during labour, 26.3 per cent received only nitrous oxide. The proportion of these women who received no pharmacological analgesia during labour was 19.4 percent (Table 31).

<sup>22</sup> Analgesia was assigned an ascending rank order of None, Nitrous Oxide, Systemic Opioids, Epidural/Caudal, Spinal, and Combined Spinal/Epidural. The highest Analgesia recorded for each woman determined her "Type of Analgesia".

<sup>23</sup> Women with multiple births were classified by the method of birth of the first infant born.

<sup>24</sup> Count of women who had Epidural, Spinal and/or Combined Spinal Epidural singly or in combination for analgesia in labour.

**Table 31: Analgesia for women who had vaginal births in WA, 2013**

Vaginal Births		
Type of analgesia	No.	%
Nitrous oxide	5,849	26.3
Systemic opioids	2,221	10.0
<b>Epidural and/or spinal</b>	<b>9,661</b>	<b>43.4</b>
Epidural	9,180	41.2
Spinal	103	0.5
Combined spinal epidural	461	2.1
Other	229	1.0
Women with any analgesia	17,960	80.6
Women with no analgesia	4,320	19.4
<b>Total women</b>	<b>22,280</b>	<b>100.0</b>

Extracted from Midwives' Notification System on 22 September 2015.

### 3.4. Anaesthesia

Anaesthesia is often administered during the birth and differs from analgesia in that its action is to block sensation, prevent some reflexes and can impact mobility. General anaesthesia also causes loss of consciousness. Each woman who gave birth may have had nil, one or multiple types of anaesthesia reported. They may also have had different anaesthesia for each of multiple infants born. Data reported in Table 32 presents one method for each woman. That method is the most intensive method for first infant born.

Of the 33,928 women who gave birth in WA during 2013, 33.0 per cent had no anaesthesia, 33.6 per cent received anaesthesia via the epidural route, 12.7 per cent via the spinal route and 12.3 per cent had combined spinal and epidural anaesthesia. A further 0.4 per cent had epidural or spinal anaesthesia in combination with a general anaesthetic. In total, 552 (1.6 per cent) women received general anaesthesia (Table 32).

**Table 32: Anaesthesia by method of birth for women who gave birth in WA, 2013**

Type of Anaesthesia <sup>25</sup>	Method of Birth <sup>26</sup>								Total	
	Spontaneous Vertex		Assisted vaginal		Elective caesarean		Emergency caesarean			
	No.	%	No.	%	No.	%	No.	%	No.	%
None	10,506	31.0	696	2.1	-	-	-	-	11,202	33.0
Local to perineum	986	2.9	636	1.9	-	-	-	-	1,622	4.8
Pudendal	***	***	158	0.5	-	-	-	-	***	***
Epidural	4,928	14.5	3,309	9.8	683	2.0	2,467	7.3	11,387	33.6
Spinal	31	0.1	71	0.2	2,613	7.7	1,578	4.7	4,293	12.7
Combined spinal epidural	211	0.6	201	0.6	2,505	7.4	1,259	3.7	4,176	12.3
General anaesthesia	***	***	6	0.0	84	0.2	327	1.0	***	***
Epidural/spinal & General anaesthesia	-	-	-	-	29	0.1	103	0.3	132	0.4
Other	476	1.4	42	0.1	-	-	-	-	518	1.5
<b>Total</b>	<b>17,160</b>	<b>50.6</b>	<b>5,119</b>	<b>15.1</b>	<b>5,914</b>	<b>17.4</b>	<b>5,734</b>	<b>16.9</b>	<b>33,928</b>	<b>100.0</b>

Extracted from Midwives' Notification System on 22 September 2015.

Values <5 are suppressed and indicated with \*\*\*, other values were suppressed to prevent calculation.

Assisted vaginal births include all breech vaginal births, vacuum extraction and forceps delivery

<sup>25</sup> Where both Epidural and Spinal were reported, the case was included in the Combined Spinal Epidural group.

<sup>26</sup> Women with multiple births were classified by the method of birth of the first infant born

Among the 22,280 women who gave birth vaginally, 50.3 per cent did not have anaesthesia at birth (Table 33).

Epidural and/or spinal anaesthesia was the most frequently administered method (39.3 per cent) for women who had a vaginal birth.

**Table 33: Anaesthesia for women who had vaginal births in WA, 2013**

<b>Vaginal births Type of anaesthesia<sup>27</sup></b>	<b>No.</b>	<b>%</b>
None	11,202	50.3
Local anaesthesia to perineum	1,622	7.3
Pudendal	178	0.8
Epidural	8,237	37.0
Spinal	102	0.5
Combined spinal epidural	412	1.8
General anaesthesia	9	0.0
Other	518	2.3
<b>Total</b>	<b>22,280</b>	<b>100.0</b>

Extracted from Midwives' Notification System on 22 September 2015.

Among the 11,648 women who gave birth by caesarean section, general anaesthesia was received by 3.5 per cent and a further 1.1 per cent had general anaesthesia with spinal and/or epidural anaesthetic. Most women (95.3 per cent) had regional anaesthesia, epidural (27.0 per cent), spinal (36.0 per cent) or combined spinal epidural (32.3 per cent) (Table 34).

**Table 34: Anaesthesia for women who gave birth by caesarean section in WA, 2013**

<b>Caesarean births Type of anaesthesia<sup>25</sup></b>	<b>No.</b>	<b>%</b>
Epidural	3,150	27.0
Spinal	4,191	36.0
Combined spinal epidural	3,764	32.3
General anaesthesia	411	3.5
Epidural or spinal and general anaesthesia	132	1.1
<b>Total</b>	<b>11,648</b>	<b>100.0</b>

Extracted from Midwives' Notification System on 22 September 2015.

Trend data over the period 1986 to 2013 demonstrated a decrease in use of general anaesthesia for caesarean birth, particularly for elective caesarean sections.

In 1986, general anaesthesia was used by 42.5 per cent of women who gave birth by caesarean section compared to 4.7 per cent in 2013.

For emergency caesareans, general anaesthesia was used in 24.2 per cent of cases in 1986 and reduced to a proportion of 3.7 per cent in 2013 (Table 35).

<sup>27</sup> Where both Epidural and Spinal were reported, the case was included in the Combined Spinal Epidural group.

**Table 35: Trend for anaesthesia for women who gave birth by caesarean section in WA, 1986-2013**

Year	Urgency of Caesarean Section												Total Caesareans No.
	Elective Caesarean						Emergency Caesarean						
	Epidural/ Spinal		General		Total		Epidural/ Spinal		General		Total		
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	
1986	1,089	32.0	622	18.3	1,711	50.3	868	25.5	823	24.2	1,691	49.7	3,402
1987	1,436	36.0	610	15.3	2,046	51.3	1,008	25.3	931	23.4	1,939	48.7	3,985
1988	1,562	37.5	632	15.2	2,194	52.6	1,047	25.1	929	22.3	1,976	47.4	4,170
1989	1,774	39.2	582	12.9	2,356	52.1	1,258	27.8	907	20.1	2,165	47.9	4,521
1990	1,922	39.8	570	11.8	2,492	51.6	1,436	29.7	901	18.7	2,337	48.4	4,829
1991	1,845	40.6	516	11.3	2,361	51.9	1,432	31.5	755	16.6	2,187	48.1	4,548
1992	2,070	43.0	489	10.2	2,559	53.2	1,486	30.9	768	16.0	2,254	46.8	4,813
1993	2,282	43.7	481	9.2	2,763	52.9	1,749	33.5	710	13.6	2,459	47.1	5,222
1994	2,347	44.9	382	7.3	2,729	52.2	1,891	36.2	603	11.5	2,494	47.8	5,223
1995	2,371	46.9	369	7.3	2,740	54.2	1,807	35.7	511	10.1	2,318	45.8	5,058
1996	2,548	49.5	317	6.2	2,865	55.7	1,860	36.1	423	8.2	2,283	44.3	5,148
1997	2,761	50.6	281	5.2	3,042	55.8	2,004	36.8	407	7.5	2,411	44.2	5,453
1998	3,008	50.9	262	4.4	3,270	55.4	2,257	38.2	379	6.4	2,636	44.6	5,906
1999	3,100	52.3	210	3.5	3,310	55.8	2,262	38.2	356	6.0	2,618	44.2	5,928
2000	3,289	52.4	231	3.7	3,520	56.1	2,439	38.8	321	5.1	2,760	43.9	6,280
2001	3,563	52.7	181	2.7	3,744	55.3	2,703	39.9	319	4.7	3,022	44.7	6,766
2002	3,844	53.6	160	2.2	4,004	55.9	2,823	39.4	339	4.7	3,162	44.1	7,166
2003	4,159	55.4	167	2.2	4,326	57.6	2,856	38.1	322	4.3	3,178	42.4	7,504
2004	4,385	53.9	152	1.9	4,537	55.8	3,250	40.0	341	4.2	3,591	44.2	8,128
2005	4,913	54.7	154	1.7	5,067	56.4	3,534	39.3	387	4.3	3,921	43.6	8,988
2006	5,162	55.9	114	1.2	5,276	57.1	3,638	39.4	322	3.5	3,960	42.9	9,236
2007	5,172	53.4	117	1.2	5,289	54.6	4,099	42.3	305	3.1	4,404	45.4	9,693
2008	5,345	53.1	140	1.4	5,485	54.5	4,231	42.0	348	3.5	4,579	45.5	10,064
2009	5,189	50.7	110	1.1	5,299	51.8	4,554	44.5	382	3.7	4,936	48.2	10,235
2010	5,276	50.9	99	1.0	5,375	51.9	4,666	45.1	316	3.1	4,982	48.1	10,357
2011	5,354	49.7	118	1.1	5,472	50.8	4,923	45.7	372	3.5	5,295	49.2	10,767
2012	5,868	50.8	101	0.9	5,969	51.7	5,184	44.9	388	3.4	5,572	48.3	11,541
2013	5,801	49.8	113	1.0	5,914	50.8	5,304	45.5	430	3.7	5,734	49.2	11,648

Extracted from Midwives' Notification System on 22 September 2015.

Anaesthesia data was included in collection for births from 1986.

### 3.5. Fetal presentation

The majority, 94.6 per cent of infants born from singleton births were vertex presentations. Of these, 68.6 per cent were born vaginally.

Among infants born as singletons, 3.9 per cent had breech presentations. Of these infants, 34.6 per cent were born by emergency caesarean section and 55.9 per cent by elective caesarean section.

Of singleton infants, 12.1 per cent were born by vacuum extraction and 2.7 per cent by forceps. There were 124 breech infants born vaginally with or without breech manoeuvres or application of forceps to head (Table 36).

**Table 36: Fetal presentation and method of birth for singleton infants born in WA, 2013**

Method of Birth <sup>28</sup>	Fetal Presentation			Total No.
	Vertex No.	Breech No.	Other <sup>29</sup> No.	
Spontaneous	16,793	-	251	17,043
Vacuum	4,008	-	44	4,052
Forceps	875	-	***	***
Breech Vaginal	-	124	***	***
Elective Caesarean	4,965	727	68	5,760
Emergency Caesarean	5,011	450	126	5,587
<b>Total</b>	<b>31,653</b>	<b>1,301</b>	<b>505</b>	<b>33,458</b>
Column Percentage				
Spontaneous	53.1	-	49.7	50.9
Vacuum	12.7	-	8.7	12.1
Forceps	2.8	-	***	***
Breech Vaginal	-	9.5	***	***
Elective Caesarean	15.7	55.9	13.5	17.2
Emergency Caesarean	15.8	34.6	25.0	16.7
<b>Total</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>
Row Percentage				
Spontaneous	98.5	-	1.5	100.0
Vacuum	98.9	-	1.1	100.0
Forceps	98.3	-	***	100.0
Breech Vaginal	-	99.2	***	100.0
Elective Caesarean	86.2	12.6	1.2	100.0
Emergency Caesarean	89.7	8.1	2.3	100.0
<b>Total</b>	<b>94.6</b>	<b>3.9</b>	<b>1.5</b>	<b>100.0</b>

Extracted from Midwives' Notification System on 22 September 2015.

Values <5 are suppressed and indicated with \*\*\*, other values were suppressed to prevent calculation.

<sup>28</sup> Where multiple methods of birth were reported for an infant, the highest method of birth was reported with ascending rank order being Spontaneous, Vacuum, Forceps, Breech Vaginal, Caesarean Section

<sup>29</sup> Cephalic presentations like Brow and Face are included in "Other" with shoulder or compound presentations



### 3.5.1. Vertex presentation and method of birth in maternity services

Women with a vertex presentation of the first or only infant of the pregnancy will be more likely to have a spontaneous vaginal birth unless they have a history of caesarean section or complication of pregnancy or labour.

In WA in 2013, just over half (53.4 per cent) of the women who gave birth to an infant with a vertex presentation had a spontaneous vaginal birth. The tertiary maternity service (KEMH) had a slightly lower proportion than the whole of WA (51.8 per cent). Rates at other metropolitan health services ranged from 30.8 to 67.2 per cent (Table 37).

**Table 37: Method of birth and maternity service of infants born with vertex presentation in WA, 2013**

Maternity service	Method of Birth				Total	
	Spontaneous Vaginal		Other <sup>30</sup>			
	No.	%	No.	%	No.	%
Armadale Kelmscott	1,490	66.8	741	33.2	2,231	100.0
Bentley	504	57.5	373	42.5	877	100.0
Glengarry	310	32.2	652	67.8	962	100.0
Goldfields	484	62.0	297	38.0	781	100.0
Great Southern	382	64.7	208	35.3	590	100.0
Joondalup HC - Public	1,308	58.1	943	41.9	2,251	100.0
KEMH	2,717	51.8	2,525	48.2	5,242	100.0
Kaleeya	781	58.0	566	42.0	1,347	100.0
Kimberley	403	66.2	206	33.8	609	100.0
Midwest	343	67.0	169	33.0	512	100.0
Osborne Park	834	57.8	609	42.2	1,443	100.0
Peel HC	634	61.9	390	38.1	1,024	100.0
Pilbara	352	63.5	202	36.5	554	100.0
Rockingham Kwinana	1,126	66.2	574	33.8	1,700	100.0
SJOG Bunbury	252	45.7	300	54.3	552	100.0
SJOG Geraldton	108	53.7	93	46.3	201	100.0
SJOG Mt Lawley (formerly Mercy)	622	43.6	803	56.4	1,425	100.0
SJOG Murdoch	677	32.9	1,379	67.1	2,056	100.0
SJOG Subiaco	1,019	30.8	2,290	69.2	3,309	100.0
South West	870	62.3	526	37.7	1,396	100.0
Swan	855	67.2	417	32.8	1,272	100.0
Wheatbelt	149	73.8	53	26.2	202	100.0
Home Birth	209	100.0	0	0.0	209	100.0
<b>Total</b>	<b>16,429</b>	<b>53.4</b>	<b>14,316</b>	<b>46.6</b>	<b>30,745</b>	<b>100.0</b>

Extracted from Midwives' Notification System on 22 September 2015.

Includes pregnancies of multiple plurality if first infant was vertex.

Includes infants born before arrival and those born at non-maternity sites.

Excludes private women at two sites.

<sup>30</sup> Other methods of birth include vacuum, forceps and caesarean section.

### 3.6. Method of birth

In 2013, half of the women had spontaneous vertex births (50.6 per cent). Caesarean section was the birth method for 34.3 per cent of women. This comprised 17.4 per cent elective caesarean section and 16.9 per cent emergency caesarean section (Table 38).

Women with a multiple pregnancy (twins or triplets) were more likely to give birth by caesarean section. In 2013, of the women with a multiple pregnancy, 64.1 per cent gave birth by caesarean section (Table 38).

**Table 38: Method of birth and plurality of birth for women who gave birth in WA, 2013**

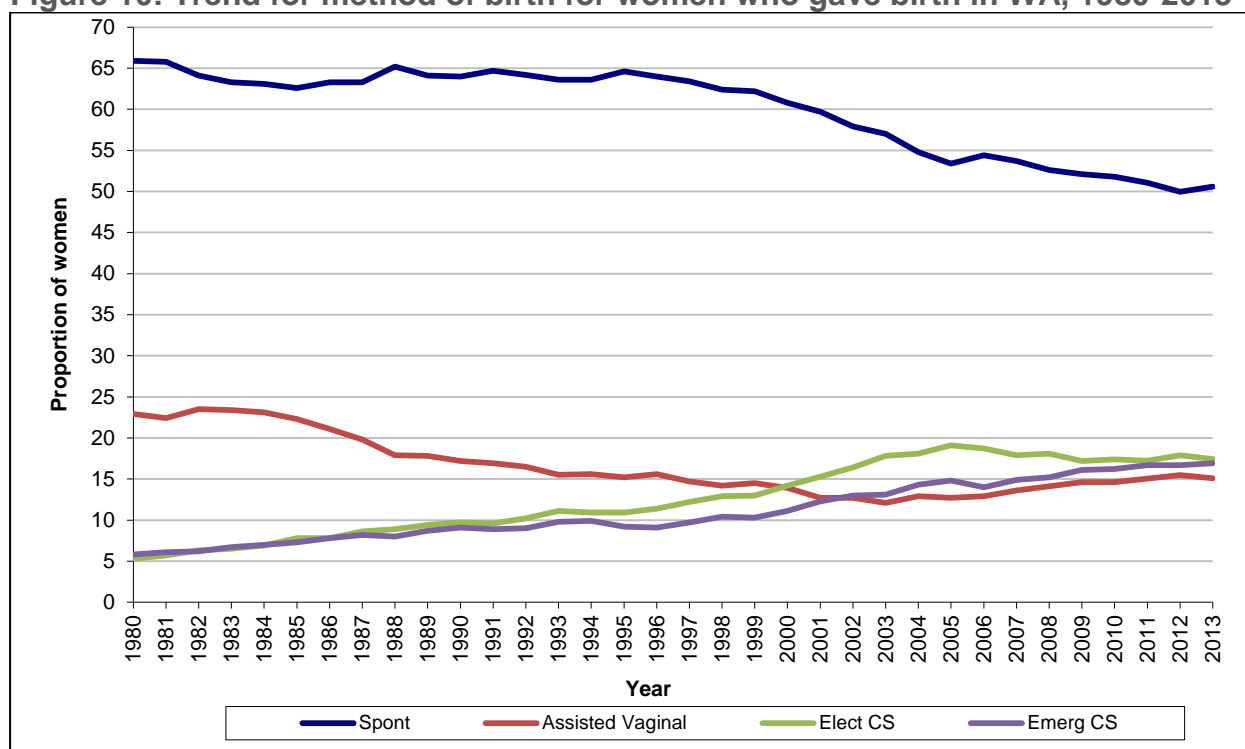
Method of birth of first infant	Plurality				Total	
	Single		Multiple			
	No.	%	No.	%	No.	%
Spontaneous vaginal	17,044	50.9	117	24.9	17,161	50.6
Breech manoeuvre	125	0.4	5	1.1	130	0.4
Vacuum	4,052	12.1	30	6.4	4,082	12.0
Forceps	890	2.7	17	3.6	907	2.7
Elective caesarean	5,760	17.2	154	32.8	5,914	17.4
Emergency caesarean	5,587	16.7	147	31.3	5,734	16.9
<b>Total</b>	<b>33,458</b>	<b>100.0</b>	<b>470</b>	<b>100.0</b>	<b>33,928</b>	<b>100.0</b>

Extracted from Midwives' Notification System on 22 September 2015.

The incidence of both elective and emergency caesarean section has more than tripled over the 34 years, 1980 to 2013. The rates of elective caesarean section and emergency caesarean section appear to have plateaued since 2009 (Figure 10).

Assisted vaginal birth (breech, vacuum or forceps) or caesarean section accounted for 49.4 per cent of births by WA women in 2013 (Table 38, Figure 10).

**Figure 10: Trend for method of birth for women who gave birth in WA, 1980-2013**



Breech, Vacuum and Forceps for first or only infant were combined to determine "Assisted Vaginal" number of women.

For women who gave birth for the first time, 35.2 per cent had a caesarean section in 2013.

For women who had vaginal births previously, 10.8 per cent had a caesarean section in 2013.

For women with a history of caesarean section and their most recent birth a vaginal birth, 33.9 per cent had a caesarean section in 2013.

For women with a history of caesarean section and their most recent birth a caesarean section, 89.7 per cent had a caesarean section in 2013 (Table 39).

**Table 39: Method of birth by history of caesarean section for women who gave birth in WA, 2013**

Previous birth Method	Method of Birth										Total	
	Spontaneous		Breech		Instrumental		Elective Caesarean		Emergency Caesarean			
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
First Birth	5,545	38.3	3,784	26.2	41	0.3	1,478	10.2	3,613	25.0	14,461	100.0
Previous births, no caesareans	11,044	81.4	995	7.3	70	0.5	636	4.7	829	6.1	13,574	100.0
<b>No previous caesarean</b>	<b>16,589</b>	<b>59.2</b>	<b>4,779</b>	<b>17.0</b>	<b>111</b>	<b>0.4</b>	<b>2,114</b>	<b>7.5</b>	<b>4,442</b>	<b>15.8</b>	<b>28,035</b>	<b>100.0</b>
Previous caesarean, last birth vaginal	206	58.7	23	6.6	3	0.9	68	19.4	51	14.5	351	100.0
Previous caesarean, last birth caesarean	366	6.6	187	3.4	16	0.3	3,732	67.3	1,241	22.4	5,542	100.0
<b>Previous caesarean</b>	<b>572</b>	<b>9.7</b>	<b>210</b>	<b>3.6</b>	<b>19</b>	<b>0.3</b>	<b>3,800</b>	<b>64.5</b>	<b>1,292</b>	<b>21.9</b>	<b>5,893</b>	<b>100.0</b>
<b>Total</b>	<b>17,161</b>	<b>50.6</b>	<b>4,989</b>	<b>14.7</b>	<b>130</b>	<b>0.4</b>	<b>5,914</b>	<b>17.4</b>	<b>5,734</b>	<b>16.9</b>	<b>33,928</b>	<b>100.0</b>

Extracted from Midwives' Notification System on 22 September 2015.

### 3.6.1. Caesarean section by maternity service

The tertiary maternity service in Western Australia (KEMH) had 37.1 per cent of women who gave birth by caesarean section in 2013. Rural health services' caesarean section rates ranged between 16.3 per cent in the Wheatbelt and 28.4 per cent in the Pilbara. Caesarean section rates at private health services ranged between 28.7 and 55.2 per cent (Table 40).

**Table 40: Caesarean section by maternity service of women who gave birth in WA, 2013**

Maternity service	Method of Birth					
	Vaginal Birth		Caesarean		Total	
	No.	%	No.	%	No.	%
Armadale Kelmscott	1,852	78.5	508	21.5	2,360	100.0
Bentley	659	71.6	262	28.4	921	100.0
Glengarry	480	47.6	529	52.4	1,009	100.0
Goldfields	663	78.1	186	21.9	849	100.0
Great Southern	448	72.7	168	27.3	616	100.0
Homebirths	210	100.0	0	0.0	210	100.0
Joondalup HC - Public	1,667	71.2	674	28.8	2,341	100.0
KEMH	3,609	62.9	2,125	37.1	5,734	100.0
Kaleeya	982	69.1	440	30.9	1,422	100.0
Kimberley	471	73.4	171	26.6	642	100.0
Midwest	420	77.9	119	22.1	539	100.0
Osborne Park	1,075	70.1	459	29.9	1,534	100.0
Peel	759	71.3	305	28.7	1,064	100.0
Pilbara	424	71.6	168	28.4	592	100.0
Rockingham Kwinana	1,346	75.4	438	24.6	1,784	100.0
SJOG Bunbury	342	57.8	250	42.2	592	100.0
SJOG Geraldton	149	69.6	65	30.4	214	100.0
SJOG Mt Lawley	915	61.3	578	38.7	1,493	100.0
SJOG Murdoch	976	44.8	1,204	55.2	2,180	100.0
SJOG Subiaco	1,891	54.4	1,585	45.6	3,476	100.0
South West	1,079	73.6	387	26.4	1,466	100.0
Swan Districts	990	73.6	356	26.4	1,346	100.0
Wheatbelt	175	83.7	34	16.3	209	100.0
<b>Total</b>	<b>21,582</b>	<b>66.2</b>	<b>11,011</b>	<b>33.8</b>	<b>32,593</b>	<b>100.0</b>

Extracted from Midwives' Notification System on 22 September 2015.

Excludes private women at two sites.

### 3.7. Hours of established labour

For women who gave birth vaginally following a spontaneous onset of labour, 58.5 per cent experienced a labour of six hours or less and 33.2 per cent laboured between six and 12 hours. Within 12 hours of spontaneous onset of labour, 91.7 per cent of these women had given birth.

Proportionally, slightly more women with an induction laboured for 12 hours or less (96.9 per cent) than those with spontaneous onset of labour (91.7 per cent) (Table 41 and Figure 11).

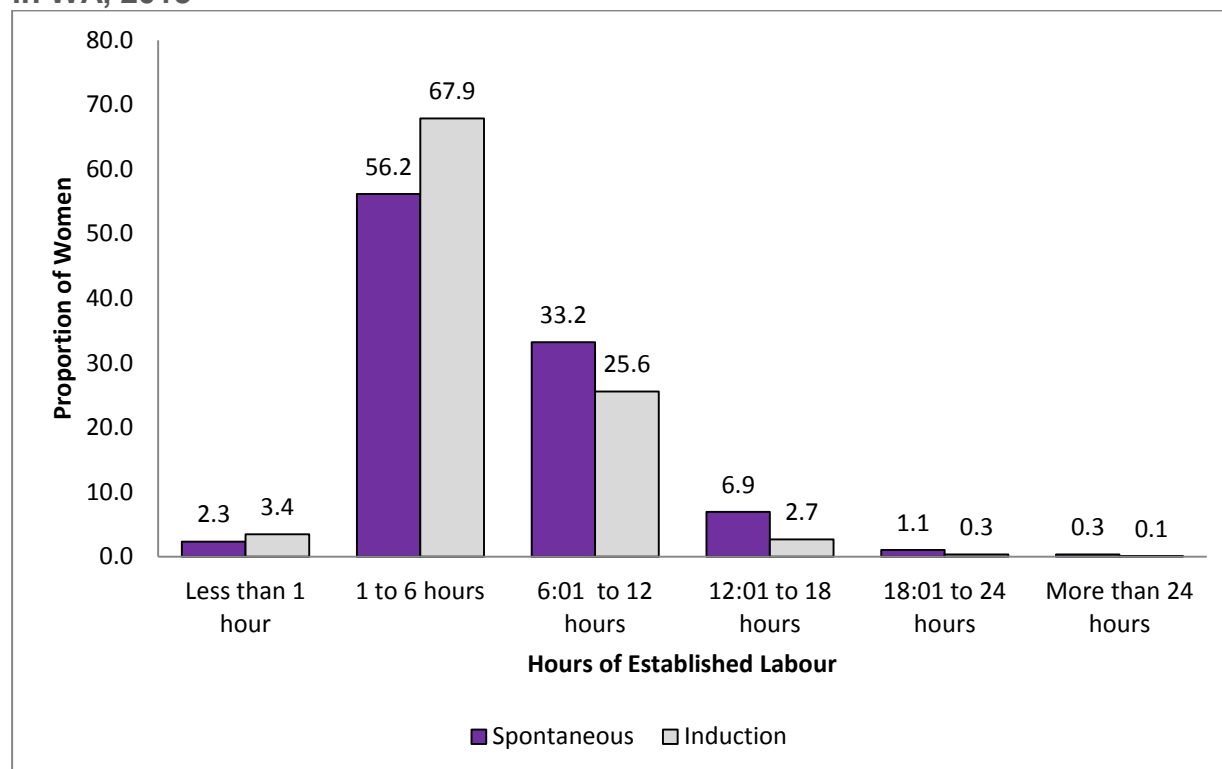
**Table 41: Onset of labour by hours of labour for women who gave birth vaginally in WA, 2013**

Hours of labour	Onset of labour				Total	
	Spontaneous		Induction		No.	%
	No.	%	No.	%		
Less than 1 hour	336	2.3	268	3.4	604	2.7
1 to 6 hours	8,140	56.2	5,284	67.9	13,424	60.3
6:01 to 12 hours	4,814	33.2	1,990	25.6	6,804	30.5
12:01 to 18 hours	1,002	6.9	207	2.7	1,209	5.4
18:01 to 24 hours	153	1.1	25	0.3	178	0.8
More than 24 hours	50	0.3	9	0.1	59	0.3
<b>Total</b>	<b>14,495</b>	<b>100.0</b>	<b>7,783</b>	<b>100.0</b>	<b>22,280</b>	<b>100.0</b>

Extracted from Midwives' Notification System on 22 September 2015.

Excludes 2 cases where duration of labour was not reported.

**Figure 11: Onset of labour by hours of labour for women who gave birth vaginally in WA, 2013**



### 3.8. Complications of labour and birth

#### 3.8.1. Plurality of pregnancy

In 2013, there were differences between the proportion of women with a singleton or multiple birth who had a complication of labour and birth.

38.2 per cent of women who had a singleton birth had no complications during labour and birth. Of the women who had a multiple birth, 5.1 per cent had no complications during labour and birth. Precipitate delivery, fetal compromise, cord tight around neck, cephalopelvic disproportion, shoulder dystocia and failure to progress in labour were reported more often for women with singleton than multiple births. Prolapsed cord, primary postpartum haemorrhage (PPH), manual removal of placenta and persistent occipito posterior position were recorded more often for multiple births than singleton births.

The most common complications reported were primary PPH (19.2 per cent), previous caesarean section (17.2 per cent) and fetal compromise (9.9 per cent) (Table 42).

**Table 42: Complications of labour and birth by plurality of birth for women who gave birth in WA, 2013**

Complications of labour and birth <sup>31</sup>	Plurality of Birth				Total	
	Singleton		Multiple		No.	%
	No.	%	No.	%	No.	%
Precipitate delivery	1,319	3.9	6	1.3	1,325	3.9
Fetal compromise	3,315	9.9	38	8.1	3,353	9.9
Prolapsed cord	41	0.1	***	0.9	***	0.1
Cord tight around neck	535	1.6	***	0.2	***	1.6
Cephalopelvic disproportion	233	0.7	***	0.2	***	0.7
Primary Postpartum Haemorrhage ≤500mLs (PPH)	6,314	18.9	216	46.0	6,530	19.2
Retained placenta manual removal	320	1.0	10	2.1	330	1.0
Persistent occipito posterior	561	1.7	16	3.4	577	1.7
Shoulder dystocia	515	1.5	.	.	515	1.5
Failure to progress ≤ 3cms	2,205	6.6	20	4.3	2,225	6.6
Failure to progress > 3cms	1,647	4.9	11	2.3	1,658	4.9
Previous caesarean section	5,752	17.2	83	17.7	5,835	17.2
Other	10,856	32.4	424	90.2	11,280	33.2
<b>One or more complications</b>	<b>20,665</b>	<b>61.8</b>	<b>446</b>	<b>94.9</b>	<b>21,111</b>	<b>62.2</b>
No complications of labour and birth	12,793	38.2	24	5.1	12,817	37.8
<b>Total Women</b>	<b>33,458</b>	<b>100</b>	<b>470</b>	<b>100</b>	<b>33,928</b>	<b>100</b>

Extracted from Midwives' Notification System on 22 September 2015.

These data include reasons for instrumental delivery or caesarean section of the first or only infant born from the pregnancy.

Values <5 are suppressed and indicated with \*\*\*, other values were suppressed to prevent calculation.

<sup>31</sup> A woman may have more than one complication of labour and birth

### 3.8.2. Obesity

For women who gave birth in 2013, maternal weight and height were recorded for a large proportion (92.9 per cent) and for these a BMI was able to be determined. For the other women, the complications of precipitate delivery, prolapsed umbilical cord, cord tight around neck and manual removal of placenta were more common than in women with a BMI determined, while PPH and failure to progress in labour were less common.

Of all women who gave birth, 19.1 percent had a BMI greater than 30 (obese). A greater proportion of these women had one or more complication of labour and birth (70.6 per cent) compared with women who had a BMI less than 30 (60.1 per cent) or no BMI determined (61.8 per cent).

Incidence of PPH (25.4 per cent) and history of caesarean section (23.3 per cent) was 50 per cent higher in obese women than in women with a BMI less than 30 (17.9 and 15.5 per cent respectively) (Table 43).

**Table 43: Complications of labour and birth by obesity in women who gave birth in WA, 2013**

Complications of labour and birth <sup>32</sup>	Maternal Obesity						Total	
	BMI <30		BMI ≥30		BMI N/A			
	No.	%	No.	%	No.	%	No.	%
Precipitate delivery	883	3.5	307	4.7	135	5.6	1,325	3.9
Fetal compromise	2,431	9.7	683	10.6	239	9.9	3,353	9.9
Prolapsed cord	22	0.1	15	0.2	8	0.3	45	0.1
Cord tight around neck	378	1.5	111	1.7	47	2.0	536	1.6
Cephalopelvic disproportion	176	0.7	44	0.7	14	0.6	234	0.7
Primary Postpartum Haemorrhage ≥500mLs (PPH)	4,496	17.9	1,644	25.4	390	16.2	6,530	19.2
Retained placenta manual removal	233	0.9	57	0.9	40	1.7	330	1.0
Persistent occipito posterior	393	1.6	136	2.1	48	2.0	577	1.7
Shoulder dystocia	350	1.4	127	2.0	38	1.6	515	1.5
Failure to progress ≤3cms	1,737	6.9	386	6.0	102	4.2	2,225	6.6
Failure to progress >3cms	1,190	4.8	380	5.9	88	3.7	1,658	4.9
Previous caesarean section	3,885	15.5	1,509	23.3	441	18.3	5,835	17.2
Other	8,235	32.9	2,327	36.0	718	29.8	11,280	33.2
<b>One or more complications</b>	<b>15,054</b>	<b>60.1</b>	<b>4,568</b>	<b>70.6</b>	<b>1,489</b>	<b>61.8</b>	<b>21,111</b>	<b>62.2</b>
No complications	9,995	39.9	1,902	29.4	920	38.2	12,817	37.8
<b>Total Women</b>	<b>25,049</b>	<b>100.0</b>	<b>6,470</b>	<b>100.0</b>	<b>2,409</b>	<b>100.0</b>	<b>33,928</b>	<b>100.0</b>
<b>Proportion of Total Women</b>	<b>73.8</b>		<b>19.1</b>		<b>7.1</b>		<b>100.0</b>	

Extracted from Midwives' Notification System on 22 September 2015.

These data include reasons for instrumental delivery or caesarean section of the first or only infant born from the pregnancy.

N/A = Not Available

<sup>32</sup> A woman may have nil, one or more complications of labour and birth reported

### 3.8.3. Primary postpartum haemorrhage

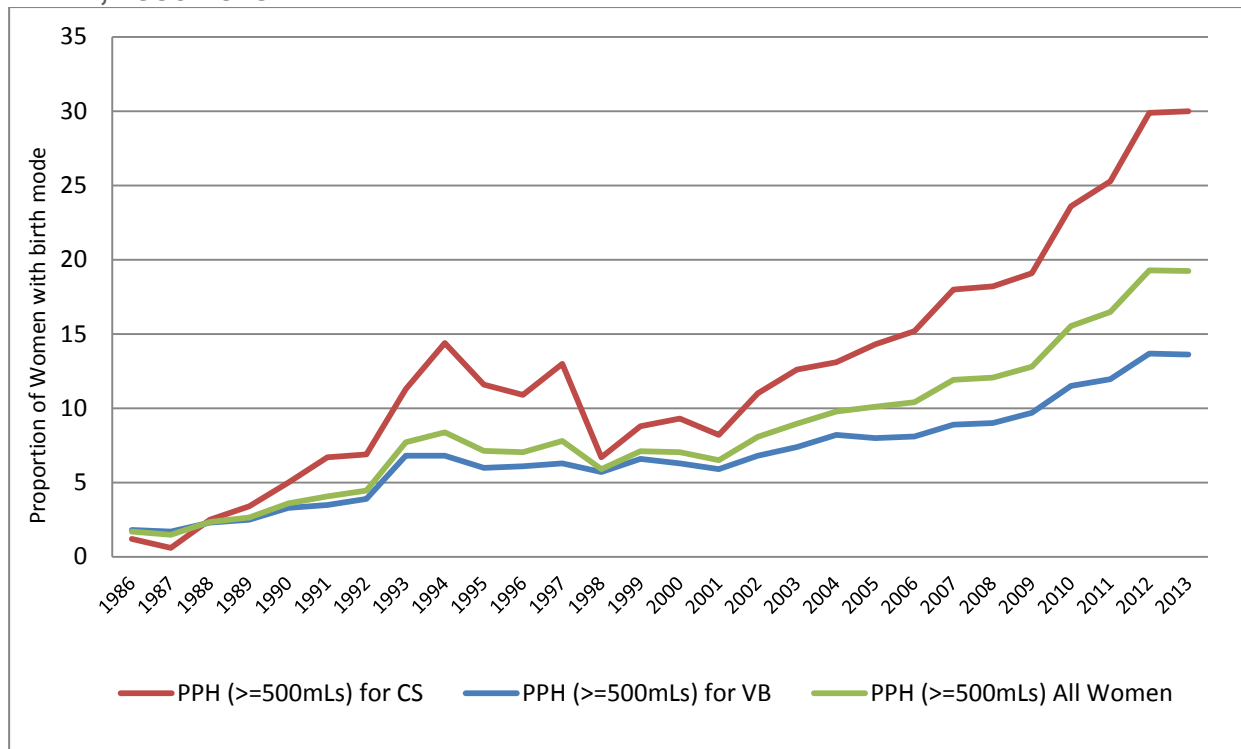
Primary PPH is reported if the blood loss within 24 hours of birth was at least 500 mLs.

The primary PPH rate for 2013 was 19.2 per cent (Table 43).

The proportion of women who had a PPH increased each year from 1.7 per cent in 1986. In particular, for women who had birth by Caesarean Section, the proportion with primary PPH increased from 1.2 percent in 1986 to 30.5 per cent in 2013 (Figure 12).

This increase should be interpreted with caution. In 2012, the staggered introduction of a new computer system at public maternity services required the recording of measured and estimated blood loss in total mLs. This meant reporting by midwives changed from reporting “Yes” for Primary PPH of at least 500 mLs to a programmed process that generated a “Yes” result if total blood loss within 24 hours was at least 500 mLs. Rates of PPH plateaued in 2013 coinciding with the first year of complete implementation of this system in all public maternity services.

**Figure 12: Trend for primary postpartum haemorrhage for women who gave birth in WA, 1986-2013**





### 3.8.4. Reason for caesarean section

The Midwives' Notification System did not collect a specified reason for caesarean section in 2013. However, midwives were required to include the reason for caesarean section when reporting complications of labour and birth. More than one complication may have been recorded and women who gave birth by caesarean section had at least one complication reported.

The most frequently reported complication in 2013 for women who gave birth by caesarean section was "previous caesarean section" (44.0 per cent). A lack of progress in labour was reported for 18.8 per cent of women who had caesarean sections. Fetal compromise occurred in 15.4 per cent of women who gave birth by caesarean section (Table 44).

**Table 44: Frequent complications of labour and birth for women who gave birth by caesarean section in WA, 2013**

<b>Complications of Labour and Birth<sup>33</sup></b>	<b>No.</b>	<b>%</b>
Previous caesarean section	5,128	44.0
No progress in labour	2,188	18.8
Fetal compromise	1,789	15.4
Other Reasons	1,130	9.7
Women with birth by caesarean section and one or more of above	5,884	50.5
Women with birth by caesarean section and other complication	2,298	19.7
<b>Total Women with birth by CS</b>	<b>11,648</b>	<b>100.0</b>

Extracted from Midwives' Notification System on 22 September 2015.

### 3.8.5. Accoucheur

A woman may give birth to more than one infant. Each infant of a birth may have had one or more birth attendants (accoucheurs) reported. These data report the first or only birth attendant for the first or only infant resulting from a pregnancy.

Midwives and obstetricians were the birth attendant in almost equal numbers of birth performing 35.6 and 42.9 per cent, respectively. Other medical officers performed 19.7 per cent. A midwife, or a supervised student, was the accoucheur for 72.4 per cent (12,423) of women who had a spontaneous vertex birth (Table 45)

**Table 45: Method of birth and accoucheur for women who gave birth in WA, 2013**

<b>Accoucheur</b>	<b>Method of Birth</b>										<b>Total</b>	
	<b>Spontaneous Vertex</b>		<b>Assisted Vaginal</b>		<b>Breech</b>		<b>Elective Caesarean</b>		<b>Emergency Caesarean</b>			
	<b>No.</b>	<b>%</b>	<b>No.</b>	<b>%</b>	<b>No.</b>	<b>%</b>	<b>No.</b>	<b>%</b>	<b>No.</b>	<b>%</b>	<b>No.</b>	<b>%</b>
Obstetrician	2,716	15.8	3,024	60.6	37	28.5	4,926	83.3	3,860	67.3	14,563	42.9
Other Med Officer <sup>34</sup>	1,835	10.7	1,965	39.4	31	23.8	988	16.7	1,874	32.7	6,693	19.7
Midwife	12,013	70.0	-	-	62	47.7	-	-	-	-	12,075	35.6
Student	410	2.4	-	-	-	-	-	-	-	-	410	1.2
Self/no attendant	54	0.3	-	-	-	-	-	-	-	-	54	0.2
Other	133	0.8	-	-	-	-	-	-	-	-	133	0.4
<b>Total</b>	<b>17,161</b>	<b>100.0</b>	<b>4,989</b>	<b>100.0</b>	<b>130</b>	<b>100.0</b>	<b>5,914</b>	<b>100.0</b>	<b>5,734</b>	<b>100.0</b>	<b>33,928</b>	<b>100.0</b>

Extracted from Midwives' Notification System on 22 September 2015.

The one birth attendant reported was determined from the order of values reported e.g. If Obstetrician value of 1 reported then a reported midwife value of 2 for the same infant is ignored.

<sup>33</sup> A woman may have nil, one or more complications of labour and birth reported.

<sup>34</sup> Other Medical Officer includes GP Obstetricians, Obstetric Registrars and Residents and District Medical Officers.

### 3.9. Repair of perineum and/or vagina

Among the 22,280 women who gave birth vaginally, there were 35.0 per cent with an intact perineum, 21.4 per cent had an episiotomy performed, and 2.5 per cent had a 3<sup>rd</sup> or 4<sup>th</sup> degree tear involving the anal sphincter. For 14.8 per cent (706) of the women who had an episiotomy, a tear extended the episiotomy. Instrumental births had the highest rates for episiotomy and anal sphincter injury (Table 46).

**Table 46: Method of birth and perineal status for women who gave birth in WA, 2013**

Method of birth	Perineal status				Total	
	Intact	Episiotomy <sup>35</sup>	1 or 2 degree	3 or 4 degree		Other
<b>Number</b>						
Spontaneous	7,243	1,827	7,485	301	305	17,161
Vacuum	432	2,206	1,221	180	43	4,082
Forceps	28	713	87	78	***	***
Breech	100	11	17	***	-	***
<b>Total</b>	<b>7,803</b>	<b>4,757</b>	<b>8,810</b>	<b>***</b>	<b>***</b>	<b>22,280</b>
<b>Row Percentage</b>						
Spontaneous	42.2	10.6	43.6	1.8	1.8	100.0
Vacuum	10.6	54.0	29.9	4.4	1.1	100.0
Forceps	3.1	78.6	9.6	8.6	0.1	100.0
Breech	76.9	8.5	13.1	1.5	-	100.0
<b>Total</b>	<b>35.0</b>	<b>21.4</b>	<b>39.5</b>	<b>2.5</b>	<b>1.6</b>	<b>100.0</b>

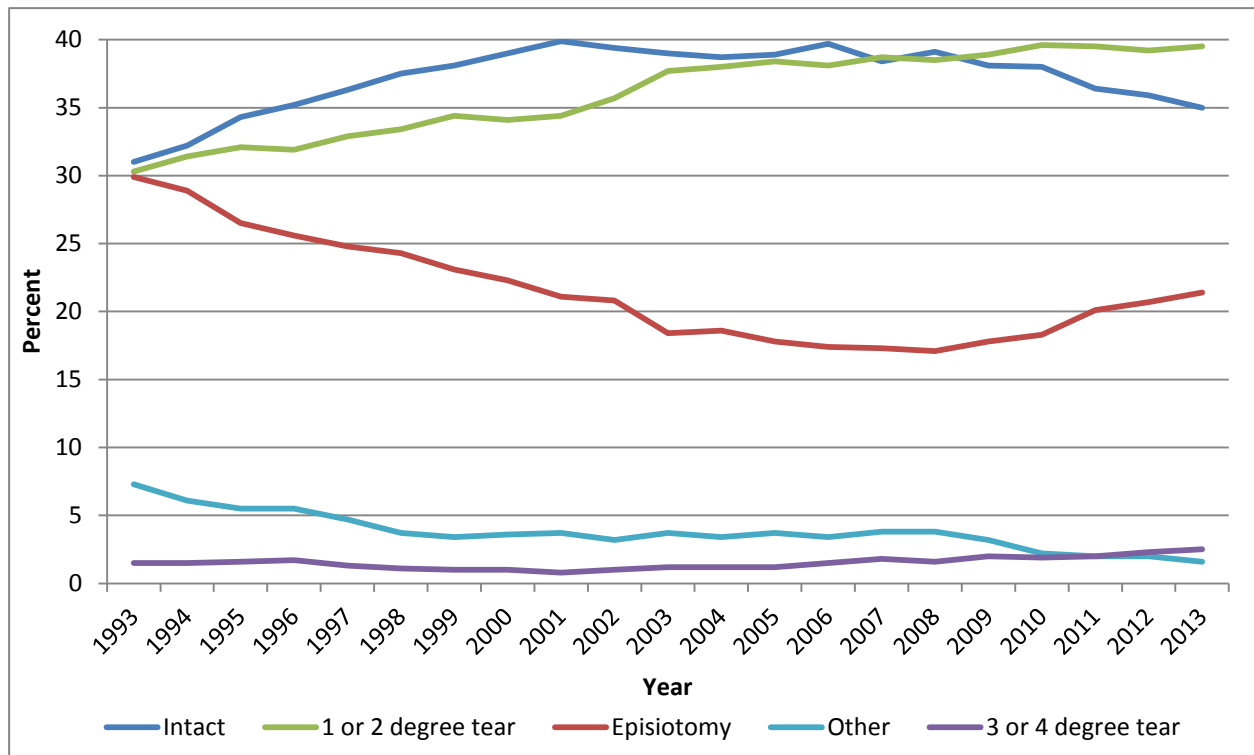
Extracted from Midwives' Notification System on 22 September 2015.

Birth method presented is for the singleton infant or first infant of a multiple birth, perineal status determined after birth of all infants. Values <5 are suppressed and indicated with \*\*\*, other values were suppressed to prevent calculation.

<sup>35</sup> Includes 706 women who had an episiotomy plus tear reported.

Earlier trends indicated a decreasing proportion of episiotomy from 29.9 per cent in 1993 to 17.1 per cent in 2008. However, this trend reversed and attained 21.4 per cent in 2013. The proportion of women with first or second degree perineal trauma increased from 1993 attaining 39.5 per cent in 2013. The proportion of women with anal sphincter injury increased from 0.8 per cent in 2001 to 2.5 per cent in 2013. The change in proportion of women with "Other" perineal status is unable to be explained in data available for analysis (Figure 13).

**Figure 13: Trend of perineal status for women who gave birth vaginally in WA, 1993-2013**



## 4. Aboriginal mothers and infants

In 2013, there were 1,739 Aboriginal women who gave birth in WA. These women comprised 5.1 per cent of all women giving birth (Table 47). This was an increase of 109 Aboriginal women (6.7 per cent) from 2012 (Table 112).

**Table 47: Aboriginal status of women who gave birth in WA, 2013**

Aboriginal status	Number	Percentage
Aboriginal	1,739	5.1
non-Aboriginal	32,189	94.9
<b>Total</b>	<b>33,928</b>	<b>100.0</b>

Extracted from Midwives' Notification System on 22 September 2015.

### 4.1. Maternal age

Maternal age for all women ranged from 13 to 51 years with a mean of 29.8 years and a median of 30 years. Aboriginal women who gave birth were younger with a mean age at birth of 24.6 years, median age of 24 years and most common age (mode) was 20 years (Table 48).

**Table 48: Maternal age summary statistics and Aboriginal status for women who gave birth in WA, 2013**

Maternal age (years)	Aboriginal Status of mother		Total
	Aboriginal	non-Aboriginal	
Minimum age	13	14	13
Maximum age	43	51	51
Mean age	24.6	30.1	29.8
Median age	24	30	30
Mode age	20	31	31
Standard Deviation of age	5.8	5.4	5.6

Extracted from Midwives' Notification System on 22 September 2015.

For Aboriginal women who gave birth in 2013, the largest proportion were aged 20 to 24 years (35.0 per cent). Among non-Aboriginal women, the highest proportion were aged 30 to 34 years (34.2 per cent) (Table 49).

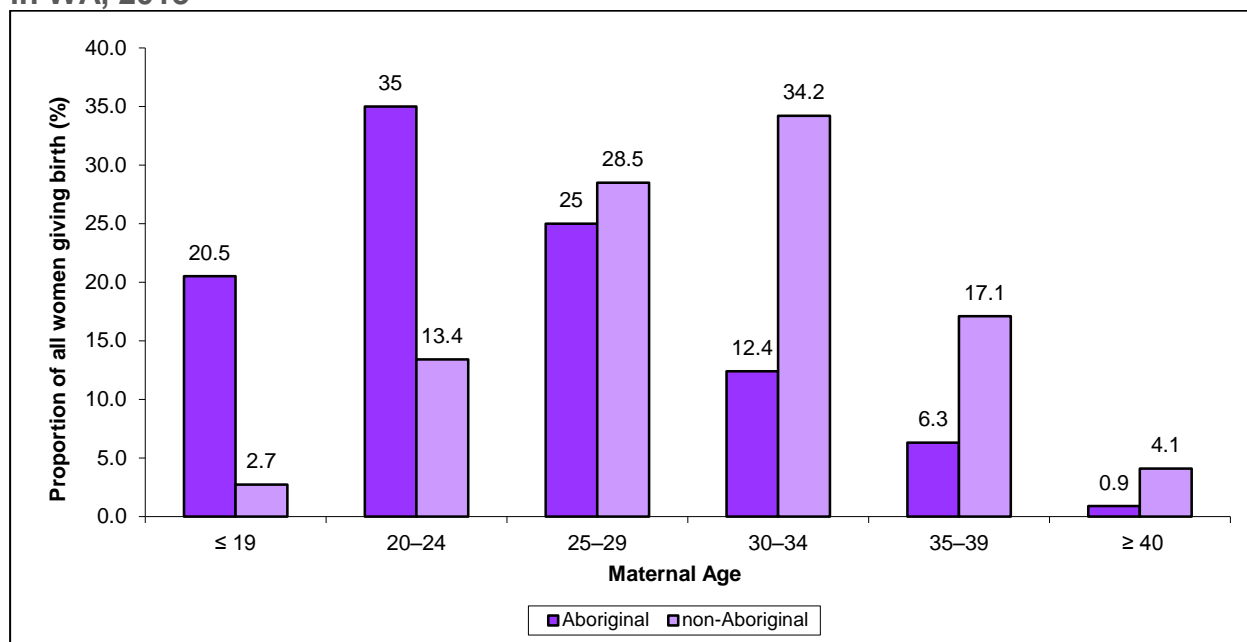
**Table 49: Maternal age and Aboriginal status of women who gave birth in WA, 2013**

Maternal age	Aboriginal status of mother				Total	
	Aboriginal		non-Aboriginal		No.	%
	No.	%	No.	%	No.	%
<=15	25	1.4	27	0.1	52	0.2
16	41	2.4	54	0.2	95	0.3
17	80	4.6	148	0.5	228	0.7
18	96	5.5	226	0.7	322	0.9
19	115	6.6	424	1.3	539	1.6
<b>&lt;=19</b>	<b>357</b>	<b>20.5</b>	<b>879</b>	<b>2.7</b>	<b>1,236</b>	<b>3.6</b>
20-24	609	35.0	4,314	13.4	4,923	14.5
25-29	434	25.0	9,164	28.5	9,598	28.3
30-34	215	12.4	11,010	34.2	11,225	33.1
35-39	109	6.3	5,505	17.1	5,614	16.5
>=40	15	0.9	1,317	4.1	1,332	3.9
<b>Total</b>	<b>1,739</b>	<b>100.0</b>	<b>32,189</b>	<b>100.0</b>	<b>33,928</b>	<b>100.0</b>

Extracted from Midwives' Notification System on 22 September 2015.

The proportion of teenagers in Aboriginal women who gave birth (20.5 per cent) was more than six times greater than teenagers in the non-Aboriginal women (2.7 per cent). Aboriginal women aged 30 to 34 years comprised 12.4 per cent, one third the proportion of non-Aboriginal women that were the age (34.2 per cent) (Figure 14).

**Figure 14: Maternal age distribution by Aboriginal status for women who gave birth in WA, 2013**



Over the past 30 years, the proportion of women who gave birth in WA that were Aboriginal remained relatively consistent, ranging from 5.0 per cent in 1980 to 6.8 per cent in 2002 and 5.1 per cent in 2013 (Table 112).

#### 4.1.1. Age-specific birth rates

The age-specific birth rate for Aboriginal women was 81.5 per 1000 women of child-bearing age. This rate declined from 126.0 in 1990 but was higher than the rate for non-Aboriginal women (62.4 per 1000).

For the 15 to 19 year age group, the age specific birth rate for Aboriginal women (78.3 per 1000) was more than six times the rate for non-Aboriginal women (12.1 per 1000).

For the 20 to 24 year age group, the birth rate for Aboriginal women (144.3 per 1000 women) was almost three times the rate for non-Aboriginal women (50.2 per 1000 women).

For women in the 30 to 34 year age group, the birth rate for Aboriginal women (69.0 per 1000) was just over half the rate for non-Aboriginal women (122.7 per 1000 women).

For women in the 40 to 44 year age group, the birth rate for Aboriginal women (5.2 per 1000) was one third the rate for non-Aboriginal women (14.9 per 1000 women) (Table 50 and Figure 15).

**Table 50: Maternal age-specific birth rates by Aboriginal status of women who gave birth in WA, 2013**

Age	Aboriginal status of women						Total		
	Aboriginal			non-Aboriginal			Women	Pop'n	Birth rate
Women	Pop'n <sup>36</sup>	Birth rate <sup>37</sup>	Women	Pop'n	Birth rate				
15–19	357	4,558	78.3	879	72808	12.1	1,236	77,366	16.0
20–24	609	4,220	144.3	4,314	85904	50.2	4,923	90,124	54.6
25–29	434	3,721	116.6	9,164	96798	94.7	9,598	100,519	95.5
30–34	215	3,116	69.0	11,010	89699	122.7	11,225	92,815	120.9
35–39	109	2,839	38.4	5,505	82330	66.9	5,614	85,169	65.9
40–44	15	2,891	5.2	1,317	88336	14.9	1,332	91,227	14.6
<b>Total</b>	<b>1,739</b>	<b>21,345</b>	<b>81.5</b>	<b>32,189</b>	<b>515,875</b>	<b>62.4</b>	<b>33,928</b>	<b>537,220</b>	<b>63.2</b>

Data Extracted from Midwives' Notification System on 22 September 2015.

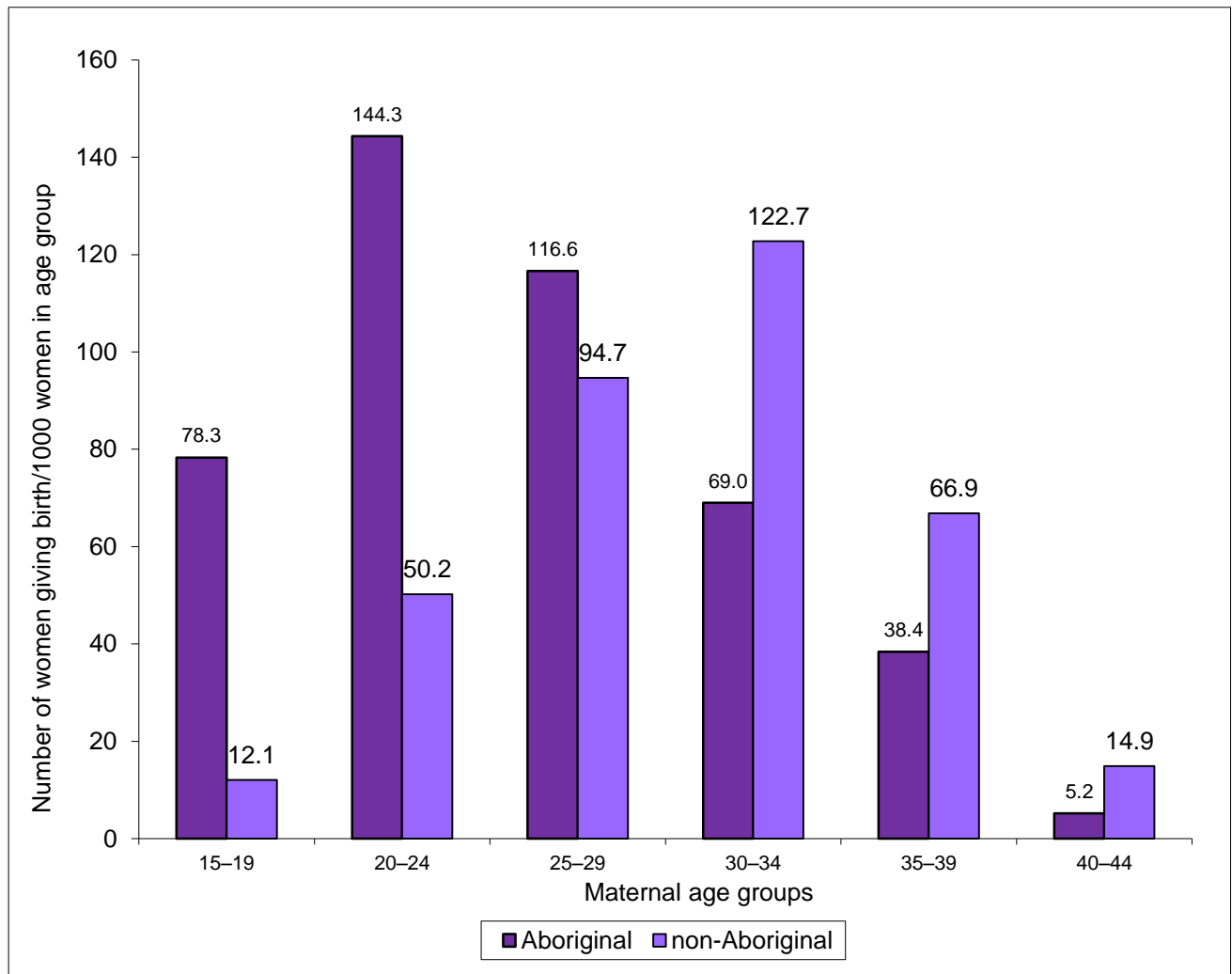
The 15-19 year age group includes births to mothers younger than 15 years of age.

The 40-45 age group includes births to mothers aged 45 years or more.

<sup>36</sup> Source of population data: Epidemiology Branch Rates Calculator, Sep 2015

<sup>37</sup> Age-Specific Birth Rate expressed as the total number of births for women in an age group per 1,000 women of the same age group.

**Figure 15: Maternal age-specific birth rates by Aboriginal status for women who gave birth in WA, 2013**

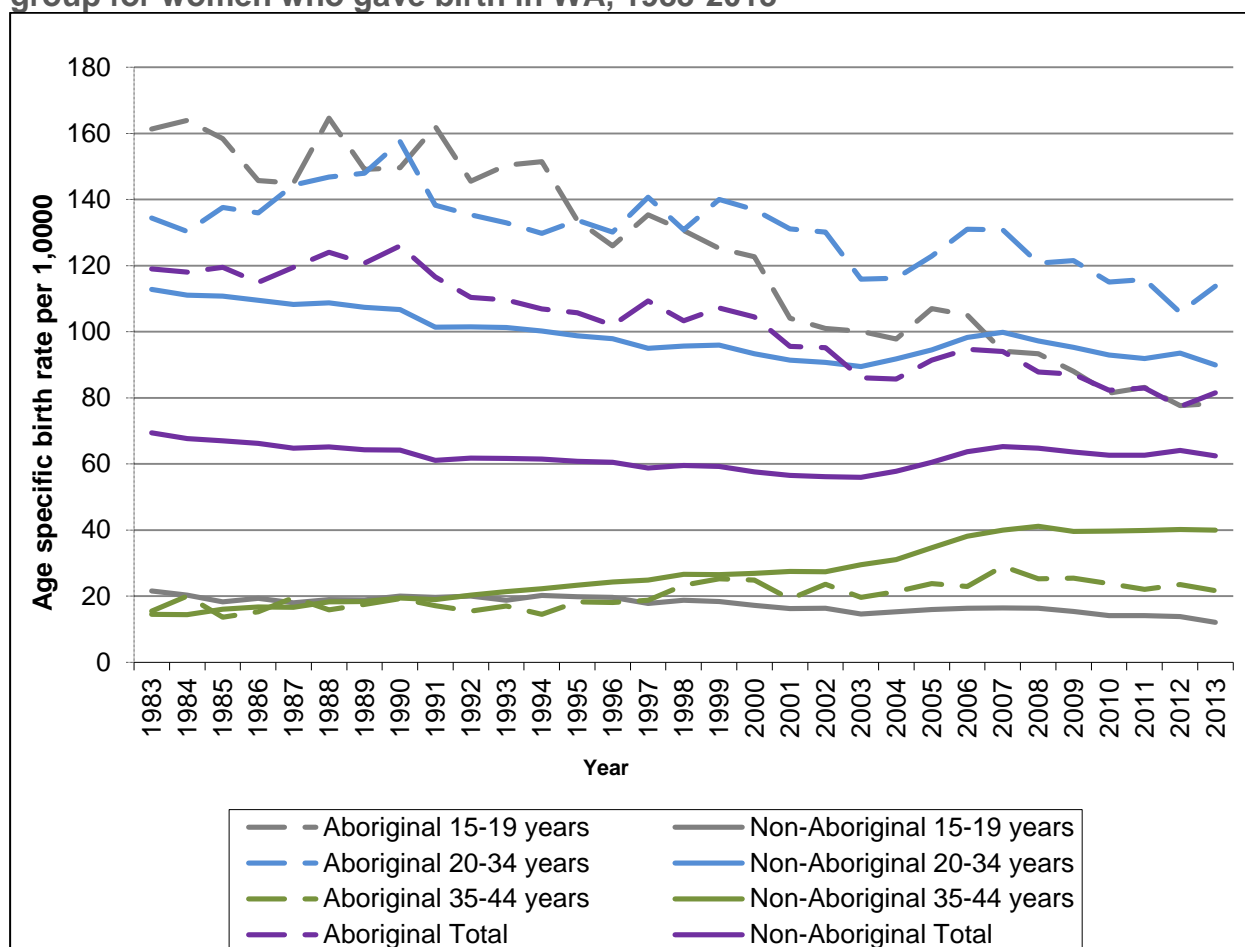


Trend data for the period 1983 to 2013 indicate the age-specific birth rate for women aged 15 to 19 years varied between 27.6 births per 1,000 women in 1983 and 16.1 in 2013. The birth rate for women aged 35 to 44 years increased from 14.5 in 1983 to 40.6 per 1,000 women in 2008. In 2013, the rate was 39.4 per 1,000 women of childbearing age (Table 111Table 111).

For Aboriginal women, the trend in age-specific birth rates for teenage women more than halved since 1988 from 164.6 to 78.3 per 1,000 in 2013. The birth rate for 20 to 34 year old Aboriginal women varied slightly since 1983 from 134.4 to 113.8 per 1,000 women in 2013. Older Aboriginal women, aged 35 years or more had a birth rate that increased from 15.5 in 1983 to 29.0 per 1,000 in 2007 and then decreased each year until it reached 21.6 per 1,000 in 2013 (Figure 16 and Table 111).

Generally the age-specific birth rate for non-Aboriginal women in 2013 of 62.4 per 1,000 was below the 1983 rate of 69.4 per 1000. The annual trend of age-specific birth rate declined over the same period from 119.0 in 1983 to 81.5 per 1000 Aboriginal women (Figure 16 and Table 111).

**Figure 16: Trend in maternal age-specific birth rates by Aboriginal status and age group for women who gave birth in WA, 1983-2013**



## 4.2. Health region of residence

Aboriginal women accounted for 5.1 per cent of women who gave birth in 2013. However, the proportion of women who were Aboriginal varied across health regions of residence.

The lowest proportions of Aboriginal women in any health region were in the metropolitan areas with 2.0 per cent in the north and 3.0 per cent in the south. Of women who lived in the country at the time they gave birth, 15.0 per cent were Aboriginal. The range in proportion of country women where were Aboriginal was between 3.2 per cent in the Southwest and 58.9 per cent in the Kimberley.

Amongst Aboriginal women, 37.9 per cent were metropolitan residents and 62.1 per cent lived in the country health regions whereas most non-Aboriginal women (80.9 per cent) lived in a metropolitan health region and 19.1 per cent resided in a country region (Table 51).



**Table 51: Health region of residence and Aboriginal status of women who gave birth in WA, 2013**

Health region of residence	Aboriginal Status of mother		Total
	Aboriginal	non-Aboriginal	
<b>Numbers</b>			
<b>Metropolitan</b>	<b>659</b>	<b>26,000</b>	<b>26,659</b>
North	268	13,148	13,416
South	391	12,852	13,243
<b>Country</b>	<b>1,079</b>	<b>6,119</b>	<b>7,198</b>
Goldfields	116	815	931
Great Southern	52	688	740
Kimberley	416	290	706
Midwest	183	705	888
Pilbara	156	698	854
Southwest	70	2,112	2,182
Wheatbelt	86	811	897
<b>Total</b>	<b>1,738</b>	<b>32,119</b>	<b>33,857</b>
<b>Row Percentage</b>			
<b>Metropolitan</b>	<b>2.5</b>	<b>97.5</b>	<b>100.0</b>
North	2.0	98.0	100.0
South	3.0	97.0	100.0
<b>Country</b>	<b>15.0</b>	<b>85.0</b>	<b>100.0</b>
Goldfields	12.5	93.0	100.0
Great Southern	7.0	41.1	100.0
Kimberley	58.9	79.4	100.0
Midwest	20.6	81.7	100.0
Pilbara	18.3	96.8	100.0
Southwest	3.2	90.4	100.0
Wheatbelt	9.6	87.5	100.0
<b>Total</b>	<b>5.1</b>	<b>94.9</b>	<b>100.0</b>
<b>Column Percentage</b>			
<b>Metropolitan</b>	<b>37.9</b>	<b>80.9</b>	<b>78.7</b>
North	15.4	40.9	39.6
South	22.5	40.0	39.1
<b>Country</b>	<b>62.1</b>	<b>19.1</b>	<b>21.3</b>
Goldfields	6.7	2.5	2.9
Great Southern	3.0	2.1	2.1
Kimberley	23.9	0.9	2.0
Midwest	10.5	2.2	2.7
Pilbara	9.0	2.2	2.6
Southwest	4.0	6.6	6.5
Wheatbelt	4.9	2.5	2.9
<b>Total</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>

Extracted from Midwives' Notification System on 22 September 2015.

 71 women, including 1 who was Aboriginal, were excluded as their residence was not within Western Australia<sup>38</sup>.

<sup>38</sup> Permanent residence reported was an external Australian Territory like Christmas Island, other Australian state or other country.

### 4.3. Care during pregnancy

The proportion of women who gave birth in 2013 with an undetermined gestational age at first antenatal care visit decreased from 10.0 per cent in 2011 to 6.4 per cent in 2013.

The proportion of women who did not attend antenatal care also decreased, from 1.9 per cent in 2011 to 0.2 per cent in 2013.

For Aboriginal women who gave birth in 2013, 46.1 per cent commenced antenatal care in the first trimester. They were less likely than non-Aboriginal women to commence antenatal care in the first trimester (RR 0.8) and were almost nine times more likely not to attend antenatal care (RR 8.9). Aboriginal women were less likely to have gestational age at first antenatal care visit to not be determined (RR 0.8) (Table 52).

**Table 52: Gestation at first antenatal care visit and Aboriginal status of women who gave birth in WA, 2013**

Aboriginal Status	Gestational Age Groups (weeks)					Total
	1-12	13-24	>24	Did not Attend	Not Determined	
<b>Number</b>						
Aboriginal	801	539	290	23	86	1,739
non-Aboriginal	19,381	8,147	2,527	48	2,086	32,189
<b>Total</b>	<b>20,182</b>	<b>8,686</b>	<b>2,817</b>	<b>71</b>	<b>2,172</b>	<b>33,928</b>
<b>Percentage</b>						
Aboriginal	46.1	31.0	16.7	1.3	4.9	100.0
non-Aboriginal	60.2	25.3	7.9	0.1	6.5	100.0
<b>Total</b>	<b>59.5</b>	<b>25.6</b>	<b>8.3</b>	<b>0.2</b>	<b>6.4</b>	<b>100.0</b>
<b>Relative Risk (RR)</b>						
Aboriginal	0.8	1.2	2.1	8.9	0.8	
non-Aboriginal	1.0	1.0	1.0	1.0	1.0	

Extracted from Midwives' Notification System on 22 September 2015.

For Aboriginal women, antenatal care in the first trimester was received by the highest proportion in the Southwest (64.3 per cent) and the Kimberley (62.3 per cent) regions. For non-Aboriginal women the highest proportions were for residents in the Kimberley (81.4 per cent), the Great Southern (74.0 per cent) and the Southwest health regions (67.7 per cent) (Table 53).

**Table 53: Gestation at first antenatal care visit, Aboriginal status and health region of residence of women who gave birth in WA, 2013**

Aboriginal status	Health region	Gestational age group (weeks)					Total
		1-12 %	13-24 %	>24 %	Did not attend %	Not determined %	
Aboriginal	North Metro	30.6	36.6	29.5	1.9	1.5	100.0
	South Metro	40.9	34.3	17.1	1.3	6.4	100.0
	Goldfields	36.2	19.8	12.1	2.6	29.3	100.0
	Great Southern	53.8	26.9	13.5	.	5.8	100.0
	Kimberley	62.3	29.1	7.5	0.7	0.5	100.0
	Midwest	53.0	26.2	14.2	.	6.6	100.0
	Pilbara	33.3	36.5	27.6	1.3	1.3	100.0
	Southwest	64.3	22.9	5.7	2.9	4.3	100.0
	Wheatbelt	41.9	31.4	22.1	3.5	1.2	100.0
<b>Aboriginal Total</b>		<b>46.1</b>	<b>31.0</b>	<b>16.7</b>	<b>1.3</b>	<b>4.9</b>	<b>100.0</b>
non-Aboriginal	North Metro	58.5	30.2	9.6	0.1	1.6	100.0
	South Metro	60.1	24.0	7.0	0.2	8.7	100.0
	Goldfields	61.6	10.8	2.6	0.1	24.9	100.0
	Great Southern	74.0	17.3	4.5	0.3	3.9	100.0
	Kimberley	81.4	14.5	3.8	.	0.3	100.0
	Midwest	65.8	23.8	5.7	0.1	4.5	100.0
	Pilbara	44.8	39.8	12.2	.	3.2	100.0
	Southwest	67.7	8.9	2.2	0.0	21.2	100.0
	Wheatbelt	60.2	23.1	13.9	0.2	2.6	100.0
<b>non-Aboriginal Total</b>		<b>60.3</b>	<b>25.3</b>	<b>7.8</b>	<b>0.1</b>	<b>6.5</b>	<b>100.0</b>
<b>Grand Total</b>		<b>59.5</b>	<b>25.6</b>	<b>8.3</b>	<b>0.2</b>	<b>6.4</b>	<b>100.0</b>

Extracted from Midwives' Notification System on 22 September 2015.

Excludes 71 women (1 Aboriginal) where maternal residence was not within WA.

#### 4.4. Previous pregnancies

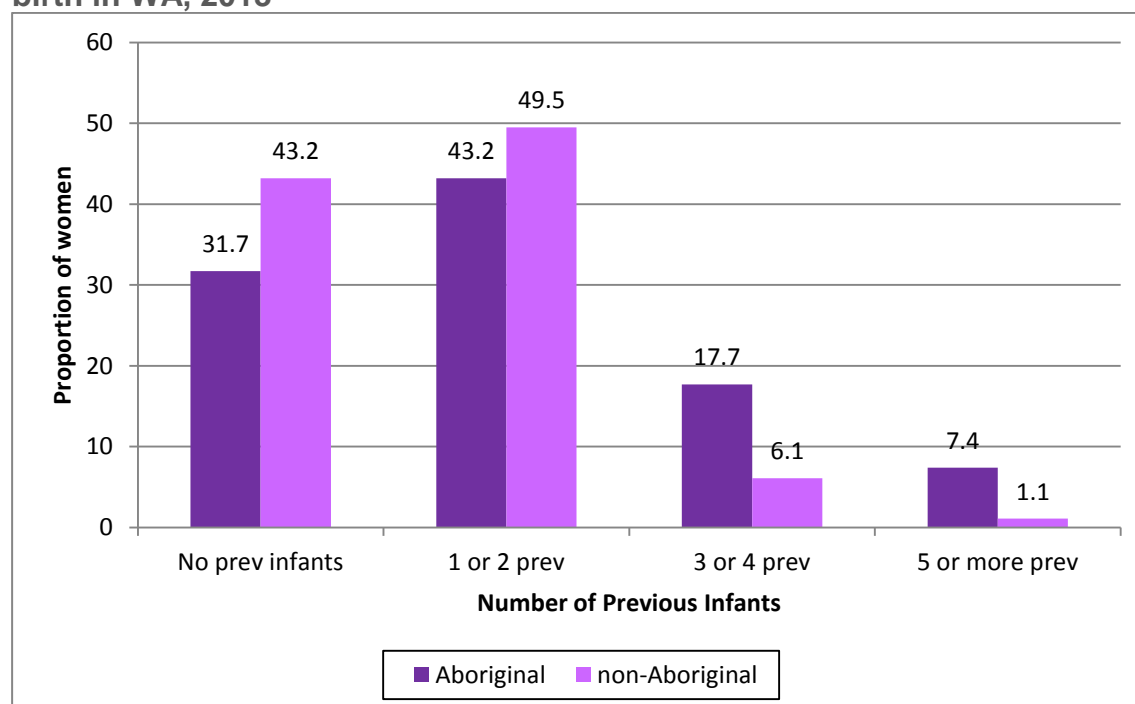
The proportion of Aboriginal women who gave birth to their first infant (31.7 per cent) was lower than for non-Aboriginal women (43.2 per cent). Conversely, the proportion of Aboriginal women who gave birth to their fifth, or higher, child (7.4 per cent) was more than five times higher than that for non-Aboriginal women (1.4 per cent) (Table 54).

**Table 54: Number of previous infants and Aboriginal status of women who gave birth in WA, 2013**

Number Previous Infants	Aboriginal Status of Mother				Total	
	Aboriginal		non-Aboriginal		No.	%
	No.	%	No.	%		
Nil	552	31.7	13,910	43.2	14,462	42.6
One or two	752	43.2	15,943	49.5	16,695	49.2
Three or four	307	17.7	1,976	6.1	2,283	6.7
Five or more	128	7.4	360	1.1	488	1.4
<b>Total</b>	<b>1,739</b>	<b>100.0</b>	<b>32,189</b>	<b>100.0</b>	<b>33,928</b>	<b>100.0</b>

Extracted from Midwives' Notification System on 22 September 2015.

**Figure 17: Number of previous infants and Aboriginal status of women who gave birth in WA, 2013**



For all women who gave birth in 2013, 17.3 percent had a history of caesarean section. In Aboriginal women, 15.8 per cent had a history of caesarean section.

The proportion of Aboriginal women with a history of caesarean section and a caesarean section immediately before the birth in 2013 (12.8 per cent) was less than the proportion of non-Aboriginal women (16.5 per cent) (Table 55).

**Table 55: Previous caesarean section and Aboriginal status of women who gave birth in WA, 2013**

CS in previous deliveries	Aboriginal status of woman				Total	
	Aboriginal		non-Aboriginal			
	No.	%	No.	%	No.	%
No Previous CS	1,464	84.2	26,571	82.5	28,035	82.6
Previous CS, Vaginal Birth Last Delivery	52	3.0	299	0.9	351	1.0
Previous CS, CS Last Delivery	223	12.8	5,319	16.5	5,542	16.3
<b>Total</b>	<b>1,739</b>	<b>100.0</b>	<b>32,189</b>	<b>100.0</b>	<b>33,928</b>	<b>100.0</b>

Extracted from Midwives' Notification System on 22 September 2015.

The proportions of Aboriginal women who had given birth previously to a stillborn infant (4.5 per cent) or an infant who died following birth (3.3 per cent) or a history of both (7.6 per cent) were twice the proportion of non-Aboriginal women (2.0, 1.2 and 3.2 per cent respectively) (Table 56).

**Table 56: Number of previous infants who died and Aboriginal status of women who gave birth in WA, 2013**

Stillbirth or Death Previous Deliveries	Aboriginal Status of Mother				Total	
	Aboriginal		non-Aboriginal			
	No.	%	No.	%	No.	%
<b>Previous stillborn infants</b>						
None	1,134	95.5	17,908	98.0	19,042	97.8
One or more	53	4.5	371	2.0	424	2.2
<b>Previous infants that died</b>						
None	1,148	96.7	18,056	98.8	19,204	98.7
One or more	39	3.3	223	1.2	262	1.3
<b>Previous stillbirth or infant that died</b>						
None	1,097	92.4	17,694	96.8	18,791	96.5
One or more	90	7.6	585	3.2	675	3.5
<b>Total with previous babies</b>	<b>1,187</b>	<b>100.0</b>	<b>18,279</b>	<b>100.0</b>	<b>19,466</b>	<b>100.0</b>

Extracted from Midwives' Notification System on 22 September 2015.

Excludes 14,462 women (552 Aboriginal) without previous infants.

#### 4.5. Smoking tobacco during pregnancy

Smoking tobacco during pregnancy is associated with low birth weight, premature birth and perinatal death (Laws, Grayson, & Sullivan, 2006).

Almost half the Aboriginal women reported smoking tobacco during pregnancy (48.7 per cent), more than five times the proportion of non-Aboriginal women (8.7 per cent) (Table 57).

**Table 57: Tobacco smoking and Aboriginal status of women who gave birth in WA, 2013**

Aboriginal status	Smoking in pregnancy				Total	
	Smoking		Non-smoking		No.	%
	No.	%	No.	%		
Aboriginal	847	48.7	892	51.3	1,739	100.0
non-Aboriginal	2,798	8.7	29,391	91.3	32,189	100.0
<b>Total</b>	<b>3,645</b>	<b>10.7</b>	<b>30,283</b>	<b>89.3</b>	<b>33,928</b>	<b>100.0</b>

Extracted from Midwives' Notification System on 22 September 2015.

Tobacco smoking by pregnant women varied across regions of residence and was highest in country areas. Amongst those living in the country the proportion of women who smoked ranged from 15.2 per cent in the Southwest to 37.3 per cent in the Kimberley. In metropolitan areas the proportion who smoked tobacco was 8.4 per cent in the north and 6.9 per cent in the south.

A higher proportion of Aboriginal women smoked tobacco during pregnancy. The highest proportions of Aboriginal women who smoked were 57.7 per cent in the Great Southern, 56.0 per cent in the Kimberley, and 51.2 per cent in the Wheatbelt.

The highest proportion of tobacco smoking (18.1 per cent) was in non-Aboriginal women living in the Wheatbelt (Table 58).

**Table 58: Tobacco smoking, health region of residence and Aboriginal status of women who gave birth in WA, 2013**

Place of residence	Maternal Aboriginal Status		Total
	Aboriginal	non-Aboriginal	
<b>Numbers</b>			
<b>Metro</b>	<b>294</b>	<b>1,955</b>	<b>2,249</b>
North Metro	115	809	924
South Metro	179	1,146	1,325
<b>Country</b>	<b>552</b>	<b>840</b>	<b>1,392</b>
Goldfields	52	132	184
Great Southern	30	89	119
Kimberley	233	30	263
Midwest	83	104	187
Pilbara	78	61	139
Southwest	32	277	309
Wheatbelt	44	147	191
<b>Total</b>	<b>846</b>	<b>2,795</b>	<b>3,641</b>
<b>Row Percentage</b>			
<b>Metro</b>	<b>44.6</b>	<b>7.5</b>	<b>8.4</b>
North Metro	42.9	6.2	6.9
South Metro	45.8	8.9	10.0
<b>Country</b>	<b>51.2</b>	<b>13.7</b>	<b>19.3</b>
Goldfields	44.8	16.2	19.8
Great Southern	57.7	12.9	16.1
Kimberley	56.0	10.3	37.3
Midwest	45.4	14.8	21.1
Pilbara	50.0	8.7	16.3
Southwest	45.7	13.1	15.2
Wheatbelt	51.2	18.1	21.3
<b>Total</b>	<b>51.3</b>	<b>9.7</b>	<b>10.8</b>

Extracted from Midwives' Notification System on 22 September 2015.

46 women, including 2 who were Aboriginal, were excluded as their residence was not within Western Australia.

Denominators used to calculate Row Percentage in this table are those totals presented in Table 51.

The average number of cigarettes smoked per day reported for two time periods during pregnancy (first and second 20 weeks of gestation) indicate that 50.6 per cent (880) of Aboriginal women did not smoke at any time during pregnancy and 66 (3.8 per cent) stopped smoking. There was no change in number of cigarettes smoked per day for 656 (37.7 per cent) of Aboriginal women. A small proportion, 2.0 per cent (35 women) increased the average cigarette number they smoked daily (Table 59).

**Table 59: Number of Aboriginal women by average number of cigarettes smoked before and after 20 weeks of pregnancy in WA, 2013**

After 20 weeks of pregnancy	First 20 weeks of pregnancy							Total
	Not reported	Did not smoke	Occasional	<10	10 to 19	20 to 29	≥ 30	
<b>Numbers</b>								
Not reported	10	-	-	-	-	1	-	11
Did not smoke	2	880	-	48	14	2	2	948
Occasional	-	1	1	-	-	-	-	2
<10	1	12	-	384	49	10	2	458
10 to 19	-	3	-	12	198	22	1	236
20 to 29	-	2	-	-	4	64	4	74
30 or more	-	-	-	1	-	-	9	10
<b>Total</b>	<b>13</b>	<b>898</b>	<b>1</b>	<b>445</b>	<b>265</b>	<b>99</b>	<b>18</b>	<b>1,739</b>

Extracted from Midwives' Notification System on 22 September 2015.

Green highlight indicates decreased or nil smoking during pregnancy.

Orange highlight indicates no change in smoking during pregnancy.

Red highlight indicates increased smoking during pregnancy.

#### 4.6. Complications of Pregnancy

There were nine complications of pregnancy able to be reported for each birth. A tenth option was "Other" described with free text or ICD-10 codes. One-third (32.1 per cent) of all women who gave birth in 2013, had one or more complications during pregnancy.

For Aboriginal women, a higher proportion (36.5 per cent) had one or more complications during pregnancy compared with non-Aboriginal women (31.8 per cent) (Table 60).

**Table 60: Complication of pregnancy, health region of residence and Aboriginal status of women who gave birth in WA, 2013**

Place of residence	Aboriginal Status				Total	
	Aboriginal		non-Aboriginal		No.	%
	No.	%	No.	%		
<b>Metro</b>	<b>256</b>	<b>14.7</b>	<b>8,389</b>	<b>26.1</b>	<b>8,645</b>	<b>25.5</b>
North Metro	100	5.8	4,417	13.8	4,517	13.3
South Metro	156	9.0	3,972	12.4	4,128	12.2
<b>Country</b>	<b>379</b>	<b>21.8</b>	<b>1,831</b>	<b>5.7</b>	<b>2,210</b>	<b>6.5</b>
Goldfields	36	2.1	302	0.9	338	1.0
Great Southern	17	1.0	183	0.6	200	0.6
Kimberley	164	9.4	92	0.3	256	0.8
Midwest	54	3.1	186	0.6	240	0.7
Pilbara	55	3.2	193	0.6	248	0.7
Southwest	24	1.4	650	2.0	674	2.0
Wheatbelt	29	1.7	225	0.7	254	0.8
<b>Had one or more complications</b>	<b>635</b>	<b>36.5</b>	<b>10,220</b>	<b>31.8</b>	<b>10,855</b>	<b>32.1</b>
<b>Had no complication of pregnancy</b>	<b>1,103</b>	<b>63.5</b>	<b>21,899</b>	<b>68.2</b>	<b>23,002</b>	<b>67.9</b>
<b>Total Women</b>	<b>1,738</b>	<b>100.0</b>	<b>32,119</b>	<b>100.0</b>	<b>33,857</b>	<b>100.0</b>

Extracted from Midwives' Notification System on 22 September 2015.

70 women, including 1 who was Aboriginal, were excluded as their residence was not within Western Australia.



Higher rates of the pregnancy complications threatened miscarriage, haemorrhage from placenta praevia and gestational diabetes were reported in non-Aboriginal women than in Aboriginal women. Aboriginal women experienced urinary tract infection three times as often and threatened preterm labour or prelabour rupture of membranes twice as often as did non-Aboriginal women (Table 61).

The lower proportion of Aboriginal women with gestational diabetes may be explained their incidence of pre-existing diabetes described in Table 62.

**Table 61: Complications of pregnancy and Aboriginal status of women who gave birth in WA, 2013**

Complications of Pregnancy <sup>39</sup>	Aboriginal Status				Total	
	Aboriginal		non-Aboriginal		No.	%
	No.	%	No.	%	No.	%
Threatened miscarriage	***	***	675	2.1	***	2.0
Threatened preterm labour	71	4.1	728	2.3	799	2.4
Urinary tract infection	154	8.9	927	2.9	1,081	3.2
Pre-eclampsia	43	2.5	715	2.2	758	2.2
Antepartum haemorrhage						
— placenta praevia	***	***	116	0.4	***	0.4
— abruption	6	0.3	73	0.2	79	0.2
— other	42	2.4	722	2.2	764	2.3
Prelabour rupture of membranes	98	5.6	1,169	3.6	1,267	3.7
Gestational diabetes	118	6.8	2,407	7.5	2,525	7.4
Other	306	17.6	4,958	15.4	5,264	15.5
<b>One or more complications</b>	<b>635</b>	<b>36.5</b>	<b>10,252</b>	<b>31.9</b>	<b>10,887</b>	<b>32.1</b>
No complications of pregnancy	1,104	63.5	21,937	68.1	23,041	67.9
<b>Total Women</b>	<b>1,739</b>	<b>100.0</b>	<b>32,189</b>	<b>100.0</b>	<b>33,928</b>	<b>100.0</b>

Extracted from Midwives' Notification System on 22 September 2015.

Values <5 are suppressed and indicated with \*\*\*, other values were suppressed to prevent calculation.

<sup>39</sup> A woman may have more than one complication during pregnancy

#### 4.7. Medical conditions before pregnancy

There were four pre-existing medical conditions able to be reported for each woman that gave birth. A fifth option was "Other" described with text or ICD-10 codes. More than one-third (42.3 per cent) of all women who gave birth in 2013, had one or more pre-existing medical conditions. For Aboriginal women, the proportion (53.0 per cent) was higher than for non-Aboriginal women (41.7 per cent) (Table 62).

In 2013, the proportion of Aboriginal women with pre-existing diabetes (2.5 per cent) was four times the proportion of non-Aboriginal women with the same condition (0.6 per cent). A higher proportion of Aboriginal women had "Other" medical conditions reported than non-Aboriginal women did, 45.4 per cent and 33.6 per cent respectively.

For most other specified conditions, a slightly higher proportion of Aboriginal women than non-Aboriginal women were affected (Table 62).

**Table 62: Pre-existing medical conditions and Aboriginal status of women who gave birth in WA, 2013**

Medical Conditions before Pregnancy <sup>40</sup>	Aboriginal Status				Total	
	Aboriginal		non-Aboriginal			
	No.	%	No.	%	No.	%
Essential hypertension	23	1.3	348	1.1	371	1.1
Pre-existing diabetes	44	2.5	202	0.6	246	0.7
Asthma	203	11.7	3,247	10.1	3,450	10.2
Genital herpes	22	1.3	620	1.9	642	1.9
Other	789	45.4	10,815	33.6	11,604	34.2
<b>One or more conditions</b>	<b>921</b>	<b>53.0</b>	<b>13,421</b>	<b>41.7</b>	<b>14,342</b>	<b>42.3</b>
No medical conditions	818	47.0	18,768	58.3	19,586	57.7
<b>Total Women</b>	<b>1,739</b>	<b>100.0</b>	<b>32,189</b>	<b>100.0</b>	<b>33,928</b>	<b>100.0</b>

Extracted from Midwives' Notification System on 22 September 2015.

<sup>40</sup> A woman may have more than one pre-existing medical condition

#### 4.8. Procedures and treatments

There were seven procedures and treatments able to be reported for each woman who gave birth. Of all women who gave birth in 2013, 97.4 per cent had one or more of the listed procedures and treatments. For Aboriginal women, the proportion (99.1 per cent) was similar to non-Aboriginal women (97.3 per cent) (Table 63).

The proportion of Aboriginal women who had an antenatal (23.6 per cent) or intrapartum cardiotocograph (60.8 per cent) was higher than for non-Aboriginal women, 23.1 and 56.5 per cent respectively. A slightly higher proportion of Aboriginal women had cervical suture or ultrasound. For all other specified procedures and treatment, a lower proportion of Aboriginal women than non-Aboriginal women received the procedure or treatment (Table 63).

**Table 63: Procedures, treatments and Aboriginal status of women who gave birth in WA, 2013**

Procedures and Treatments <sup>41</sup>	Aboriginal Status				Total	
	Aboriginal		non-Aboriginal		No.	%
	No.	%	No.	%		
Fertility treatments	8	0.5	1,120	3.5	1,128	3.3
Cervical suture	***	***	81	0.3	***	0.3
CVS (placental biopsy)	***	***	120	0.4	***	0.4
Amniocentesis	11	0.6	840	2.6	851	2.5
Ultrasound	1,707	98.2	30,528	94.8	32,235	95.0
CTG antepartum	411	23.6	7,429	23.1	7,840	23.1
CTG intrapartum	1,058	60.8	18,183	56.5	19,241	56.7
<b>One or more procedures</b>	<b>1,723</b>	<b>99.1</b>	<b>31,307</b>	<b>97.3</b>	<b>33,030</b>	<b>97.4</b>
No procedures	16	0.9	882	2.7	898	2.6
<b>Total Women</b>	<b>1,739</b>	<b>100.0</b>	<b>32,189</b>	<b>100.0</b>	<b>33,928</b>	<b>100.0</b>

Extracted from Midwives' Notification System on 22 September 2015.

Values <5 are suppressed and indicated with \*\*\*, other values were suppressed to prevent calculation.

<sup>41</sup> A woman may have more than one treatment or procedure during the pregnancy

## 4.9. Labour and birth details

### 4.9.1. Onset of labour

Labour established spontaneously for 62.7 per cent of Aboriginal women. This was a higher proportion than for non-Aboriginal women (49.4 per cent).

Labour was induced for 25.4 per cent of Aboriginal women.

A lower proportion of Aboriginal women (11.9 per cent) than non-Aboriginal women (21.1 per cent) gave birth by caesarean section before labour (Table 64).

**Table 64: Onset of labour and Aboriginal status of women who gave birth in WA, 2013**

Onset of labour	Aboriginal Status				Total	
	Aboriginal		non-Aboriginal		No.	%
	No.	%	No.	%		
Spontaneous not Augmented	793	45.6	10,072	31.3	10,865	32.0
Spontaneous and Augmented	297	17.1	5,814	18.1	6,111	18.0
Induced	442	25.4	9,497	29.5	9,939	29.3
No labour	207	11.9	6,806	21.1	7,013	20.7
<b>Total</b>	<b>1,739</b>	<b>100.0</b>	<b>32,189</b>	<b>100.0</b>	<b>33,928</b>	<b>100.0</b>

Extracted from Midwives' Notification System on 22 September 2015.

### 4.9.2. Place of birth

The largest proportion of Aboriginal women for place they gave birth was at the tertiary maternity service (24.1 per cent) and 21.9 per cent gave birth in health services in the Kimberley. Twice the proportion of Aboriginal women gave birth in the southern (13.2 per cent) than in the northern metropolitan region (6.6 per cent). Most Aboriginal women gave birth in public hospitals (99.2 per cent) (Table 65).

**Table 65: Place of birth and Aboriginal status of women who gave birth in WA, 2013**

Place of birth	Aboriginal status		Total
	Aboriginal	non-Aboriginal	
	Number		
Private Homebirth	-	68	68
<b>Metro</b>	<b>847</b>	<b>27,303</b>	<b>28,150</b>
Private Metro	***	8,647	***
Private site with Public	69	4,169	4,238
Public Homebirth	-	144	144
Birth Centres	***	357	***
Tertiary	419	4,964	5,383
North Metro	115	2,765	2,880
South Metro	230	6,257	6,487
<b>Country</b>	<b>892</b>	<b>4,818</b>	<b>5,710</b>
Private Country	***	804	***
Goldfields	104	745	849
Great Southern	39	577	616
Kimberley	381	261	642
Midwest	144	395	539
Pilbara	137	455	592
Southwest	56	1,410	1,466
Wheatbelt	***	180	***
<b>Total</b>	<b>1,739</b>	<b>32,189</b>	<b>33,928</b>

Western Australia's Mothers and Babies, 2013, 31<sup>st</sup> Annual Report

Place of birth	Aboriginal status		Total
	Aboriginal	non-Aboriginal	
<b>Row Percentage</b>			
Private Homebirth	-	100.0	100.0
<b>Metro</b>	<b>3.0</b>	<b>97.0</b>	<b>100.0</b>
Private Metro	0.2	99.8	100.0
Private site with Public	1.6	98.4	100.0
Public Homebirth	-	100.0	100.0
Birth Centres	0.3	99.7	100.0
Tertiary	7.8	92.2	100.0
North Metro	4.0	96.0	100.0
South Metro	3.5	96.5	100.0
<b>Country</b>	<b>15.6</b>	<b>84.4</b>	<b>100.0</b>
Private Country	0.2	99.8	100.0
Goldfields	12.2	87.8	100.0
Great Southern	6.3	93.7	100.0
Kimberley	59.3	40.7	100.0
Midwest	26.7	73.3	100.0
Pilbara	23.1	76.9	100.0
Southwest	3.8	96.2	100.0
Wheatbelt	13.9	86.1	100.0
<b>Total</b>	<b>5.1</b>	<b>94.9</b>	<b>100.0</b>
<b>Column Percentage</b>			
Private Homebirth	-	0.2	0.2
<b>Metro</b>	<b>48.7</b>	<b>84.8</b>	<b>82.9</b>
Private Metro	0.7	26.9	25.5
Private site with Public	4.0	13.0	12.5
Public Homebirth	-	0.4	0.4
Birth Centres	0.1	1.1	1.1
Tertiary	24.1	15.4	15.9
North Metro	6.6	8.6	8.5
South Metro	13.2	19.4	19.1
<b>Country</b>	<b>51.3</b>	<b>15.0</b>	<b>16.9</b>
Private Country	0.1	2.5	2.4
Goldfields	6.0	2.3	2.5
Great Southern	2.2	1.8	1.8
Kimberley	21.9	0.8	1.9
Midwest	8.3	1.2	1.6
Pilbara	7.9	1.4	1.7
Southwest	3.2	4.4	4.3
Wheatbelt	1.7	0.6	0.6
<b>Total</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>

Extracted from Midwives' Notification System on 22 September 2015.

Values <5 are suppressed and indicated with \*\*\*, other values were suppressed to prevent calculation.

### 4.9.3. Method of birth

A higher proportion of Aboriginal women had spontaneous vertex (65.6 per cent) and breech births (1.2 per cent) than did non-Aboriginal women (49.8 and 0.3 per cent respectively). Aboriginal women had a lower caesarean section rate (26.1 per cent) when compared to the rate for non-Aboriginal women (34.8 per cent) with elective caesarean proportion in non-Aboriginal women (17.9 per cent) more than twice that of Aboriginal women (8.3 per cent). Proportions of instrumental vaginal births in Aboriginal women (5.1 and 2.1 per cent) were less than those for non-Aboriginal women (12.4 and 2.7 per cent respectively) (Table 66).

**Table 66: Method of birth and Aboriginal status for women who gave birth in WA, 2013**

Method of birth of first infant	Aboriginal status				Total	
	Aboriginal		non-Aboriginal		No.	%
	No.	%	No.	%	No.	%
Spontaneous	1,140	65.6	16,021	49.8	17,161	50.6
Breech	20	1.2	110	0.3	130	0.4
Vacuum	88	5.1	3,994	12.4	907	2.7
Forceps	36	2.1	871	2.7	907	2.7
Elective Caesarean	145	8.3	5,769	17.9	5,914	17.4
Emergency Caesarean	310	17.8	5,424	16.9	5,734	16.9
<b>Total</b>	<b>1,739</b>	<b>100.0</b>	<b>32,189</b>	<b>100.0</b>	<b>33,928</b>	<b>100.0</b>

Extracted from Midwives' Notification System on 22 September 2015.

Method of birth reported is that for the only or first infant of the pregnancy.

#### 4.9.4. Complications of labour or birth

The differences in proportion of complications of labour or birth (Table 67) between Aboriginal and non-Aboriginal women may be partly explained by the differences seen by method of birth in Table 66.

There were a higher proportion of Aboriginal women who had complications related to vaginal birth, for example precipitate delivery, cord tight around neck, manual removal of placenta and persistent occipito posterior position.

Aboriginal women had a higher primary postpartum haemorrhage rate (23.4 per cent) compared with non-Aboriginal women (19.0 per cent). A higher proportion of Aboriginal women had delayed progress in labour but a slightly lower proportion had cephalopelvic disproportion. A higher proportion of non-Aboriginal women (38.2 per cent) had "Other" complications of labour than non-Aboriginal women (33.0 per cent). Overall, a higher proportion of Aboriginal women had complications (65.0 per cent) than non-Aboriginal women (62.1 per cent).

**Table 67: Complications of labour or birth and Aboriginal status of women who gave birth in WA, 2013**

Complications of labour or birth <sup>42</sup>	Aboriginal status				Total	
	Aboriginal		non-Aboriginal		No.	%
	No.	%	No.	%	No.	%
Precipitate delivery	124	7.1	1,201	3.7	1,325	3.9
Fetal compromise	195	11.2	3,158	9.8	3,353	9.9
Prolapsed cord	5	0.3	40	0.1	45	0.1
Cord tight around neck	30	1.7	506	1.6	536	1.6
Cephalopelvic disproportion	10	0.6	224	0.7	234	0.7
Primary Postpartum Haemorrhage (PPH)	407	23.4	6,123	19.0	6,530	19.2
Retained placenta manual removal	31	1.8	299	0.9	330	1.0
Persistent occipito posterior	34	2.0	543	1.7	577	1.7
Shoulder dystocia	25	1.4	490	1.5	515	1.5
Failure to progress ≤3cms	125	7.2	2,100	6.5	2,225	6.6
Failure to progress >3cms	81	4.7	1,577	4.9	1,658	4.9
Previous caesarean section	276	15.9	5,559	17.3	5,835	17.2
Other	665	38.2	10,615	33.0	11,280	33.2
<b>One or more complications</b>	<b>1,130</b>	<b>65.0</b>	<b>19,981</b>	<b>62.1</b>	<b>21,111</b>	<b>62.2</b>
No complications	609	35.0	12,208	37.9	12,817	37.8
<b>Total Women</b>	<b>1,739</b>	<b>100.0</b>	<b>32,189</b>	<b>100.0</b>	<b>33,928</b>	<b>100.0</b>

Extracted from Midwives' Notification System on 22 September 2015.

These data include reasons for caesarean section of the first or only infant born from the pregnancy.

<sup>42</sup> A woman may have had more than one pre-existing medical condition

#### 4.10. Trauma to perineum and/or vagina

Among the 1,284 Aboriginal women who gave birth vaginally, 62.4 per cent of them had an intact perineum following birth, compared to 33.4 per cent for non-Aboriginal women.

For all degrees of perineal trauma, a lower proportion of Aboriginal women than non-Aboriginal women experienced the trauma (Table 68).

**Table 68: Perineal status and Aboriginal status for women who gave birth vaginally in WA, 2013**

Perineal Status	Aboriginal Status				Total	
	Aboriginal		Non-Aboriginal		No.	%
	No.	%	No.	%		
Intact	801	62.4	7,002	33.4	7,803	35.0
1 <sup>st</sup> degree tear/vaginal tear	155	12.1	3,101	14.8	3,256	14.6
2 <sup>nd</sup> degree tear	173	13.5	5,381	25.6	5,554	24.9
3 <sup>rd</sup> degree tear	19	1.5	505	2.4	524	2.4
Episiotomy	103	8.0	4,144	19.7	4,247	19.1
Episiotomy plus tear	24	1.9	486	2.3	510	2.3
4 <sup>th</sup> degree tear	***	***	36	0.2	***	0.2
Other	8	0.6	341	1.6	349	1.6
<b>Total Women</b>	<b>***</b>	<b>100.0</b>	<b>20,996</b>	<b>100.0</b>	<b>***</b>	<b>100.0</b>

Extracted from Midwives' Notification System on 22 September 2015.

Where an Episiotomy extended to a 1<sup>st</sup> or 2<sup>nd</sup> degree tear, these cases were included in item "Episiotomy plus tear". Where an Episiotomy extended to a 3<sup>rd</sup> or 4<sup>th</sup> degree tear, these cases were included in the relevant item "3<sup>rd</sup> degree tear" or "4<sup>th</sup> degree tear".

Where Other perineal status was reported with no tear or episiotomy described, these women were reported as "Other".

Values <5 are suppressed and indicated with \*\*\*, other values were suppressed to prevent calculation.



#### 4.11. Infants born to Aboriginal women

In 2013, there were 1,757 infants born to Aboriginal mothers. The proportion born alive was 98.7 per cent.

The proportion of stillborn infants for Aboriginal women (1.3 per cent) was twice that for non-Aboriginal women (0.6 per cent) (Table 69).

There were no stillborn infants where fetal death was not able to be specified as occurring before or during labour for Aboriginal women. This was likely impacted by reporting system differences between public and private maternity services. The public reporting system groups unspecified timing of fetal death to the antenatal period.

For just over half of all stillborn infants (55.7 per cent), death occurred before the onset of labour. For infants of Aboriginal women, the proportion of stillborn infants that died before onset of labour was 65.2 per cent, higher than the non-Aboriginal proportion of 54.5 per cent.

The proportion of intrapartum stillbirth in infants for Aboriginal women (34.8 per cent) was similar to the proportion of intrapartum stillbirth for non-Aboriginal women (35.8 per cent).

**Table 69: Birth status and maternal Aboriginal status for infants born in WA, 2013**

Birth Status	Maternal Aboriginal Status				Total	
	Aboriginal		non-Aboriginal		No.	%
	No.	%	No.	%		
Liveborn	1,734	98.7	32,460	99.4	34,194	99.4
Stillborn	23	1.3	187	0.6	210	0.6
<b>Total</b>	<b>1,757</b>	<b>100.0</b>	<b>32,647</b>	<b>100.0</b>	<b>34,404</b>	<b>100.0</b>
<b>Time of death</b>						
Antenatal	15	65.2	102	54.5	117	55.7
Intrapartum	8	34.8	67	35.8	75	35.7
Unspecified time	.	.	18	9.6	18	8.6
<b>Total</b>	<b>23</b>	<b>100.0</b>	<b>187</b>	<b>100.0</b>	<b>210</b>	<b>100.0</b>

Extracted from Midwives' Notification System on 22 September 2015.

Births of infants reported by public establishments are never reported as unspecified time of death. For these cases, unknown time of fetal death was reported as an antenatal death.

The North metropolitan region was the area of residence of the highest proportion of infants of Non-Aboriginal women (41.0 per cent). The Kimberley region was the residence of the highest proportion of infants of Aboriginal women (23.8 per cent).

Aboriginal women living in the Wheatbelt had the highest proportion of stillborn infants (4.5 per cent). The next highest proportion was for Aboriginal women living in the North metropolitan area (1.9 per cent). Residents of the Midwest and Wheatbelt had the highest proportion of stillborn infants born to non-Aboriginal women (1.0 and 0.9 per cent respectively) (Table 70).

**Table 70: Birth status, maternal residence and maternal Aboriginal status for infants born in WA, 2013**

Health region maternal residence	Maternal Aboriginal status						Total
	Aboriginal			non-Aboriginal			
	Livebirth	Stillbirth	Total	Livebirth	Stillbirth	Total	
<b>Row Percentage</b>							
North Metropolitan	98.1	1.9	100.0	99.5	0.5	100.0	
South Metropolitan	99.3	0.7	100.0	99.4	0.6	100.0	
Goldfields	99.1	0.9	100.0	99.8	0.2	100.0	
Great Southern	100.0	-	100.0	99.4	0.6	100.0	
Kimberley	98.8	1.2	100.0	99.3	0.7	100.0	
Midwest	98.4	1.6	100.0	99.0	1.0	100.0	
Pilbara	99.4	0.6	100.0	99.3	0.7	100.0	
South West	98.6	1.4	100.0	99.6	0.4	100.0	
Wheatbelt	95.5	4.5	100.0	99.1	0.9	100.0	
<b>Total</b>	<b>98.7</b>	<b>1.3</b>	<b>100.0</b>	<b>99.4</b>	<b>0.6</b>	<b>100.0</b>	
<b>Column Percentage</b>							
North Metropolitan	15.2	21.7	15.3	41.0	38.2	41.0	<b>39.7</b>
South Metropolitan	23.1	13.0	22.9	39.9	42.5	40.0	<b>39.1</b>
Goldfields	6.6	4.3	6.6	2.6	1.1	2.5	<b>2.8</b>
Great Southern	3.0	-	3.0	2.1	2.2	2.1	<b>2.2</b>
Kimberley	23.8	21.7	23.8	0.9	1.1	0.9	<b>2.1</b>
Midwest	10.4	13.0	10.4	2.2	3.8	2.2	<b>2.6</b>
Pilbara	8.9	4.3	8.9	2.2	2.7	2.2	<b>2.5</b>
South West	4.0	4.3	4.0	6.6	4.8	6.6	<b>6.4</b>
Wheatbelt	4.8	17.4	5.0	2.5	3.8	2.5	<b>2.6</b>
<b>Total</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>

Extracted from Midwives' Notification System on 22 September 2015.

Excludes 73 infants (1 stillborn) where mother was not resident in WA.

To avoid a large number of cell values <5 being suppressed only the proportions are displayed.

#### 4.11.1. Crude birth rate

Notification forms (sample on Page 120) were received for 1,757 infants born to Aboriginal mothers. This was an increase of 100 infants (6.0 per cent) from the 1,657 infants born in 2012. Of these infants, 98.7 per cent were born alive in 2013.

The crude birth rate for Aboriginal women was 19.2 per 1,000 (Table 71).

**Table 71: Trends for crude birth rate of Aboriginal population in WA, 1983-2013**

Year	Birth Status				Total		Aboriginal Population <sup>43</sup>	Crude Birth Rate <sup>44</sup>
	Livebirth		Stillbirth		No.	%		
	No.	%	No.	%	No.	%		
1983	1,135	98.6	16	1.4	1,151	100.0	41,011	27.7
1984	1,179	98.0	24	2.0	1,203	100.0	42,259	27.9
1985	1,235	98.4	20	1.6	1,255	100.0	43,491	28.4
1986	1,231	98.4	20	1.6	1,251	100.0	44,760	27.5
1987	1,329	98.6	19	1.4	1,348	100.0	46,098	28.8
1988	1,428	98.6	21	1.4	1,449	100.0	47,461	30.1
1989	1,431	98.4	23	1.6	1,454	100.0	48,878	29.3
1990	1,542	98.9	17	1.1	1,559	100.0	50,306	30.7
1991	1,464	98.5	22	1.5	1,486	100.0	51,834	28.2
1992	1,412	98.5	22	1.5	1,434	100.0	53,263	26.5
1993	1,436	98.6	20	1.4	1,456	100.0	54,650	26.3
1994	1,431	98.4	24	1.6	1,455	100.0	56,072	25.5
1995	1,444	98.6	20	1.4	1,464	100.0	57,511	25.1
1996	1,426	98.6	20	1.4	1,446	100.0	59,001	24.2
1997	1,549	97.9	33	2.1	1,582	100.0	60,369	25.7
1998	1,506	99.0	15	1.0	1,521	100.0	61,712	24.4
1999	1,603	98.6	22	1.4	1,625	100.0	63,199	25.4
2000	1,587	98.3	27	1.7	1,614	100.0	64,557	24.6
2001	1,632	98.9	18	1.1	1,650	100.0	71,572	22.8
2002	1,646	98.4	27	1.6	1,673	100.0	73,038	22.5
2003	1,525	98.4	25	1.6	1,550	100.0	74,791	20.4
2004	1,559	98.9	17	1.1	1,576	100.0	76,982	20.3
2005	1,697	98.6	24	1.4	1,721	100.0	78,824	21.5
2006	1,780	98.5	27	1.5	1,807	100.0	80,270	22.2
2007	1,810	99.0	19	1.0	1,829	100.0	81,624	22.2
2008	1,715	98.7	23	1.3	1,738	100.0	83,464	20.5
2009	1,740	98.7	23	1.3	1,763	100.0	85,595	20.3
2010	1,677	98.6	23	1.4	1,700	100.0	87,282	19.2
2011	1,706	98.0	34	2.0	1,740	100.0	88,270	19.3
2012	1,629	98.3	28	1.7	1,657	100.0	89,365	18.2
2013	1,734	98.7	23	1.3	1,757	100.0	90,526	19.2

Data Extracted from Midwives' Notification System on 22 September 2015.

Trend table begins in 1983 as population data not available for 1980 to 1982.

Aboriginal population data retrieved from Epidemiology Population Calculator and crude birth rate published in previous reports have been amended in this report with updated population data.

<sup>43</sup> Source of population data: ABS Estimated Resident Populations for WA.

<sup>44</sup> Crude birth rate was derived by dividing total infants born alive by mid-year total population and then multiplied by 1,000.

#### 4.11.2. Birthweight and gestational age

Preterm birth (less than 37 weeks gestation) is associated with significant morbidity and mortality in newborn infants (Saigal & Doyle, 2008).

Preterm birth occurred for 16.2 per cent of all infants born to Aboriginal women compared to 8.9 per cent preterm proportion for all infants born (Table 72).

**Table 72: Gestational age and birthweight for infants born to Aboriginal mothers in WA, 2013**

Birthweight (grams)	Gestation (weeks)				Total
	20-27	28-32	33-36	37-44	
<b>Row Percentage</b>					
< 1000	85.7	14.3	-	-	100.0
1000-1499	10.0	90.0	-	-	100.0
1500-1999	-	24.1	68.5	7.4	100.0
2000-2499	-	1.4	61.5	37.2	100.0
<b>&lt; 2500</b>	<b>12.5</b>	<b>14.8</b>	<b>49.8</b>	<b>23.0</b>	<b>100.0</b>
2500-2999	-	-	13.8	86.2	100.0
3000-3499	-	-	4.4	95.6	100.0
3500-3999	-	-	0.8	99.2	100.0
4000-4499	-	-	2.8	97.2	100.0
>= 4500	-	-	10.5	89.5	100.0
<b>Total</b>	<b>1.8</b>	<b>2.2</b>	<b>12.2</b>	<b>83.8</b>	<b>100.0</b>
<b>Column Percentage</b>					
< 1000	93.8	13.2	-	-	2.0
1000-1499	6.3	47.4	-	-	1.1
1500-1999	-	34.2	17.3	0.3	3.1
2000-2499	-	5.3	42.5	3.7	8.4
<b>&lt; 2500</b>	<b>100.0</b>	<b>100.0</b>	<b>59.8</b>	<b>4.0</b>	<b>14.6</b>
2500-2999	-	-	23.8	21.7	21.1
3000-3499	-	-	12.6	40.1	35.2
3500-3999	-	-	1.4	26.0	22.0
4000-4499	-	-	1.4	7.1	6.1
>= 4500	-	-	0.9	1.2	1.1
<b>Total</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>

Extracted from Midwives' Notification System on 22 September 2015.

### 4.11.3. Birthweight

Low birthweight (less than 2,500 grams) occurred in 14.6 per cent of infants of Aboriginal women and was a larger proportion than for infants of non-Aboriginal women (6.4 per cent).

Infants of Aboriginal mothers had a proportion with birthweight of at least 4,500 grams that was similar to infants of non-Aboriginal mothers (1.1 and 1.3 per cent respectively) (Table 73).

**Table 73: Birthweight and maternal Aboriginal status for infants born in WA, 2013**

Birthweight (grams)	Aboriginal Status of Mother				Total	
	Aboriginal		non-Aboriginal		No.	%
	No.	%	No.	%		
<1000	35	2.0	245	0.8	280	0.8
1000-1499	20	1.1	186	0.6	206	0.6
1500-1999	54	3.1	404	1.2	458	1.3
2000-2499	148	8.4	1,240	3.8	1,388	4.0
<b>&lt; 2500</b>	<b>257</b>	<b>14.6</b>	<b>2,075</b>	<b>6.4</b>	<b>2,332</b>	<b>6.8</b>
2500-2999	370	21.1	5,149	15.8	5,519	16.0
3000-3499	618	35.2	12,275	37.6	12,893	37.5
3500-3999	386	22.0	9,836	30.1	10,222	29.7
4000-4499	107	6.1	2,882	8.8	2,989	8.7
≥ 4500	19	1.1	429	1.3	448	1.3
<b>Total</b>	<b>1,757</b>	<b>100.0</b>	<b>32,646</b>	<b>100.0</b>	<b>34,403</b>	<b>100.0</b>

Extracted from Midwives' Notification System on 22 September 2015.

1 infant with a non-Aboriginal mother was excluded as no birthweight reported

All Infants: Mean = 3327 grams. Standard deviation = 599.1 grams. Median = 3370 grams.

Infants of Aboriginal mothers: Mean = 3116.4 grams. Standard deviation = 707.9 grams. Median = 3195 grams.

Infants of non-Aboriginal mothers: Mean = 3338.3 grams. Standard deviation = 590.6 grams. Median = 3380 grams.

#### 4.11.4. Risk of Low Birthweight

Data over time indicate an increase in the annual proportion of infants of Aboriginal women with low birthweight. This proportion ranged between 11.0 per cent in 1987 and 16.5 per cent in 2005. In 2013 the proportion was 14.6 per cent.

Infants born to Aboriginal women had a higher risk (RR 2.3) of low birthweight (less than 2,500 grams) than infants of non-Aboriginal women. In addition, the RR for infants of Aboriginal women to weigh less than 1,500 grams was 2.4 times that for infants of non-Aboriginal women.

The proportion of infants with low birthweight that were born to non-Aboriginal women has had very little variability since 1980 ranging between 5.6 per cent in 1980 and 6.6 per cent in 2004. In 2013, 6.4 per cent had low birthweight (Table 74)

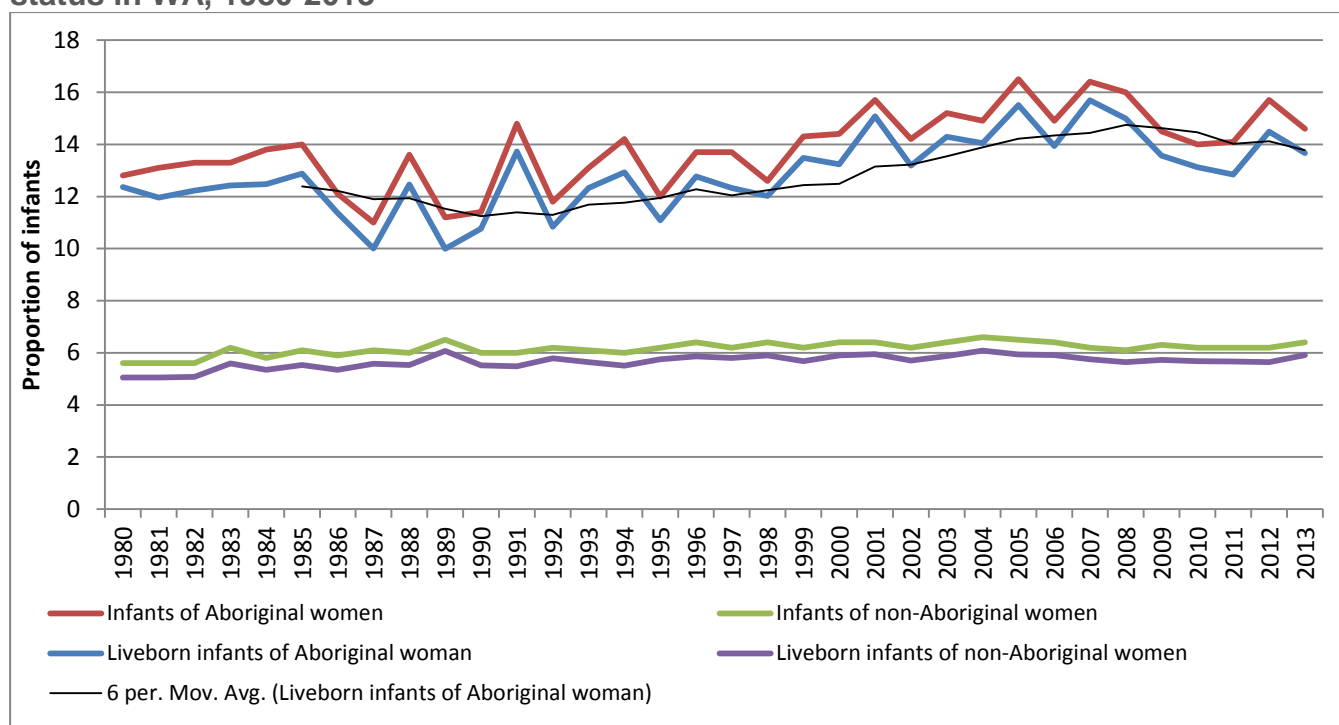
**Table 74: Trends for Relative Risk of low birthweight and maternal Aboriginal status for infants born in WA, 1980-2013**

Year	Proportion in Birthweight Group								
	Non-Aboriginal			Aboriginal			Aboriginal Relative Risk		
	<1500	<2500	>=2500	<1500	<2500	>=2500	<1500	<2500	>=2500
1980	1.3	5.6	94.4	1.4	12.8	87.2	1.1	2.3	0.9
1981	1.1	5.6	94.4	2.1	13.1	86.9	1.9	2.3	0.9
1982	1.2	5.6	94.4	3.1	13.3	86.7	2.6	2.4	0.9
1983	1.4	6.2	93.8	1.9	13.3	86.7	1.4	2.1	0.9
1984	1.2	5.8	94.2	3.6	13.8	86.2	3.0	2.4	0.9
1985	1.4	6.1	93.9	3.7	14.0	86.0	2.6	2.3	0.9
1986	1.3	5.9	94.1	2.6	12.1	87.9	2.0	2.1	0.9
1987	1.4	6.1	93.9	2.3	11.0	89.0	1.6	1.8	0.9
1988	1.4	6.0	94.0	3.0	13.6	86.4	2.1	2.3	0.9
1989	1.5	6.5	93.5	2.8	11.2	88.8	1.9	1.7	0.9
1990	1.1	6.0	94.0	2.2	11.4	88.6	2.0	1.9	0.9
1991	1.3	6.0	94.0	3.2	14.8	85.2	2.5	2.5	0.9
1992	1.3	6.2	93.8	2.3	11.8	88.2	1.8	1.9	0.9
1993	1.2	6.1	93.9	4.3	13.1	86.9	3.6	2.1	0.9
1994	1.5	6.0	94.0	3.2	14.2	85.8	2.1	2.4	0.9
1995	1.3	6.2	93.8	2.8	12.0	88.0	2.2	1.9	0.9
1996	1.4	6.4	93.6	2.7	13.7	86.3	1.9	2.1	0.9
1997	1.4	6.2	93.8	2.8	13.7	86.3	2.0	2.2	0.9
1998	1.3	6.4	93.6	2.9	12.6	87.4	2.2	2.0	0.9
1999	1.3	6.2	93.8	3.9	14.3	85.7	3.0	2.3	0.9
2000	1.4	6.4	93.6	3.8	14.4	85.6	2.7	2.3	0.9
2001	1.4	6.4	93.6	3.6	15.7	84.3	2.6	2.5	0.9
2002	1.3	6.2	93.8	3.3	14.2	85.8	2.5	2.3	0.9
2003	1.2	6.4	93.6	3.7	15.2	84.8	3.1	2.4	0.9
2004	1.5	6.6	93.4	3.4	14.9	85.1	2.3	2.3	0.9
2005	1.4	6.5	93.5	3.7	16.5	83.5	2.6	2.5	0.9
2006	1.4	6.4	93.6	3.9	14.9	85.1	2.8	2.3	0.9
2007	1.3	6.2	93.8	2.7	16.4	83.6	2.1	2.6	0.9
2008	1.4	6.1	93.9	3.5	16.0	84.0	2.5	2.6	0.9
2009	1.5	6.3	93.7	3.5	14.5	85.5	2.3	2.3	0.9
2010	1.3	6.2	93.8	3.3	14.0	86.0	2.5	2.3	0.9
2011	1.4	6.2	93.8	3.3	14.1	85.9	2.4	2.3	0.9
2012	1.3	6.2	93.8	3.9	15.7	84.3	3.0	2.5	0.9
2013	1.3	6.4	93.6	3.1	14.6	85.4	2.4	2.3	0.9

Extracted from Midwives' Notification System on 22 September 2015.

Excluding stillborn infants and comparing low birthweight in liveborn infants between Aboriginal and non-Aboriginal women the trend in proportion is very similar to the trend for all infants. The trend in six year averages for low birthweight proportions for infants of Aboriginal women indicate that the downward (improving) trend that commenced in 1985 reversed in 1993 and was rising until 2009 with an improvement seen from that time. The six year average was below 12 per cent in 1991 and was almost 14 per cent in 2013 (Figure 18).

**Figure 18: Trends for low birthweight for liveborn infants by maternal Aboriginal status in WA, 1980-2013**



The proportion of liveborn infants of Aboriginal women with low birthweight in 2013 was higher at 13.7 per cent than for infants of non-Aboriginal women which was 5.9 per cent (Table 75).

**Table 75: Birthweight and maternal Aboriginal status for infants born alive in WA, 2013**

Birthweight (grams)	Aboriginal Status of Mother				Total	
	Aboriginal No.	%	non-Aboriginal No.	%	No.	%
<1000	18	1.0	106	0.3	124	0.4
1000-1499	17	1.0	176	0.5	193	0.6
1500-1999	54	3.1	400	1.2	454	1.3
2000-2499	148	8.5	1,235	3.8	1,383	4.0
<b>&lt; 2500</b>	<b>237</b>	<b>13.7</b>	<b>1,917</b>	<b>5.9</b>	<b>2,154</b>	<b>6.3</b>
2500-2999	368	21.2	5,135	15.8	5,503	16.1
3000-3499	617	35.6	12,267	37.8	12,884	37.7
3500-3999	386	22.3	9,831	30.3	10,217	29.9
4000-4499	107	6.2	2,881	8.9	2,988	8.7
≥ 4500	19	1.1	429	1.3	448	1.3
<b>Total</b>	<b>1,734</b>	<b>100.0</b>	<b>32,460</b>	<b>100.0</b>	<b>34,194</b>	<b>100.0</b>

Extracted from Midwives' Notification System on 22 September 2015.

All Liveborn Infants: Mean = 3,341.6 grams. Standard deviation = 565.5 grams. Median = 3,374 grams.

Liveborn infants of Aboriginal mothers: Mean = 3,146.2 grams. Standard deviation = 655.4 grams. Median = 3,201 grams.

Liveborn infants of non-Aboriginal mothers: Mean = 3,352.1 grams. Standard deviation = 558.4 grams. Median = 3,380 grams.

#### 4.11.5. Low birthweight and place of residence

For infants born alive to Aboriginal women who lived in metropolitan regions, the proportion with low birthweight was 15.1 per cent compared with 12.8 per cent of those who lived in country regions. These proportions were more than double those occurring in infants born alive to non-Aboriginal women, 6.0 per cent and 5.3 per cent respectively (Table 76).

**Table 76: Low birthweight, maternal residence and maternal Aboriginal status for infants born alive in WA, 2013**

Health region of maternal residence	Aboriginal status					
	Aboriginal			non-Aboriginal		
	<2500 grams	Total	%	<2500 grams	Total	%
<b>Metro</b>	<b>100</b>	<b>664</b>	<b>15.1</b>	<b>1,583</b>	<b>26,216</b>	<b>6.0</b>
North Metro	32	264	12.1	865	13,280	6.5
South Metro	68	400	17.0	718	12,936	5.6
<b>Country</b>	<b>137</b>	<b>1,069</b>	<b>12.8</b>	<b>325</b>	<b>6,173</b>	<b>5.3</b>
Goldfields	15	115	13.0	43	828	5.2
Great Southern	10	52	19.2	27	691	3.9
Kimberley	47	413	11.4	9	291	3.1
Midwest	18	180	10.0	36	712	5.1
Pilbara	18	155	11.6	38	709	5.4
Southwest	15	70	21.4	126	2,129	5.9
Wheatbelt	14	84	16.7	46	813	5.7
<b>Total</b>	<b>237</b>	<b>1,733</b>	<b>13.7</b>	<b>1,908</b>	<b>32,389</b>	<b>5.9</b>

Extracted from Midwives' Notification System on 22 September 2015.

Infants included in Low Birthweight Number had a birthweight less than 2500 grams.

73 liveborn infants, including 10 that were low birthweight were excluded as their maternal residence was not within Western Australia.

#### 4.12. Aboriginal status of infant

Of the 1,757 infants born to Aboriginal mothers, 91.5 per cent were reported as Aboriginal, 7.2 per cent as Aboriginal and Torres Strait Islander and 1.4 per cent were Torres Strait Islander and not Aboriginal.

As well as infants of Aboriginal mothers, an additional 501 infants were identified as Aboriginal and/or Torres Strait Islander using the "Indigenous Status of Infant", a total of 2,258 infants born in WA in 2013 were Aboriginal and/or Torres Strait Islander.

**Table 77: Infant Aboriginal status and maternal Aboriginal status for infants born in WA, 2013**

Aboriginal status of infant	Aboriginal status of mother				Total	
	Aboriginal		non-Aboriginal			
	No.	%	No.	%	No.	%
Aboriginal not Torres Strait Islander	1,607	91.5	365	1.1	1,972	5.7
Torres Strait Islander not Aboriginal	24	1.4	99	0.3	123	0.4
Aboriginal and Torres Strait Islander	126	7.2	37	0.1	163	0.5
Other	-	-	32,145	98.5	32,145	93.4
<b>Total</b>	<b>1,757</b>	<b>100.0</b>	<b>32,646</b>	<b>100.0</b>	<b>34,403</b>	<b>100.0</b>

Extracted from Midwives' Notification System on 22 September 2015.

1 infant was excluded as Aboriginal Status was not specified at time of reporting.



## 5. Infants

### 5.1. Metrics of infants born

Notification forms (sample on Page 120) were received for 34,404 infants born in 2013. This was an increase of 542 (1.6 per cent) infants from the 33,862 infants born in 2012. Of the infants born in 2013, 99.4 per cent were born alive (Table 78).

#### 5.1.1. Crude birth rate

Trend data indicate that the crude birth rate generally declined from a high of 17.0 in 1981 to a low of 12.5 per 1000 total population in 2003. An increase to 14.2 occurred in 2007. Since 2007, the rate varied little and was 13.6 per 1,000 in 2013 (Table 78 and Figure 19).

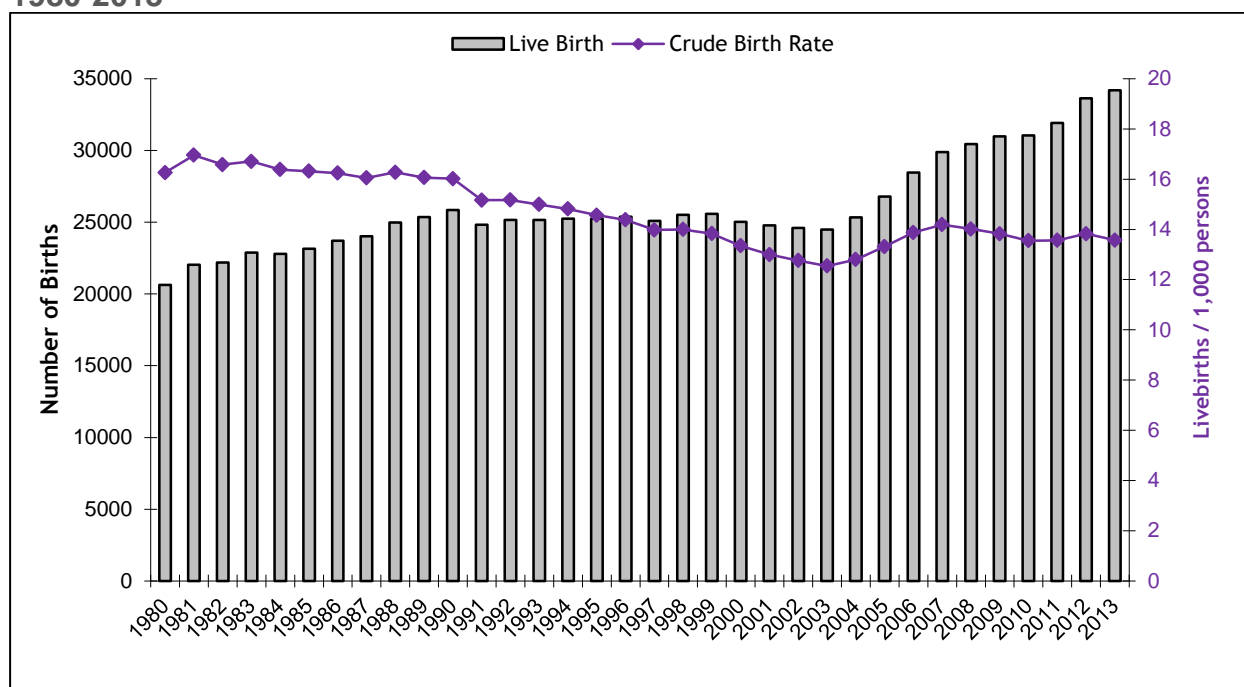
**Table 78: Trends for birth status and crude birth rate for infants born in WA, 1980-2013**

Year	Condition at Birth				Total		Total Population <sup>45</sup>	Crude Birth Rate <sup>46</sup>
	Live Birth		Stillbirth		No.	%		
	No.	%	No.	%	No.	%		
1980	20,636	99.1	178	0.9	20,814	100.0	1,269,068	16.3
1981	22,039	99.2	182	0.8	22,221	100.0	1,300,056	17.0
1982	22,196	99.1	195	0.9	22,391	100.0	1,338,899	16.6
1983	22,875	99.1	197	0.9	23,072	100.0	1,369,318	16.7
1984	22,795	99.3	168	0.7	22,963	100.0	1,391,539	16.4
1985	23,153	99.1	204	0.9	23,357	100.0	1,419,012	16.3
1986	23,703	99.2	185	0.8	23,888	100.0	1,459,247	16.2
1987	24,015	99.2	191	0.8	24,206	100.0	1,496,472	16.0
1988	24,981	99.3	177	0.7	25,158	100.0	1,535,449	16.3
1989	25,359	99.3	184	0.7	25,543	100.0	1,578,761	16.1
1990	25,844	99.3	175	0.7	26,019	100.0	1,613,447	16.0
1991	24,814	99.2	194	0.8	25,008	100.0	1,636,599	15.2
1992	25,158	99.3	165	0.7	25,323	100.0	1,658,609	15.2
1993	25,160	99.3	176	0.7	25,336	100.0	1,678,292	15.0
1994	25,237	99.3	188	0.7	25,425	100.0	1,703,503	14.8
1995	25,255	99.2	191	0.8	25,446	100.0	1,734,228	14.6
1996	25,386	99.2	199	0.8	25,585	100.0	1,765,635	14.4
1997	25,095	99.3	171	0.7	25,266	100.0	1,795,300	14.0
1998	25,514	99.4	164	0.6	25,678	100.0	1,822,891	14.0
1999	25,591	99.3	179	0.7	25,770	100.0	1,849,855	13.8
2000	25,022	99.2	206	0.8	25,228	100.0	1,874,518	13.3
2001	24,774	99.3	167	0.7	24,941	100.0	1,906,274	13.0
2002	24,609	99.3	175	0.7	24,784	100.0	1,928,512	12.8
2003	24,493	99.3	184	0.7	24,677	100.0	1,952,741	12.5
2004	25,341	99.3	188	0.7	25,529	100.0	1,979,542	12.8
2005	26,778	99.3	200	0.7	26,978	100.0	2,011,207	13.3
2006	28,456	99.3	209	0.7	28,665	100.0	2,050,581	13.9
2007	29,884	99.4	189	0.6	30,073	100.0	2,106,139	14.2
2008	30,443	99.3	225	0.7	30,668	100.0	2,171,700	14.0
2009	30,973	99.3	234	0.7	31,207	100.0	2,240,250	13.8
2010	31,039	99.3	218	0.7	31,257	100.0	2,290,845	13.5
2011	31,922	99.2	269	0.8	32,191	100.0	2,353,409	13.6
2012	33,625	99.3	237	0.7	33,862	100.0	2,432,706	13.8
2013	34,194	99.4	210	0.6	34,404	100.0	2,519,321	13.6

<sup>45</sup> Source of population data: ABS Estimated Resident Populations for WA. Data previously reported here has been updated from WA DoH Epidemiology Health Calculator on 10 January 2014.

<sup>46</sup> Crude birth rate was derived by dividing total infants born alive by mid-year total population and then multiplied by 1,000.

**Figure 19: Trends for number and crude birth rate for infants born alive in WA, 1980-2013**



### 5.1.2. Plurality

In 2013, there were 33,458 singleton infants born, representing 97.3 per cent of the total infants born.

Twin infants totalled 928 and represented 2.7 per cent of all infants born. There were six sets of triplets born (Table 79). The proportion of multiple infants born to Aboriginal women was 2.0 per cent, less than the proportion for non-Aboriginal women (2.8 per cent).

**Table 79: Plurality of birth and maternal Aboriginal status for infants born in WA, 2013**

Plurality	Maternal Aboriginal status				Total	
	Aboriginal		non-Aboriginal		No.	%
	No.	%	No.	%		
Single	1,721	98.0	31,737	97.2	33,458	97.3
Twin	36	2.0	892	2.7	928	2.7
Triplet	-	-	18	0.1	18	0.1
<b>Total</b>	<b>1,757</b>	<b>100.0</b>	<b>32,647</b>	<b>100.0</b>	<b>34,404</b>	<b>100.0</b>

Extracted from Midwives' Notification System on 22 September 2015.

### 5.1.3. Gender

Of all infants born, 51.2 per cent were male with a male-female birth ratio of 1.05. There were 840 more male infants born than female (Table 80).

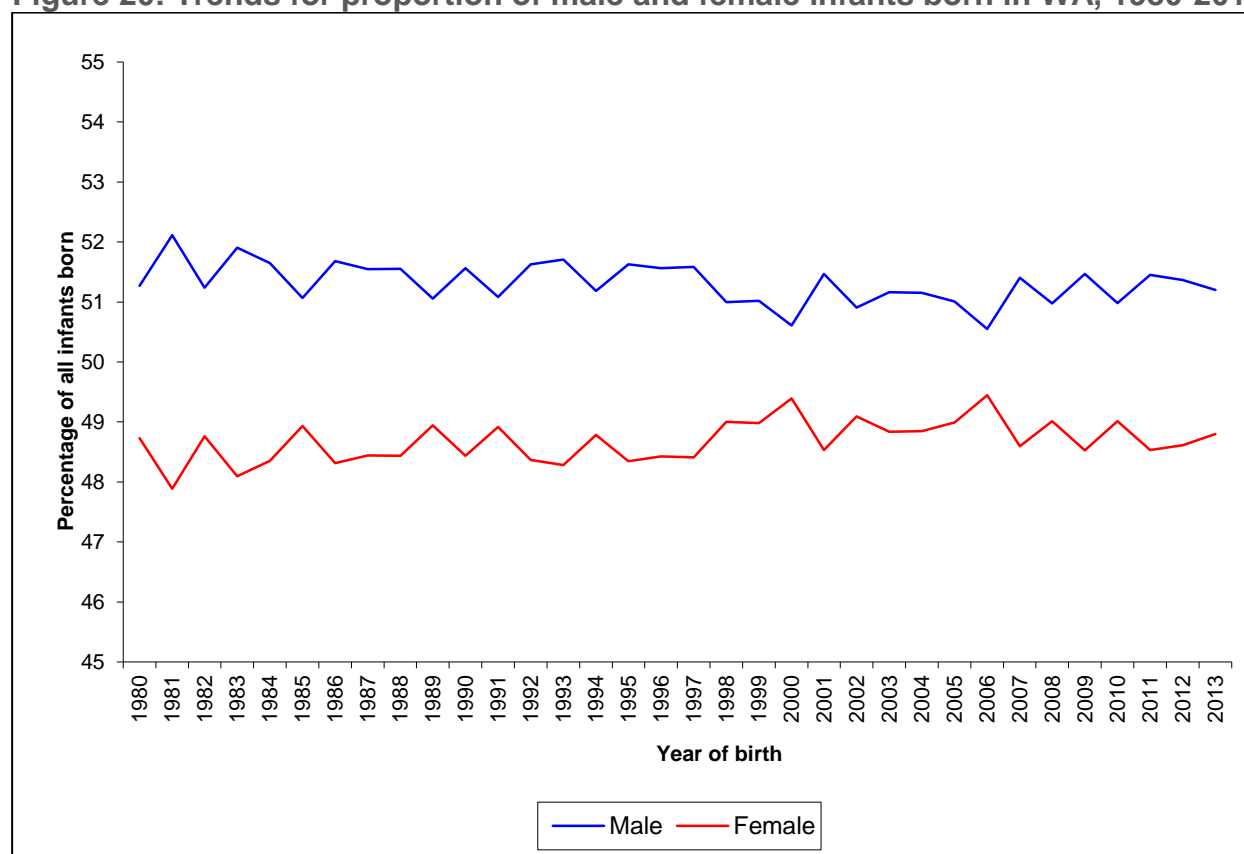
**Table 80: Birth status and gender for infants born in WA, 2013**

Gender	Condition at birth				Total	
	Livebirth		Stillbirth		No.	%
	No.	%	No.	%	No.	%
Male	17,507	51.2	113	53.8	17,620	51.2
Female	16,687	48.8	93	44.3	16,780	48.8
Indeterminate	.	.	4	1.9	4	0.0
<b>Total</b>	<b>34,194</b>	<b>100.0</b>	<b>210</b>	<b>100.0</b>	<b>34,404</b>	<b>100.0</b>

Extracted from Midwives' Notification System on 22 September 2015.

The trend data for 30 years displays a fluctuation in the percentage of males or females born. For all years, more males than females were born reflecting national and international birth ratios (Figure 20).

**Figure 20: Trends for proportion of male and female infants born in WA, 1980-2013**



### 5.1.4. Gestational age

Preterm birth (less than 37 weeks gestation) is associated with significant morbidity and mortality in newborn infants.

Preterm birth occurred for 9.1 per cent of all infants born. In preterm infants, 94.1 per cent were born alive, 2.3 per cent were stillborn with death occurring during labour, the remaining preterm infants (3.6 per cent) were stillborn where timing of death was unknown or occurred before onset of labour.

For term infants, 99.9 per cent were born alive; less than five term infants were stillborn with death occurring during labour (Table 81).

**Table 81: Gestational age and birth status for infants born in WA, 2013**

Gestation (weeks)	Birth status			Total
	Livebirth	Fetal death (before labour)	Fetal death (during labour)	
<b>Number</b>				
20 to 27	123	68	72	263
28 to 32	378	21	***	***
33 to 36	2,454	24	-	2,478
< 37	2,955	113	73	3,141
37 to 44	31,239	22	***	***
<b>Total</b>	<b>34,194</b>	<b>135</b>	<b>75</b>	<b>34,404</b>
<b>Row percent</b>				
20 to 27	46.8	25.9	27.4	100.0
28 to 32	94.5	5.3	***	100.0
33 to 36	99.0	1.0	-	100.0
< 37	94.1	3.6	2.3	100.0
37 to 44	99.9	0.1	***	100.0
<b>Total</b>	<b>99.4</b>	<b>0.4</b>	<b>0.2</b>	<b>100.0</b>
<b>Column percent</b>				
20 to 27	0.4	50.4	96.0	0.8
28 to 32	1.1	15.6	***	1.2
33 to 36	7.2	17.8	-	7.2
< 37	8.6	83.7	97.3	9.1
37 to 44	91.4	16.3	***	90.9
<b>Total</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>

Extracted from Midwives' Notification System on 22 September 2015.

Values <5 are suppressed and indicated with \*\*\*, other values were suppressed to prevent calculation.

Infants where timing of stillbirth was unspecified (18 infants) were included in "before labour" counts.

### 5.1.5. Gestational age, birthweight and plurality

Plurality of birth influenced proportion of infants in gestational age and birthweight groups.

Among singleton infants, 7.5 per cent were born before 37 weeks gestation (preterm) and 5.3 per cent weighed less than 2,500 grams at birth. For term singleton infants, 1.6 per cent weighed less than 2,500 grams at birth (Table 82).

**Table 82: Gestational age and birthweight for singleton infants born in WA, 2013**

Birthweight (grams)	Gestation (weeks)								Total	
	20-27		28-32		33-36		37-44			
	No.	%	No.	%	No.	%	No.	%	No.	%
<1000	204	89.1	32	11.3	***	***	-	-	***	0.7
1000-1499	22	9.6	102	36.2	29	1.4	***	***	***	0.5
1500-1999	***	***	107	37.9	176	8.8	***	***	***	0.9
2000-2499	***	***	35	12.4	560	28.0	474	1.5	***	3.2
<b>&lt; 2500</b>	<b>228</b>	<b>99.6</b>	<b>276</b>	<b>97.9</b>	<b>766</b>	<b>38.3</b>	<b>504</b>	<b>1.6</b>	<b>1,774</b>	<b>5.3</b>
2500-2999	-	-	***	***	799	39.9	4,434	14.3	***	15.7
3000-3499	-	-	***	***	336	16.8	12,459	40.3	***	38.2
3500-3999	-	-	***	***	76	3.8	10,136	32.8	***	30.5
4000-4499	-	-	-	-	20	1.0	2,969	9.6	2,989	8.9
≥ 4500	-	-	-	-	***	***	444	1.4	***	1.3
<b>Total</b>	<b>228</b>	<b>100.0</b>	<b>282</b>	<b>100.0</b>	<b>2,001</b>	<b>100.0</b>	<b>30,946</b>	<b>100.0</b>	<b>33,457</b>	<b>100.0</b>
<b>Per cent of Total</b>	<b>0.7</b>		<b>0.8</b>		<b>6.0</b>		<b>92.5</b>		<b>100.0</b>	

Extracted from Midwives' Notification System on 22 September 2015.

Excludes 1 infant where birthweight was unknown.

Values <5 are suppressed and indicated with \*\*\*, other values were suppressed to prevent calculation.

Among infants from multiple births, the proportion born preterm was 66.5 per cent and 59.0 per cent weighed less than 2,500 grams at birth. For term multiple infants, 23.0 per cent weighed less than 2,500 grams at birth (Table 83).

**Table 83: Gestational age and birthweight for multiple birth infants born in WA, 2013**

Birthweight (grams)	Gestation (weeks)								Total	
	20-27		28-32		33-36		37-44			
	No.	%	No.	%	No.	%	No.	%	No.	%
<1000	29	85.3	8	6.8	***	***	***	***	43	4.5
1000-1499	5	14.7	41	34.7	***	***	-	-	***	***
1500-1999	-	-	59	50.0	87	18.2	-	-	146	15.4
2000-2499	-	-	10	8.5	237	49.7	71	22.4	318	33.6
<b>&lt; 2500</b>	<b>34</b>	<b>100.0</b>	<b>118</b>	<b>100.0</b>	<b>333</b>	<b>69.8</b>	<b>73</b>	<b>23.0</b>	<b>558</b>	<b>59.0</b>
2500-2999	-	-	-	-	126	26.4	156	49.2	282	29.8
3000-3499	-	-	-	-	17	3.6	80	25.2	97	10.3
3500-3999	-	-	-	-	***	***	8	2.5	***	***
4000-4499	-	-	-	-	-	-	-	-	-	-
<b>Total</b>	<b>34</b>	<b>100.0</b>	<b>118</b>	<b>100.0</b>	<b>477</b>	<b>100.0</b>	<b>***</b>	<b>100.0</b>	<b>946</b>	<b>100.0</b>
<b>Per cent of Total</b>	<b>3.6</b>		<b>12.5</b>		<b>50.4</b>		<b>33.5</b>		<b>100.0</b>	

Extracted from Midwives' Notification System on 22 September 2015.

Values <5 are suppressed and indicated with \*\*\*, other values were suppressed to prevent calculation.

Among all infants, the proportion born preterm was 9.1 per cent and 6.8 per cent weighed less than 2,500 grams at birth. For term infants, 1.8 per cent weighed less than 2,500 grams at birth (Table 84).

**Table 84: Gestational age and birthweight for infants born in WA, 2013**

Birthweight (grams)	Gestation (weeks)								Total	
	20-27		28-32		33-36		37-44			
	No.	%	No.	%	No.	%	No.	%	No.	%
< 1000	233	88.6	40	10.0	5	0.2	***	***	***	0.8
1000-1499	27	10.3	143	35.8	34	1.4	***	***	***	0.6
1500-1999	***	***	166	41.5	263	10.6	28	0.1	458	1.3
2000-2499	***	***	45	11.3	797	32.2	545	1.7	1,388	4.0
<b>&lt; 2500</b>	<b>262</b>	<b>99.6</b>	<b>394</b>	<b>98.5</b>	<b>1,099</b>	<b>44.4</b>	<b>577</b>	<b>1.8</b>	<b>2,332</b>	<b>6.8</b>
2500-2999	-	-	***	***	925	37.3	4,590	14.7	***	16.0
3000-3499	-	-	***	***	353	14.2	12,539	40.1	***	37.5
3500-3999	-	-	***	***	77	3.1	10,144	32.4	10,222	29.7
4000-4499	-	-	-	-	20	0.8	2,969	9.5	2,989	8.7
>= 4500	-	-	-	-	***	***	444	1.4	448	1.3
<b>Total</b>	<b>262</b>	<b>100.0</b>	<b>400</b>	<b>100.0</b>	<b>2,478</b>	<b>100.0</b>	<b>31,263</b>	<b>100.0</b>	<b>34,403</b>	<b>100.0</b>
<b>Per cent of Total</b>	<b>0.8</b>		<b>1.2</b>		<b>7.2</b>		<b>90.9</b>		<b>100.0</b>	

Extracted from Midwives' Notification System on 22 September 2015.

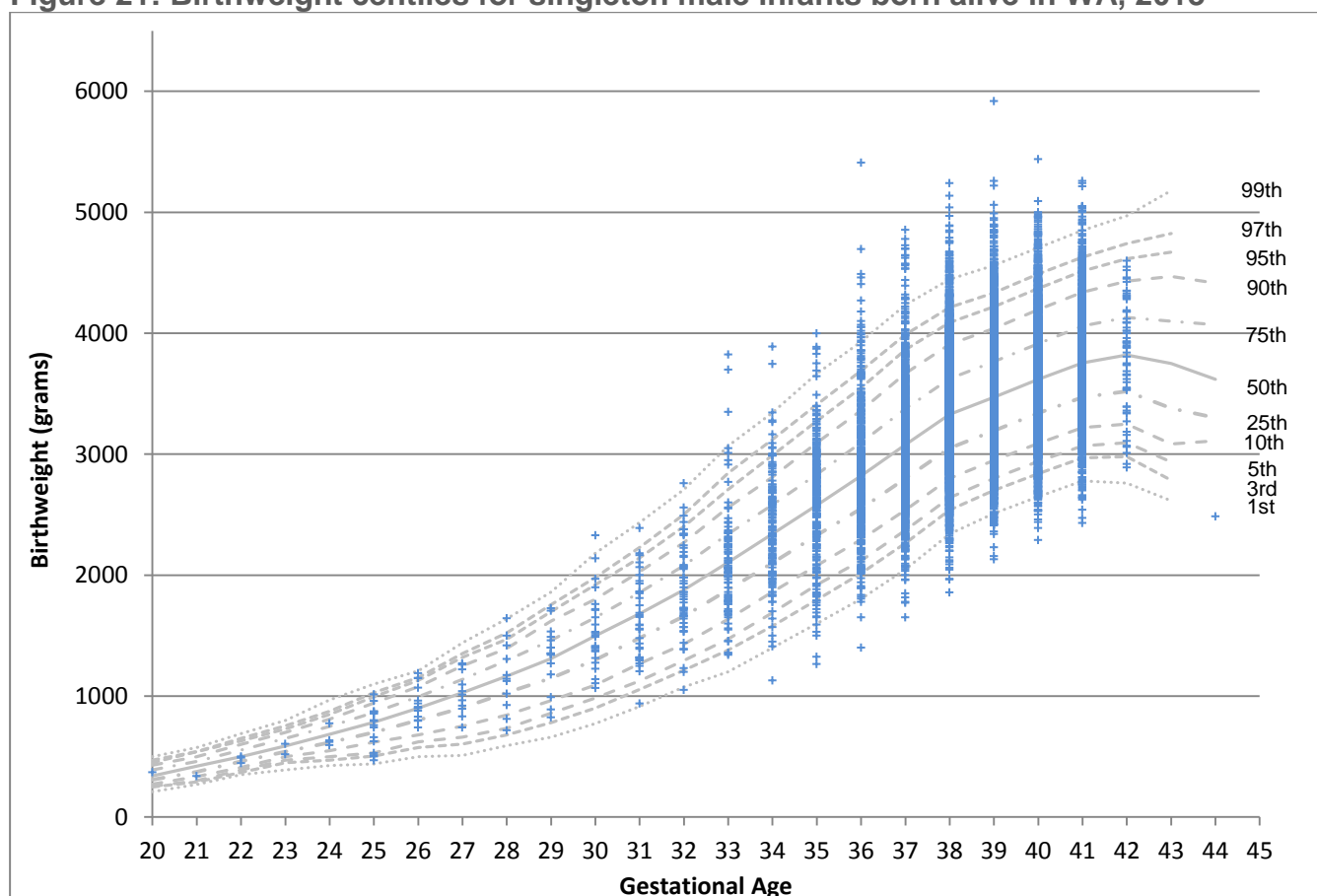
Excludes 1 infants where birthweight was unknown.

Values <5 are suppressed and indicated with \*\*\*, other values were suppressed to prevent calculation.

### 5.1.6. Birthweight centiles

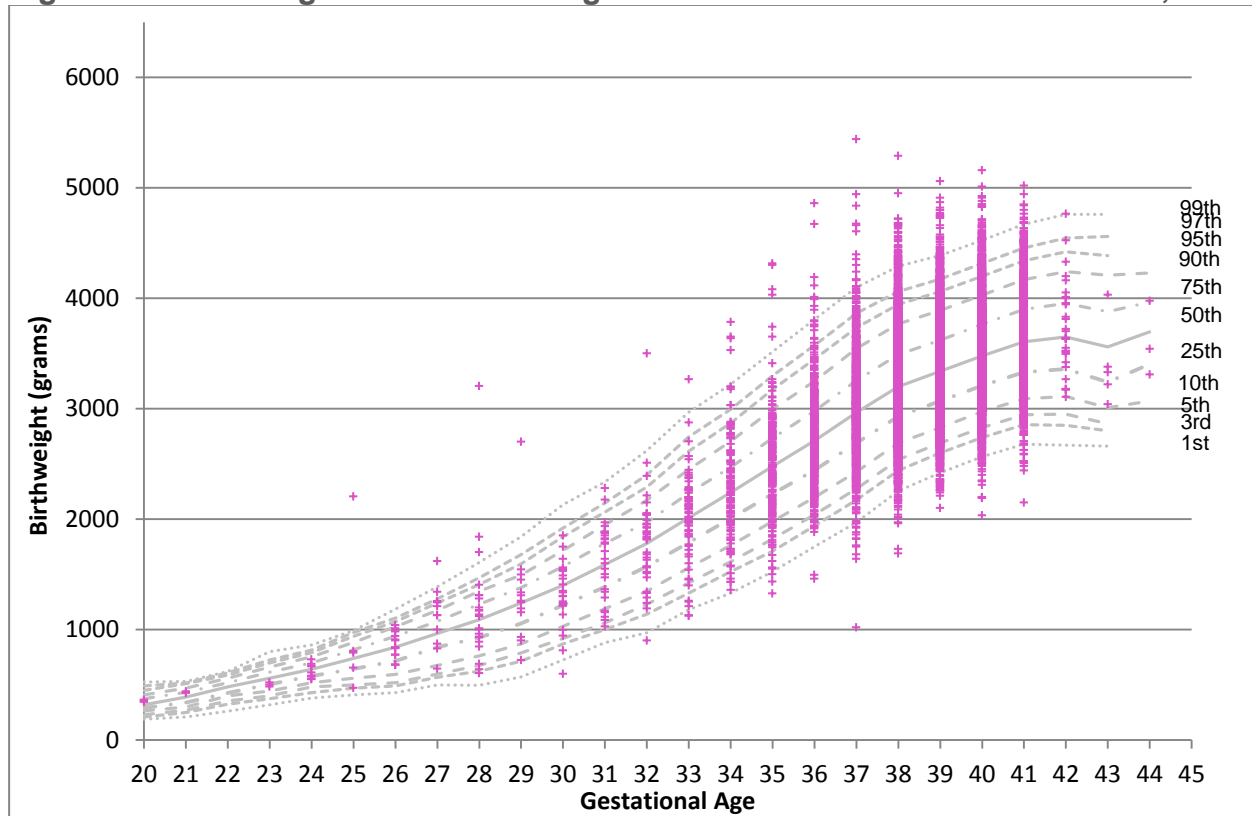
Birthweight centile charts have been compiled using information from publication on Australian births by AIHW (Dobbins, et al. 2012). The following figures display birthweight by gestational age in completed weeks for liveborn singleton infants of each gender.

**Figure 21: Birthweight centiles for singleton male infants born alive in WA, 2013**



17,027 Male infants that were singleton and liveborn in 2013.

Figure 22: Birthweight centiles for singleton female infants born alive in WA, 2013



16,242 Female infants that were singleton and liveborn in 2013.

### 5.1.7. Birth status and place of birth of preterm infants

Among all preterm infants born alive at 23 to 31 weeks gestation, 88.7 per cent were born in the tertiary maternity service. Of these infants, a small proportion, 4.1 per cent, were born in private hospitals. The large proportion of preterm stillborn infants (86.0 per cent) born at the tertiary maternity service may reflect the state-wide practice of in-utero transfer of compromised infants (Table 85).

Table 85: Birth status and place of birth of infants born at 23 to 31 weeks gestation in WA, 2013

Place of birth	Live birth					Still birth					Total	
	Gestation (weeks)				Subtotal	Gestation (weeks)				Subtotal		
	23-25	26-28	29-31	No.		%	23-25	26-28	29-31		No.	%
Tertiary	87.8	86.1	90.3	306	88.7	75.0	61.9	81.8	49	72.1	355	86.0
Public Metro	2.0	3.0	2.1	8	2.3	2.8	4.8	9.1	3	4.4	11	2.7
Public Country	8.2	7.9	2.6	17	4.9	5.6	-	9.1	3	4.4	20	4.8
Private	2.0	3.0	5.1	14	4.1	16.7	33.3	-	13	19.1	27	6.5
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>345</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>68</b>	<b>100</b>	<b>413</b>	<b>100</b>

Extracted from Midwives' Notification System on 22 September 2015.

Includes infants that were "born before arrival" at birth site.

Trend data for the period 1986 to 2013 indicate that the proportion of live births among infants born at 23 to 31 weeks gestation increased from a low of 74.3 per cent in 1987 to a high of 86.7 per cent in 2007. In 2013, the proportion of live births among these infants was 83.5 per cent (Table 86).

**Table 86: Trends for birth status and place of birth of infants born at 23 to 31 weeks gestation in WA, 1986-2013**

Year	Tertiary				Other				Total			
	Live birth		Fetal death		Live birth		Fetal death		Live birth		Fetal death	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
1986	212	67.1	46	14.6	33	10.4	25	7.9	245	77.5	71	22.5
1987	182	65.0	48	17.1	26	9.3	24	8.6	208	74.3	72	25.7
1988	250	73.1	48	14.0	24	7.0	20	5.8	274	80.1	68	19.9
1989	271	78.1	36	10.4	20	5.8	20	5.8	291	83.9	56	16.1
1990	206	72.3	41	14.4	19	6.7	19	6.7	225	78.9	60	21.1
1991	220	72.1	34	11.1	23	7.5	28	9.2	243	79.7	62	20.3
1992	231	77.5	32	10.7	21	7.0	14	4.7	252	84.6	46	15.4
1993	200	69.9	40	14.0	22	7.7	24	8.4	222	77.6	64	22.4
1994	244	74.4	32	9.8	22	6.7	30	9.1	266	81.1	62	18.9
1995	225	75.0	37	12.3	20	6.7	18	6.0	245	81.7	55	18.3
1996	226	71.7	45	14.3	22	7.0	22	7.0	248	78.7	67	21.3
1997	265	78.4	35	10.4	22	6.5	16	4.7	287	84.9	51	15.1
1998	264	78.1	37	10.9	16	4.7	21	6.2	280	82.8	58	17.2
1999	246	79.4	34	11.0	18	5.8	12	3.9	264	85.2	46	14.8
2000	268	76.6	44	12.6	27	7.7	11	3.1	295	84.3	55	15.7
2001	261	77.2	35	10.4	24	7.1	18	5.3	285	84.3	53	15.7
2002	219	73.7	40	13.5	25	8.4	13	4.4	244	82.2	53	17.8
2003	230	76.4	30	10.0	23	7.6	18	6.0	253	84.1	48	15.9
2004	283	78.8	36	10.0	23	6.4	17	4.7	306	85.2	53	14.8
2005	286	77.9	36	9.8	27	7.9	16	4.4	315	85.8	52	14.2
2006	302	77.8	43	11.1	29	7.5	14	3.6	331	85.3	57	14.7
2007	317	79.4	38	9.5	29	7.3	15	3.8	346	86.7	53	13.3
2008	328	77.5	44	10.4	31	7.3	20	4.7	359	84.9	64	15.1
2009	313	72.3	46	10.6	51	11.8	23	5.3	364	84.1	69	15.9
2010	297	75.4	49	12.4	29	7.4	19	4.8	326	82.7	68	17.3
2011	305	76.3	45	11.3	26	6.5	24	6.0	331	82.8	69	17.3
2012	323	73.7	58	13.2	37	8.4	20	4.6	360	82.2	78	17.8
2013	306	74.1	49	11.9	39	9.4	19	4.6	345	83.5	68	16.5

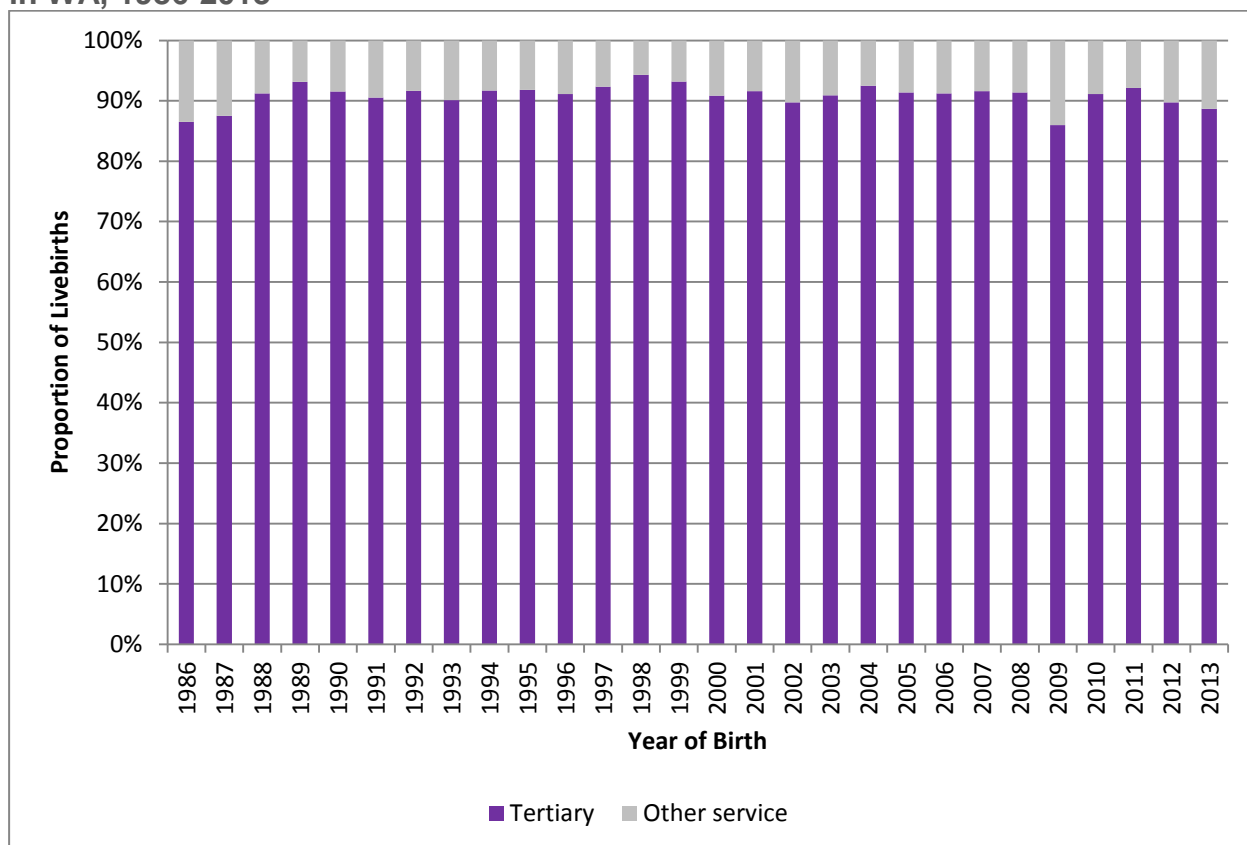
Extracted from Midwives' Notification System on 22 September 2015.

Denominator for all percentages in above table was total infants born in the year at a gestation 23 to 31 completed weeks.



A tertiary maternity service is considered the optimal birth place for infants born alive at 23 to 31 weeks gestation. The proportion of these infants that were born at the tertiary maternity service ranged between 86.5 per cent in 1986 and 94.3 per cent 1998 and was 88.7 per cent in 2013 (Figure 23).

**Figure 23: Trend for place of birth of infants born alive at 23 to 31 weeks gestation in WA, 1986-2013**



### 5.1.8. Birthweight

The average birthweight was 3,326.9 grams, with a standard deviation of 599.1 grams. The median birthweight was 3,370 grams.

The largest proportion of infants (37.5 per cent) weighed between 3,000 and 3,499 grams. A further 29.7 per cent of infants weighed between 3,500 and 3,999 grams. Infants less than 2,500 grams represented 6.8 per cent of all infants born.

For liveborn infants the average birthweight was 3,341.6 grams with a standard deviation of 565.5 grams. The median birthweight was 3,374 grams. Infants less than 2,500 grams represented 6.3 per cent of all liveborn infants.

For stillborn infants 85.2 per cent had a birthweight less than 2,500 grams.

Of the 2,332 infants with low birthweight, 92.4 per cent were born alive (Table 87).

**Table 87: Birthweight and birth status for infants born in WA, 2013**

Birthweight (grams)	Birth status		Total
	Live birth	Fetal death	
<b>Number</b>			
<1000	124	156	280
1000-1499	193	13	206
1500-1999	454	***	***
2000-2499	1,383	5	1,388
<b>&lt; 2500</b>	<b>2,154</b>	<b>178</b>	<b>2,332</b>
2500-2999	5,503	16	5,519
3000-3499	12,884	9	12,893
3500-3999	10,217	5	10,222
4000-4499	2,988	***	***
≥ 4500	448	-	448
<b>Total</b>	<b>34,194</b>	<b>209</b>	<b>34,403</b>
<b>Row percent</b>			
<1000	44.3	55.7	100.0
1000-1499	93.7	6.3	100.0
1500-1999	***	***	100.0
2000-2499	99.6	0.4	100.0
<b>&lt; 2500</b>	<b>92.4</b>	<b>7.6</b>	<b>100.0</b>
2500-2999	99.7	0.3	100.0
3000-3499	99.9	0.1	100.0
3500-3999	100.0	0.0	100.0
4000-4499	***	***	100.0
≥ 4500	100.0	-	100.0
<b>Total</b>	<b>99.4</b>	<b>0.6</b>	<b>100.0</b>
<b>Column percent</b>			
<1000	0.4	74.6	0.8
1000-1499	0.6	6.2	0.6
1500-1999	1.3	***	***
2000-2499	4.0	2.4	4.0
<b>&lt; 2500</b>	<b>6.3</b>	<b>85.2</b>	<b>6.8</b>
2500-2999	16.1	7.7	16.0
3000-3499	37.7	4.3	37.5
3500-3999	29.9	2.4	29.7
4000-4499	8.7	***	***
≥ 4500	1.3	-	1.3
<b>Total</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>

Extracted from Midwives' Notification System on 22 September 2015.

Excludes 1 infant where birthweight was unknown

Values <5 are suppressed and indicated with \*\*\*, other values were suppressed to prevent calculation.

### 5.1.9. Birth resuscitation methods for infant

Procedures like oral and nasal suction and other more intensive therapy was reported as birth resuscitation for each infant. Of infants born alive with a birthweight of at least 2,500 grams 17.5 per cent received one of these procedures. In comparison, 49.9 per cent of infants with a birthweight less than 2,500 grams received resuscitation.

The most frequent procedures provided were suction, oxygen or ventilation by bag and mask (Table 88).

**Table 88: Birthweight and resuscitation for infants born alive in WA, 2013**

Resuscitation methods <sup>47</sup>	Birthweight (grams)				Total	
	< 1500	1500-1999	2000-2499	≥ 2500	No.	%
1-None	40	157	883	26,442	27,522	80.5
2-Suction Only	***	10	39	1,217	***	3.7
3-Oxygen Therapy	***	36	82	1,473	***	4.7
4-Continuous positive airway pressure (CPAP)	-	-	***	8	***	0.0
5-Bag & Mask	125	208	312	2,357	3,002	8.8
6-Intubation	81	15	11	105	212	0.6
7-External cardiac massage	6	5	***	87	***	0.3
8-Other	56	23	46	351	476	1.4
<b>Any resuscitation</b>	<b>277</b>	<b>297</b>	<b>500</b>	<b>5,598</b>	<b>6,672</b>	<b>19.5</b>
% receiving any resus	87.4	65.4	36.2	17.5	19.5	
<b>Total</b>	<b>317</b>	<b>454</b>	<b>1,383</b>	<b>32,040</b>	<b>34,194</b>	<b>100.0</b>

Extracted from Midwives' Notification System on 22 September 2015.

Values <5 are suppressed and indicated with \*\*\*, other values were suppressed to prevent calculation.

<sup>47</sup> Description of resuscitation received at birth was limited to reporting only the most "intensive" method as determined by the order of these values displayed here.

### 5.1.10. Birth status and place of birth

There were 34,194 (99.4 per cent) infants born alive and 210 (0.6 per cent) stillborn. These infants include those born from termination of pregnancy when gestation was 20 weeks or greater. Of the stillborn infants, many died before onset of labour or did not have a time of fetal death specified (64.3 per cent).

The stillbirth rate was 6.1 per 1,000 births with an intrapartum fetal death rate of 2.2 per 1,000 births. Of the infants that died during labour, 94.7 per cent were born at the tertiary maternity service. The stillbirth rate of the tertiary maternity service was 24.1 per 1,000 births reflecting the referral of mothers with extreme prematurity or other high-risk condition in pregnancy (Table 89).

**Table 89: Birth status and place of birth for infants born in WA, 2013**

Place of birth	Birth status						Total No.	Total %	Stillbirth rate <sup>48</sup>
	Livebirths		Fetal death before labour <sup>49</sup>		Fetal death during labour				
	No.	%	No.	%	No.	%			
<b>Metropolitan</b>									
Tertiary	5,791	16.9	72	53.3	71	94.7	5,934	17.2	24.1
Public	9,348	27.3	18	13.3	***	4.0	***	27.2	2.2
Private	13,003	38.0	26	19.3	-	-	13,029	37.9	2.0
BBA	101	0.3	***	2.2	-	-	***	0.3	28.8
<b>Country</b>									
Regional public	3,445	10.1	10	7.4	-	-	3,455	10.0	2.9
Other public	1,451	4.2	***	3.0	***	1.3	1,456	4.2	3.4
Private	811	2.4	***	1.5	-	-	***	2.4	2.5
BBA	34	0.1	-	-	-	-	34	0.1	0.0
<b>Non-hospital</b>									
Home births	194	0.6	-	-	-	-	194	0.6	0.0
BBA	16	0.0	-	-	-	-	16	0.0	0.0
<b>Total</b>	<b>34,194</b>	<b>100.0</b>	<b>135</b>	<b>100.0</b>	<b>75</b>	<b>100.0</b>	<b>34,404</b>	<b>100.0</b>	<b>6.1</b>
<b>Proportion</b>		<b>99.4</b>		<b>0.4</b>		<b>0.2</b>		<b>100.0</b>	

Extracted from Midwives' Notification System on 22 September 2015.

BBA (Born Before Arrival) are those infants born enroute to hospital or at home when not attended by a health professional.

Values <5 are suppressed and indicated with \*\*\*, other values were suppressed to prevent calculation.

<sup>48</sup> Number of infants stillborn per 1,000 infants born.

<sup>49</sup> There were 18 infants reported as stillborn with no indicator of when fetal death occurred, these infants are counted with those where death occurred before onset of labour.

### 5.1.11. Plurality of infants born

In 2013, there were 33,458 singleton infants born, representing 97.3 per cent of total infants born. Twin infants comprised 2.6 per cent and triplets 0.1 per cent of all infants born (Table 90).

The occurrence of twins was 1 per 73.1 pregnancies. A natural rate of 1 per 89 would be expected when applying Hellin's law<sup>50</sup>. For triplets the occurrence was 1 per 5,654.5 pregnancies. The higher than expected occurrence of twins and triplets born in 2013 could be attributed to the increased use of fertility treatments such as assisted reproductive technology (Tough, et al. 2002).

Of the 946 twins and triplets, 2.4 per cent were stillborn compared with 0.6 per cent of singleton infants stillborn (Table 90).

**Table 90: Birth status and plurality of birth for infants born in WA, 2013**

Plurality	Birth status		Total
	Livebirth	Stillbirth	
	<b>Number</b>		
Single	33,270	188	<b>33,458</b>
Twin	906	22	<b>928</b>
Triplet	18	-	<b>18</b>
<b>Total</b>	<b>34,194</b>	<b>210</b>	<b>34,404</b>
	<b>Column percent</b>		
Single	97.3	89.5	<b>97.3</b>
Twin	2.6	10.5	<b>2.7</b>
Triplet	0.1	-	<b>0.1</b>
<b>Total</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>
	<b>Row percent</b>		
Single	99.4	0.6	<b>100.0</b>
Twin	97.6	2.4	<b>100.0</b>
Triplet	100.0	-	<b>100.0</b>
<b>Total</b>	<b>99.4</b>	<b>0.6</b>	<b>100.0</b>

Extracted from Midwives' Notification System on 22 September 2015.

<sup>50</sup> **Hellin's Law** is the principle that one in about 89 pregnancies ends in the birth of twins, triplets once in 89<sup>2</sup> (7,921) births, and quadruplets once in 89<sup>3</sup> births.

### 5.1.12. Plurality, presentation and birth method

In 2013, there were 1,301 singleton infants with a breech presentation at birth (3.8 per cent of all infants). Of these 9.5 per cent were born vaginally. For infants from multiple pregnancies, 301 had a breech presentation and 24.6 per cent were born vaginally.

Of the 31,652 singleton infants that had vertex presentation, 68.6 per cent were born vaginally, 53.1 per cent were spontaneous, 12.7 per cent were delivered with vacuum extraction and 2.8 per cent by forceps (Table 91).

**Table 91: Fetal presentation, method of birth and plurality of birth for infants born in WA, 2013**

Birth method	Fetal presentation						Total
	Vertex		Breech		Other		
	Plurality of birth		Plurality of birth		Plurality of birth		
	Single	Multiple	Single	Multiple	Single	Multiple	
<b>Number</b>							
Spontaneous	16,793	175	-	-	251	***	***
Breech	-	-	124	74	***	-	***
Vacuum	4,008	50	-	-	44	-	<b>4,102</b>
Forceps	875	29	-	-	***	***	<b>920</b>
Elective CS	4,965	203	727	105	68	5	<b>6,073</b>
Emergency CS	5,011	167	450	122	126	11	<b>5,887</b>
<b>Total</b>	<b>31,652</b>	<b>624</b>	<b>1,301</b>	<b>301</b>	<b>505</b>	<b>21</b>	<b>34,404</b>
<b>Percent</b>	<b>92.0</b>	<b>1.8</b>	<b>3.8</b>	<b>0.9</b>	<b>1.5</b>	<b>0.1</b>	<b>34,404</b>
<b>Column percent</b>							
Spontaneous	53.1	28.0	-	-	49.7	19.0	<b>50.1</b>
Breech	-	-	9.5	24.6	0.2	-	<b>0.6</b>
Vacuum	12.7	8.0	-	-	8.7	-	<b>11.9</b>
Forceps	2.8	4.6	-	-	3.0	4.8	<b>2.7</b>
Elective CS	15.7	32.5	55.9	34.9	13.5	23.8	<b>17.7</b>
Emergency CS	15.8	26.8	34.6	40.5	25.0	52.4	<b>17.1</b>
<b>Total</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>

Extracted from Midwives' Notification System on 22 September 2015.

Other presentations include face, brow, compound, transverse, other or unspecified.

Each infant born from a multiple pregnancy may have a different method of birth.

Unsuccessful vacuum extraction, unsuccessful forceps and forceps lift out at CS are not specified in this table.

The percentages for CS presented here do not represent a "caesarean section rate" they are the percentage of infants born by CS; multiple babies may be born from one CS.

Values <5 are suppressed and indicated with \*\*\*, other values were suppressed to prevent calculation.

## 5.2. Infant extra-uterine adjustment

### 5.2.1. Apgar score at one minute and five minutes

Apgar scoring is a practical method of evaluating the physical condition of a newborn infant shortly after birth and their response to resuscitation should it be required. The Apgar score is calculated based on the infant's heart rate, respiratory effort, muscle tone, skin colour and reflexes. Stillborn infants have a total score of 0.

For liveborn infants with an Apgar score at one minute reported, 86.1 per cent had an Apgar score of 8 to 10 and 1.7 per cent of these infants had an Apgar score of less than 4 at one minute of age.

Among all infants born alive with an Apgar score reported, 91.4 per cent established spontaneous respirations within the first minute of life.

Of liveborn infants with no Apgar score reported at one minute of age, most were born before arrival at health service and no health professional was present to assess the infant's condition at one minute of age (Table 92).

**Table 92: Apgar score at one minute and time to spontaneous respiration for infants born alive in WA, 2013**

Time to spontaneous respiration (mins)	Apgar score at 1 minute						Total	
	0-3		4-7		8-10			
	No.	%	No.	%	No.	%	No.	%
1	51	8.6	2,250	54.3	28,945	98.3	31,246	91.4
2-3	181	30.5	1,258	30.4	420	1.4	1,859	5.4
4-6	157	26.4	398	9.6	46	0.2	601	1.8
≥ 7	81	13.6	93	2.2	10	0.0	184	0.5
Unknown <sup>51</sup>	124	20.9	144	3.5	18	0.1	286	0.8
<b>Total</b>	<b>594</b>	<b>100.0</b>	<b>4,143</b>	<b>100.0</b>	<b>29,439</b>	<b>100.0</b>	<b>34,176</b>	<b>100.0</b>
<b>Row percentage</b>		<b>1.7</b>		<b>12.1</b>		<b>86.1</b>		<b>100.0</b>

Extracted from Midwives' Notification System on 22 September 2015.

18 infants with no Apgar score reported for 1 minute after birth were excluded from the table above.

<sup>51</sup> Cases have no time to spontaneous respiration reported if the infant received ventilation assistance for more than 10 minutes or was not attended at birth by a health professional.

For liveborn infants with an Apgar score at five minutes reported, 96.6 per cent had an Apgar score of 8 to 10 and 0.3 per cent of had an Apgar score of less than 4 at five minutes of age.

A small number of infants had an unknown Apgar score at five minutes and most of these infants were born before arrival at health service (Table 93).

**Table 93: Apgar score at five minutes and time to spontaneous respiration for infants born alive in WA, 2013**

Time to spontaneous respiration	Apgar score at 5 minutes						Total	
	0-3		4-7		8-10		No.	%
	No.	%	No.	%	No.	%		
1	13	15.1	257	23.9	30,979	93.8	31,249	91.4
2-3	***	1.2	261	24.2	1,597	4.8	***	5.4
4-6	***	2.3	269	25.0	330	1.0	***	1.8
≥ 7	23	26.7	141	13.1	20	0.1	184	0.5
Unknown <sup>52</sup>	47	54.7	149	13.8	90	0.3	286	0.8
<b>Total</b>	<b>86</b>	<b>100.0</b>	<b>1,077</b>	<b>100.0</b>	<b>33,016</b>	<b>100.0</b>	<b>34,179</b>	<b>100.0</b>
<b>Row Percentage</b>		<b>0.3</b>		<b>3.2</b>		<b>96.6</b>		<b>100.0</b>

Extracted from Midwives' Notification System on 22 September 2015.

15 infants with an unknown Apgar score at 5 minutes were excluded from the table above.

Values <5 are suppressed and indicated with \*\*\*, other values were suppressed to prevent calculation.

<sup>52</sup> Cases have no time to spontaneous respiration reported if the infant received ventilation assistance for more than 10 minutes or was not attended at birth by a health professional.



### 5.2.2. Infant resuscitation

Only one method of infant resuscitation was reported by midwives for each infant. Reporting was hierarchical with the most intensive method reported. That is a value of one was the least intensive and eight was the most intensive as outlined in Table 94.

In 2013, midwives may have reported medications like Adrenaline or Naloxone or the use of continuous positive airway pressure (CPAP) as "Other".

Of the total infants born alive, 19.5 per cent received some form of resuscitation. A method of "Other" was reported for 1.4 per cent of these infants. The proportion that received external cardiac massage was 0.3 per cent and 0.6 per cent had endotracheal intubation without external cardiac massage. Assisted ventilation with bag and mask was provided to 8.8 per cent, 4.7 per cent received oxygen with or without suction and only suction was administered to 3.7 per cent of infants (Table 94).

**Table 94: Resuscitation received by infants born alive in WA, 2013**

Resuscitation method	Liveborn infants	
	No.	%
1-None	27,522	80.5
2-Suction Only	1,270	3.7
3-Oxygen Therapy	1,596	4.7
4-Continuous positive airway pressure (CPAP)	9	0.0
5-Bag & Mask	3,002	8.8
6-Intubation	212	0.6
7-External Cardiac Massage	107	0.3
8-Other <sup>53</sup>	476	1.4
<b>Total</b>	<b>34,194</b>	<b>100.0</b>

Extracted from Midwives' Notification System on 22 September 2015.

<sup>53</sup> Other Resuscitation Methods included medications. The "Other" option is considered the highest value for resuscitation methods. Infants that have had the "Other" option reported may or may not have had any other methods employed.

The Apgar score at 5 minutes often reflects the response by an infant to resuscitation if it was required. Of infants born alive in 2013 with an Apgar score at five minutes of 8 to 10, 83.2 per cent required no resuscitation, 4.5 per cent received oxygen therapy, 3.8 per cent received suction only and 7.1 per cent required assisted ventilation using a bag and mask (Table 95).

**Table 95: Resuscitation and Apgar score at five minutes for infants born alive in WA, 2013**

Resuscitation methods	Apgar score at 5 minutes						Total	
	0-3		4-7		8-10		No.	%
	No.	%	No.	%	No.	%		
1-None	16	18.6	21	1.9	27,473	83.2	27,510	80.5
2-Suction Only	***	***	15	1.4	1,254	3.8	***	3.7
3-Oxygen Therapy	***	***	93	8.6	1,502	4.5	***	4.7
4-Cont. +ve airway pressure (CPAP)	-	-	-	-	9	0.0	9	0.0
5-Bag & Mask	16	18.6	639	59.3	2,345	7.1	3,000	8.8
6-Intubation	10	11.6	122	11.3	80	0.2	212	0.6
7-External Cardiac Massage	18	20.9	57	5.3	32	0.1	107	0.3
8-Other <sup>54</sup>	24	27.9	130	12.1	321	1.0	475	1.4
<b>Total</b>	<b>86</b>	<b>100.0</b>	<b>1077</b>	<b>100.0</b>	<b>33,016</b>	<b>100.0</b>	<b>34,179</b>	<b>100.0</b>

Extracted from Midwives' Notification System on 22 September 2015.

15 infants with no Apgar score at 5 minutes reported were excluded from the table above.

Values <5 are suppressed and indicated with \*\*\*, other values were suppressed to prevent calculation.

### 5.3. Birth trauma

Infant birth trauma can occur from the duration of time the presenting part of the fetus is well applied to the maternal cervix during labour. Trauma can also result from application of a vacuum cup or forceps to facilitate birth. Other manipulation of a fetus during birth can be required for situations such as shoulder dystocia, breech or compound presentation. These manipulations contribute additional risk of birth trauma to the infant.

In 2013, the most frequently reported birth trauma was chignon that affected 2.1 per cent of all infants or 3.2 per cent of infants born vaginally. The most frequently occurring trauma in infants born by caesarean section was bruising of the scalp (1.8 per cent). Trauma like Erb's Palsy or a fracture of the clavicle was reported for 13 vaginally born infants, affecting 0.1 per cent of all infants born and 0.1 per cent of all infants born vaginally (Table 96).

**Table 96: Birth trauma to infants born in WA, 2013**

Type of birth trauma	Birth method				Total	
	Caesarean		Vaginal		No.	%
	No.	%	No.	%		
Cephalhaematoma	10	0.1	138	0.6	148	0.4
Chignon	24	0.2	713	3.2	737	2.1
Bruising of scalp	218	1.8	212	0.9	430	1.2
Other trauma to scalp	117	1.0	369	1.6	486	1.4
Birth trauma to face/facial nerve/eye	***	***	19	0.1	***	0.1
Birth trauma to skeleton, unspecified	7	0.1	7	>0.1	14	0.1
Erb's Palsy/Fracture of clavicle	***	***	13	0.1	***	0.1
Other specified birth trauma	29	0.2	12	0.1	41	0.1
<b>Total infants by birth method</b>	<b>11,960</b>		<b>22,444</b>		<b>34,404</b>	

Extracted from Midwives' Notification System on 22 September 2015.

<sup>54</sup> Other Resuscitation Methods included medications. The "Other" option is considered the highest value for resuscitation methods. Infants that have had the "Other" option reported may or may not have had any other methods lower in the hierarchy employed.

## 5.4. Birth defects

Detailed information including trends over birth years is available for births occurring 1980 to 2014 in the Western Australian Register of Developmental Anomalies (WARDA) Annual Report at

[http://kemh.health.wa.gov.au/services/register\\_developmental\\_anomalies/documents/2016\\_Annual\\_Report\\_of\\_the\\_WA\\_Register\\_of\\_Developmental\\_Abnormalities.pdf](http://kemh.health.wa.gov.au/services/register_developmental_anomalies/documents/2016_Annual_Report_of_the_WA_Register_of_Developmental_Abnormalities.pdf) or by request to WARDA.

## 5.5. Infant outcome

### 5.5.1. Admission to Special Care Nursery

In 2013, there was one birth site in Western Australia with a Level 3 and Level 2 Special Care Nursery (SCN); eleven other birth sites had a Level 2 SCN. Sites without a SCN may provide neonatal care for unstable infants for a short time, usually less than 1 day. Infant stays in SCN of less than one day are not reported in Table 97.

Of all liveborn infants, 11.4 per cent were admitted to a SCN (Level 2 or 3) at their birth site with a length of stay of at least one day.

Of twins and triplets 56.6 per cent were admitted to SCN compared to singleton infants who had 10.3 per cent admitted to SCN.

The SCN length of stay exceeded 7 days for 22.4 per cent of singleton infants and 57.4 per cent of infants from multiple births.

**Table 97: Length of stay in Special Care Nursery and plurality of birth for infants born alive in WA, 2013**

Length of Stay <sup>55</sup> (days)	Plurality				Total	
	Single		Multiple		No.	%
	No.	%	No.	%		
1	1,012	29.6	39	7.5	1051	26.6
2	649	19.0	27	5.2	676	17.1
3	363	10.6	37	7.1	400	10.1
4	245	7.2	27	5.2	272	6.9
5	171	5.0	41	7.8	212	5.4
6	119	3.5	20	3.8	139	3.5
7	95	2.8	32	6.1	127	3.2
8-14	347	10.1	120	22.9	467	11.8
15-20	134	3.9	68	13.0	202	5.1
21-28	76	2.2	46	8.8	122	3.1
29-60	122	3.6	48	9.2	170	4.3
61-90	47	1.4	11	2.1	58	1.5
>90	42	1.2	7	1.3	49	1.2
<b>More than 7</b>	<b>768</b>	<b>22.4</b>	<b>300</b>	<b>57.4</b>	<b>1,068</b>	<b>27.1</b>
<b>Total admitted ≥ 1 day</b>	<b>3,422</b>	<b>100.0</b>	<b>523</b>	<b>100.0</b>	<b>3,945</b>	<b>100.0</b>
<b>Total liveborn</b>	<b>33,270</b>		<b>924</b>		<b>34,194</b>	
<b>Proportion of liveborn admitted ≥ 1 day</b>		<b>10.3</b>		<b>56.6</b>		<b>11.4</b>

Extracted from Midwives' Notification System on 22 September 2015.

<sup>55</sup> Excludes infants transferred from a birth site to another site for admission to SCN and excludes infants with a stay in SCN at the birth site of less than 24 hours.

### 5.5.2. Transfer from birth place

Transfer of infants to another hospital following birth occurred for 5.4 per cent of liveborn infants. Transfer may have been undertaken when a higher level of care was required than was available at the birth site or when lower level of care provision was appropriate for ongoing care before discharge (Table 98).

In the neonatal period (before 28 days of age) 0.1 per cent of infants died before discharge from their birth site (Table 98).

Infants that were stillborn or died within one year of birth in 2013 were notified for review to the WA Perinatal and Infant Mortality Committee.

**Table 98: Transfer from birth place to other hospital for infants born alive in WA, 2013**

Place of Birth	Discharge Outcome						Total	
	Transferred		Died		Discharged Home			
	No.	%	No.	%	No.	%	No.	%
<b>Metropolitan</b>								
Tertiary	1,083	18.6	33	0.6	4,701	80.8	5,817	100.0
Other Public	238	2.5	***	***	9,160	97.4	***	100.0
Private	181	1.4	***	***	12,839	98.6	***	100.0
<b>Country</b>								
Regional	242	7.0	***	***	3,221	92.9	***	100.0
Other Public	82	5.6	***	***	1,379	94.3	***	100.0
Private	12	1.5	.	.	801	98.5	813	100.0
<b>Homebirth</b>	<b>13</b>	<b>6.2</b>	.	.	<b>197</b>	<b>93.8</b>	<b>210</b>	<b>100.0</b>
<b>Total</b>	<b>1,851</b>	<b>5.4</b>	<b>45</b>	<b>0.1</b>	<b>32,298</b>	<b>94.5</b>	<b>34,194</b>	<b>100.0</b>

Extracted from Midwives' Notification System on 22 September 2015.

Values <5 are suppressed and indicated with \*\*\*, other values were suppressed to prevent calculation.

Of liveborn infants with an outcome of discharge from their birth site 77.4 per cent had a length of stay between two and seven days. A small proportion of infants stayed longer than a week before discharge home, 1.8 per cent stayed between 8 and 14 days, the remaining 1.2 per cent stayed more than two weeks (Table 99).

Of the infants who weighed at least 2,500 grams at birth 20.3 per cent were discharged home within one day.

Infants with low birthweight spent more days at birth site before discharge. 82.1 per cent of infants who stayed more than two weeks had a low birthweight (Table 99).

**Table 99: Length of stay at birth site before discharge home by birthweight for infants born alive in WA, 2013**

Birthweight (grams)	Length of stay (days)				Total
	≤ 1	2-7	8-14	> 14	
<b>Number</b>					
<1000	-	-	-	40	40
1000-1499	***	-	***	63	65
1500-1999	***	25	***	95	***
2000-2499	38	710	188	114	1,050
<b>&lt; 2500</b>	<b>40</b>	<b>735</b>	<b>228</b>	<b>312</b>	<b>1,315</b>
2500-2999	822	4,155	178	40	5,195
3000-3499	2,552	9,843	109	18	12,522
3500-3999	2,210	7,684	60	7	9,961
4000-4499	622	2,240	15	***	***
≥ 4500	70	348	7	***	***
<b>≥ 2500</b>	<b>6,276</b>	<b>24,270</b>	<b>369</b>	<b>68</b>	<b>30,983</b>
<b>Total</b>	<b>6,316</b>	<b>25,005</b>	<b>597</b>	<b>380</b>	<b>32,298</b>
<b>Row percent</b>					
<1000	-	-	-	100.0	100.0
1000-1499	***	-	***	96.9	100.0
1500-1999	***	15.6	***	59.4	100.0
2000-2499	3.6	67.6	17.9	10.9	100.0
<b>&lt; 2500</b>	<b>3.0</b>	<b>55.9</b>	<b>17.3</b>	<b>23.7</b>	<b>100.0</b>
2500-2999	15.8	80.0	3.4	0.8	100.0
3000-3499	20.4	78.6	0.9	0.1	100.0
3500-3999	22.2	77.1	0.6	0.1	100.0
4000-4499	21.6	77.8	0.5	***	100.0
≥ 4500	16.4	81.7	1.6	***	100.0
<b>≥ 2500</b>	<b>20.3</b>	<b>78.3</b>	<b>1.2</b>	<b>0.2</b>	<b>100.0</b>
<b>Total</b>	<b>19.6</b>	<b>77.4</b>	<b>1.8</b>	<b>1.2</b>	<b>100.0</b>
<b>Column percent</b>					
<1000	-	-	-	10.5	0.1
1000-1499	***	-	***	16.6	0.2
1500-1999	***	0.1	***	25.0	0.5
2000-2499	0.6	2.8	31.5	30.0	3.3
<b>&lt; 2500</b>	<b>0.6</b>	<b>2.9</b>	<b>38.3</b>	<b>82.1</b>	<b>4.1</b>
2500-2999	13.0	16.6	29.9	10.5	16.1
3000-3499	40.4	39.4	18.3	4.7	38.8
3500-3999	35.0	30.7	10.1	1.8	30.8
4000-4499	9.8	9.0	2.5	***	8.9
≥ 4500	1.1	1.4	1.2	***	1.3
<b>≥ 2500</b>	<b>99.4</b>	<b>97.1</b>	<b>61.8</b>	<b>17.9</b>	<b>95.9</b>
<b>Total</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>

Extracted from Midwives' Notification System on 22 September 2015.

Includes homebirths in midwife's care where discharge date equals birth date.

Excludes infants that were stillborn or died or were transferred to another site.

Values <5 are suppressed and indicated with \*\*\*, other values were suppressed to prevent calculation.

Gestational age is a superior predictor of infant endurance than birthweight. Length of stay at birth site of one day or less for preterm infants could be explained by transfer to another health service or early neonatal death.

The proportion of liveborn infants of gestational age 33 to 36 weeks discharged home alive that stayed for two weeks or more at birth site was 11.7 per cent (Table 100).

**Table 100: Length of stay at birth site before discharge home by gestation for infants born alive in WA, 2013**

Gestation age	Length of stay (days)				Total
	≤1	2-7	8-14	>14	
<b>Number</b>					
33-36 weeks	64	1,213	319	212	1,808
37-44 weeks	6,250	23,788	277	26	30,341
<b>Total</b>	<b>6,314</b>	<b>25,001</b>	<b>596</b>	<b>238</b>	<b>32,149</b>
<b>Row percent</b>					
33-36 weeks	3.5	67.1	17.6	11.7	100.0
37-44 weeks	20.6	78.4	0.9	0.1	100.0
<b>Total</b>	<b>19.6</b>	<b>77.8</b>	<b>1.9</b>	<b>0.7</b>	<b>100.0</b>
<b>Column percent</b>					
33-36 weeks	1.0	4.9	53.5	89.1	5.6
37-44 weeks	99.0	95.1	46.5	10.9	94.4
<b>Total</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>

Extracted from Midwives' Notification System on 22 September 2015.

Excludes 149 infants of gestational age less than 33 weeks. These infants contributed low values to most cells of the table and were excluded to suppress values less than 5.

Other infants born alive were transferred from the birth site or died before discharge. Of these 998 were preterm and 898 were 37 weeks gestation or more (Table 101).

**Table 101: Length of stay at birth site by gestation for infants who were transferred from birth or died in WA, 2013**

Gestation age	Length of stay (days)				Total
	≤1	2-7	8-14	>14	
<b>Number</b>					
20-27 weeks	31	9	2	40	82
28-32 weeks	31	26	58	155	270
33-36 weeks	155	295	126	70	646
<b>Less than 37 weeks</b>	<b>217</b>	<b>330</b>	<b>186</b>	<b>265</b>	<b>998</b>
37-44 weeks	579	291	18	10	898
<b>TOTAL</b>	<b>796</b>	<b>621</b>	<b>204</b>	<b>275</b>	<b>1,896</b>

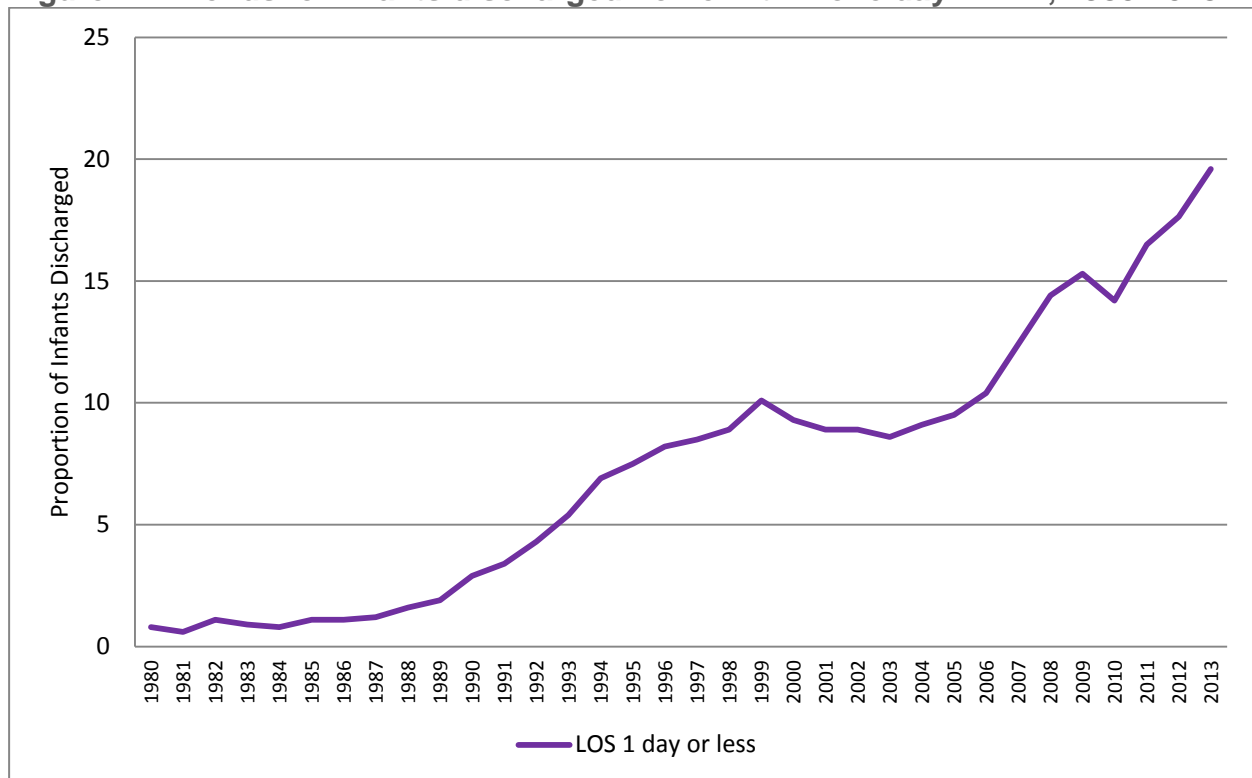
Extracted from Midwives' Notification System on 22 September 2015.

### 5.5.3. Liveborn infant length of stay at birthplace

Infant length of stay at birth place can be affected by birthweight, gestation, condition and maternal length of stay. At all maternity services a well infant will not usually be discharged from the birth site before an unwell mother.

Trend data in Figure 24 illustrate a change in the proportion of infants discharged home within a day of birth. From a low of 0.6 per cent in 1981, a proportion of 10.1 per cent was attained by 1999. By 2013, the proportion of infants discharged home on day of birth or the day after birth was 19.6 per cent. The Australian national proportion for infants born in 2013 was 18.5 per cent (AIHW, 2015).

**Figure 24: Trends for infants discharged home within one day in WA, 1980-2013**



Proportion of all infants discharged alive from site of birth without transfer to another hospital.

## 6. Perinatal Mortality

Perinatal deaths include stillborn infants (fetal deaths) where the infant died before the onset of labour or during labour, and neonatal deaths where the infant died in the neonatal period, between birth and the 28<sup>th</sup> day of life.

These data include infants of 20 weeks gestation that were born as a result of termination of a pregnancy as these infants cannot be distinguished from other infants and therefore contribute to the perinatal mortality rate presented here. Unreported data of the WA Abortion Notification System indicate that these would comprise 17.8 per cent of the perinatal deaths described in text and tables below.

There were 269 perinatal deaths occurring for infants born in 2013 from pregnancies of 20 weeks or more gestation. There were 210 stillborn infants and 59 infants born alive who died in the neonatal period. There was a perinatal mortality rate of 7.8 per 1,000 infants born, a fetal mortality rate of 6.1 per 1,000 infants born and a neonatal mortality rate of 1.7 per 1,000 infants born alive (Table 102).

Mortality rates for infants of Aboriginal mothers were between two and three times higher than for infants of non-Aboriginal mothers in all categories.

For more information about perinatal mortality in Western Australia go to the reports of the WA Perinatal Mortality Committee at:

[http://www.health.wa.gov.au/publications/subject\\_index/p/Perinatal\\_infant\\_maternal.cfm](http://www.health.wa.gov.au/publications/subject_index/p/Perinatal_infant_maternal.cfm).

**Table 102: Perinatal mortality and maternal Aboriginal status in WA, 2013**

Mortality type	Maternal Aboriginal status				Total	
	Aboriginal Number	Rate <sup>56</sup>	non-Aboriginal Number	Rate <sup>57</sup>	Number	Rate <sup>58</sup>
Fetal deaths	23	13.1	187	5.7	210	6.1
Neonatal death	13	7.5	46	1.4	59	1.7
Perinatal deaths	<b>36</b>	<b>20.5</b>	<b>233</b>	<b>7.1</b>	<b>269</b>	<b>7.8</b>

Extracted from the Perinatal Mortality Database 22 September 2015.

<sup>56</sup> The denominators used for infants of Aboriginal mothers were 1,757 total infants born and 1,734 infants born alive.

<sup>57</sup> The denominators used for infants of non-Aboriginal mothers were 32,647 total infants born and 32,460 infants born alive.

<sup>58</sup> The denominators used were for Total infants born in WA 34,404 and 34,194 infants born alive.



Since 1994, infants of Aboriginal mothers had a perinatal mortality rate ranging from 25.8 per 1,000 infants in 1999 to 14.8 per 1,000 in 2007. The perinatal mortality rate for 2013 was 20.5 per 1,000 infants born to Aboriginal women (Table 103).

**Table 103: Trends for perinatal mortality by maternal Aboriginal status for infants born in WA, 1994-2013**

Year of birth	Maternal Aboriginal status		Total rate
	Aboriginal rate	Non-Aboriginal rate	
1994	22.7	10.2	10.9
1995	21.9	10.0	10.7
1996	21.4	11.1	11.7
1997	25.9	8.6	9.7
1998	17.8	8.6	9.1
1999	25.8	9.0	10.1
2000	24.2	9.9	10.8
2001	17.6	9.2	9.7
2002	25.1	8.0	9.2
2003	23.9	8.6	9.6
2004	16.5	9.3	9.8
2005	19.8	9.5	10.2
2006	24.3	8.5	9.5
2007	14.8	7.8	8.2
2008	19.6	8.6	9.3
2009	20.4	9.4	10.0
2010	21.2	8.5	9.2
2011	23.6	9.6	10.3
2012	21.1	7.8	8.4
2013	20.5	7.1	7.8

Extracted from the Perinatal Mortality Database 22 September 2015.

### 6.1.1. Perinatal mortality by gestational age in WA

Early gestational age corresponded with a higher perinatal death rate. When infants born at gestations of 20 or 21 completed weeks were excluded, the perinatal mortality rate was 5.7 per 1,000 infants born (Table 104).

**Table 104: Perinatal mortality by gestation for infants born in WA, 2013**

Gestation	Fetal death rate	Neonatal death rate	Perinatal death rate
≥ 20 weeks	6.1	1.7	7.8
≥ 22 weeks	4.2	1.5	5.7

Extracted from the Perinatal Mortality Database 22 September 2015.

Includes infants of at least 20 weeks gestation that may have had severe congenital abnormalities.

### 6.1.2. Perinatal mortality by birthweight in WA

Low birthweight corresponded with a higher perinatal death rate. When infants with birthweight less than 400 grams were excluded, the perinatal mortality rate was 5.5 per 1,000 infants. When infants with birthweight less than 500 grams were excluded, the perinatal mortality rate was 4.4 per 1000 infants born (Table 105).

**Table 105: Perinatal mortality by birthweight for infants born in WA, 2013**

Birthweight (grams)	Fetal death rate	Neonatal death rate	Perinatal death rate
≥ 400 grams	4.0	1.6	5.5
≥ 500 grams	3.0	1.4	4.4

Extracted from the Perinatal Mortality Database 22 September 2015.

Excludes 1 case where birthweight was not reported and 79 cases where birthweight was less than 400 grams.

Includes infants of at least 20 weeks gestation who had severe congenital abnormalities.

Of stillborn infants, 85.2 percent had a birthweight less than 2,500 grams. Of infants who died in the neonatal period a lower proportion were in this low birthweight category (64.4 per cent). The proportion of perinatal deaths that were low birthweight infants was 80.6 per cent (Table 106).

**Table 106: Birthweight for infants that died in perinatal period and were born in WA, 2013**

Birthweight (grams)	Mortality type		
	Fetal deaths	Neonatal deaths	Perinatal deaths
	Number		
<b>Total Number</b>	<b>209</b>	<b>59</b>	<b>268</b>
	Column Percentage		
< 1000	74.6	42.4	67.5
1000–1499	6.2	5.1	6.0
1500–1999	1.9	8.5	3.4
2000–2499	2.4	8.5	3.7
<b>&lt; 2500</b>	<b>85.2</b>	<b>64.4</b>	<b>80.6</b>
2500–2999	7.7	22.0	10.8
3000–3499	4.3	8.5	5.2
≥ 3500	2.9	5.1	3.4
<b>Total Percentage</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>

Extracted from the Perinatal Mortality Database and Midwives' Notification System 22 September 2015.  
Excludes 1 case where birthweight was not reported.

For infants of multiple births, the perinatal mortality rate was 30.7 per 1000 infants, more than four times the rate for singleton infants of 7.2 per 1000 (Table 107).

**Table 107: Perinatal mortality and plurality of birth for infants born in WA, 2013**

Plurality	Mortality type					
	Fetal death		Neonatal death		Perinatal death	
	No.	Rate	No.	Rate	No.	Rate <sup>59</sup>
Single	188	5.6	52	1.6	240	7.2
Multiple	22	23.3	7	7.6	29	30.7
<b>Total</b>	<b>210</b>	<b>6.1</b>	<b>59</b>	<b>1.7</b>	<b>269</b>	<b>7.8</b>

Extracted from the Perinatal Mortality Database 22 September 2015.

A neonatal death (the death of a liveborn infant during the first 28 days of life) is more likely to occur within the first day of life. In 2013, 50.8 per cent of neonatal deaths occurred in infants aged less than one day (Table 108).

**Table 108: Age at neonatal death for infants born in WA, 2013**

Age at neonatal death	Neonatal Deaths	
	No.	%
< Day 1	30	50.8
Day 1	9	15.3
Day 2	5	8.5
Day 3-7	7	11.9
Day 8-28	8	13.6
<b>Total</b>	<b>59</b>	<b>100.0</b>

Extracted from the Perinatal Mortality Database 22 September 2015.

<sup>59</sup> Rates for fetal and perinatal death were determined per 1,000 infants born. The rate for neonatal death was determined per 1,000 liveborn infants.

Autopsy occurred for 59.0 per cent of infants that were stillborn (fetal death) and 44.1 per cent of infants that died in the neonatal period (Table 109).

**Table 109: Autopsy requests for infants that died in perinatal period in WA, 2013**

Autopsy	Mortality type					
	Fetal deaths		Neonatal deaths		Perinatal deaths	
	No.	%	No.	%	No.	%
Yes	124	59.0	26	44.1	150	55.8
No/Unknown	86	41.0	33	55.9	119	44.2
<b>Total</b>	<b>210</b>	<b>100.0</b>	<b>59</b>	<b>100.0</b>	<b>269</b>	<b>100.0</b>

Extracted from the Perinatal Mortality Database 22 September 2015.

The principal known causes for fetal death were lethal birth defect (37.6 per cent) and extremely low birthweight of less than 1,000 grams (41.4 per cent). Among infants that died neonatally, lethal birth defect was the cause of death for 39.0 per cent and extremely low birthweight for 33.9 per cent (Table 110).

**Table 110: Causes of perinatal death for infants born in WA, 2013**

Cause of perinatal death	Mortality type			
	Fetal deaths		Neonatal deaths	
	No.	%	No.	%
Lethal birth defect	79	37.6	23	39.0
Extremely low birthweight (< 1,000 grams) <sup>60</sup>	87	41.4	20	33.9
Asphyxia	-	-	8	13.6
Placenta and cord	-	-	-	-
Maternal condition	***	***	-	-
Sudden Infant Death Syndrome	-	-	-	-
Unknown or Other	43	20.5	8	13.6
<b>Total</b>	<b>***</b>	<b>100.0</b>	<b>59</b>	<b>100.0</b>

Extracted from the Perinatal Mortality Database 22 September 2015.

Values <5 are suppressed and indicated with \*\*\*, other values were suppressed to prevent calculation.

<sup>60</sup> Any infant without malformation that died and had birthweight less than 1000 grams is reported in the "extremely low birthweight" category

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## 8. Appendix A: Glossary

<b>Age-specific birth rate</b>	The total births (live births and still births) per 1,000 born to women aged between 15–44 years or detailed age groups such as 15-19, 20-24, 25-29 etc.
<b>Anaesthesia</b>	Often administered immediately before delivery and differs from analgesia in that it causes a loss of all sensation. It includes loss of touch, loss of certain reflexes and loss of ability to move. With general anaesthesia there is also a loss of consciousness.
<b>Analgesia</b>	Often administered during labour to reduce the feeling of pain while allowing sensations of touch, pressure and the ability to move to generally remain intact.
<b>Apgar score</b>	A numerical scoring system applied after birth to evaluate the condition of the infant. It is based on heart rate, respiration, muscle tone, reflexes and colour. A low score indicates poor condition of the infant.
<b>Augmentation of labour</b>	Refers to the use of medication or other intervention to 'speed up' the process of labour that has already commenced spontaneously. Augmentation may be required to assist with an abnormal or difficult labour (dystocia), or to speed up normal labour if the health of the mother or baby is at risk.
<b>Body Mass Index (BMI)</b>	<p>The calculation for BMI was maternal weight (kgs) divided by the maternal height (m) squared, for example <math>72\text{kgs}/1.65\text{m}^2</math> is 26.45 BMI.</p> <p>BMI was calculated where height and weight at time of booking for pregnancy care was reported. However, if the woman had no weight recorded before 20 weeks gestation, it will be the self-reported weight at conception.</p>
<b>Born before arrival (BBA)</b>	A birth that occurs prior to arrival of the mother at the health service reporting the birth. It usually indicates a planned hospital or birth centre birth occurring unexpectedly before arrival at service. A planned homebirth is reported as BBA if birth occurs before midwife arrives at the home. BBA is an indication of a birth occurring in an uncontrolled environment.
<b>Birth defects</b>	Any defect present in the infant at the time of birth, probably of developmental origin.
<b>Birthweight</b>	The first weight, measured of the infant, to the nearest five grams. Usually obtained within the first hour of birth.
<b>Caesarean section</b>	<p>Infant is born through an incision in the maternal uterus via the abdomen.</p> <p><u>Elective caesarean section:</u> a scheduled procedure that occurs prior to onset of labour and rupture of membranes and without any labour induction procedure.</p> <p><u>Emergency caesarean section:</u> a procedure performed at a time determined by an arising complication. May be performed before or after the onset of labour.</p>

<b>Diabetes</b>	Two values are reported to the Midwives' Notification System, "gestational diabetes" as a pregnancy complication and "pre-existing diabetes" as a medical condition. Pre-existing diabetes includes both Type 1 and Type 2 diabetes.
<b>Crude birth rate</b>	The number of liveborn infants occurring per 1000 of the total general population.
<b>Epidural</b>	Injection of analgesic agent outside the dura mater encasing the maternal spinal canal.
<b>Episiotomy</b>	An incision of the perineum and vagina to enlarge the opening of the vagina.
<b>Gestational age</b>	The duration of pregnancy from the first day of the last normal menstrual period. If unable to be determined in this way, ultrasound estimations of gestational age during pregnancy or assessment of the newborn infant may be used to determine this age. Data presented here is in completed weeks e.g. a gestational age of 40 days would be presented as 5 weeks and not 5 weeks and 5 days or 6 weeks.
<b>Health Service Area</b>	Within WA, there are three Health Service Areas created by grouping of the Statistical Local Areas (SLA) devised by the Australian Bureau of Statistics (ABS) into North Metro, South Metro and Country.
<b>Statistical Local Area</b>	Known as an SLA is an Australian Standard Geographical Classification (ASGC) defined area that comprises a suburb or groups of suburb. Describes geographical locations for the whole of Australia without gaps or overlays. It is described with a 9 digit number made up of values representing state, statistical division (SD), statistical subdivision (SSD) and SLA, for example, the SLA of Armadale (City) has an SLA value of 505250210 which can be broken down to 5/05/25/0210 to represent values for WA/SD/SSD/SLA.
<b>Health Region</b>	SLAs also determine the division of the Country Area into seven Regions: Kimberley, Pilbara, Midwest, Wheatbelt, Goldfields, Southwest, and Great Southern. With the two Metropolitan regions of North and South, these comprise the nine Health Regions in WA.
<b>Homebirth</b>	Homebirths reported in the annual report only include women attended by midwives for a planned homebirth. Other homebirths may include "freebirths", a homebirth planned to occur without a health professional in attendance, or an unplanned or unexpected homebirth where the birth may be reported as homebirth or "born before arrival" to the health service.
<b>Induction of labour</b>	The process of using medications or procedures to artificially initiate labour. Induction is performed when birth in next 24 hours was believed to best serve the welfare of mother and/or infant.

<b>Length of stay</b>	The total number of days spent in hospital. A stay of less than one day (admission, birth and discharge occur on the same day) is counted as one day, in the total days of care. For women or infants admitted and discharged on different days, the number of days is computed by subtracting the date of admission/birth from the day of separation. For planned home births length of stay is reported as 0 days from date of birth.
<b>Livebirth</b>	The complete expulsion or extraction from its mother of an infant irrespective of duration of pregnancy, which after birth shows signs of life.
<b>Mortality rates</b>	<p><u>Fetal death rate</u>: the number of fetal deaths per 1000 total births in a year.</p> <p><u>Neonatal mortality</u>: the number of neonatal deaths per 1000 live births in a year.</p> <p><u>Perinatal mortality</u>: the number of stillbirths and neonatal deaths per 1000 total births in a year.</p>
<b>Neonatal death</b>	The death of a liveborn infant within 28 days of birth.
<b>Obstetrician</b>	Medical Practitioner who has achieved consultant status in Obstetrics and Gynaecology.
<b>Other medical officer</b>	Medical Practitioner who is not a consultant of Obstetrics and Gynaecology.
<b>Oxytocin/Syntocinon</b>	Oxytocin is a naturally occurring hormone released by the pituitary gland. Two of its actions are to stimulate smooth muscle of the uterus producing rhythmic contractions and cause contraction of small muscles in the breast facilitating lactation. Syntocinon is a synthetic copy of Oxytocin made available by pharmaceutical companies as an injectable solution.
<b>Parity</b>	<p>The total number of infants born alive or stillborn to the mother prior to the index pregnancy.</p> <p><u>Nulliparous</u>: Never having completed a pregnancy beyond 20 weeks gestation prior to the index pregnancy.</p> <p><u>Primiparous</u>: having completed one pregnancy beyond 20 weeks gestation.</p> <p><u>Multiparous</u>: having completed two or more pregnancies beyond 20 weeks gestation.</p>
<b>Perinatal death</b>	A stillbirth (fetal death) or neonatal death.
<b>Perineal status</b>	<p><u>First degree tear</u>: a perineal graze, laceration, or tear involving the fourchette, hymen, labia, skin, vagina or vulva.</p> <p><u>Second degree tear</u>: a perineal laceration or tear involving the pelvic floor or perineal muscles or vagina muscles.</p> <p><u>Third degree tear</u>: a perineal laceration or tear involving the anal sphincter or rectovaginal septum.</p> <p><u>Fourth degree tear</u>: a third degree perineal laceration or tear which has extended to involve the anal or rectal mucosa.</p>



<b>Plurality</b>	The number of infants resulting from a pregnancy of 20 weeks gestation or more. On this basis a birth may be classified as single or multiple.
<b>Prostaglandin</b>	Prostaglandins are naturally occurring products of metabolism. Some cause strong contraction of the uterine muscle and ripening and dilatation of the cervix. Prostaglandin E formulas are synthetic copies made available by pharmaceutical companies in formats that can be administered orally, sublingually or vaginally.
<b>Relative Risk (RR)</b>	The likelihood of having an adverse event following exposure to some factor. Determines association rather than causation. Calculation used to describe Relative Risk (RR) in this report, was the Rate Ratio (rate of occurrence in exposed) / (rate of occurrence in non-exposed). For example, (number of infants of Aboriginal mothers with low birthweight/number of infants of Aboriginal Mother) / (number of infants of non-Aboriginal mothers with low birthweight/number of infants born to non-Aboriginal mothers)
<b>SEIFA Disadvantage Index</b>	Using 2011 census data, Statistical Area 2 (SA2) values were allocated to five groups based on the Socio-economic Index for Areas (SEIFA 2012) disadvantage index. Group I is considered as having the highest disadvantage and group V has the least disadvantage. <a href="http://www.abs.gov.au/AUSSTATS/abs@.nsf/Lookup/2033.0.55.001Main+Features12012?OpenDocument">http://www.abs.gov.au/AUSSTATS/abs@.nsf/Lookup/2033.0.55.001Main+Features12012?OpenDocument</a> .
<b>Stillbirth or Fetal death</b>	The complete expulsion or extraction from its mother of an infant which did not show any sign of life from the time of birth, where the pregnancy was at least 20 weeks gestation or the infant's birthweight is at least 400 grams.
<b>Term Infants</b>	Infants born from pregnancy with gestational age of 37 weeks or greater.
<b>Vertex Presentation</b>	The most common presentation of the fetus immediately prior to birth. The fetal chin is tucked in and the smallest and roundest circumference of the fetal head (just above the ears) is applied to the maternal cervix.



## 9. Appendix B: Supplementary Tables

Table 111: Trend for age-specific birth rates and Aboriginal status for women who gave birth in WA, 1983-2013

Year of birth	Aboriginal Status of mother						Total		
	Aboriginal			Non-Aboriginal			15-19	20-34	35-44
	15-19	20-34	35-44	15-19	20-34	35-44			
1983	161.4	134.4	15.5	21.6	112.8	14.5	27.6	113.4	14.5
1984	164.0	130.3	20.0	20.3	111.1	14.4	26.7	111.7	14.5
1985	158.4	137.6	13.7	18.3	110.7	16.0	24.7	111.6	16.0
1986	145.8	135.9	15.2	19.4	109.5	16.8	25.1	110.3	16.7
1987	144.9	144.4	19.6	18.0	108.3	16.6	23.6	109.5	16.7
1988	164.6	146.8	15.8	19.0	108.7	18.3	25.5	110.0	18.3
1989	149.1	148.0	17.5	18.8	107.4	18.4	24.5	108.8	18.4
1990	149.6	157.6	19.3	20.1	106.6	19.4	25.7	108.4	19.4
1991	162.1	138.3	17.1	19.6	101.4	19.0	25.9	102.7	18.9
1992	145.5	135.4	15.4	20.0	101.5	20.3	25.6	102.7	20.2
1993	150.4	132.9	17.0	18.8	101.3	21.3	24.5	102.4	21.2
1994	151.4	129.8	14.5	20.3	100.2	22.3	26.0	101.3	22.1
1995	133.6	133.7	18.3	19.8	98.7	23.3	24.7	100.1	23.2
1996	125.9	130.1	18.1	19.6	97.9	24.3	24.4	99.1	24.1
1997	135.4	140.7	18.8	17.8	95.0	24.8	23.1	96.8	24.7
1998	130.6	130.9	23.3	18.8	95.6	26.6	24.0	97.0	26.5
1999	125.2	140.0	25.2	18.4	95.9	26.5	23.4	97.6	26.5
2000	122.6	136.9	24.8	17.2	93.3	26.9	22.2	95.1	26.8
2001	104.1	131.1	19.1	16.3	91.3	27.5	20.9	93.1	27.2
2002	101.0	130.1	23.7	16.4	90.7	27.4	20.9	92.5	27.3
2003	100.1	115.9	19.7	14.6	89.4	29.5	19.3	90.6	29.2
2004	97.8	116.1	21.4	15.3	91.8	31.0	19.9	92.9	30.7
2005	107.0	122.9	23.8	15.9	94.4	34.6	21.2	95.7	34.2
2006	105.0	131.0	22.9	16.4	98.3	38.2	21.5	99.8	37.6
2007	94.1	130.8	29.0	16.5	99.9	39.9	20.9	101.2	39.5
2008	93.4	120.8	25.2	16.3	97.2	41.1	20.7	98.2	40.6
2009	88.0	121.5	25.4	15.4	95.3	39.6	19.6	96.4	39.1
2010	81.4	115.1	23.8	14.1	93.0	39.6	18.0	93.9	39.1
2011	83.2	115.8	22.0	14.1	91.9	39.9	18.2	92.9	39.3
2012	77.6	105.8	23.5	13.9	93.5	40.1	17.6	93.8	39.6
2013	78.3	113.8	21.6	12.1	90.4	40.0	16.1	91.2	39.4

Data Extracted from Midwives' Notification System on 22 September 2015.

The 15-19 year age group includes births to mothers younger than 15 years of age. The 40-45 year age group includes births to mothers aged 45 years or more.

Age-Specific Birth Rate was from the total number of births in one year per 1000 women of the same age group.

ABS population data available from WA Department of Health Calculator were used. No population data was available for years 1980 to 1982.

**Table 112: Trend for proportion of Aboriginal women who gave birth in WA, 1980-2013**

Year	Maternal Aboriginal Status				Total	
	Aboriginal		non-Aboriginal			
	No.	%	No.	%	No.	%
1980	1,030	5.0	19,580	95.0	20,610	100.0
1981	1,110	5.0	20,871	95.0	21,981	100.0
1982	1,123	5.1	21,029	94.9	22,152	100.0
1983	1,142	5.0	21,684	95.0	22,826	100.0
1984	1,185	5.2	21,518	94.8	22,703	100.0
1985	1,247	5.4	21,829	94.6	23,076	100.0
1986	1,239	5.2	22,364	94.8	23,603	100.0
1987	1,336	5.6	22,559	94.4	23,895	100.0
1988	1,436	5.8	23,366	94.2	24,802	100.0
1989	1,439	5.7	23,718	94.3	25,157	100.0
1990	1,548	6.0	24,154	94.0	25,702	100.0
1991	1,468	5.9	23,211	94.1	24,679	100.0
1992	1,422	5.7	23,548	94.3	24,970	100.0
1993	1,442	5.8	23,531	94.2	24,973	100.0
1994	1,439	5.7	23,632	94.3	25,071	100.0
1995	1,455	5.8	23,633	94.2	25,088	100.0
1996	1,431	5.7	23,761	94.3	25,192	100.0
1997	1,564	6.3	23,304	93.7	24,868	100.0
1998	1,508	6.0	23,784	94.0	25,292	100.0
1999	1,600	6.3	23,777	93.7	25,377	100.0
2000	1,597	6.4	23,220	93.6	24,817	100.0
2001	1,627	6.6	22,868	93.4	24,495	100.0
2002	1,652	6.8	22,745	93.2	24,397	100.0
2003	1,527	6.3	22,748	93.7	24,275	100.0
2004	1,556	6.2	23,557	93.8	25,113	100.0
2005	1,698	6.4	24,828	93.6	26,526	100.0
2006	1,788	6.3	26,466	93.7	28,254	100.0
2007	1,805	6.1	27,826	93.9	29,631	100.0
2008	1,722	5.7	28,515	94.3	30,237	100.0
2009	1,749	5.7	29,011	94.3	30,760	100.0
2010	1,683	5.5	29,160	94.5	30,843	100.0
2011	1,723	5.4	30,011	94.6	31,734	100.0
2012	1,630	4.9	31,763	95.1	33,393	100.0
2013	1,739	5.1	32,189	94.9	33,928	100.0

Extracted from Midwives' Notification System on 22 September 2015.

**Table 113: Trend for place of birth for women who gave birth in WA, 1980-2013**

Year	Place of Birth										Total	
	Tertiary		Public		Private		Home Birth		BBA			
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
1980	5,126	24.9	10,935	53.1	4,436	21.5	62	0.3	50	0.2	20,609	100.0
1981	5,332	24.3	11,994	54.6	4,521	20.6	59	0.3	75	0.3	21,981	100.0
1982	5,249	23.7	11,362	51.3	5,374	24.3	94	0.4	73	0.3	22,152	100.0
1983	4,731	20.7	11,872	52.0	6,065	26.6	99	0.4	59	0.3	22,826	100.0
1984	4,894	21.6	11,236	49.5	6,411	28.2	96	0.4	66	0.3	22,703	100.0
1985	4,666	20.2	11,296	49.0	6,900	29.9	143	0.6	71	0.3	23,076	100.0
1986	4,921	20.8	11,977	50.7	6,483	27.5	174	0.7	48	0.2	23,603	100.0
1987	4,625	19.4	12,008	50.3	7,053	29.5	144	0.6	65	0.3	23,895	100.0
1988	4,768	19.2	12,360	49.8	7,420	29.9	175	0.7	79	0.3	24,802	100.0
1989	4,675	18.6	12,751	50.7	7,478	29.7	176	0.7	77	0.3	25,157	100.0
1990	4,677	18.2	13,346	51.9	7,436	28.9	151	0.6	92	0.4	25,702	100.0
1991	4,200	17.0	13,052	52.9	7,204	29.2	145	0.6	77	0.3	24,678	100.0
1992	4,301	17.2	13,267	53.1	7,216	28.9	107	0.4	78	0.3	24,969	100.0
1993	4,695	18.8	12,934	51.8	7,161	28.7	102	0.4	81	0.3	24,973	100.0
1994	4,917	19.6	12,841	51.2	7,111	28.4	109	0.4	93	0.4	25,071	100.0
1995	4,930	19.7	12,912	51.5	7,055	28.1	96	0.4	95	0.4	25,088	100.0
1996	5,074	20.1	12,332	49.0	7,583	30.1	120	0.5	84	0.3	25,193	100.0
1997	5,025	20.2	11,925	48.0	7,741	31.1	112	0.5	65	0.3	24,868	100.0
1998	4,912	19.4	11,979	47.4	8,200	32.4	101	0.4	100	0.4	25,292	100.0
1999	5,150	20.3	11,634	45.8	8,397	33.1	123	0.5	73	0.3	25,377	100.0
2000	4,671	18.8	11,312	45.6	8,633	34.8	120	0.5	81	0.3	24,817	100.0
2001	4,168	17.0	10,787	44.0	9,316	38.0	137	0.6	87	0.4	24,495	100.0
2002	4,267	17.5	10,279	42.1	9,645	39.5	120	0.5	85	0.3	24,396	100.0
2003	4,335	17.9	9,971	41.1	9,726	40.1	163	0.7	80	0.3	24,275	100.0
2004	4,425	17.6	10,325	41.1	10,131	40.3	149	0.6	82	0.3	25,112	100.0
2005	4,811	18.1	10,949	41.3	10,517	39.6	150	0.6	98	0.4	26,525	100.0
2006	5,792	20.5	11,164	39.5	10,997	38.9	194	0.7	107	0.4	28,254	100.0
2007	6,008	20.3	11,363	38.4	11,928	40.3	203	0.7	127	0.4	29,629	100.0
2008	6,051	20.0	11,633	38.5	12,186	40.3	232	0.8	129	0.4	30,231	100.0
2009	5,653	18.4	12,231	39.8	12,493	40.6	245	0.8	126	0.4	30,748	100.0
2010	5,744	18.6	12,168	39.5	12,539	40.7	255	0.8	129	0.4	30,835	100.0
2011	5,650	17.8	12,993	40.9	12,733	40.1	232	0.7	126	0.4	31,734	100.0
2012	5,900	17.7	13,492	40.4	13,673	40.9	200	0.6	128	0.4	33,393	100.0
2013	5,707	16.8	14,192	41.8	13,681	40.3	195	0.6	153	0.5	33,928	100.0

Extracted from Midwives' Notification System on 22 September 2015.

BBA indicates women who give birth before arrival at the health service or for homebirths before the midwife arrived at the home.

Homebirth total includes both public and private homebirths and public births at the freestanding birth centre in Kalamunda.

Tertiary total includes women giving birth at the Birth Centre attached.

**Table 114: Trend for smoking tobacco during pregnancy in women who gave birth in WA, 1999-2013**

Year	Smoking in pregnancy				Total No.
	Smoking		Non-smoking		
	No.	%	No.	%	
1999	5,737	22.6	19,640	77.4	25,377
2000	5,260	21.2	19,557	78.8	24,817
2001	5,255	21.5	19,240	78.5	24,495
2002	4,932	20.2	19,464	79.8	24,396
2003	4,584	18.9	19,691	81.1	24,275
2004	4,307	17.2	20,805	82.8	25,112
2005	4,523	17.1	22,002	82.9	26,525
2006	4,941	17.5	23,313	82.5	28,254
2007	4,885	16.5	24,744	83.5	29,629
2008	4,660	15.4	25,571	84.6	30,231
2009	4,453	14.5	26,295	85.5	30,748
2010	3,710	12.0	27,125	88.0	30,835
2011	3,826	12.1	27,908	87.9	31,734
2012	3,863	11.6	29,530	88.4	33,393
2013	3,645	10.7	30,283	89.3	33,928

Extracted from Midwives' Notification System on 22 September 2015.

Data collection for tobacco smoking commenced 1999.

**Table 115: Trend for proportions by number of previous infants for women who gave birth in WA, 1980-2013**

Year	Number of Previous Infants				Total Women
	0 %	1-2 %	3-4 %	≥ 5 %	
1980	39.1	50.8	8.4	1.7	18,786
1981	39.2	51.0	8.4	1.3	21,981
1982	39.6	50.7	8.5	1.2	22,152
1983	39.3	51.2	8.2	1.3	22,826
1984	38.7	51.7	8.3	1.3	22,703
1985	38.1	52.2	8.4	1.2	23,076
1986	38.9	51.4	8.5	1.2	23,603
1987	38.9	51.3	8.5	1.3	23,895
1988	38.6	51.4	8.7	1.3	24,802
1989	39.5	50.2	8.9	1.4	25,157
1990	39.0	50.5	9.2	1.3	25,702
1991	39.7	49.8	9.1	1.3	24,678
1992	38.7	50.8	9.0	1.5	24,969
1993	38.7	50.9	8.9	1.6	24,973
1994	40.0	49.7	8.8	1.5	25,071
1995	40.6	49.2	8.6	1.6	25,088
1996	40.0	49.9	8.5	1.5	25,193
1997	40.3	49.6	8.6	1.6	24,868
1998	40.0	49.7	8.7	1.6	25,292
1999	40.4	49.6	8.4	1.6	25,377
2000	41.2	48.5	8.5	1.9	24,817
2001	40.7	49.4	8.2	1.8	24,495
2002	40.6	49.3	8.4	1.8	24,396
2003	41.3	49.0	7.8	1.9	24,275
2004	41.9	48.6	7.8	1.8	25,112
2005	41.9	48.4	7.8	1.9	26,525
2006	41.8	48.2	8.0	2.0	28,254
2007	42.0	48.5	7.6	2.0	29,629
2008	41.3	49.0	7.9	1.8	30,231
2009	41.9	48.8	7.5	1.7	30,748
2010	42.4	48.5	7.4	1.8	30,835
2011	42.5	49.2	6.6	1.7	31,734
2012	42.9	48.8	6.8	1.6	33,393
2013	42.6	49.2	6.7	1.4	33,928

Extracted from Midwives' Notification System on 22 September 2015

**Table 116: Trend for proportion by onset of labour for women who gave birth in WA, 1986-2013**

Year	Onset of Labour						Total	
	Spontaneous		Induction		No Labour		No.	%
	No.	%	No.	%	No.	%		
1986	14,956	63.4	6,363	27.0	2,284	9.7	23,603	100.0
1987	15,092	63.2	6,277	26.3	2,526	10.6	23,895	100.0
1988	15,826	63.8	6,428	25.9	2,548	10.3	24,802	100.0
1989	15,923	63.3	6,487	25.8	2,747	10.9	25,157	100.0
1990	16,638	64.7	6,180	24.0	2,884	11.2	25,702	100.0
1991	15,815	64.1	6,135	24.9	2,728	11.1	24,678	100.0
1992	15,537	62.2	6,544	26.2	2,888	11.6	24,969	100.0
1993	14,997	60.1	6,872	27.5	3,104	12.4	24,973	100.0
1994	15,092	60.2	6,876	27.4	3,103	12.4	25,071	100.0
1995	15,024	59.9	6,988	27.9	3,076	12.3	25,088	100.0
1996	14,985	59.5	7,036	27.9	3,172	12.6	25,193	100.0
1997	14,428	58.0	7,046	28.3	3,394	13.6	24,868	100.0
1998	14,186	56.1	7,394	29.2	3,712	14.7	25,292	100.0
1999	14,181	55.9	7,552	29.8	3,644	14.4	25,377	100.0
2000	13,745	55.4	7,266	29.3	3,806	15.3	24,817	100.0
2001	12,830	52.4	7,449	30.4	4,216	17.2	24,495	100.0
2002	12,535	51.4	7,314	30.0	4,547	18.6	24,396	100.0
2003	12,266	50.5	7,090	29.2	4,919	20.3	24,275	100.0
2004	12,680	50.5	7,210	28.7	5,222	20.8	25,112	100.0
2005	13,091	49.4	7,617	28.7	5,817	21.9	26,525	100.0
2006	14,424	51.1	7,873	27.9	5,957	21.1	28,254	100.0
2007	15,497	52.3	8,157	27.5	5,975	20.2	29,629	100.0
2008	15,909	52.6	8,058	26.7	6,264	20.7	30,231	100.0
2009	16,020	52.1	8,606	28.0	6,122	19.9	30,748	100.0
2010	15,811	51.3	8,788	28.5	6,236	20.2	30,835	100.0
2011	16,260	51.2	9,068	28.6	6,406	20.2	31,734	100.0
2012	16,717	50.1	9,720	29.1	6,956	20.8	33,393	100.0
2013	16,976	50.0	9,939	29.3	7,013	20.7	33,928	100.0

Extracted from Midwives' Notification System on 22 September 2015.

Data collection for onset of labour commenced 1986.

**Table 117: Trend for proportion by method of birth for women who gave birth in WA, 1980-2013**

Year	Method of Birth										Total	
	Spontaneous Vertex		Assisted Vaginal		Breech		Elective Caesarean		Emergency Caesarean			
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
1980	13,572	65.9	4,373	21.2	358	1.7	1,096	5.3	1,205	5.8	20,609	100.0
1981	14,471	65.8	4,642	21.1	286	1.3	1,250	5.7	1,332	6.1	21,981	100.0
1982	14,191	64.1	4,820	21.8	370	1.7	1,406	6.3	1,365	6.2	22,152	100.0
1983	14,453	63.3	4,972	21.8	376	1.6	1,488	6.5	1,537	6.7	22,826	100.0
1984	14,315	63.1	4,923	21.7	324	1.4	1,560	6.9	1,581	7.0	22,703	100.0
1985	14,452	62.6	4,813	20.9	317	1.4	1,804	7.8	1,690	7.3	23,076	100.0
1986	14,944	63.3	4,675	19.8	298	1.3	1,851	7.8	1,835	7.8	23,603	100.0
1987	15,135	63.3	4,466	18.7	264	1.1	2,063	8.6	1,967	8.2	23,895	100.0
1988	16,161	65.2	4,201	16.9	246	1.0	2,198	8.9	1,996	8.0	24,802	100.0
1989	16,133	64.1	4,231	16.8	252	1.0	2,357	9.4	2,184	8.7	25,157	100.0
1990	16,444	64.0	4,216	16.4	208	0.8	2,493	9.7	2,338	9.1	25,702	100.0
1991	15,963	64.7	3,974	16.1	193	0.8	2,361	9.6	2,187	8.9	24,678	100.0
1992	16,027	64.2	3,943	15.8	186	0.7	2,559	10.2	2,254	9.0	24,969	100.0
1993	15,873	63.6	3,728	14.9	150	0.6	2,763	11.1	2,459	9.8	24,973	100.0
1994	15,935	63.6	3,738	14.9	175	0.7	2,729	10.9	2,494	9.9	25,071	100.0
1995	16,207	64.6	3,672	14.6	151	0.6	2,740	10.9	2,318	9.2	25,088	100.0
1996	16,120	64.0	3,781	15.0	144	0.6	2,865	11.4	2,283	9.1	25,193	100.0
1997	15,755	63.4	3,535	14.2	122	0.5	3,042	12.2	2,414	9.7	24,868	100.0
1998	15,792	62.4	3,449	13.6	145	0.6	3,270	12.9	2,636	10.4	25,292	100.0
1999	15,772	62.2	3,529	13.9	148	0.6	3,310	13.0	2,618	10.3	25,377	100.0
2000	15,095	60.8	3,300	13.3	142	0.6	3,520	14.2	2,760	11.1	24,817	100.0
2001	14,618	59.7	2,998	12.2	113	0.5	3,744	15.3	3,022	12.3	24,495	100.0
2002	14,137	57.9	2,999	12.3	94	0.4	4,004	16.4	3,162	13.0	24,396	100.0
2003	13,832	57.0	2,830	11.7	109	0.4	4,326	17.8	3,178	13.1	24,275	100.0
2004	13,751	54.8	3,143	12.5	90	0.4	4,537	18.1	3,591	14.3	25,112	100.0
2005	14,177	53.4	3,260	12.3	100	0.4	5,067	19.1	3,921	14.8	26,525	100.0
2006	15,373	54.4	3,548	12.6	97	0.3	5,276	18.7	3,960	14.0	28,254	100.0
2007	15,918	53.7	3,907	13.2	111	0.4	5,289	17.9	4,404	14.9	29,629	100.0
2008	15,895	52.6	4,135	13.7	136	0.4	5,485	18.1	4,580	15.2	30,231	100.0
2009	16,032	52.1	4,353	14.2	127	0.4	5,299	17.2	4,937	16.1	30,748	100.0
2010	15,961	51.8	4,410	14.3	107	0.3	5,375	17.4	4,982	16.2	30,835	100.0
2011	16,195	51.0	4,646	14.6	127	0.4	5,472	17.2	5,294	16.7	31,734	100.0
2012	16,680	50.0	5,040	15.1	132	0.4	5,969	17.9	5,572	16.7	33,393	100.0
2013	17,161	50.6	4,989	14.7	130	0.4	5,914	17.4	5,734	16.9	33,928	100.0

Extracted from Midwives' Notification System on 22 September 2015.

Method of birth for women with multiple births was reported by method of birth of first infant born.

**Table 118: Trend for proportion by gender of infants born in WA, 1980-2013**

Year	Gender of birth			
	Male		Female	
	No.	%	No.	%
1980	10,671	51.3	10,143	48.7
1981	11,580	52.1	10,641	47.9
1982	11,473	51.2	10,918	48.8
1983	11,975	51.9	11,097	48.1
1984	11,860	51.6	11,103	48.4
1985	11,928	51.1	11,429	48.9
1986*	12,345	51.7	11,541	48.3
1987*	12,477	51.5	11,726	48.4
1988*	12,970	51.6	12,185	48.4
1989	13,041	51.1	12,502	48.9
1990*	13,416	51.6	12,602	48.4
1991	12,775	51.1	12,233	48.9
1992*	13,073	51.6	12,248	48.4
1993*	13,101	51.7	12,233	48.3
1994*	13,014	51.2	12,403	48.8
1995*	13,137	51.6	12,302	48.3
1996*	13,192	51.6	12,390	48.4
1997*	13,034	51.6	12,231	48.4
1998	13,095	51.0	12,583	49.0
1999	13,147	51.0	12,623	49.0
2000	12,768	50.6	12,460	49.4
2001	12,836	51.5	12,105	48.5
2002	12,617	50.9	12,167	49.1
2003	12,625	51.2	12,052	48.8
2004	13,059	51.2	12,470	48.8
2005	13,761	51.0	13,217	49.0
2006*	14,490	50.5	14,173	49.4
2007	15,459	51.4	14,614	48.6
2008*	15,634	51.0	15,032	49.0
2009*	16,062	51.5	15,144	48.5
2010*	15,935	51.0	15,320	49.0
2011*	16,563	51.5	15,623	48.5
2012*	17,393	51.4	16,461	48.6
2013*	17,620	51.2	16,780	48.8

Extracted from Midwives' Notification System on 22 September 2015.

Values <5 are suppressed by not displaying infants of indeterminate gender nor totals of infants born each year.

\* indicate years where there were infants of indeterminate gender born.



# 10. Appendix C: Notification of Case Attended

Health (Notifications by Midwives) Regulations 1994 Form 2 NOTIFICATION OF CASE ATTENDED

MR15

Last name <input type="text"/> Unit Record No. <input type="text"/>		Establishment <input type="text"/>	
First name <input type="text"/> Birth date (Mother) <input type="text"/>		Ward <input type="text"/>	
Address of usual residence Number and street <input type="text"/> State <input type="text"/> Post code <input type="text"/>		Marital status 1=never married 2=widowed 3=divorced <input type="checkbox"/> 4=separated 5=married (incl. defacto) <input type="checkbox"/> 6=unknown <input type="checkbox"/>	
Town or suburb <input type="text"/> Height <input type="text"/> Weight <input type="text"/> (whole cm) (whole kilogram)		Ethnic status of mother 1=Caucasian 10=Aboriginal not TSI <input type="checkbox"/> 11=TSI not Aboriginal 12=Aboriginal and TSI <input type="checkbox"/> Other <input type="text"/>	
Maiden name <input type="text"/> Telephone <input type="text"/>			
<b>PREGNANCY DETAILS</b>		<b>LABOUR DETAILS</b>	
<b>PREVIOUS PREGNANCIES:</b> Total number (excluding this pregnancy): <input type="text"/> Previous pregnancy outcomes: - liveborn, now living <input type="checkbox"/> - liveborn, now dead <input type="checkbox"/> - stillborn <input type="checkbox"/> Number of previous caesareans <input type="text"/> Caesarean last delivery 1=yes 2=no <input type="checkbox"/> Previous multiple births 1=yes 2=no <input type="checkbox"/>		Onset of labour: <input type="checkbox"/> 1=spontaneous 2=induced 3=no labour Augmentation (labour has begun): 1 <input type="checkbox"/> none 2 <input type="checkbox"/> oxytocin 3 <input type="checkbox"/> prostaglandins 4 <input type="checkbox"/> artificial rupture of membranes 8 <input type="checkbox"/> other Induction (before labour began): 1 <input type="checkbox"/> none 2 <input type="checkbox"/> oxytocin 3 <input type="checkbox"/> prostaglandins 4 <input type="checkbox"/> artificial rupture of membranes 8 <input type="checkbox"/> other Analgesia (during labour): 1 <input type="checkbox"/> none 2 <input type="checkbox"/> nitrous oxide 4 <input type="checkbox"/> epidural/caudal 5 <input type="checkbox"/> spinal 6 <input type="checkbox"/> systemic opioids 7 <input type="checkbox"/> combined spinal/epidural 8 <input type="checkbox"/> other Duration of labour: <input type="text"/> hr <input type="text"/> min 1 <sup>st</sup> stage (hour & min): <input type="text"/> <input type="text"/> 2 <sup>nd</sup> stage (hour & min): <input type="text"/> <input type="text"/>	
<b>THIS PREGNANCY:</b> Estimated gest wk at 1st antenatal visit <input type="text"/> Total number of antenatal care visits <input type="text"/> Date of LMP: <input type="text"/> 2 0 This date certain 1=yes 2=no <input type="checkbox"/> Expected due date: <input type="text"/> 2 0 based on 1=clinical signs/dates <input type="checkbox"/> 2=ultrasound <20 wks 3=ultrasound ≥20 wks Smoking: Number of tobacco cigarettes usually smoked each day during first 20 weeks <input type="text"/> Number of tobacco cigarettes usually smoked each day after 20 weeks of pregnancy. (none, use '000'; occasional or smoked <1, use '998'; undetermined, use '999') <input type="text"/>		<b>DELIVERY DETAILS</b>	
Complications of pregnancy: 1 <input type="checkbox"/> threatened abortion (<20wks) 2 <input type="checkbox"/> threatened preterm labour (<37 wks) 3 <input type="checkbox"/> urinary tract infection 4 <input type="checkbox"/> pre-eclampsia 5 <input type="checkbox"/> Antepartum haemorrhage (APH) - placenta praevia 6 <input type="checkbox"/> APH - placental abruption 7 <input type="checkbox"/> APH - other 8 <input type="checkbox"/> pre-labour rupture of membranes 9 <input type="checkbox"/> gestational diabetes 10 <input type="checkbox"/> other (specify) <input type="text"/>		Anaesthesia (during delivery): 1 <input type="checkbox"/> none 2 <input type="checkbox"/> local anaesthesia to perineum 3 <input type="checkbox"/> pudendal 4 <input type="checkbox"/> epidural/caudal 5 <input type="checkbox"/> spinal 6 <input type="checkbox"/> general 7 <input type="checkbox"/> combined spinal/epidural 8 <input type="checkbox"/> other Complications of labour and delivery (Includes the reason for operative delivery): 1 <input type="checkbox"/> precipitate delivery 2 <input type="checkbox"/> fetal distress 3 <input type="checkbox"/> prolapsed cord 4 <input type="checkbox"/> cord tight around neck 5 <input type="checkbox"/> cephalopelvic disproportion 6 <input type="checkbox"/> PPH(≥500mls) 7 <input type="checkbox"/> retained placenta - manual removal 8 <input type="checkbox"/> persistent occipito posterior 9 <input type="checkbox"/> shoulder dystocia 10 <input type="checkbox"/> failure to progress ≤3cm 11 <input type="checkbox"/> failure to progress > 3cm 12 <input type="checkbox"/> previous caesarean section 13 <input type="checkbox"/> other (specify) <input type="text"/>	
Medical conditions: 1 <input type="checkbox"/> essential hypertension 2 <input type="checkbox"/> pre-existing diabetes mellitus 3 <input type="checkbox"/> asthma 4 <input type="checkbox"/> genital herpes 8 <input type="checkbox"/> other (specify) <input type="text"/>		<b>ABORIGINAL STATUS OF BABY</b>	
Procedures/treatments: 1 <input type="checkbox"/> fertility treatments (include drugs) 2 <input type="checkbox"/> cervical suture 3 <input type="checkbox"/> CVS/placental biopsy 4 <input type="checkbox"/> amniocentesis 5 <input type="checkbox"/> ultrasound 6 <input type="checkbox"/> CTG antepartum 7 <input type="checkbox"/> CTG intrapartum Intended place of birth at onset of labour: <input type="checkbox"/> 1=hospital 2=birth centre attached to hospital 3=birth centre free standing 4=home 8=other		Perineal status: 1 <input type="checkbox"/> intact 2 <input type="checkbox"/> 1 <sup>st</sup> degree tear/vaginal tear 3 <input type="checkbox"/> 2 <sup>nd</sup> degree tear 4 <input type="checkbox"/> 3 <sup>rd</sup> degree tear 5 <input type="checkbox"/> episiotomy 7 <input type="checkbox"/> 4 <sup>th</sup> degree tear 8 <input type="checkbox"/> other	
MIDWIFE Name <input type="text"/> Signature <input type="text"/> Date <input type="text"/> 2 0 Reg. No. <input type="text"/>		(Tick one box only) 1 <input type="checkbox"/> Aboriginal but not TSI 2 <input type="checkbox"/> TSI but not Aboriginal 3 <input type="checkbox"/> Aboriginal and TSI 4 <input type="checkbox"/> Other	
		<b>DELIVERY DETAILS</b>	
		(Please use a separate form for each baby) Adoption: 1=yes 2=no <input type="checkbox"/> Born before arrival: 1=yes 2=no <input type="checkbox"/> Birth date: <input type="text"/> 2 0 Birth time (24hr clock): <input type="text"/> Plurality (number of babies this birth): <input type="text"/> Birth order (specify this baby, eg, 1=1 <sup>st</sup> baby born, 2=2 <sup>nd</sup> baby born, etc): <input type="text"/> Presentation: <input type="checkbox"/> 1=vertex 2=breech 3=face 4=brow 8=other Method of birth: 1 <input type="checkbox"/> spontaneous 2 <input type="checkbox"/> vacuum successful 3 <input type="checkbox"/> vacuum unsuccessful 4 <input type="checkbox"/> forceps successful 5 <input type="checkbox"/> forceps unsuccessful 6 <input type="checkbox"/> breech (vaginal) 7 <input type="checkbox"/> elective caesarean 8 <input type="checkbox"/> emergency caesarean Accoucheur(s): 1 <input type="checkbox"/> obstetrician 2 <input type="checkbox"/> other medical officer 3 <input type="checkbox"/> midwife 4 <input type="checkbox"/> student 5 <input type="checkbox"/> self/no attendant 8 <input type="checkbox"/> other Gender: 1=male 2=female 3=indeterminate <input type="checkbox"/> Status of baby at birth: 1=liveborn 2=stillborn (unspecified) <input type="checkbox"/> 3=antepartum stillborn 4=intrapartum stillborn Infant weight (whole gram): <input type="text"/> Length (whole cm): <input type="text"/> Head circumference (whole cm): <input type="text"/> Time to establish unassisted regular breathing (whole min): <input type="text"/> Resuscitation: (record one only - the most invasive or highest number) 1 <input type="checkbox"/> none 2 <input type="checkbox"/> suction only 3 <input type="checkbox"/> oxygen therapy only 4 <input type="checkbox"/> bag and mask (IPPR) 5 <input type="checkbox"/> endotracheal intubation 6 <input type="checkbox"/> ext. cardiac massage and ventilation 8 <input type="checkbox"/> other Apgar score: 1 minute <input type="text"/> 5 minutes <input type="text"/> Estimated gestation (whole weeks): <input type="text"/> Birth defects (specify): <input type="text"/> Birth trauma (specify): <input type="text"/>	
		<b>BABY SEPARATION DETAILS</b>	
		Separation date: <input type="text"/> 2 0 Mode of separation: <input type="checkbox"/> 1=transferred 8=died 9=discharged home Transferred to: <input type="text"/> (specify establishment code) Special care number of days: <input type="text"/> (excludes Level 1; whole days only) Coder ID: <input type="text"/>	

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on request for a person with a disability.**

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