



Government of **Western Australia**
Department of Health



Western Australia's Mothers and Babies, 2009

Twenty-seventh Annual Report of the
Western Australian Midwives'
Notification System

July 2011

Maternal and Child Health
Data Integrity Directorate
Performance and Quality Division
Department of Health, Western Australia

Statistical series
number 84
ISSN: 0816-2999

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ACKNOWLEDGEMENTS

The authors wish to thank all midwives for continuing to provide high quality data to the Western Australian Maternal and Child Health Unit for all births in Western Australia. The completeness and accuracy of the data is dependent on their dedication.

Appreciations are also extended to:

- Ms Daelene Johnson and other Maternal and Child Health Unit staff who processed and validated the data;
- The staff at Information Development and Management;
- Dr Carol Bower- WA Register of Developmental Anomalies for providing information on birth defects;
- The Hospital Morbidity Data Collection Unit for their support in the validation process;
- The Registry of Births, Deaths and Marriages for providing additional information on births and perinatal deaths in Western Australia via the Western Australia Data Linkage Branch.

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CITATION

The citation below should be used in reference to this publication.

Joyce A, Tran BN (2009). *Western Australia's Mothers and Babies, 2009: Twenty-seventh Annual Report of the Western Australian Midwives' Notification System*, Department of Health, Western Australia.

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EXECUTIVE SUMMARY

This is the twenty-seventh annual report on perinatal statistics in Western Australia (WA) from the Midwives' Notification System. All routine reports from the collection are in statistical form without identification of individual patients, midwives, doctors or hospitals.

The report contains information on women who gave birth in WA in 2009, and their babies. Pregnancies that resulted in the birth of a baby at or greater than 20 weeks gestation or more than 400 grams in weight have been included. These criteria are in accordance with national reporting methods.

Note that the terms Aboriginal and non-Aboriginal are used as alternatives to Indigenous and non-Indigenous recently used in these reports. Aboriginal includes both Aboriginal and Torres Strait Islander mothers and babies.

Maternal Demographic Information

- In 2009, there were 30,760 women giving birth in Western Australia, and the average age of the mothers was 29.5 years (Table 1).
- Teenage mothers (≤ 19 years) represented 4.8 per cent, and mothers aged 35 years or more represented 20.8 per cent, of women who gave birth. While the proportion of teenage mothers has remained stable, the group of older mother has increased significantly during the last 15 years. The proportion of women giving birth at age 35 or more steadily increased every year from 4.7 per cent in 1980 to 21.5 per cent in 2008 before dropping to 20.8 per cent in 2009 (Appendix B-Table S1).
- Aboriginal mothers represented 5.7 per cent of women who gave birth and had a higher birth rate (101.1 per 1000 women) than non-Aboriginal women (65.5 per 1000 women) (Table 16).
- The birth rate for Aboriginal teenage mothers (97.7 per 1000 women) was over six times the rate for non-Aboriginal teenage mothers (15.4 per 1000 women) (Table 16).
- The majority (98.8 per cent) of women gave birth in hospitals. Non-hospital births (1.2 per cent) included mothers who gave birth before arrival at the hospital (BBA) (0.4 per cent) and babies born at home (0.8 per cent) (Table 9).

Smoking During Pregnancy

- 14.5 per cent of all mothers smoked in 2009. Among teenage mothers the smoking proportion was 35.4 per cent (Table 10) while 51.2 per cent of Aboriginal mothers smoked (Table 12).
- The highest proportions of smoking mothers were born in New Zealand (23.2 per cent) and Australia (17.7 per cent). (Table 11).
- The proportion of women smoking during pregnancy has decreased from 22.6 per cent in 1999 to 14.5 per cent in 2009 (Appendix B – Table S4).

Pregnancy Profile

- First time mothers, with an average age of 27.7 years, represented 41.9 per cent of women who gave birth in 2009 (Table 13). Trend data shows that there has been no substantial variation in this proportion over the last 16 years (Appendix B – Table S5).
- Among women giving birth in 2009 who were aged 35 years or more, 25.7 per cent were having their first baby.(Table 15).
- The age-specific birth rate for women aged 15-19 years has varied over the past 17 years from 25.7 births per 1000 women in 1994 to 18.7 per 1000 in 2003. In 2009 the rate was 19.7 (Table 17).
- The birth rate for women aged 35-44 years increased from 21.6 births per 1000 women in 1993 to 41.1 births per 1000 women in 2008. In 2009 the rate was 39.8 births per 1000 women. (Table 17).
- Complications of pregnancy were recorded for 32.3 per cent of women. The most common complications were gestational diabetes (5.1 per cent), premature rupture of membranes (4.0 per cent), urinary tract infection (3.2 per cent), and threatened miscarriage in early pregnancy (2.9 per cent) (Table 18).
- Of women who gave birth in 2009, 29.4 per cent had pre-existing medical conditions recorded. The most frequent diseases were of the respiratory system (11.3 per cent) and mental and behavioural disorders (6.5 per cent) (Table 19).

Labour and Delivery

- Labour was of spontaneous onset for 52.1 per cent of pregnant women and 28.0 per cent were induced in 2009. The remaining mothers (19.9 percent) did not experience labour prior to birth by caesarean section (Table 21). There has been a significant increase over the past 15 years in the proportion of women who did not experience labour (from 9.7 per cent in 1986 to 22.0 per cent in 2005) (Appendix B-Table S6).
- The caesarean section rate in 2009 was 33.3 per cent (10,241) (Table 33). Of the women recorded as having had a previous caesarean section, 87.1 per cent again delivered by caesarean section (Table 34). The rise in caesarean rate in the last few decades is correlated with an increase in the proportion of women who did not experience labour.
- Less than a quarter of births occurred without augmentation and achieved a spontaneous vaginal birth (23.1 per cent) although more than half (52.2 per cent) of women established labour spontaneously (Table 22).

Baby Characteristics

- In 2009, there were 31,219 babies born in Western Australia. Of these, 30,985 (99.3 percent) were born alive and 234 were fetal deaths (0.7 per cent) (Table 41).
- The crude birth rate declined steadily from 17.0 per 1000 total population in 1981 to 12.6 per 1000 total population in 2003, reached 14.2 per 1000 total population in 2007 and 2008 and then declined to 13.9 per 1000 in 2009 (Table 41).
- In 2009, there were 30,305 single births, representing 97.1 per cent of total births. Of the 455 multiple births (2.9 per cent) there were 451 sets of twins and 4 sets of triplets (Table

53). There were no cases of quadruplet or quintuplet pregnancies recorded in 2009. There has been minimal difference in these proportions over the previous 15 years (Appendix B – Table S9).

- In 2009, an Apgar score of 8-10 at one minute was recorded for 26,140 (84.4 per cent) live births and Apgar score at five minutes of 8-10 was recorded for 30,058 (97.1 per cent) live births (Tables 54 and 55).
- More than two-thirds of babies (66.9 per cent) weighed 3000–3999 grams at birth in 2009, and the average birthweight was 3341 grams. The percentage of low birthweight (<2500 grams) babies was 6.8 per cent (Table 48), and this proportion has remained steady over the previous 15 years.
- The percentage of low birthweight babies born to Aboriginal mothers (14.5 per cent) in 2009 was more than twice the percentage of low birthweight babies born to non-Aboriginal mothers (6.3 per cent). The proportion of Aboriginal mothers having babies with low birthweight has remained stable over the last 15 years (Table 51).
- In 2009, there were 24.5 per cent of live babies receiving resuscitation (Table 56). The majority of babies with low birthweight and low Apgar score after five minutes required resuscitation (Table 57).
- There were 364 (1.2 per cent) live babies born as low pre-term (23–31 weeks gestation) in 2009. Of these, the majority were born in the tertiary public centre (86.0 per cent), reflecting high referral rates to this institution (Table 46).
- Neonatal length of stay is related to babies' birthweight and gestational age. Of the babies who stayed in hospital more than 28 days, in 2009, 84.3 per cent had a birthweight lower than 2500 grams and 84.6 per cent had a gestational age of less than 37 weeks. (Tables 63 and 64).

Australian Council on Health care Standard (ACHS) Clinical Indicators (CI) (V.6)

- In 2009, there were 8,696 women identified as selected primiparae (indicator 1) who had no previous viable pregnancies. Of these, 41.0 per cent had a spontaneous vaginal birth (CI.1.1); 29.3 per cent underwent instrumental vaginal births (CI.1.3) and 29.7 per cent had a caesarean section (CI.1.4). Also, there were 3,034 (34.9 per cent) women who underwent induction of labour (CI.1.4) (Tables 65 and 66).
- There were 4,805 women identified as having previous primary caesarean section (indicator 2), of whom, 9.7 per cent delivered vaginally following a previous caesarean (Table 69).
- In 2009, there were 6,115 women defined as selected primipara who delivered vaginally, of whom 18.3 per cent had an intact perineum after birth (CI.3.1); 23.3 per cent were identified as having episiotomy and no tear (CI.3.2); 9.9 per cent had episiotomy and a tear (CI.3.4) and 4.0 per cent had a third degree tear (CI.3.5) (Table 71). There were 2,726 (44.6 per cent) having perineal tear and no episiotomy (CI.3.3) (Table 72).
- In 2009, there were 10,241 caesarean cases of which 4.7 per cent received general anaesthesia (CI. 4.1) (Table 75).
- In 2009, there were 11,804 cases delivered at 40 gestation weeks but only 1.8 per cent had birthweight less than 2750 grams (CI.8.1) (Table 77).

- Of the 28,508 cases chosen as indicator 9, only 0.9 per cent had Apgar score less than 7 at 5 minutes (CI.9.1) (Table 79).

Perinatal Mortality

- Among babies born in 2009 there were 234 fetal deaths and 77 neonatal deaths, providing a perinatal mortality rate of 10.0 perinatal deaths per 1000 total births (Table 81). The perinatal mortality rate has generally declined over the past 15 years, from a high of 11.5 per 1000 total births in 1996 to a low 8.3 per 1000 in 2007 (Table 82).
- The perinatal mortality rate in 2009 for babies with Aboriginal mothers was 20.4 per 1000 total births compared with the rate of 9.3 per 1000 total births for babies with non-Aboriginal mothers (Table 82).
- Babies in lower gestational age categories and lower birth weight groups had higher perinatal death rates (Table 83 and 84).
- The mortality rate for multiple births (37.2 per 1000 births) was more than four times the rate for single births (9.1 per 1000 births) (Table 86).
- The principal cause of fetal death was extremely low birthweight (32.5 per cent) while the main cause of neonatal death was lethal birth defects (35.0 per cent) (Table 89).

INTRODUCTION

This is the twenty-seventh annual report on perinatal statistics in Western Australia (WA) from the Midwives' Notification System. All routine reports from the collection are in statistical form without identification of individual patients, midwives, doctors or hospitals.

The report contains information on women who gave birth in WA in 2009 and their babies. Pregnancies that resulted in a baby at or greater than 20 weeks gestation or more than 400 grams in weight have been included. These criteria are in accordance with national reporting methods.

The report presents an overview of data on births for 2009 in terms of maternal demography, procedures and infant outcomes. It also describes trends over the collection period from 1980 to 2009 (where available). Information on women resident in this state who gave birth outside WA during 2009 is not included in this report.

To ensure complete ascertainment of births and perinatal deaths within WA, information is collated from the WA Midwives' Notification System, the WA Hospital Morbidity System and the WA Registry of Births, Deaths and Marriages. These data are maintained separately as state-wide data collections.

Legal Status of Perinatal Statistics in Western Australia

Western Australia's statutory reporting requirements are outlined in the *Health Act 1911, Section 355(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-time birth, or stillbirth, or abortion." The birth notification report should be submitted within 48 hours of the birth for the Community Child Health Nurse to monitor the health and welfare of the mother and her newborn. A more comprehensive Notification of Case Attended (NOCA) (Form 2, 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 baby has been discharged from hospital, or in the case of home birth, after the midwife is satisfied with the birth event.

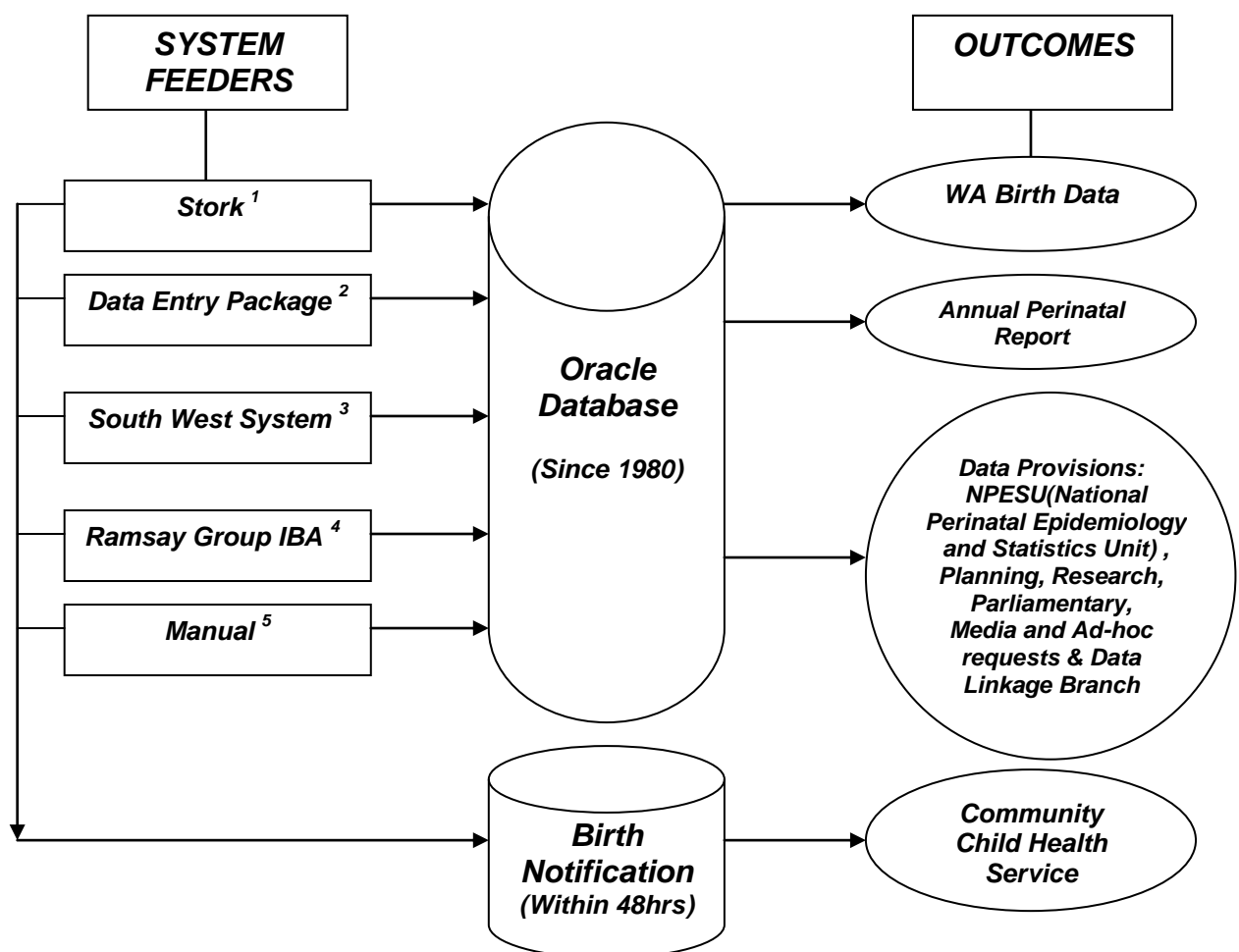
The NOCA form can be updated without amendments to the Act. The last update to include new variables and values was in 2002. In 2010, three new data items have been added to the collection to comply with National Minimum Data Set requirements. Additionally there have been small modifications to data value domains.

A midwife who enters into private practice needs to notify the Executive Director of Public Health of her intention. Initial contact should be made to the office of the Maternal and Child Health (MCH) Unit to formalise the process. The Manager of the MCH Unit is the delegate for the Executive Director of Public Health for midwives' data collection in WA.

Midwives' Notification System

The Midwives' Notification System (MNS) within the MCH Unit is an *Oracle* database storing notification data since 1980. Data are submitted electronically from a number of feeder systems or manually in paper forms. The main electronic systems are *Stork*, the *Midwives' Data Entry Package (MDEP)*, the *South West System* (Replaced by *Stork* July 2011) and the *IBA* system from the Ramsay Group hospitals. *Stork* is managed by the Department of Health's Health Information Network and the *MDEP* is maintained by the MCH Unit. A new Obstetric system has been developed by the St John of God Group and has been implemented into the four SJOG hospitals in WA over the 2010/2011 financial year. The majority of rural hospitals provide their data manually, though some have indicated a readiness to use the *MDEP* to capture notification data. One such hospital was Kalgoorlie which started using the *MDEP* in early 2010.

WESTERN AUSTRALIAN MIDWIVES' NOTIFICATION SYSTEM – 2009



1 STORK

King Edward Memorial Hospital, Armadale Kelmscott District Hospital, Bentley Hospital, Community Midwifery Program, Kaleeya Hospital, Osborne Park Hospital, Rockingham General Hospital and Swan District Hospital.

2 Midwives Data Entry Package

Public Hospitals – Rural: Albany Hospital, Broome Hospital, Carnarvon Hospital, Esperance Hospital, Geraldton Hospital, Kalgoorlie Hospital, Katanning Hospital, Kellerberrin Memorial Hospital, Narrogin Hospital, Nickol Bay Hospital.

Private Hospitals - Metro: Mercy Hospital, Peel Health Campus, St John of God Health Care Murdoch, St John of God Health Care Subiaco.

Private Hospitals - Rural: St John of God Health Care Bunbury, St John of God Health Care Geraldton.

(SJOG hospitals have their own Perinatal System from 2010/2011)

3 South West System (From July 2011 the South West System has been replaced by STORK)

Bridgetown Hospital, South West Health Campus (formerly Bunbury Regional Hospital), Busselton Hospital, Collie Hospital, Margaret River Hospital, Warren Hospital.

4 Ramsay Group IBA

Attadale Hospital, Glengarry Hospital, Joondalup Health Campus.

5 Manual

Denmark Hospital, Halls Creek Hospital, Kununnurra Hospital, Northam Hospital, Plantagenet Hospital, Port Hedland Hospital. In addition, there are emergency births in some non-maternity hospitals, especially in the rural areas, that also report their data in paper forms.

Midwives Data 1975 – 1979

Data for public hospital and homebirths for the years 1975 – 1979 are stored on microfiche at the Department of Health. The Maternal and Child Health Unit is currently transferring this information to electronic format for incorporation into the Midwives Notification System.

1 MOTHERS

1.1 Maternal Demographic Information

1.1.1 Maternal Age

In 2009, there were 30,760 women who gave birth in WA (Table 1). This was an increase of 1.7 per cent compared to 2008 and was the highest annual number of births on record for the State.

The age of mothers ranged from 13 to over 45 years with a mean of 29.5 years and a median of 30 years. Among birthing non-Aboriginal women, the highest proportion of mothers giving birth was in the 30-34 year old age group (31.8 per cent). For Aboriginal women, the highest proportion of women giving birth was in the 20-24 age group (33.4 per cent).

Table 1: Age and Aboriginality of Women who gave birth in WA, 2009

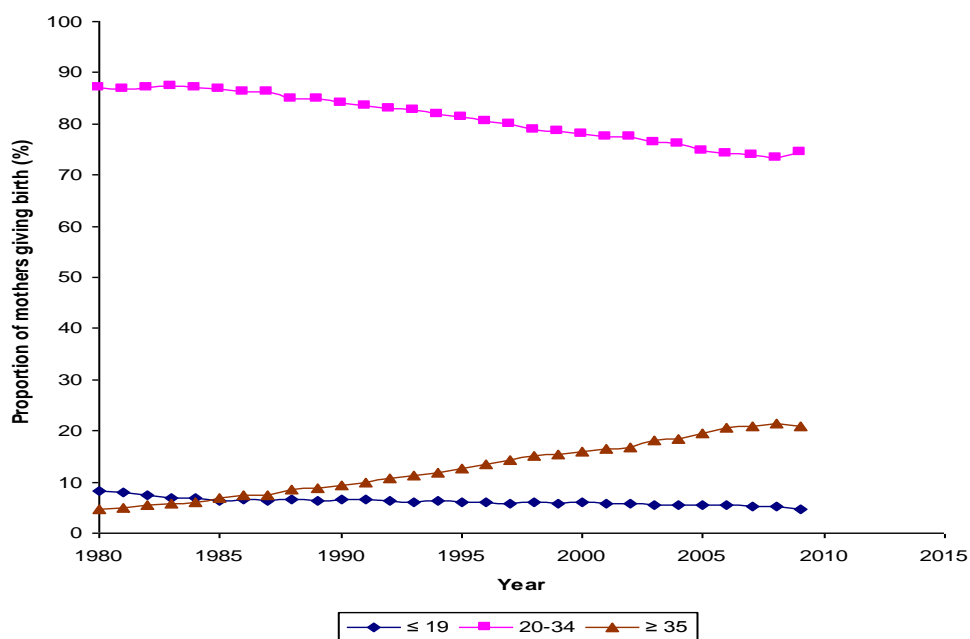
Maternal age	Aboriginality of mother				Total	
	Aboriginal		Non-Aboriginal		No.	%
	No.	%	No.	%		
≤ 14	7	0.4	7	0.02	14	0.04
15	27	1.5	26	0.1	53	0.2
16	46	2.6	66	0.2	112	0.4
17	69	3.9	193	0.7	262	0.9
18	109	6.2	304	1.0	413	1.3
19	122	7.0	492	1.7	614	2.0
≤ 19	380	21.7	1088	3.8	1468	4.8
20-24	585	33.4	4323	14.9	4908	16.0
25-29	395	22.6	8108	27.9	8503	27.6
30-34	244	14.0	9235	31.8	9479	30.8
35-39	119	6.8	5202	17.9	5321	17.3
40-44	26	1.5	1018	3.5	1044	3.4
≥ 45	-	-	37	0.1	37	0.1
Total	1749	100.0	29011	100.0	30760	100.0

Mean = 29.5 years, standard deviation = 5.8 years, Median = 30 years.
 Extracted from Midwives' Notification system on 9 May 2011.

Over the past two decades, the proportion of teenage pregnancies has remained constant while the proportion of women with pregnancies aged from 20-34 has gradually declined.

In the last 30 years, there has been a steady increase in the proportion of women aged 35 years and older giving birth. This figure increased from 4.7 per cent in 1980, peaked at 21.5 per cent in 2008 and was 20.8 per cent in 2009 (Figure 1 and Appendix B - Table S1).

Figure 1: Age of Mother giving birth in WA, 1980-2009



1.1.2 Aboriginality

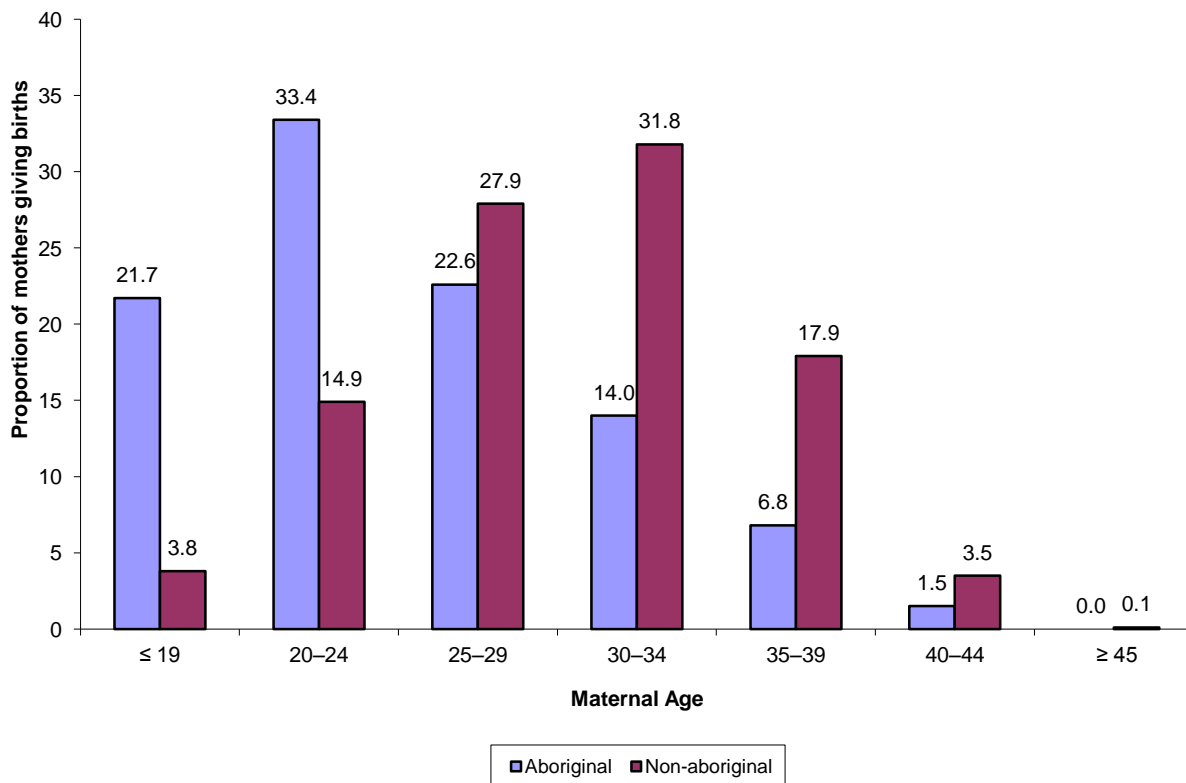
In 2009, Aboriginal women represented 5.7 per cent (1749) of all women who gave birth and 94.3 per cent identified as non-Aboriginal women giving birth in WA (Table 1).

Aboriginal mothers are more likely to have their babies at a younger age compared to non-Aboriginal mothers. The proportion of teenage mothers among all Aboriginal mothers (21.7 per cent) was more than five times greater than the corresponding proportion among non-Aboriginal mothers (3.8 per cent) (Figure 2).

Among Aboriginal women, 14 per cent of all births occurred to women aged 30-34. This is less than half that for non-Aboriginal women in the same age group (31.8 per cent) (Figure 2).

Over the past 30 years, the proportion of births to Aboriginal mothers has remained relatively consistent, ranging from 5.0 per cent to 6.8 per cent..(Appendix B - Table S2).

Figure 2: Age Distribution by Aboriginality in WA, 2009



1.1.3 Country of Birth

The country of birth was recorded for 29,785 women who gave birth in WA (Table 2). Of women who gave birth in Western Australia in 2009, approximately one-third (30.0 per cent) were born in countries other than Australia. Mothers born in the United Kingdom accounted for a relatively high proportion of all mothers in WA (7.2 per cent). New Zealand-born mothers constituted 3.9 per cent of all women giving birth. Mothers born in Asian countries also accounted for a high proportion (9.5 per cent) of all mothers giving birth in WA.

Table 2: Maternal Country of Birth, WA 2009

Country of birth	Maternal age						Total	
	≤ 19		20–34		≥ 35		No.	%
	No.	%	No.	%	No.	%	No.	%
Oceania								
Australia	1286	89.5	15640	70.7	3919	63.1	20845	70.0
New Zealand	62	4.3	867	3.9	220	3.5	1149	3.9
Europe								
United Kingdom and Ireland	23	1.6	1368	6.2	749	12.1	2140	7.2
Other Europe	11	0.8	523	2.4	214	3.4	748	2.5
Asia								
Vietnam	1	0.1	221	1.0	76	1.2	298	1.0
Malaysia	1	0.1	234	1.1	80	1.3	315	1.1
Other SE Asia	10	0.7	728	3.3	249	4.0	987	3.3
Other Asia	4	0.3	975	4.4	249	4.0	1228	4.1
Africa								
South Africa and Zimbabwe	6	0.4	462	2.1	168	2.7	636	2.1
Other Africa and Middle East	28	1.9	770	3.5	172	2.8	970	3.3
North America	4	0.3	164	0.7	61	1.0	229	0.8
South and Central America	-	-	135	0.6	42	0.7	177	0.6
Other Pacific	1	0.1	49	0.2	13	0.2	63	0.2
Total	1437	100.0	22136	100.0	6212	100.0	29785	100.0

There were 975 cases (3.2%) where the mother's country of birth was incomplete or unknown.
 Extracted from Midwives' Notification system on 9 May 2011.

In the period 2005-2009, 72.5 per cent of all mothers were born in Australia (Table 3). The trend for Australian born mothers and mothers from other English-speaking countries has been slowly decreasing in the last five years except from New Zealand.

Table 3: Maternal Country of Birth in WA, 2005-2009

	Year											
	2005		2006		2007		2008		2009		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Oceania												
Australia	19197	74.2	20518	74.4	21157	73	20856	71.1	20845	70	102573	72.5
New Zealand	818	3.2	899	3.3	953	3.3	1064	3.6	1149	3.9	4883	3.4
Europe												
UK & Ireland	2037	7.9	2129	7.7	2292	7.9	2211	7.5	2140	7.2	10809	7.6
Other Europe	639	2.5	661	2.4	689	2.4	739	2.5	748	2.5	3476	2.5
Asia												
Vietnam	277	1.1	299	1.1	307	1.1	311	1.1	298	1	1492	1.1
Malaysia	265	1	244	0.9	299	1	295	1	315	1.1	1418	1
Other SE Asia	696	2.7	731	2.6	810	2.8	914	3.1	987	3.3	4138	2.9
Other Asia	543	2.1	642	2.3	793	2.7	964	3.3	1228	4.1	4170	2.9
Africa												
South Africa & Zimbabwe	373	1.4	422	1.5	456	1.6	598	2	636	2.1	2485	1.8
Other Africa & Middle East	627	2.4	644	2.3	827	2.9	915	3.1	970	3.3	3983	2.8
North America	203	0.8	207	0.8	199	0.7	212	0.7	229	0.8	1050	0.7
South & Central America	111	0.4	119	0.4	127	0.4	168	0.6	177	0.6	702	0.5
Other Pacific	71	0.3	78	0.3	64	0.2	83	0.3	63	0.2	359	0.3
Total	25857	100	27595	100	28973	100	29330	100	29785	100	141540	100

There were 975 cases(3.2%) where the mothers country of birth was missing and unknown in the system in 2009. Extracted from Midwives' Notification system on 9 May 2011.

1.1.4 Marital Status

At the time of giving birth, 88.5 per cent of women in WA were reported as being in a married or de-facto relationship (Table 4).

Single women represented 9.2 per cent and the remaining women (2.2 per cent) were either separated, divorced or widowed (Table 4).

Table 4: Conjugal State and Plurality of Women who gave birth in WA 2009

Conjugal state	Plurality				Total	
	Single		Multiple		No.	%
	No.	%	No.	%		
Single	2794	9.2	47	10.3	2841	9.2
Married/De facto	26835	88.5	400	87.9	27235	88.5
Other ¹	676	2.2	8	1.8	684	2.2
Total	30305	100.0	455	100.0	30760	100.0

¹ Other includes separated, divorced and widowed.

Extracted from Midwives' Notification system on 9 May 2011.

1.1.5 Health Area of Residence

As can be seen in Table 5, more than three-quarters (76.2 per cent) of women who gave birth in 2009 reported their usual residential address as a metropolitan health region, while 23.5 per cent reported their usual place of residence as within one of the seven non-metropolitan health regions, and 0.4 per cent were non-residents of WA.

Among birthing Aboriginal women, 34.2 per cent were metropolitan residents and 65.6 per cent were resident in a non-metropolitan region

Conversely, 78.7 per cent of non-Aboriginal women were resident in the metropolitan health region, 20.9 per cent were resident in a non-metropolitan health region, and 0.4 per cent were not usual residents of WA.

Table 5: Health Region of Residence and Aboriginality of Mothers in WA, 2009

Health region of residence	Aboriginality of mother				Total	
	Aboriginal		Non-Aboriginal		No.	%
	No.	%	No.	%		
Metropolitan						
North	282	16.1	12021	41.4	12303	40.0
South	317	18.1	10809	37.3	11126	36.2
Total Metropolitan	599	34.2	22830	78.7	23429	76.2
Country						
Kimberley	402	23.0	277	1.0	679	2.2
Pilbara	176	10.1	676	2.3	852	2.8
Midwest	216	12.3	742	2.6	958	3.1
Wheatbelt	93	5.3	877	3.0	970	3.2
Goldfields	151	8.6	851	2.9	1002	3.3
South West	70	4.0	1975	6.8	2045	6.6
Great Southern	39	2.2	673	2.3	712	2.3
Total Country	1147	65.6	6071	20.9	7218	23.5
Outside WA	3	0.2	110	0.4	113	0.4
Total	1749	100.0	29011	100.0	30760	100.0

Extracted from Midwives' Notification system on 9 May 2011.

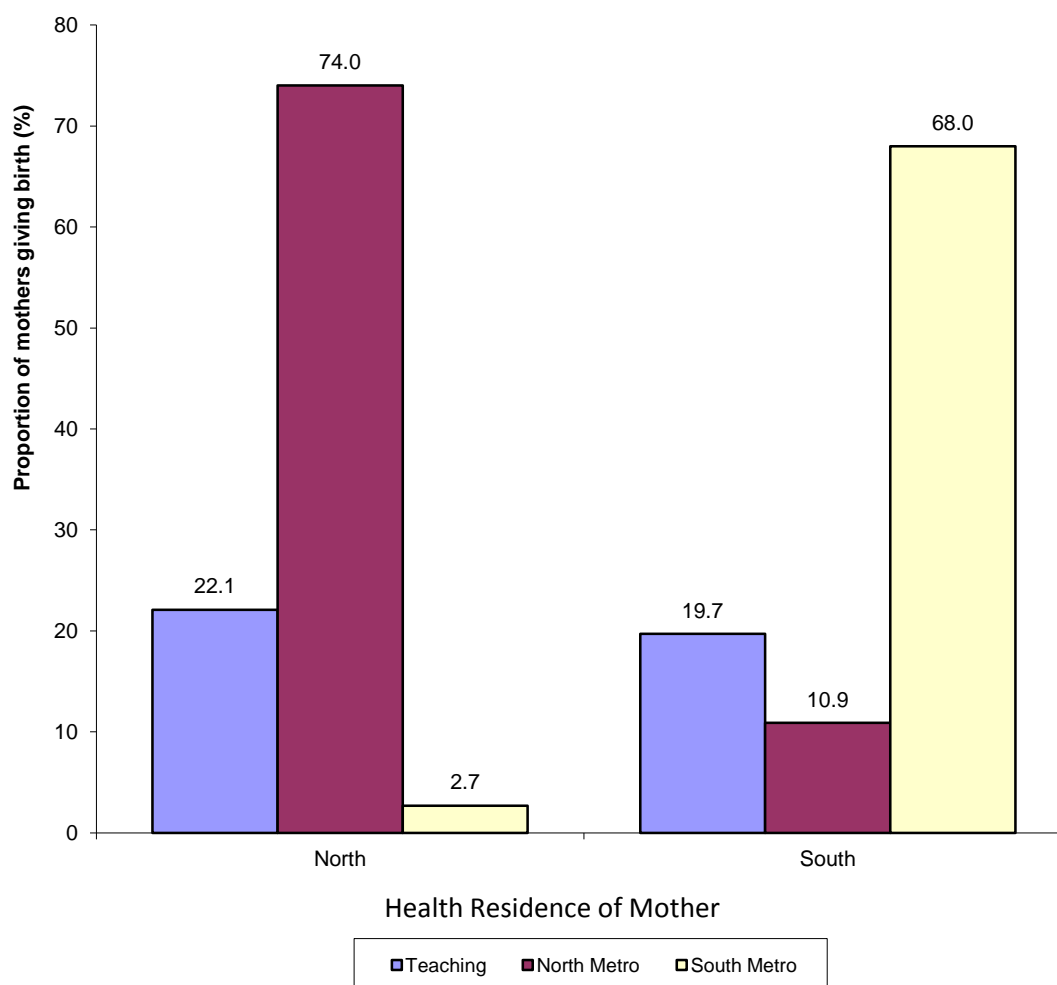
Among women resident in the metropolitan regions, the majority of the women gave birth in hospitals within their health region or at a metropolitan teaching hospital (Table 6 and Figure 3).

Table 6: Place of Birth for Women Resident in Metropolitan Health Regions in WA 2009

Health region of residence	Birth hospital in health region					Total
	Teaching	North Metro	South Metro	Country	Non-hospital	
Number						
North	2717	9106	330	5	145	12303
South	2188	1215	7568	10	145	11126
Total	4905	10321	7898	15	290	23429
Percentage						
North	22.1	74.0	2.7	0.0	1.2	100.0
South	19.7	10.9	68.0	0.1	1.3	100.0
Total	20.9	44.0	33.7	0.1	1.2	100.0

Extracted from Midwives' Notification system on 9 May 2011

Figure 3: Place of Birth for Women Resident in Metropolitan Health Region in WA, 2009



Among women resident in country regions, 77.5 per cent (5,593) of the women gave birth at a hospital outside the metropolitan area including local hospitals (5,513) and non-hospital (80). A further 1,625 (22.5 per cent) women with a non-metropolitan residential address gave birth in a metropolitan hospital, metropolitan teaching hospitals (737) and other metropolitan hospitals (888) (Table 7).

Table 7: Place of Birth for Women Resident in Country Health Regions in WA, 2009

Country Health Region	Birth Hospital in Health Region									
	Local		Metro Teaching		Metro Other		Non Hospital		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Kimberley	554	81.6	91	13.4	23	3.4	11	1.6	679	100.0
Pilbara	570	66.9	81	9.5	191	22.4	10	1.2	852	100.0
Midwest	770	80.4	120	12.5	61	6.4	7	0.7	958	100.0
Wheatbelt	299	30.8	204	21.0	458	47.2	9	0.9	970	100.0
Goldfields	868	86.6	81	8.1	47	4.7	6	0.6	1002	100.0
Southwest	1838	89.9	119	5.8	57	2.8	31	1.5	2045	100.0
Great Southern	614	86.2	41	5.8	51	7.2	6	0.8	712	100.0
Total	5513	76.4	737	10.2	888	12.3	80	1.1	7218	100.0

Extracted from Midwives' Notification system on 9 May 2011.

1.1.6 Place of Birth

Of the 30,760 women who gave birth in WA in 2009, 50 women did not have intended place of birth recorded; Of the 30,710 women with a recorded intended place of birth, 97.7 per cent gave birth in a hospital, including teaching hospital (5,292), other public hospitals (12,231) and private hospitals (12,495). Non-hospital births included 120 (0.4 per cent) mothers who gave birth before arrival at hospital (BBA), 245 (0.8 per cent) babies born at home and 327 (1.0 per cent) babies at birth centres (Table 8).

In 2009, 96.6 per cent of mothers intended to give birth in hospital while 1 per cent intended to give birth at home. Only 2.4 per cent intended to give birth in birth centres (Table 8). Among mothers intending to give birth in birth centres, less than half of them actually did so.

Table 8: Place of Birth and Intended Place of Birth in WA 2009

Actual place of birth	Intended place of birth			Total
	Hospital	Birth centre	Home	
Number				
Teaching hospital ¹	4910	337	45	5292
Departmental hospital ²	12166	54	11	12231
Private hospital ³	12473	18	4	12495
Birth centre	6	321	-	327
Home	1	-	244	245
BBA ⁴	101	3	16	120
Total	29654	732	321	30710
Percentage				
Teaching hospital	92.8	6.4	0.9	100.0
Public hospital	99.5	0.4	0.1	100.0
Private hospital	99.8	0.1	0.0	100.0
Birth centre	1.8	98.2	-	100.0
Home	0.4	-	99.6	100.0
BBA	84.2	2.5	13.3	100.0
Total	96.6	2.4	1.0	100.0

50 cases did not have intended place of birth complete.

Extracted from Midwives' Notification System on 9 May 2011

Plurality of pregnancy influenced the place of birth, with metropolitan teaching hospitals being the place of birth for 46.2 per cent of women with multiple pregnancy and 18.0 per cent of those with a single pregnancy (Table 9).

Table 9: Place of Birth and Plurality in WA 2009

Place of birth	Plurality				Total	
	Single		Multiple		No.	%
	No.	%	No.	%	No.	%
Metropolitan						
Teaching hospital	5443	18.0	210	46.2	5653	18.4
Departmental hospital	7429	24.5	35	7.7	7464	24.3
Private hospital	11578	38.2	158	34.7	11736	38.2
Total	24450	80.7	403	88.6	24853	80.8
Country						
Regional hospital ¹	3363	11.1	36	7.9	3399	11.1
Private hospital	750	2.5	9	2	757	2.5
Other ²	1369	4.5	5	1.1	1374	4.5
Total	5482	18.1	50	11.0	5530	18.0
Non-hospital						
Home births	245	0.8	-	-	245	0.8
BBA	124	0.4	2	0.4	126	0.4
other	4	0	-	-	4	0
Total	373	1.2	2	0.4	375	1.2
Grand Total	30305	100	455	100	30760	100

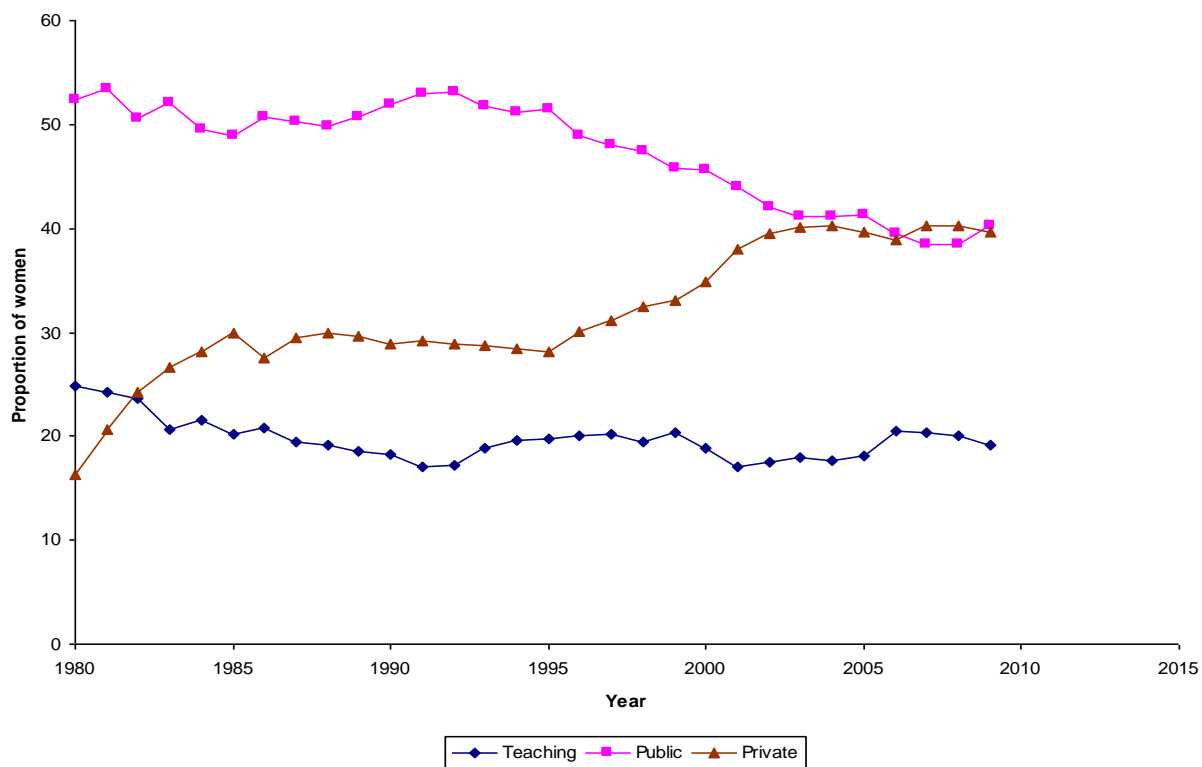
¹ Country regional hospital — public hospital in regional centre.

² Other Country hospital — other public hospital.

Extracted from Midwives' Notification System on 9 May 2011.

Trend data indicates that the proportion of births at private hospitals over the past 28 years has increased. However, the increase mostly occurred in the period 1997–2001 with the establishment of public patient facilities at two large private hospitals. These two hospitals provide care for public patients in private facilities. The proportion of births at teaching hospitals has remained relatively constant (Figure 4).

Figure 4: Trend in Use of Public and Private Facilities for Women giving birth in WA 1980-2009.



1.1.7 Smoking during Pregnancy

Smoking is a factor that can result in pregnancy complications associated with low birth weight, premature birth, and perinatal death.

In 2009, 35.4 percent of teenage mothers were recorded as smoking during pregnancy (Table 10).

Table 10: Smoking and Age in WA 2009

Age	Smoking in pregnancy				Total	
	Smoking		Non-smoking		No.	%
	No.	%	No.	%		
≤14	5	35.7	9	64.3	14	100.0
15	16	30.2	37	69.8	53	100.0
16	36	32.1	76	67.9	112	100.0
17	99	37.8	163	62.2	262	100.0
18	160	38.7	253	61.3	413	100.0
19	204	33.2	410	66.8	614	100.0
≤19	520	35.4	948	64.6	1468	100.0
20-24	1252	25.5	3656	74.5	4908	100.0
25-29	1197	14.1	7306	85.9	8503	100.0
30-34	920	9.7	8559	90.3	9479	100.0
35-39	458	8.6	4863	91.4	5321	100.0
40-44	107	10.2	937	89.8	1044	100.0
≥ 45	2	5.4	35	94.6	37	100.0
Total	4456	14.5	26304	85.5	30760	100.0

Extracted from Midwives' Notification system on 9 May 2011

In 2009, smoking during pregnancy was more common among mothers born in New Zealand (23.2 per cent) and Australia (17.7 per cent) (Table 11). This was a much higher rate than for mothers born in other countries such as Vietnam (1.3 per cent), Malaysia (3.2 per cent) and other Asian countries (1.5 per cent).

Table 11: Smoking and Country of Birth in WA 2009

Country of birth	Smoking in pregnancy					
	Smoking		Non-smoking		Total	
	No.	%	No.	%	No.	%
Oceania						
Australia	3690	17.7	17155	82.3	20845	100.0
New Zealand	266	23.2	883	76.8	1149	100.0
Europe						
UK & Ireland	195	9.1	1945	90.9	2140	100.0
Other Europe	58	7.8	690	92.2	748	100.0
Asia						
Vietnam	4	1.3	294	98.7	298	100.0
Malaysia	10	3.2	305	96.8	315	100.0
Other SE Asia	28	2.8	959	97.2	987	100.0
Other Asia	19	1.5	1209	98.5	1228	100.0
Africa						
South Africa & Zimbabwe	43	6.8	593	93.2	636	100.0
Other Africa & Middle East	20	2.1	950	97.9	970	100.0
North America	12	5.2	217	94.8	229	100.0
Other Pacific	10	15.9	53	84.1	63	100.0
South & Central America	6	3.4	171	96.6	177	100.0
Total	4361	14.6	25424	85.4	29785	100.0

There were 885 cases with incomplete or unknown place of birth.
 Extracted from Midwives' Notification system on 9 May 2011

As presented in the table below, 51.2 per cent of Aboriginal women who gave birth in 2009 were recorded as having smoked during pregnancy while 12.3 per cent for non-Aboriginal mothers were reported as smoking during pregnancy (Table 12).

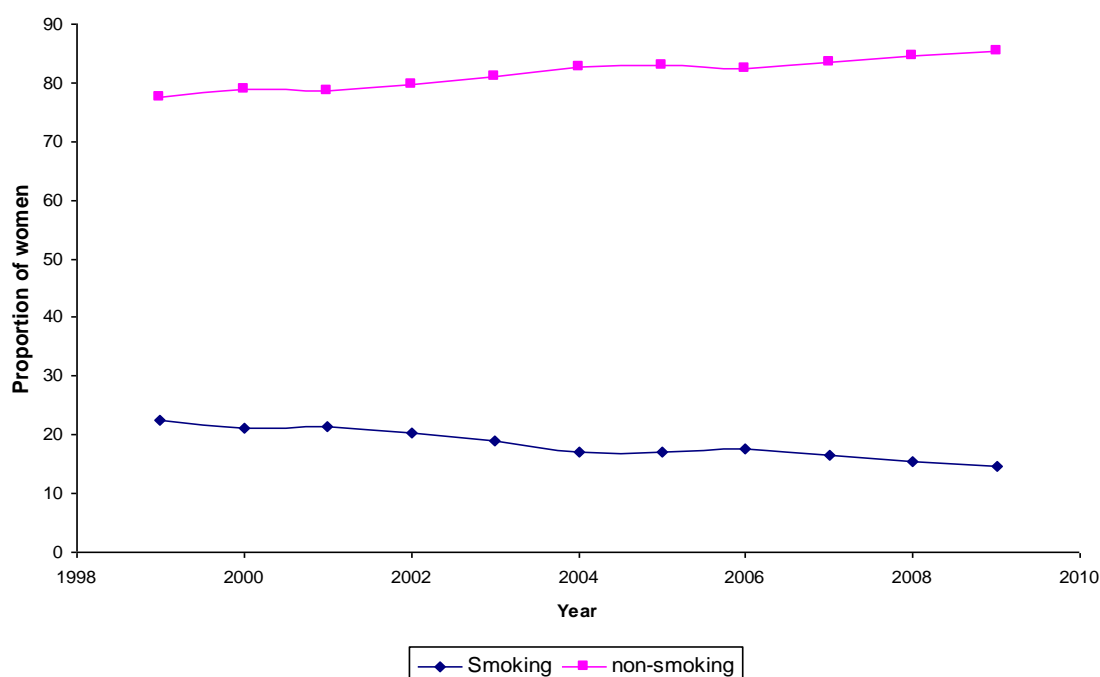
Table 12: Smoking and Aboriginality in WA 2009

Aboriginality	Smoking in pregnancy				Total	
	Smoking No.	%	Non-smoking No.	%	No.	%
Aboriginal	896	51.2	853	48.8	1749	100.0
Non-Aboriginal	3560	12.3	25451	87.7	29011	100.0
Total	4456	14.5	26304	85.5	30760	100.0

Extracted from Midwives' Notification system on 9 May 2011

The proportion of mothers who reported smoking during pregnancy declined from 22.6 per cent 1999 to 14.5 per cent in 2009. (Figure 5 and Appendix B - Table S4).

Figure 5: Trend in Smoking in Pregnancy, WA 1999-2009



1.1.8 Socio-Economic Status

Socio-economic status was assessed for all women who gave birth in WA in 2009 according to their Socio-Economic-Index-For-Areas (SEIFA) disadvantage index¹.

In Group I, the highest socio-economic status, the highest proportion of women giving birth were aged ≥ 35 years (30.3). Conversely, in group V, the lowest socio-economic status, the highest proportion of births were to teenage women (8.2 per cent). (Table 13).

Table 13: Socio-Economic Status and Age of Women in WA 2009

Socio-economic status ¹	Maternal age						Total	
	≤ 19		20–34		≥ 35			
	No.	%	No.	%	No.	%	No.	%
I	127	1.8	4923	67.9	2197	30.3	7247	100.0
II	177	3.9	3414	75.5	929	20.6	4520	100.0
III	246	4.2	4400	75.9	1149	19.8	5795	100.0
IV	418	6.2	5131	75.9	1211	17.9	6760	100.0
V	478	8.2	4560	78.1	797	13.7	5835	100.0
Total	1446	4.8	22428	74.4	6283	20.8	30157	100.0

Note: 603 cases were not recorded about Socio-economic status in 2009;

Extracted from Midwives' Notification System on 9 May 2011

¹ Socio-economic status is in accord with the Socio-economic Indices for Areas (SEIFA) disadvantage index, constructed by the Australian Bureau of Statistics using 2001 Census data. Group I has the highest socio-economic status and group V has the lowest disadvantage index. Index ranges used are:

Group I = 1045.000–1999.999 Group II = 1012.000–1044.999

Group III = 984.000–1011.999

Group IV = 952.000–983.999 Group V = 100.000–951.999

1.2 Pregnancy Profile

1.2.1 Previous Pregnancy

The number of previous pregnancies includes live births, stillborns and terminations where the gestational age of the baby reached at least 20 weeks. Table 14 shows that 41.9 per cent of the women who gave birth in WA during 2009 were giving birth for the first time. The average age of mothers having their first baby in 2009 was 27.7 years and the median age was 28 years.

The percentage of non-Aboriginal women giving birth for the first time (42.7 per cent) was higher than for Aboriginal first-time mothers (29.6 per cent).

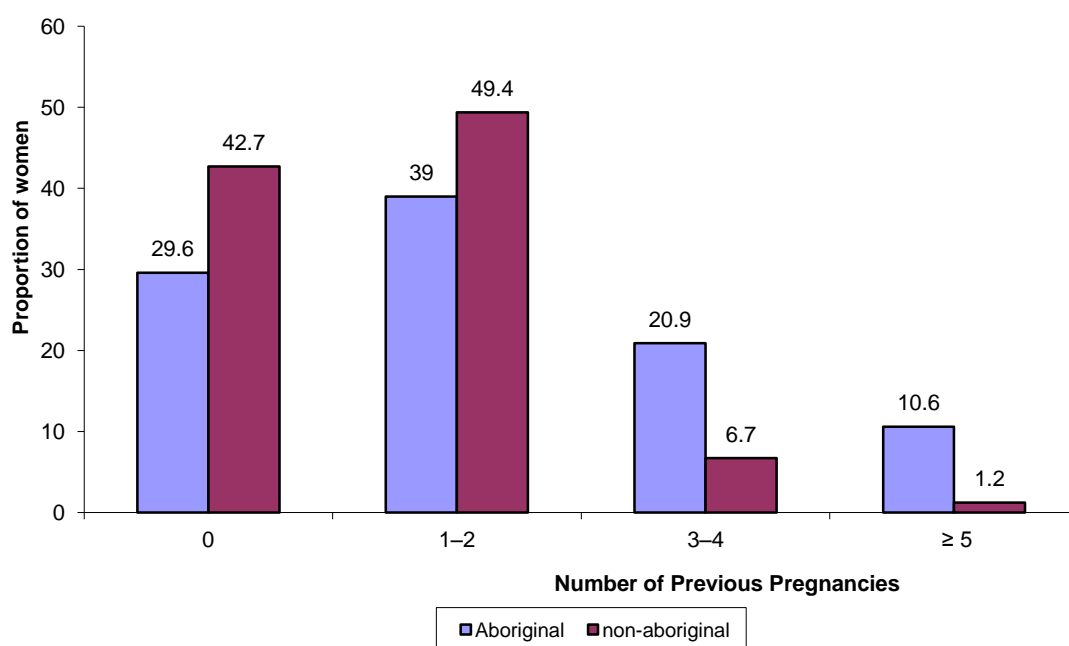
Of the women giving birth, the percentage having their fifth or more children among Aboriginal mothers (10.6 per cent) was more than eight times higher than the percentage (1.2 per cent) among non-Aboriginal women.

Table 14: Number of previous pregnancies and Aboriginality in WA 2009

Number of Previous Pregnancies	Aboriginality of mother				Total	
	Aboriginal		Non-Aboriginal		No.	%
	No.	%	No.	%		
0	517	29.6	12380	42.7	12897	41.9
1–2	682	39.0	14332	49.4	15014	48.8
3–4	365	20.9	1946	6.7	2311	7.5
≥ 5	185	10.6	353	1.2	538	1.7
Total	1749	100.0	29011	100.0	30760	100.0

Mean age of having first baby in 2009 was 27.7 years (The Median was 28 years).
Extracted from Midwives' Notification system on 9 May 2011

Figure 6: Number of previous pregnancies and Aboriginality of Women giving birth in WA 2009



Of the 12,897 women giving birth for the first time (Table 15):

- 9.5 per cent (1,228) were teenagers (≤ 19 years)
- 77.7 per cent (10,021) were aged 20–34 years; and
- 12.8 per cent (1,648) were aged 35 years or more.

Among the 6,402 women giving birth who were aged 35 years or more, 1,648 (25.7 per cent) were having their first baby.

Of women who have had either one or two previous births:

- 1.6 per cent (237) were teenage women;
- 73.6 per cent (11,053) were women aged 20–34; and
- 24.8 per cent (3,724) were women aged 35 or more.

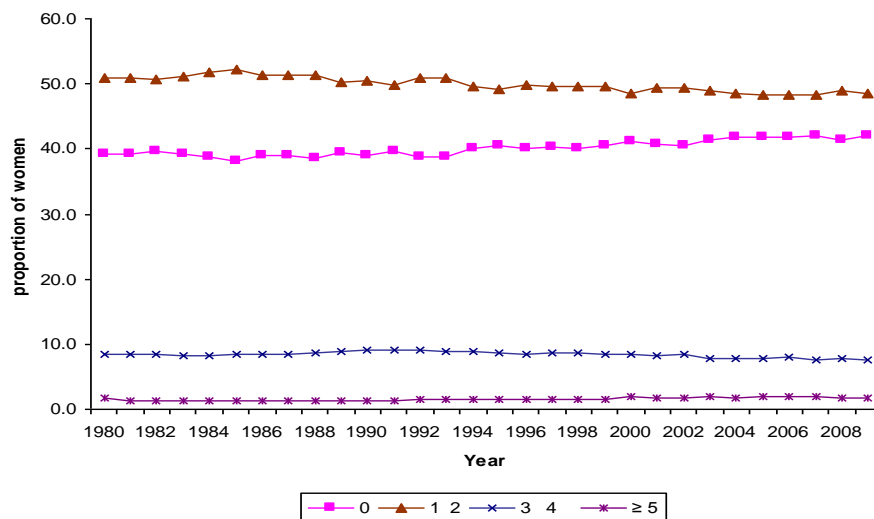
Table 15: Number of previous pregnancies and Age of Mother in WA 2009

Parity	Maternal age						Total	
	≤ 19		20–34		≥ 35		No.	%
	No.	%	No.	%	No.	%		
0	1228	83.7	10021	43.8	1648	25.7	12897	41.9
1–2	237	16.1	11053	48.3	3724	58.2	15014	48.8
3–4	3	0.2	1521	6.6	787	12.3	2311	7.5
≥ 5	-	-	295	1.3	243	3.8	538	1.7
Total	1468	100.0	22890	100.0	6402	100.0	30760	100.0

Extracted from Midwives' Notification system on 9 May 2011

Trend data shows that the proportion of mothers having their first birth experience is quite constant. The proportion of mothers with more than five babies is consistently low (Figure 7). Trend data also shows that the average parity (births before current pregnancy) has remained constant during the 29 years period from 1981 to 2009, ranging from a high 1.06 in the 1990s to a low 0.98 in 2009 (Appendix B- Table S5).

Figure 7: Number of previous pregnancies of Women in WA 1980-2009



1.2.2 Age-Specific Birth Rates

Overall, the age-specific birth rate of Aboriginal women was 101.1 per 1000 women of child-bearing age (15–44 years old) which was higher than the age-specific rate for non-Aboriginal women of 65.5 per 1000 women of child-bearing age (Table 16 and Figure 8).

Among the 15–19 year age group, the birth rate for Aboriginal women (97.7 per 1000) was more than six times the rate for non-Aboriginal women (15.4 per 1000).

For the 20–24 year age group, the birth rate for Aboriginal women (175.4 per 1000 women) was more than three times the rate for non-Aboriginal women (58.0 per 1000 women).

For women in the 30–34 year age group, the birth rate for Aboriginal women (99.1 per 1000) was lower than the rate for non-Aboriginal women (132.5 per 1000 women).

Table 16: Age- Specific Birth Rates and Aboriginality in WA 2009

Age	Aboriginality of mother						Total		
	Aboriginal			Non-Aboriginal			Births	Population	Birth rate ¹
	Births	Population	Birth rate ¹	Births	Population	Birth rate ¹			
15–19	380	3,888	97.7	1088	70,549	15.4	1468	74,437	19.7
20–24	585	3,336	175.4	4323	74,551	58.0	4908	77,887	63.0
25–29	395	2,755	143.4	8108	71,700	113.1	8503	74,455	114.2
30–34	244	2,463	99.1	9235	69,663	132.5	9479	72,126	131.4
35–39	119	2,563	46.4	5202	79,929	65.1	5321	82,492	64.5
40–44	26	2,290	11.4	1055	76,158	13.9	1081	78,448	13.8
Total	1749	17,295	101.1	29011	442,550	65.5	30760	459,845	66.9

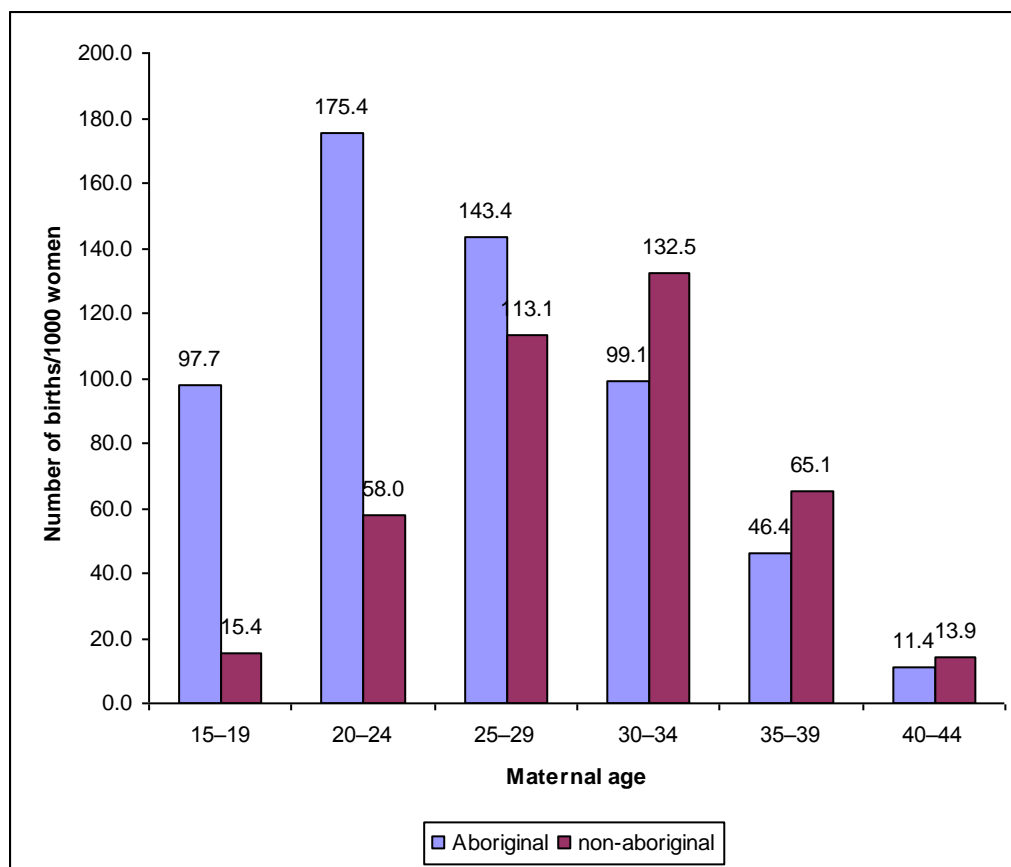
¹ Age-Specific Birth Rate — the total number of births in one year per 1000 women of the same age group.

Note: The 15-19 age group includes 7 births to Aboriginal mothers and 7 births to non-Aboriginal mothers under 15 years of age. The 40-45 age group includes and 37 births to non-indigenous mothers aged 45+

Data extracted from Midwives' Notification System on 9 May 2011.

Source of population data: ABS Estimated Resident Populations for WA.

Figure 8: Age-Specific Birth Rates by Age Group and Aboriginality in WA 2009



Trend data for the period 1993 to 2009 indicates that the age-specific birth rate for women in the age group 15–19 years varied between a high of 25.7 births per 1000 women in 1994 and a low of 18.7 in 2003. The 2009 the rate of 19.5 per 1000 women was slightly above the low. This downward trend has been mostly driven by a decline in the Aboriginal age-specific birth rate in this period (Table 17).

Trend data for 1993 to 2009 also indicates that the number of mothers aged 35-44 years has increased. The birth rate for women aged 35–44 increased from 21.6 births per 1000 women in 1993 to a peak of 41.1 per 1000 women in 2008 and reduced to 39.8 per 1000 women in 2009 (Table 17). The trend in delayed childbearing can be attributed to a number of factors including social, educational and economic (Carolan, 2003).

Table 17: Age-Specific Birth Rates by Age and Aboriginality of Women who gave birth, 1993–2009

Year of birth	Aboriginality of mother						Total ¹		
	Aboriginal ¹			Non-Aboriginal ¹			15–19	20–34	35–44
	15–19	20–34	35–44	15–19	20–34	35–44			
1993	165.7	152.3	21.4	18.5	102.4	21.6	24.2	104.0	21.6
1994	166.0	148.2	18.2	20.1	101.2	22.5	25.7	102.7	22.4
1995	143.6	151.8	22.5	19.7	99.6	23.7	24.6	101.3	23.7
1996	137.7	148.2	21.7	19.6	98.9	24.6	24.1	100.6	24.5
1997	156.2	159.4	22.0	17.4	95.7	25.1	22.7	97.9	25.0
1998	137.9	151.7	26.3	18.2	95.1	27.0	23.2	97.0	27.0
1999	134.4	164.5	28.0	17.9	94.9	26.9	22.8	97.2	27.0
2000	126.8	160.3	28.0	17.0	91.6	27.5	21.7	93.9	27.5
2001	118.1	167.0	24.4	16.2	91.8	27.2	20.8	94.4	27.1
2002	103.5	143.4	25.7	16.0	84.8	27.7	20.3	87.0	27.7
2003	101.7	127.8	21.2	14.3	90.8	29.7	18.7	92.3	29.5
2004	97.2	125.8	23.1	15.0	90.4	30.8	19.4	91.9	30.5
2005	108.4	133.5	25.6	15.7	93.5	34.4	20.8	95.1	34.2
2006	106.3	141.4	24.7	16.1	97.2	37.7	21.4	99.0	37.3
2007	94.3	144.4	31.0	16.5	101.4	40.8	21.0	104.8	41.0
2008	104.2	142.2	29.1	16.6	100.8	41.4	21.1	102.4	41.1
2009	97.7	143.1	29.9	15.4	100.3	40.1	19.7	102.0	39.8

¹ Age-Specific Birth Rate = the total number of births in one year per 1000 women of the same age group.

1.2.3 Complications of Pregnancy

Over two-thirds (67.7 per cent) of the women who gave birth during 2009, recorded having no complications during pregnancy (Table 18).

For the women who did experience complications, those with the highest proportions were gestational diabetes (5.1 per cent) and premature rupture of membranes (4.0 per cent) followed by urinary tract infection (3.2 per cent).

Table 18: Selected Complications of Pregnancy and Plurality in WA 2009

Complications of pregnancy ¹	Plurality				Total	
	Single		Multiple		No.	% ⁴
	No.	% ²	No.	% ³	No.	% ⁴
Threatened miscarriage	878	2.9	18	4.0	896	2.9
Threatened preterm labour	697	2.3	54	11.9	751	2.4
Urinary tract infection	975	3.2	15	3.3	990	3.2
Pre-eclampsia	810	2.7	41	9.0	851	2.8
Antepartum haemorrhage						
— placenta praevia	200	0.7	4	0.9	204	0.7
— abruption	109	0.4	4	0.9	113	0.4
— other	765	2.5	18	4.0	783	2.5
Premature rupture of membranes	1181	3.9	43	9.5	1224	4.0
Gestational diabetes	1528	5.0	27	5.9	1555	5.1
Other	4513	14.9	309	67.9	4822	15.7
No complications of pregnancy	20734	68.4	97	21.3	20831	67.7

¹ A woman may have more than one complication during pregnancy.

² Percentage of women with a single pregnancy (n=30,305).

³ Percentage of women with a multiple pregnancy (n=455).

⁴ Percentage of women who gave birth (n=30,760).

Extracted from Midwives' Notification System on 9 May 2011

1.2.4 Medical Conditions

There were 12,464 reported instances of pre-existing medical conditions recorded among the 30,760 women who gave birth during 2009. These conditions affected 9,049 women. The most frequent were diseases of the respiratory system (11.3 per cent) and mental and behavioural disorders (6.5 per cent) (Table 19).

No pre-existing medical condition was recorded for 21,711 women.

Table 18: Selected Pre-existing Medical Conditions and Number of Mother giving birth in WA 2009.

Medical Conditions ¹	No.	% of women ²
Respiratory system diseases	3463	11.3
Mental and behavioural disorders	2000	6.5
Endocrine, nutritional and metabolic diseases	1383	4.5
Infectious and parasitic diseases	1244	4.0
Blood and blood-forming organs and disorders involving the immune mechanism	1122	3.6
Circulatory system diseases	565	1.8
Genito-urinary system diseases	529	1.7
Pregnancy, childbirth and puerperial disorders	438	1.4
Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified	349	1.1
Nervous system diseases	317	1.0
Digestive system diseases	292	0.9
Factors influencing health status and contact with health services	256	0.8
Musculo skeletal system and connective tissue diseases	169	0.5
Neoplasms	113	0.4
Skin and subcutaneous tissue diseases	81	0.3
Congenital malformations, deformations and chromosomal abnormalities	63	0.2
Injury poisoning and certain other consequences of external causes	40	0.1
Ear and mastoid process diseases	33	0.1
Eye and adnexa diseases	7	0.0
Certain conditions originating in the perinatal period	5	0.0
No medical conditions	21711	70.6

¹ A woman may have more than one medical condition.

² Percentage of women who gave birth (n= 30,760).

Extracted from Midwives' Notification System on 9 May 2011.

1.2.5 Procedures and Treatments

There were 55,539 procedures and treatments given to 29,875 women in 2009. The most common procedure was ultrasound examination, with 94.5 per cent of all women giving birth having undergone this procedure. There were 51.8 per cent and 29.0 per cent of women having Cardiotocography (CTG) intrapartum and CTG antepartum, respectively (Table 20).

Table 20: Procedure and Treatments Provided to Women giving birth in WA 2009

Procedures and Treatments ¹	No.	% of women
Ultrasound	29063	94.5
CTG intrapartum ²	15946	51.8 ⁴
CTG antepartum	8923	29.0
Fertility treatment	950	3.1
Amniocentesis	485	1.6
CVS/placental biopsy ³	87	0.3
Cervical suture	85	0.3
Total	55539	

¹ A Woman may have more than one procedure or treatment.

² CTG – Cardiotocography.

³ CVS – Chorionic Villus Samplin

⁴ 64.7% of women who experienced labour had a CTG intrpartum.

Extracted from Midwives' Notification System on 9 May 2011.

1.3 Labour

1.3.1 Onset of Labour

Onset of labour is categorised as spontaneous, induced or no labour. Labour established spontaneously for 52.1 per cent of the women who gave birth in WA in 2009.

Labour was induced for 28.0 per cent of all women who gave birth, and 19.9 per cent did not experience labour, being delivered by caesarean section (Table 21).

Table 21: Onset of Labour and Plurality of Women giving birth in WA 2009

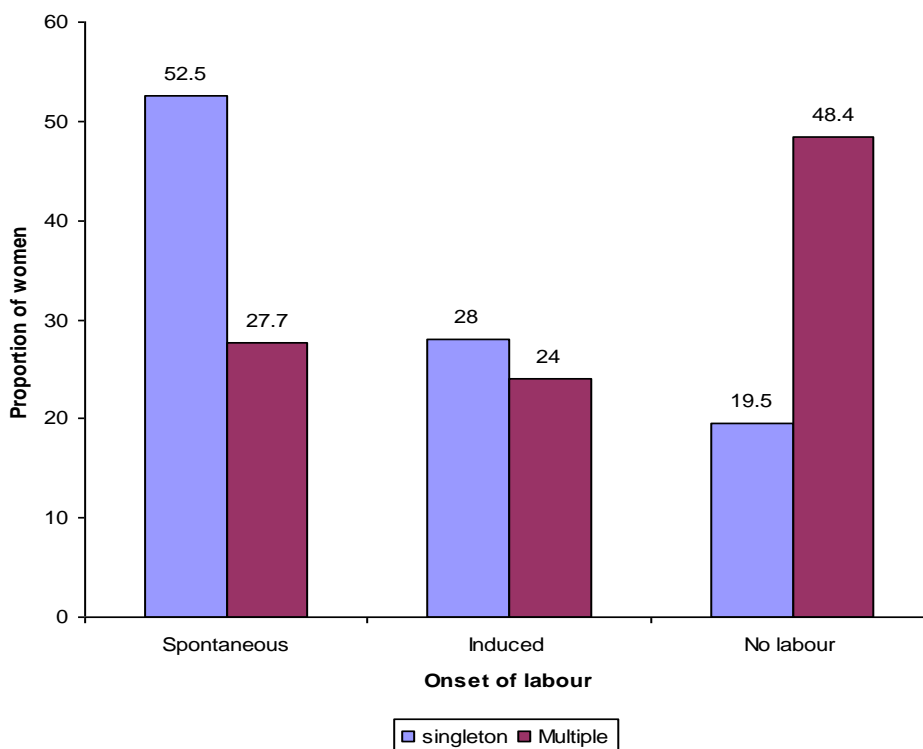
Onset of labour	Plurality				Total	
	Single		Multiple		No.	%
	No.	%	No.	%		
Spontaneous	15903	52.5	126	27.7	16029	52.1
Induced	8498	28.0	109	24.0	8607	28.0
No labour	5904	19.5	220	48.4	6124	19.9
Total	30305	100.0	455	100.0	30760	100.0

Extracted from Midwives' Notification System on 9 May 2011

Figure 9 shows that among the women with multiple pregnancy:

- 27.7 per cent had a spontaneous onset of labour;
- 24.0 per cent had labour induced; and
- 48.4 per cent did not experience labour.

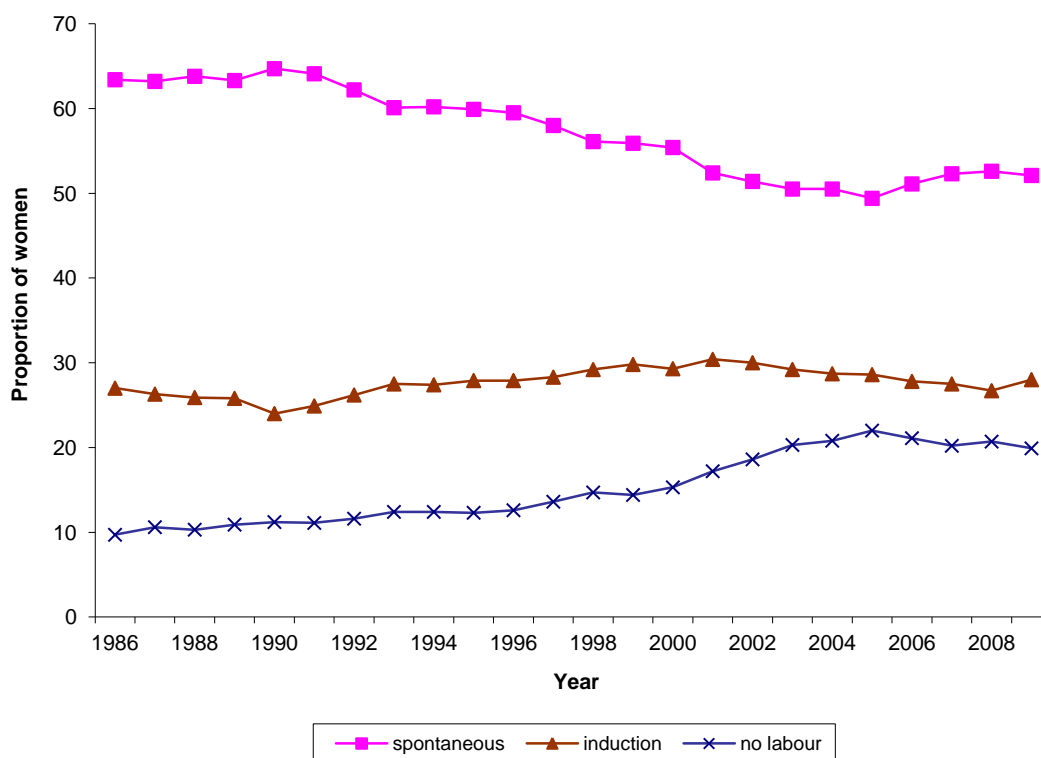
Figure 9: Onset of Labour for Single and Multiple births in WA 2009



Trend data from 1986 shows that there was little change in the proportion of women with a single pregnancy where labour was induced. However, there has been a steady increase in the number of pregnant women who did not experience labour (9.7 per cent in 1986 to 22.0 per cent in 2005 with a decrease to 19.9 per cent in 2009).

There was a general decrease in the proportion of women with a Single pregnancy who established labour spontaneously, from a high of 63.4 per cent in 1986, to a low of 49.4 per cent in 2005. There has been a slight increase since then to 52.1 per cent in 2009 (Figure 10 and Appendix B- Table S6).

Figure 10: Onset of Labour of Pregnant Women, 1980-2009



1.3.2 Augmentation of Labour

Augmentation of labour refers to the use of medication or other intervention to 'speed up' the process of labour. 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.

Augmentation of spontaneous labour by surgical and/or medical intervention was administered to 6,616 (41.3 per cent) of women who established labour spontaneously (Table 22).

Of the pregnant women where labour was augmented, 3,814 (57.6 per cent) progressed to a spontaneous vaginal birth, 1,767 (26.7 per cent) to assisted vaginal birth and 1,035 (15.6 per cent) required a caesarean section delivery.

Women who established labour and gave birth without obstetric intervention comprised 23.1 per cent (7,095) of all women who gave birth in 2009.

Table 22: Onset and Augmentation of Labour and Type of Delivery in WA 2009

Onset and augmentation of labour	Type of delivery								Total	
	Spontaneous vaginal		Assisted vaginal		Elective caesarean		Emergency caesarean		No.	%
	No.	%	No.	%	No.	%	No.	%		
Spontaneous onset no augmentation	7095	23.1	978	3.2	-	-	1340	4.4	9413	30.6
Spontaneous onset and augmentation	3814	12.4	1767	5.7	-	-	1035	3.4	6616	21.5
Induced onset	5134	16.7	1731	5.6	-	-	1742	5.7	8607	28.0
No labour	-	-	-	-	5300	17.2	824	2.7	6124	19.9
Total	16043	52.2	4476	14.6	5300	17.2	4941	16.1	30760	100.0

Women with multiple pregnancies are classified according to the features of the first multiple delivered.

Extracted from Midwives' Notification System on 9 May 2011

Among women with a spontaneous onset of labour in 2009, artificial rupture of membrane was recorded for 3,085 women (19.2 per cent), and oxytocin was recorded for 1,878 women (11.7 per cent). A further 9.8 per cent (1571) had both oxytocin and artificial rupture of membrane recorded (Table 23).

Table 19: Augmentation of Labour and Hours of Established Labour after Spontaneous Onset for women giving birth in WA 2009

Type of augmentation	Hours of Established labour						n/r ¹	Total
	< 1	1-4	5-12	13-18	19-24	> 24		
Number								
None	860	4471	3667	303	61	26	25	9413
Oxytocin	154	425	983	258	42	16	-	1878
Artificial rupture of membranes (ARM)	158	1007	1656	219	40	5	-	3085
Oxytocin and ARM	126	334	810	239	50	12	-	1571
Prostaglandin	5	11	8	3	-	-	-	27
Other	7	18	24	3	2	1	-	55
Total	1310	6266	7148	1025	195	60	25	16029
Percentage								
None	65.6	71.3	51.3	29.6	31.3	43.3	100.0	58.7
Oxytocin	11.8	6.8	13.8	25.2	21.5	26.7	-	11.7
Artificial rupture of membranes (ARM)	12.1	16.1	23.2	21.4	20.5	8.3	-	19.2
Oxytocin and ARM	9.6	5.3	11.3	23.3	25.6	20.0	-	9.8
Prostaglandin	0.4	0.2	0.1	0.3	-	-	-	0.2
Other	0.5	0.3	0.3	0.3	1.0	1.7	-	0.3
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Women with multiple pregnancies are classified according to the features of the first multiple delivered.

¹ n/r = not recorded.

Extracted from Midwives' Notification System on 9 May 2011.

1.3.3 Induction of Labour

Induction of labour is the process of using drugs or other methods to artificially start labour. Induction is carried out so that a baby can be delivered even though labour has not started spontaneously (on its own).

Labour was induced by medical and/or surgical means for 8,607 (28.0 per cent) women who gave birth (Table 24).

The methods of induction were usually combined. Artificial rupture of membranes combined with an oxytocin infusion was recorded for 42.4 per cent (3,653) of the women whose labour was induced. Artificial rupture of membranes alone and oxytocin infusion alone were recorded for 5.6 per cent (486) and 7.4 per cent (638) of births, respectively.

Table 20: Type of Induction and Delivery for Women who were induced in WA 2009

Type of Induction	Type of delivery						Total	
	Spontaneous vaginal		Assisted vaginal		Emergency caesarean		No.	Total %
	No.	%	No.	%	No.	%		
Oxytocin	368	57.7	128	20.1	142	22.3	638	7.4
Prostaglandin	489	55.8	136	15.5	252	28.7	877	10.2
Artificial rupture of membrane (ARM)	375	77.2	52	10.7	59	12.1	486	5.6
Oxytocin and ARM	2416	66.2	756	20.7	481	13.2	3653	42.4
Prostaglandin and ARM	355	72.2	64	13.0	73	14.8	492	5.7
Prostaglandin and Oxytocin	87	36.9	70	29.7	79	33.5	236	2.7
Prostaglandin, oxytocin and ARM	597	48.7	324	26.4	305	24.9	1226	14.2
Other	447	44.7	201	20.1	351	35.1	999	11.6
Total	5134	59.7	1731	20.1	1742	20.2	8607	100.0

Women with multiple pregnancies are classified according to the features of the first multiple delivered.

Extracted from Midwives' Notification System on 9 May 2011.

1.3.4 Analgesia

Analgesia is often administered during labour to reduce the feeling of pain while allowing sensations of touch, pressure and the ability to move generally to remain intact.

Of the 19,572 women who received analgesia during labour, lumbar epidural block was administered to 51.3 per cent (10,051) and spinal analgesic block to 2.2 per cent. Nitrous oxide and oxygen inhalation were provided to 26.6 per cent and narcotic sedation was given to 16.5 per cent of women who received analgesia during birth (Table 25).

Table 25: Analgesia and Type of Delivery for Women giving birth in WA 2009

Type of Analgesia	Type of delivery								Total	
	Spontaneous vaginal		Assisted vaginal		Elective caesarean		Emergency caesarean		No.	%
	No.	%	No.	%	No.	%	No.	%		
Nitrous oxide & oxygen inhalation	4446	36.5	517	12.2	-	-	234	7.4	5197	26.6
Intra-muscular narcotics	2472	20.3	476	11.2	-	-	278	8.8	3226	16.5
Epidural	4793	39.4	3037	71.7	0	0	2221	70.2	10051	51.3
Spinal	91	0.7	79	1.9	0	0	251	7.9	421	2.2
Other	373	3.1	124	2.9	-	-	180	5.7	677	3.5
Total of women received analgesia	12175	100.0	4233	100.0	-	-	3164	100.0	19572	100.0
No of women received analgesia	12175	75.9	4233	94.6	0	0.0	3164	64.0	19572	63.6
No of women not received analgesia	3868	12.5	243	0.8	5300	17.3	1777	5.8	11188	36.3
Total	16043	100.0	4476	100.0	5300	100	4941	100.0	30760	100.0

Women with multiple pregnancies are classified according to the features of the first multiple delivered.

Extracted from Midwives' Notification System on 9 May 2011.

Among the 20,519 women who gave birth vaginally, 38.2 per cent had an epidural, 24.2 per cent received nitrous oxide and oxygen (Table 26). Only 20.0 per cent received no pharmacological analgesia.

Table 26: Analgesia for Women who had vaginal births in WA 2009

Vaginal births		
Type of analgesia	No.	Per cent of women
None	4111	20.0
Nitrous oxide & oxygen	4963	24.2
Narcotic sedation	2948	14.4
Epidural	7830	38.2
Spinal	170	0.8
Other	497	2.4
Total	20519	100.0

Extracted from Midwives' Notification System on 9 May 2011.

1.4 Birth

1.4.1 Anaesthesia

Anaesthesia is often administered during delivery and differs from analgesia in that it causes the loss of all sensation. It includes loss of touch, loss of certain reflexes and loss of one's ability to move. With general anaesthesia the patient is also asleep.

Among 30,760 of women giving birth in WA 2009, there were 10,973 cases (35.7 per cent) that received no anaesthesia, 34.3 per cent (10,549) had an epidural and 14.5 per cent (4,458) received spinal anaesthesia (Table 27).

Table 27: Anaesthesia and Type of Delivery for Women giving birth in WA, 2009

Type of Anaesthesia	Type of delivery								Total	
	Spontaneous vaginal		Assisted vaginal		Elective caesarean		Emergency caesarean		No.	%
	No.	%	No.	%	No.	%	No.	%		
None	10328	33.6	645	2.1	-	-	-	-	10973	35.7
Local anaesthesia to perineum	795	2.6	528	1.7	-	-	-	-	1323	4.3
Pudendal	18	0.1	157	0.5	-	-	1	0.0	176	0.6
Epidural	4036	13.1	2848	9.3	1385	4.5	2280	7.4	10549	34.3
Spinal	58	0.2	66	0.2	2954	9.6	1380	4.5	4458	14.5
General with epidural or spinal	8	0.0	2	0.0	82	0.3	334	1.1	426	1.4
General	2	0.0	1	0.0	28	0.1	48	0.2	79	0.3
Other	798	2.6	229	0.7	851	2.8	898	2.9	2776	9.0
Total	16043	52.2	4476	14.6	5300	17.2	4941	16.1	30760	100.0

Extracted from Midwives' Notification System on 9 May 2011.

Among the 20,519 women who gave birth vaginally, 10,973 (53.5 per cent) did not receive anaesthesia at the time of birth (Table 28).

Epidural and/or spinal anaesthesia was the most frequently administered (34.2 per cent) form of anaesthesia to those women in labour who required pain relief.

Table 21: Anaesthesia for Women who had Vaginal Births in WA, 2009

Vaginal births		
Type of anaesthesia	No.	% of women
None	10973	53.5
Local anaesthesia to perineum	1323	6.4
Pudendal	175	0.9
Epidural &/or spinal	7008	34.2
General/ other	1040	5.1
Total	20519	100.0

Extracted from Midwives' Notification System on 9 May 2011

Among the 10,241 women who were delivered by caesarean section, epidural and/or spinal anaesthesia was the preferred option (78.1 per cent) (Table 29).

Table 22: Anaesthesia for Women who had Caesarean Births in WA, 2009

Caesarean Births		
Type of Anaesthesia	No.	per cent of women
Epidural &/or spinal	7999	78.1
General with Epidural or Spinal	416	4.1
General	76	0.7
Other	1750	17.1
Total	10241	100.0

Extracted from Midwives' Notification System on 9 May 2011.

Trend data over the period 1986 to 2009 shows that the use of general anaesthesia/analgesia has decreased for women who were delivered by caesarean section (Table 30). In 1986 general anaesthesia was used in 42.5 per cent of caesareans (18.3 elective caesareans + 24.2 emergency caesareans) compared with 5.7 per cent in 2009 (1.3 elective caesareans + 4.4 emergency caesareans). For emergency caesareans, general anaesthesia was used in 24.2 per cent of cases in 1986 and dramatically reduced to 4.4 per cent in 2009. Regional anaesthesia such as epidural / spinal is considered to be safer than general anaesthesia (Afolabi, *et al.*, 2006).

Table 30: Epidural and General Anaesthesia for Women giving births by Caesarean Section in WA 1980-2009

Year	Type of Delivery												Total
	Elective Caesarean						Emergency Caesarean						
	Epidural/Spinal		General		Total		Epidural/Spinal		General		Total		
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	
1986	1089	32.0	622	18.3	1711	50.3	868	25.5	823	24.2	1691	49.7	3402
1987	1436	36.0	610	15.3	2046	51.3	1008	25.3	931	23.4	1939	48.7	3985
1988	1562	37.5	632	15.2	2194	52.6	1047	25.1	929	22.3	1976	47.4	4170
1989	1774	39.2	582	12.9	2356	52.1	1258	27.8	907	20.1	2165	47.9	4521
1990	1923	39.8	570	11.8	2493	51.6	1436	29.7	902	18.7	2338	48.4	4831
1991	1846	40.6	516	11.3	2362	51.9	1432	31.5	755	16.6	2187	48.1	4549
1992	2070	43.0	489	10.2	2559	53.2	1486	30.9	768	16.0	2254	46.8	4813
1993	2282	43.7	481	9.2	2763	52.9	1749	33.5	710	13.6	2459	47.1	5222
1994	2347	44.9	382	7.3	2729	52.2	1891	36.2	603	11.5	2494	47.8	5223
1995	2371	46.9	369	7.3	2740	54.2	1807	35.7	511	10.1	2318	45.8	5058
1996	2548	49.5	317	6.2	2865	55.7	1860	36.1	423	8.2	2283	44.3	5148
1997	2761	50.6	281	5.2	3042	55.8	2004	36.8	407	7.5	2411	44.2	5453
1998	3008	50.9	262	4.4	3270	55.4	2257	38.2	379	6.4	2636	44.6	5906
1999	3100	52.3	210	3.5	3310	55.8	2262	38.2	356	6.0	2618	44.2	5928
2000	3289	52.4	231	3.7	3520	56.1	2439	38.8	321	5.1	2760	43.9	6280
2001	3563	52.7	182	2.7	3745	55.3	2703	39.9	319	4.7	3022	44.7	6767
2002	3844	53.6	160	2.2	4004	55.9	2823	39.4	339	4.7	3162	44.1	7166
2003	4159	55.4	167	2.2	4326	57.6	2856	38.1	322	4.3	3178	42.4	7504
2004	4386	54.0	152	1.9	4538	55.8	3249	40.0	341	4.2	3590	44.2	8128
2005	4917	54.7	154	1.7	5071	56.4	3530	39.3	387	4.3	3917	43.6	8988
2006	4702	56.3	114	1.4	4816	57.6	3221	38.5	322	3.9	3543	42.4	8359
2007	4495	53.5	117	1.4	4612	54.9	3487	41.5	305	3.6	3792	45.1	8404
2008	4526	53.0	140	1.6	4666	54.6	3529	41.3	348	4.1	3878	45.4	8544
2009	4339	50.0	110	1.3	4449	51.3	3846	44.3	382	4.4	4228	48.7	8677

Extracted from Midwives' Notification System on 9 May 2011

1.4.2 Presentation

The majority of the single pregnancy babies 28,912 (95.4 per cent of single births) were cephalic presentations, of which 69.6 per cent (20,119) were delivered vaginally including spontaneous vaginal (15,834), vacuum (3,472) and forceps (813) (Table 31).

There were 1,146 (3.8 per cent) breech presentations among single births. Of these, there were 1,026 cases delivered by caesarean section, including 622 elective caesarean cases and 404 emergency caesarean cases.

11.5 per cent of single births were vaginal births aided by vacuum extraction and 2.7 per cent were vaginal births aided by forceps. There were 117 women with breech presentation, shown as "Breech Manoeuvre" in the table below, who gave birth vaginally with or without assistance (Table 31).

Table 31: Presentation and Type of Delivery for Single Births in WA 2009

Type of delivery	Presentation						Total	
	Vertex		Breech		Other			
	No.	%	No.	%	No.	%	No.	%
Spontaneous Vaginal	15834	54.8	3	0.3	95	38.5	15932	52.6
Vacuum	3472	12.0	-	-	21	8.5	3493	11.5
Forceps	813	2.8	-	-	6	2.4	819	2.7
Breech Manoeuvre	-	-	117	10.2	-	-	117	0.4
Elective Caesarean	4501	15.6	622	54.3	25	10.1	5148	17.0
Emergency Caesarean	4292	14.8	404	35.3	100	40.5	4796	15.8
Total	28912	100.0	1146	100.0	247	100.0	30305	100.0

Note: There were 455 cases multiple births in 2009.
Extracted from Midwives' Notification System on 9 May 2011.

1.4.3 Type of Birth

Spontaneous vaginal birth occurred for just over half of the women (52.2 per cent) who gave birth in 2009. A further 14.6 per cent had an assisted vaginal birth (Table 32).

Table 32: Type of Analgesia and Type of Delivery for Women giving birth in WA 2009

Type of Analgesia	Type of Delivery									
	Spontaneous Vaginal		Assisted Vaginal		Elective Caesarean		Emergency Caesarean		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
None	3868	12.6	243	0.8	5300	17.2	1777	5.8	11188	36.4
Nitrous oxide & oxygen inhalation	4446	14.5	517	1.7	-	-	234	0.8	5197	16.9
Intra-muscular narcotics	2472	8.0	476	1.5	-	-	278	0.9	3226	10.5
Epidural	4793	15.6	3037	9.9	-	-	2221	7.2	10051	32.7
Spinal	91	0.3	79	0.3	-	-	251	0.8	421	1.4
Other	373	1.2	124	0.4	-	-	180	0.6	677	2.2
Total	16043	52.2	4476	14.6	5300	17.2	4941	16.1	30760	100.0

Extracted from Midwives' Notification System on 9 May 2011

Caesarean section was the method of birth for 10,241 (33.3 per cent) women. This comprised 5,300 (17.2 per cent) elective caesarean and 4,941 (16.1 per cent) emergency procedures (Table 33).

Women with multiple birth pregnancies had a higher probability of a caesarean section delivery. In 2009, there were 294 (65.2 per cent) women with a twin pregnancy who delivered by caesarean section (Table 33).

Table 33: Type of Delivery and Plurality for Women giving birth in WA 2009

Type of Delivery	Plurality							
	Single		Twin		Triplet		Total	
	No.	%	No.	%	No.	%	No.	%
Spontaneous Vaginal	15932	52.6	111	24.6	-	-	16043	52.2
Vacuum	3493	11.5	30	6.7	-	-	3523	11.5
Forceps	819	2.7	11	2.4	-	-	830	2.7
Breech Manoeuvre	117	0.4	5	1.1	1	25.0	123	0.4
Elective Caesarean	5148	17.0	151	33.5	1	25.0	5300	17.2
Emergency Caesarean	4796	15.8	143	31.7	2	50.0	4941	16.1
Total	30305	100.0	451	100.0	4	100.0	30760	100.0

Extracted from Midwives' Notification System on 9 May 2011

Women who have had caesarean section births previously are most likely to have repeat procedures. This is shown by 87.1 per cent of women with a previous caesarean section recorded, undergoing a repeat caesarean in 2009, comprising previous caesarean, last delivery vaginal (100 women) and previous caesarean, last delivery caesarean (4,338 women) (Table 34).

Table 34: Type of Delivery and Type of Previous Delivery of Women giving birth in WA 2009

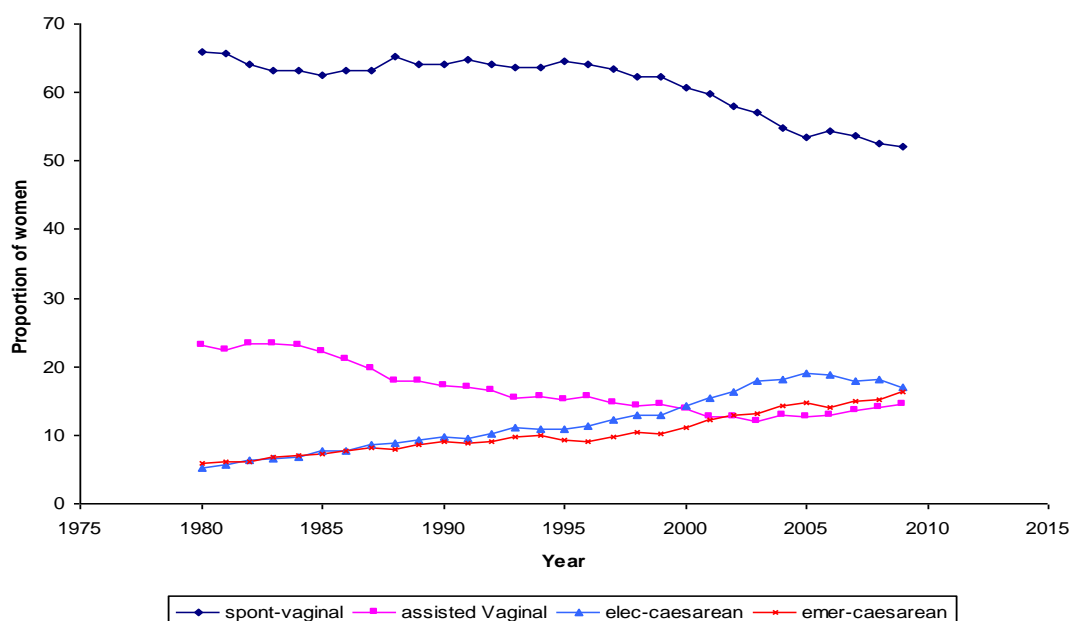
Previous delivery	Type of Delivery								Total	
	Spontaneous Vaginal		Assisted Vaginal		Elective Caesarean		Emergency Caesarean			
	No.	%	No.	%	No.	%	No.	%	No.	%
First delivery	5060	39.2	3353	26.0	1377	10.7	3107	24.1	12897	100.0
Previous deliveries, no caesareans	10505	82.3	944	7.4	564	4.4	755	5.9	12768	100.0
Previous caesarean, last delivery vaginal	174	60.0	16	5.5	45	15.5	55	19.0	290	100.0
Previous caesarean, last delivery caesarean	304	6.3	163	3.4	3314	69.0	1024	21.3	4805	100.0
Total	16043	52.2	4476	14.6	5300	17.2	4941	16.1	30760	100.0

$$87.1\% = (45 + 3314 + 55 + 1024) / (290 + 4805)$$

Extracted from Midwives' Notification System on 9 May 2011

Trend data indicates that the incidence of caesarean section has increased significantly over the past 28 years while the spontaneous vaginal and assisted vaginal have reduced slightly (Figure 11 and Appendix B – Table S7). The increase in caesarean births can be attributed to causes such as the increased and safer use of regional anaesthesia procedures giving mothers more choices between vaginal and caesarean births. In addition, according to a recent study in 2007, other factors in the increasing rates of caesareans include, complications in pregnancy, plurality of birth, maternal age and affluence. (Chester, 2007).

Figure 11: Type of Delivery from 1980-2009



1.4.4 Hours of Established Labour

For the women who experienced spontaneous labour, 47.4 per cent had a duration of labour of 4 hours or less and 44.7 per cent had a duration of 5 to 12 hours. (Table 35).

Women for whom labour was induced tended to have shorter hours of labour than those with spontaneous onset of labour.

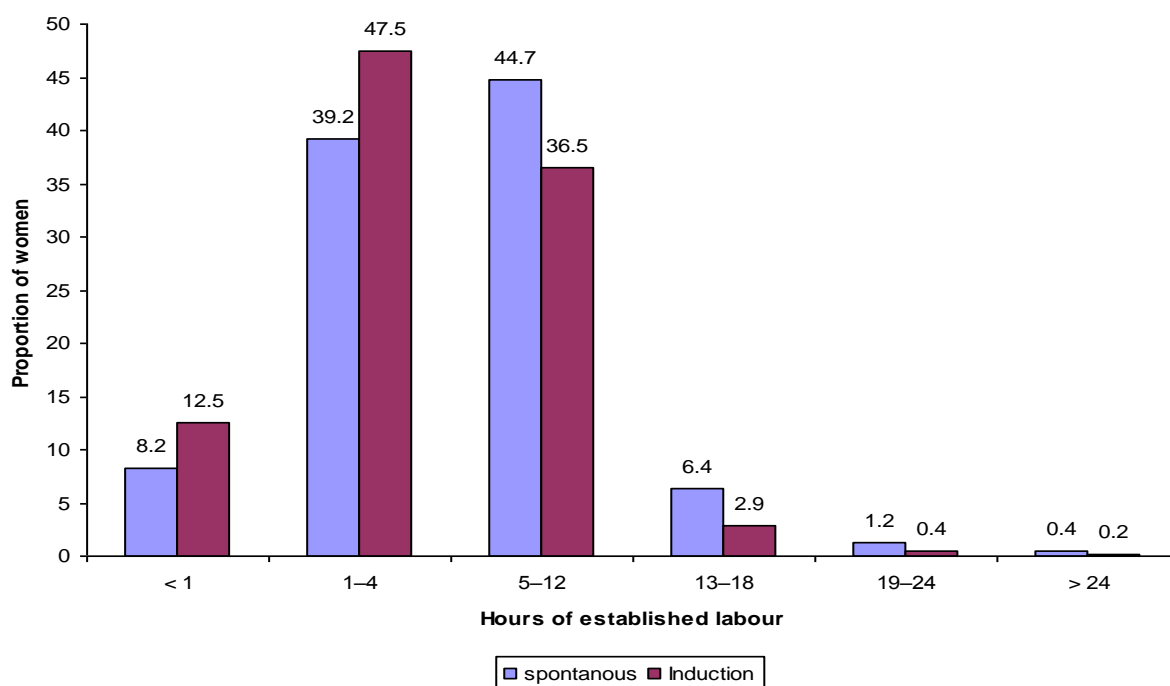
Table 35: Hours of Established Labour and Onset of Labour for Women giving birth in WA 2009

Hours of labour	Onset of labour			
	Spontaneous		Induction	
	No.	%	No.	%
< 1	1310	8.2	1077	12.5
1-4	6266	39.2	4092	47.5
5-12	7148	44.7	3137	36.5
13-18	1025	6.4	249	2.9
19-24	195	1.2	35	0.4
> 24	60	0.4	16	0.2
Total	16004	100.0	8606	100.0

There were 6124 cases experienced no labour; 26 cases were not recorded.

Extracted from Midwives' Notification System on 9 May 2011

Figure 12: Hours of Established Labour for Spontaneous and Induced Onsets in WA 2009



1.4.5 Complications of Labour and Delivery

In 2009, 38.0 per cent of women who had a single birth were recorded as having no complications during labour and delivery (Table 36).

Of the women who had a multiple pregnancy, only 7.0 per cent were reported as having no complications during labour and delivery.

There were significant differences in the rates of complications of labour and delivery between single and multiple births. Post partum haemorrhage was recorded for 12.4 per cent of single pregnancies and for 37.8 per cent of multiple pregnancies. The overall figure for 2009 was 12.8 per cent of all births.

Table 36: Selected Complications of Labour and Delivery and Plurality for Women giving birth in WA 2009

Complications of labour and delivery ¹	Plurality				Total	
	Single		Multiple		No.	%
	No.	% ²	No.	% ³		
Precipitate delivery	1706	5.6	12	2.6	1718	5.6
Fetal distress	4072	13.4	52	11.4	4124	13.4
Prolapsed cord	44	0.1	9	2.0	53	0.2
Cord tightly around neck	1021	3.4	12	2.6	1033	3.4
Cephalopelvic disproportion	424	1.4	0	0.0	424	1.4
Post partum haemorrhage	3763	12.4	172	37.8	3935	12.8
Retained placenta — manual removal	334	1.1	7	1.5	341	1.1
Persistent occipito posterior	813	2.7	8	1.8	821	2.7
Shoulder dystocia	516	1.7	0	0.0	516	1.7
Failure to progress ≤ 3cms	1493	4.9	24	5.3	1517	4.9
Failure to progress > 3cms	1812	6.0	20	4.4	1832	6.0
Previous caesarean section	4800	15.8	72	15.8	4872	15.8
Other	7956	26.3	390	85.7	8346	27.1
No complications of labour and delivery	11664	38.5	32	7.0	11696	38.0

¹ A woman may have more than one complication of labour and delivery.

² Percentage of women with single birth (n=30,305).

³ Percentage of women with multiple birth (n=455).

⁴ Percentage of women who gave birth (n=30,760).

Among the women who were identified as having had a complication, the most common complication was due to previous caesarean section (15.8 per cent) which may have influence on the labour, method of delivery and birth outcome. Fetal distress (13.4 per cent) and postpartum haemorrhage (12.8 per cent) were also common complications (Table 37).

Table 237: Complications of Labour and Delivery for Women giving birth in WA 2009

Complications of Labour and Delivery ¹	No.	% of women
Previous caesarean section	4872	15.8
Fetal distress	4124	13.4
Postpartum haemorrhage	3935	12.8
Precipitate delivery	1718	5.6
Failure to progress >3cms	1832	6.0
Cord tight around neck	1033	3.4
Failure to progress ≤ 3cms	1517	4.9
Persistent occipito posterior	821	2.7
Cephalopelvic disproportion	424	1.4
Shoulder dystocia	516	1.7
Retained placenta manual removal	341	1.1
Prolapsed cord	53	0.2
Other	8346	27.1
Total	29532	

¹ A woman may have more than one complication of labour and delivery.
 Extracted from Midwives' Notification System on 9 May 2011.

Indications for caesarean section are provided by complications of labour and delivery. More than one complication may be recorded and women delivering by caesarean section had a minimum of one complication recorded (Table 38).

Table 38: Frequently Recorded Complications of Labour and Delivery for Women giving birth by Caesarean Section in WA 2009

Caesarean Births		
Complications of Labour and Delivery ¹	No.	% of caesarean section
Previous caesarean section	4371	42.7
Labour and delivery complicated by fetal distress	2086	20.4
Postpartum haemorrhage	1955	19.1
Long labour	1581	15.4
Maternal care — known/suspected malpresentation of fetus	1189	11.6
Maternal care — known/suspected abnormality of pelvic organs	988	9.6
Abnormalities of forces of labour	783	7.6

¹ A woman may have more than one complication of labour and delivery recorded.
 Extracted from Midwives' Notification System on 9 May 2011.

1.4.6 Accoucheur

Obstetricians were accoucheurs in 41.8 per cent of all births, midwives in 34.3 per cent, other medical officers in 19.6 per cent and midwife supervising students in 3.8 per cent (Table 39).

Table 249: Type of Delivery and Accoucheur of Women giving birth in WA 2009

Accoucheur	Type of Delivery									
	Spontaneous Vaginal		Assisted Vaginal		Elective Caesarean		Emergency Caesarean		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Obstetrician	2694	16.8	2628	58.7	4335	81.8	3197	64.7	12854	41.8
Other Medical Officer	1554	9.7	1753	39.2	965	18.2	1744	35.3	6016	19.6
Midwife	10456	65.2	95	2.1	-	-	-	-	10551	34.3
Student	1167	7.3	-	-	-	-	-	-	1167	3.8
Self/no attendant	67	0.4	-	-	-	-	-	-	67	0.2
Other	105	0.7	-	-	-	-	-	-	105	0.3
Total	16043	100.0	4476	100.0	5300	100.0	4941	100.0	30760	100.0

GP Obstetricians are included in Other Medical Officer figures.

Extracted from Midwives' Notification System on 9 May 2011

A midwife, or a midwife supervising student, was the accoucheur for 11,623 women (72.5 per cent) who had a spontaneous vaginal birth.

Obstetricians and other medical officers were reported to be the accoucheur for 100 per cent of women who gave birth by caesarean sections.

1.4.7 Repair of Perineum and/or Vagina

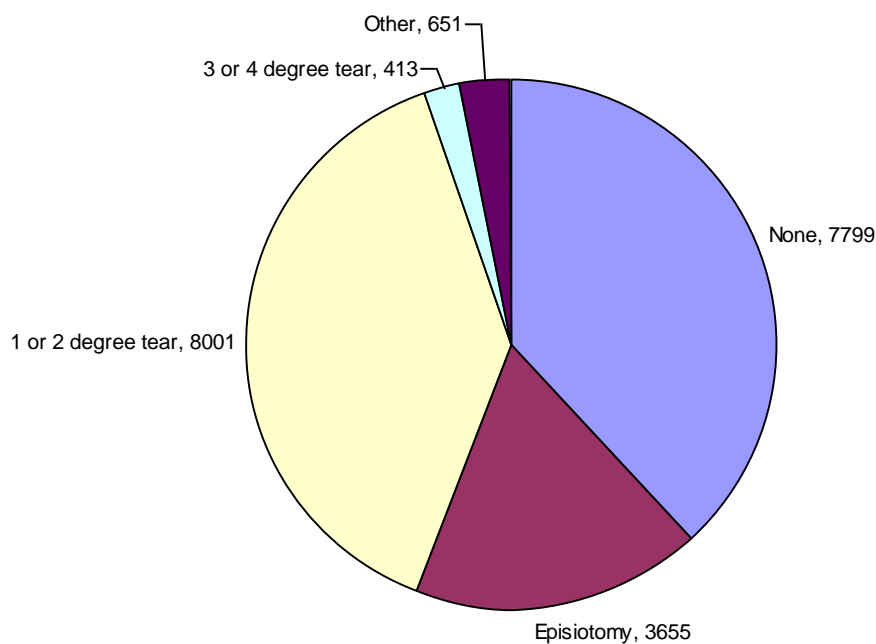
Among the 20,519 women who gave birth vaginally, there were 7,799 (38.0 per cent) women who did not require a perineal repair, 17.8 per cent (3,655 women) had an episiotomy repaired, and 39.0 per cent (8,001) received repair for first or second degree tear (Table 40 and Figure 13).

Table 40: Type of Delivery and Repair of Perineum and/or Vagina for Women giving birth in WA 2009

Type of Delivery	Repair of perineum and/or vagina					TOTAL
	None	Episiotomy	1 or 2 degree tear	3 or 4 degree tear	Other	
Spontaneous Vaginal	7172	1452	6633	230	556	16043
Vacuum	490	1576	1248	124	85	3523
Forceps	35	619	109	58	9	830
Breech Manoeuvre	102	8	11	1	1	123
Total	7799	3655	8001	413	651	20519

Extracted from Midwives' Notification System on 9 May 2011

Figure 13: Repair of Perineum and/or Vagina for Vaginal Births in WA 2009



2 BABIES

2.1 Births

Notification forms (Appendix C) were received for 31,219 births of 20 weeks or more gestation in 2009, an increase of 1.8 per cent on the number of births in 2008. Of the 31,219 births in 2009, 99.3 per cent (30,985) were live births and 0.7 per cent were fetal deaths.

Table 41: Condition at Birth and Crude Birth Rate in WA, 1980-2009

Year	Condition at Birth						Total Population	Crude Birth Rate
	Live Birth		Fetal Death		Total			
	No.	%	No.	%	No.	%		
1980	20637	99.1	178	0.9	20815	100.0	1,269,068	16.3
1981	22039	99.2	182	0.8	22221	100.0	1,300,056	17.0
1982	22196	99.1	195	0.9	22391	100.0	1,338,899	16.6
1983	22875	99.1	197	0.9	23072	100.0	1,369,050	16.7
1984	22795	99.3	168	0.7	22963	100.0	1,391,237	16.4
1985	23153	99.1	204	0.9	23357	100.0	1,418,564	16.3
1986	23703	99.2	185	0.8	23888	100.0	1,459,019	16.2
1987	24015	99.2	191	0.8	24206	100.0	1,496,248	16.1
1988	24981	99.3	177	0.7	25158	100.0	1,535,167	16.3
1989	25359	99.3	184	0.7	25543	100.0	1,578,434	16.1
1990	25844	99.3	175	0.7	26019	100.0	1,613,049	16.0
1991	24815	99.2	194	0.8	25009	100.0	1,636,067	15.2
1992	25159	99.3	165	0.7	25324	100.0	1,658,045	15.2
1993	25160	99.3	176	0.7	25336	100.0	1,677,669	15.0
1994	25237	99.3	188	0.7	25425	100.0	1,703,009	14.8
1995	25255	99.2	191	0.8	25446	100.0	1,733,787	14.6
1996	25385	99.2	199	0.8	25584	100.0	1,765,256	14.4
1997	25095	99.3	171	0.7	25266	100.0	1,794,992	14.0
1998	25514	99.4	164	0.6	25678	100.0	1,822,668	14.0
1999	25591	99.3	179	0.7	25770	100.0	1,849,733	13.8
2000	25022	99.2	206	0.8	25228	100.0	1,874,459	13.3
2001	24774	99.3	167	0.7	24941	100.0	1,901,159	13.0
2002	24610	99.3	175	0.7	24785	100.0	1,924,553	12.8
2003	24493	99.3	184	0.7	24677	100.0	1,949,948	12.6
2004	25343	99.3	188	0.7	25531	100.0	1,978,079	12.8
2005	26781	99.3	200	0.7	26981	100.0	2,010,113	13.3
2006	28456	99.3	209	0.7	28665	100.0	2,059,381	13.8
2007	29888	99.4	189	0.6	30077	100.0	2,106,119	14.2
2008	30447	99.3	226	0.7	30673	100.0	2,150,252	14.2
2009	30985	99.3	234	0.7	31219	100.0	2,236,901	13.9

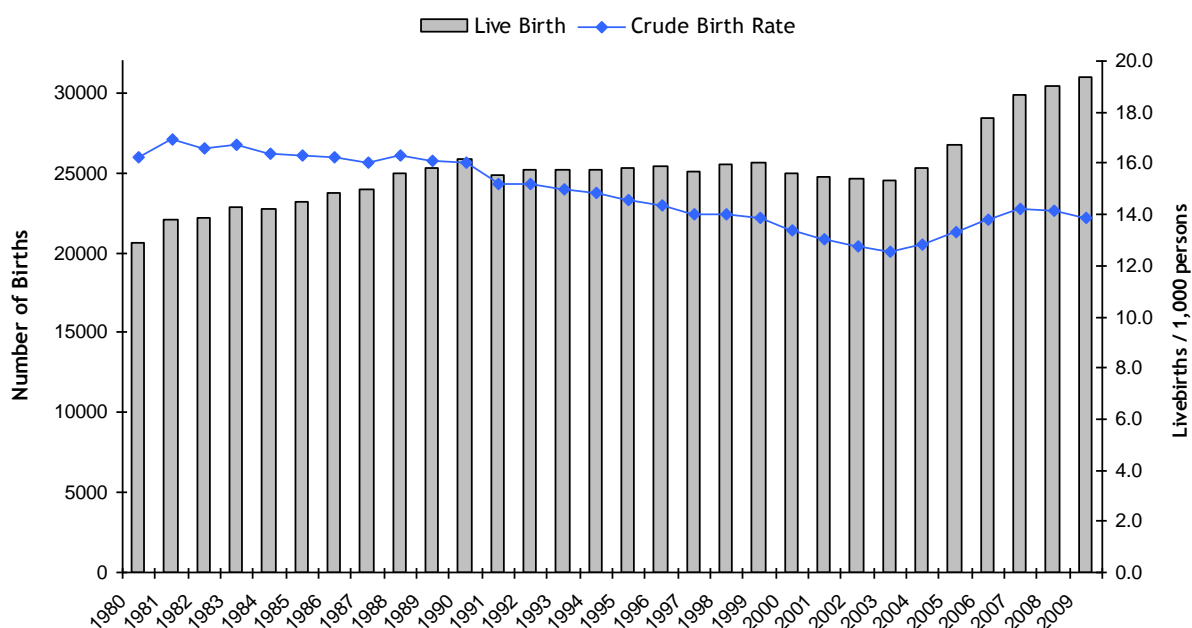
Data extracted from Midwives' Notification System on 9 May 2011.

Source of population data: ABS Estimated Resident Populations for WA.

2.2 Crude Birth Rate

Trend data indicates that the crude birth rate generally declined from a high of 17.0 per 1000 total populations in 1981 to a low of 12.6 per 1000 total populations in 2003. This increased to 14.2 per 1000 total population in 2008 and decreased to 13.9 per 1000 total population in 2009 (Table 41).

Figure 14: Live Births and Crude Birth Rates in WA, 1980-2009



2.3 Gender

During 2009, 51.5 per cent of all births were male and 48.5 per cent were female, yielding a male-female birth ratio of 1.06 which translates to 916 more male babies than female babies being born (Table 42).

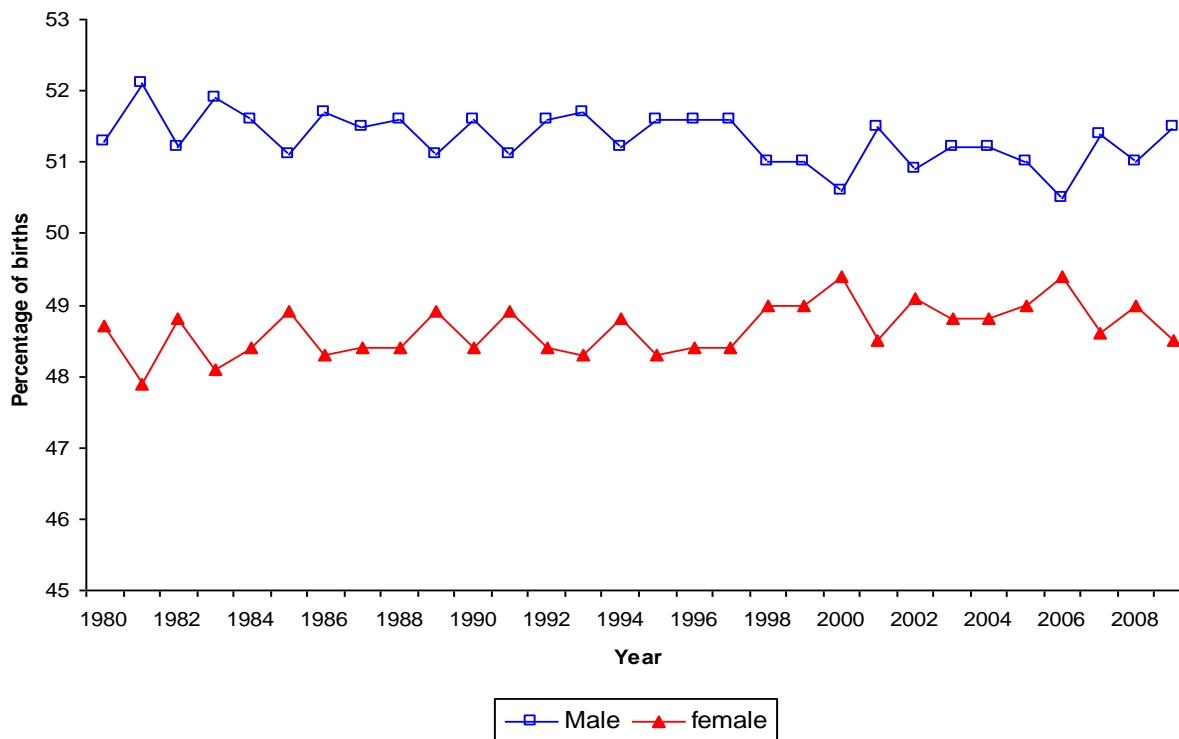
Table 42: Condition at Birth and Gender of Baby in WA 2009

Gender	Condition at birth				Total	
	Live birth		Fetal death		No.	%
	No.	%	No.	%		
Male	15938	51.4	129	55.1	16067	51.5
Female	15047	48.6	104	44.4	15151	48.5
Indeterminate	-	-	1	0.4	1	0.0
Total	30985	100.0	234	100.0	31219	100.0

Extracted from Midwives' Notification System on 9 May 2011.

The trend data shows that over the past 30 years the percentage of males and females fluctuated however there were more males born than females in each of those years (Figure 15).

Figure 15: Gender of Births in WA, 1980-2009



2.4 Gestational Age

Preterm birth (less than 37 weeks gestation) is associated with neonatal problems that cause significant morbidity and mortality in newborn babies. In 2009, preterm birth occurred in 8.6% (2,672) of the total births (Table 43).

Table 43: Gestational Age and Birthweight for Total Births in WA 2009

Birthweight (grams)	Gestation (weeks)								TOTAL	
	20-27		28-32		33-36		37-43		No.	%
	No.	%	No.	%	No.	%	No.	%	No.	%
< 500	122	41.4	2	0.5	-	-	4	0.0	128	0.4
500-999	148	50.2	30	8.0	1	0.1	-	-	179	0.6
1000-1499	25	8.5	147	39.0	24	1.2	1	0.0	197	0.6
1500-1999	-	-	150	39.8	238	11.9	25	0.1	413	1.3
2000-2499	-	-	38	10.1	636	31.8	518	1.8	1192	3.8
< 2500	295	100.0	367	97.3	899	45.0	548	1.9	2109	6.8
2500-2999	-	-	7	1.9	731	36.6	4070	14.3	4808	15.4
3000-3499	-	-	3	0.8	287	14.4	11052	38.7	11342	36.3
3500-3999	-	-	-	-	68	3.4	9490	33.2	9558	30.6
4000-4499	-	-	-	-	13	0.7	2937	10.3	2950	9.4
≥ 4500	-	-	-	-	2	0.1	447	1.6	449	1.4
Unknown	-	-	-	-	-	-	1	0.0	1	0.0
TOTAL	295	100.0	377	100.0	2000	100.0	28545	100.0	31217	100.0

There were 2 cases where Gestation was not recorded.

Extracted from Midwives' Notification System on 9 May 2011.

As illustrated below, plurality affected gestational age outcome. Among single births, 7.0 per cent* of single births were born preterm. In contrast to this, among multiple births, the proportion of babies born preterm was 60.8 per cent** . (Table 44 and Table 45).

Table 44: Gestational Age and Birthweight for Single Births in WA 2009

Birthweight (grams)	Gestation (weeks)								TOTAL	
	20-27		28-32		33-36		37-43		No.	%
	No.	%	No.	%	No.	%	No.	%		
< 500	106	45.3	2	0.7	-	-	1	0.0	109	0.4
500-999	108	46.2	27	9.3	-	-	-	-	135	0.4
1000-1499	20	8.5	110	37.8	18	1.1	1	0.0	149	0.5
1500-1999	-	-	114	39.2	140	8.8	23	0.1	277	0.9
2000-2499	-	-	28	9.6	482	30.3	433	1.5	943	3.1
< 2500	234	100.0	281	96.6	640	40.2	458	1.6	1613	5.3
2500-2999	-	-	7	2.4	609	38.3	3897	13.8	4513	14.9
3000-3499	-	-	3	1.0	261	16.4	10967	38.9	11231	37.1
3500-3999	-	-	-	-	66	4.1	9481	33.6	9547	31.5
4000-4499	-	-	-	-	13	0.8	2936	10.4	2949	9.7
≥ 4500	-	-	-	-	2	0.1	447	1.6	449	1.5
Unknown	-	-	-	-	-	-	1	0.0	1	0.0
TOTAL	234	100.0	291	100.0	1591	100.0	28187	100.0	30303	100.0

7.0%= 100*(234+291+1591)/30303.

There was 2 cases where Gestation was not recorded.

Extracted from Midwives' Notification System on 9 May 2011.

Table 45: Gestational Age and Birthweight for Multiple Births in WA 2009

Birthweight (grams)	Gestation (weeks)								TOTAL	
	20-27		28-32		33-36		37-42		No.	%
	No.	%	No.	%	No.	%	No.	%		
< 500	16	26.2	-	-	-	-	3	0.8	19	2.1
500-999	40	65.6	3	3.5	1	0.2	-	-	44	4.8
1000-1499	5	8.2	37	43.0	6	1.5	-	-	48	5.3
1500-1999	-	-	36	41.9	98	24.0	2	0.6	136	14.9
2000-2499	-	-	10	11.6	154	37.7	85	23.7	249	27.2
< 2500	61	100.0	86	100.0	259	63.3	90	25.1	496	54.3
2500-2999	-	-	-	-	122	29.8	173	48.3	295	32.3
3000-3499	-	-	-	-	26	6.4	85	23.7	111	12.1
3500-3999	-	-	-	-	2	0.5	9	2.5	11	1.2
4000-4499	-	-	-	-	-	-	1	0.3	1	0.1
TOTAL	61	100.0	86	100.0	409	100.0	358	100.0	914	100.0

(**) 60.8%=100* (61+86+409)/914.

Extracted from Midwives' Notification System on 9 May 2011.

Among all preterm live births born during 23 to 31 weeks gestation, 86.0 per cent were born in a metropolitan teaching hospital and 4.7 per cent in private hospitals or non-hospital (Table 46).

Table 46: Conditions at Birth and Place of Births for pre-term births (23-31 week gestation) in WA 2008

Place of birth	Live Birth								Fetal Death										
	23-25 weeks		26-28 weeks		29-31 weeks		Subtotal		23-25 weeks		26-28 weeks		29-31 weeks		Subtotal		Total		
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	
Public																			
Teaching	56	83.6	95	90.5	162	84.4	313	86.0	29	78.4	9	60.0	7	43.8	45	66.2	358	82.9	
Department	3	4.5	-	-	4	2.1	7	1.9	-	-	1	6.7	5	31.3	6	8.8	13	3.0	
Country	7	10.4	5	4.8	15	7.8	27	7.4	1	2.7	3	20.0	2	12.5	6	8.8	33	7.6	
Private	1	1.5	2	1.9	10	5.2	13	3.6	6	16.2	1	6.7	2	12.5	9	13.2	22	5.1	
Non-hospital	-	-	3	2.9	1	0.5	4	1.1	1	2.7	1	6.7	-	-	2	2.9	6	1.4	
Total	67	100.0	105	100.0	192	100.0	364	100.0	37	100.0	15	100.0	16	100.0	68	100.0	432	100.0	

Extracted from Midwives' Notification System on 9 May 2011.

Trend data for the period 1986–2009 indicates that the proportion of live births among 23–31 week gestation babies has increased from a low of 74.3 per cent in 1987 to a high of 86.7 per cent in 2007 (Table 47). In 2009, the proportion of live births among these babies was 84.3 per cent.

Table 47: Conditions at Birth and Place of Birth for pre-term births (23-31 week gestation) in WA 1986-2009

Year	Teaching				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	29	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	72.5	45	10.4	51	11.8	23	5.3	364	84.3	68	15.7

Extracted from Midwives' Notification System on 9 May 2011.

2.5 Birthweight

A baby's birthweight affects its health status. Low birthweight babies have a higher risk of poor health and significant disabilities.

In 2009, an average birthweight of 3341 grams, with a standard deviation of 616 grams was recorded for all births. The median birthweight was 3390 grams

Of all live births, there were 36.3 per cent of babies who weighed between 3000-3499 and 30.6 per cent of babies weighed between 3500-3999. Low birthweight babies (< 2500 grams) represented 6.8 per cent of all live births (Table 48).

Among babies whose mothers were identified as Aboriginal, the proportion of low birthweight was higher (14.5 per cent) than the proportion of babies born to mothers who were not identified as Aboriginal (6.3 per cent) (Table 48).

Table 48: Birthweight Distribution and Aboriginality of Mother in WA 2009

Birthweight (grams)	Aboriginality of Mother				Total	
	Aboriginal		Non-Aboriginal		No.	%
	No.	%	No.	%		
< 500	19	1.1	109	0.4	128	0.4
500-999	23	1.3	156	0.5	179	0.6
1000-1499	20	1.1	177	0.6	197	0.6
1500-1999	45	2.5	368	1.2	413	1.3
2000-2499	149	8.4	1043	3.5	1192	3.8
< 2500	256	14.5	1853	6.3	2109	6.8
2500-2999	432	24.5	4376	14.9	4808	15.4
3000-3499	583	33.0	10759	36.5	11342	36.3
3500-3999	372	21.1	9186	31.2	9558	30.6
4000-4499	108	6.1	2843	9.7	2951	9.5
≥ 4500	14	0.8	436	1.5	450	1.4
TOTAL	1765	100.0	29453	100.0	31218	100.0

Mean = 3341 grams. Standard deviation = 616 grams. Median = 3390 grams

Extracted from Midwives' Notification System on 9 May 2011.

Low birthweight increases the possibility of fetal death. In 2009, 84.6 per cent of all fetal deaths were recorded to have a low birthweight of less than 2500 grams (Table 49).

Table 49: Birthweight and Condition at Birth for Total Births in WA 2009

Birthweight	Condition at Birth					
	Live Birth		Fetal Death		Total	
	No.	%	No.	%	No.	%
< 500	24	0.1	104	44.4	128	0.4
500-999	132	0.4	47	20.1	179	0.6
1000-1499	182	0.6	15	6.4	197	0.6
1500-1999	400	1.3	13	5.6	413	1.3
2000-2499	1173	3.8	19	8.1	1192	3.8
< 2500	1911	6.2	198	84.6	2109	6.8
2500-2999	4796	15.5	12	5.1	4808	15.4
3000-3499	11329	36.6	13	5.6	11342	36.3
3500-3999	9553	30.8	5	2.1	9558	30.6
4000-4499	2946	9.5	5	2.1	2951	9.5
≥ 4500	449	1.4	1	0.4	450	1.4
Total	30984	100.0	234	100.0	31218	100.0

There was 1 case where Birthweight was not recorded.
 Extracted from Midwives' Notification System on 9 May 2011.

In 2009, 54.1 per cent (1,033) of babies with low birthweight (< 2500 grams) received resuscitation compared with 22.5 per cent (6,562) of babies with birthweight ≥ 2500. (Table 50).

Table 50: Birthweight and Resuscitation Methods for Liveborn Babies in WA 2009

Resuscitation methods	Birthweight (grams)					Total
	< 500	500-1499	1500-1999	2000-2499	≥ 2500	
None	15	23	146	694	22511	23389
Suction Only	-	1	12	67	1835	1915
Oxygen Therapy	-	16	47	149	2573	2785
Bag & Mask	-	52	94	152	1467	1765
Intubation	7	119	19	18	77	240
Ext card mass	1	6	6	5	47	65
Other	1	97	76	88	563	825
Total	24	314	400	1173	29073	30984

$$54.1\% = (1033 \times 100) / (24 + 314 + 400 + 1173)$$

There was 1 case where Birthweight was not recorded.
 Extracted from Midwives' Notification System on 9 May 2011.

Trend data indicates that the proportion of low birthweight among babies of Aboriginal mothers ranged between a low 11.0 per cent in 1987 to a high 16.5 per cent in 2005 (Table 51). The 2009 figure of 14.5 per cent was reduced from 16.0 per cent in 2008. The proportion of low birthweight among babies of non-Aboriginal women has not changed significantly over the same period, ranging between 5.6 per cent in 1980 and 6.6 per cent in 2004. In 2009, 6.3 per cent of babies born with non-Aboriginal mothers were recorded to have low birthweight.

Table 51: Low Birthweight and very Low Birthweight by Aboriginality of Mother in WA 1980-2009

Year	Aboriginality of Mother											
	<u>Aboriginal</u>					<u>Non-Aboriginal</u>						
	Low birthweight		Very low birthweight		≥ 2500 gram		Low birthweight		Very low birthweight		≥ 2500 gram	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
1980	133	12.8	15	1.4	905	87.2	1116	5.6	265	1.3	18652	94.4
1981	146	13.1	24	2.1	972	86.9	1175	5.6	239	1.1	19928	94.4
1982	150	13.3	35	3.1	982	86.7	1197	5.6	251	1.2	20062	94.4
1983	153	13.3	22	1.9	998	86.7	1355	6.2	299	1.4	20566	93.8
1984	166	13.8	43	3.6	1037	86.2	1264	5.8	271	1.2	20496	94.2
1985	176	14.0	47	3.7	1079	86.0	1351	6.1	318	1.4	20751	93.9
1986	151	12.1	32	2.6	1099	87.9	1329	5.9	305	1.3	21308	94.1
1987	148	11.0	31	2.3	1200	89.0	1405	6.1	311	1.4	21453	93.9
1988	197	13.6	44	3.0	1252	86.4	1420	6.0	340	1.4	22289	94.0
1989	163	11.2	40	2.8	1291	88.8	1573	6.5	356	1.5	22516	93.5
1990	177	11.4	34	2.2	1382	88.6	1457	6.0	280	1.1	23003	94.0
1991	220	14.8	48	3.2	1266	85.2	1405	6.0	311	1.3	22118	94.0
1992	169	11.8	33	2.3	1265	88.2	1481	6.2	309	1.3	22409	93.8
1993	191	13.1	62	4.3	1265	86.9	1456	6.1	281	1.2	22424	93.9
1994	206	14.2	47	3.2	1249	85.8	1441	6.0	348	1.5	22529	94.0
1995	176	12.0	41	2.8	1288	88.0	1496	6.2	322	1.3	22486	93.8
1996	198	13.7	39	2.7	1247	86.3	1542	6.4	349	1.4	22597	93.6
1997	217	13.7	45	2.8	1365	86.3	1467	6.2	328	1.4	22217	93.8
1998	192	12.6	44	2.9	1329	87.4	1538	6.4	320	1.3	22619	93.6
1999	233	14.3	63	3.9	1392	85.7	1488	6.2	314	1.3	22657	93.8
2000	232	14.4	62	3.8	1382	85.6	1521	6.4	337	1.4	22093	93.6
2001	259	15.7	59	3.6	1391	84.3	1498	6.4	325	1.4	21793	93.6
2002	238	14.2	55	3.3	1435	85.8	1431	6.2	297	1.3	21681	93.8
2003	235	15.2	57	3.7	1315	84.8	1477	6.4	286	1.2	21650	93.6
2004	235	14.9	54	3.4	1340	85.1	1586	6.6	357	1.5	22370	93.4
2005	284	16.5	64	3.7	1437	83.5	1631	6.5	357	1.4	23627	93.5
2006	269	14.9	71	3.9	1538	85.1	1726	6.4	381	1.4	25132	93.6
2007	300	16.4	50	2.7	1529	83.6	1757	6.2	381	1.3	26489	93.8
2008	278	16.0	60	3.5	1461	84.0	1775	6.1	398	1.4	27159	93.9
2009	256	14.5	62	3.5	1509	85.5	1853	6.3	442	1.5	27601	93.7

Extracted from Midwives' Notification System on 9 May 2011.

2.6 Condition at Birth

There were 30,985 (99.3 per cent) live births and 234 (0.7 per cent) fetal deaths during 2009 (Table 52).

The referral pattern of mothers with a high-risk pregnancy and/or known fetal death in utero is illustrated by the fact that more than two-thirds of fetal deaths (66.7 per cent) were delivered in metropolitan teaching hospitals.

The fetal death rate in 2009 was 7.5 per 1000 live births. The highest fetal death rate was in teaching hospitals (26.6 per 1000 live births).

Table 52: Conditions at Birth and Place of Birth in WA 2009

Place of birth	Condition at birth				Total		Fetal death rate*
	Live birth		Fetal death		No.	%	
	No.	%	No.	%	No.	%	
Metropolitan							
Teaching hospital	5712	18.4	156	66.7	5868	18.8	26.6
Departmental hospital	7484	24.2	15	6.4	7499	24	2.0
Private hospital	11869	38.3	26	11.1	11895	38.1	2.2
Country							
Regional hospital	3416	11	19	8.1	3435	11	5.5
Private hospital	762	2.5	6	2.6	768	2.5	7.8
Other	1373	4.4	6	2.6	1379	4.4	4.4
Non-hospital							
Home births	245	0.8	0	0	245	0.8	0.0
BBA	120	0.4	6	2.6	126	0.4	47.6
Other	4	0	0	0	4	0	0.0
Total	30985	100	234	100	31219	100	7.5

(*): Number of fetal deaths/ Total number of births*1000
 Extracted from Midwives' Notification System on 9 May 2011.

2.7 Plurality of Birth

In 2009, there were 30,305 single births, representing 97.1 per cent of total births. Of the 455 multiple births (2.9 per cent) there were 451 sets of twins and 4 sets of triplets (Table 53).

Table 53: Plurality of Birth and Aboriginality in WA 2009

Plurality	Aboriginality				Total	
	Aboriginal		Non-Aboriginal			
	No.	%	No.	%	No.	%
Single	1733	5.7	28572	94.3	30305	97.1
Twin	32	3.5	870	96.5	902	2.9
Triplet	.	.	12	100.0	12	0.0
Total	1765	5.7	29454	94.3	31219	100.0

Extracted from Midwives' Notification System on 9 May 2011.

The proportion of twin births has varied over the past 30 years from a low of 2.0 per cent in 1980 to a high of 3.4 per cent of total births in 2001. This figure was 2.9 per cent in 2009 (Appendix B Table S9). The overall increasing trend in multiple births over the last two decades could be attributed to the increased use of assisted reproductive technology (Tough et al., 2002).

2.8 Apgar score at One Minute and Five Minutes

Apgar score is a practical method of evaluating the physical condition of a newborn infant shortly after delivery. The Apgar score is calculated based on newborn baby's characteristics such as the heart rate, respiratory effort, muscle tone, skin colour, and reflexes.

In 2009, an Apgar score at one minute of 8–10 was recorded for 26,140 (84.4 per cent) live births while only 470 (1.5 per cent) live births had an Apgar score of less than four at one minute (Table 54).

Table 54: Apgar score at One Minute and Time to Spontaneous Respiration of Live Births in WA 2009

Time to Spontaneous Respiration	Apgar Score at 1 Minute								TOTAL	
	0		1-3		4-7		8-10		No.	%
	No.	%	No.	%	No.	%	No.	%		
≤ 1	-	-	21	4.6	2581	59.3	25762	98.6	28364	91.6
2-3	1	6.3	117	25.8	1281	29.4	317	1.2	1716	5.5
4-6	-	-	145	32.0	300	6.9	42	0.2	487	1.6
7-10	2	12.5	32	7.1	37	0.9	5	0.0	76	0.2
> 10	5	31.3	9	2.0	15	0.3	1	0.0	30	0.1
Intubation ¹	6	37.5	117	25.8	136	3.1	13	0.0	272	0.9
Unknown	3	17.6	12	2.6	-	-	-	-	15	0.0
TOTAL	17	100.0	453	100.0	4350	100.0	26140	100.0	30960	100.0

There were 26 cases that did not have time to spontaneous respiration recorded
 Extracted from Midwives' Notification System on 9 May 2011.

At five minutes, 97.1 per cent (30,058) of live births had an Apgar score of 8-10 and only 0.2 per cent (72) of live births had Apgar score under 4 (Table 55).

Table 55: Apgar Score at Five Minutes and Time to Spontaneous Respiration of Live Births in WA 2009

Time to Spontaneous Respiration	Apgar Score at 5 Minutes								TOTAL	
	0		1-3		4-7		8-10		No.	%
	No.	%	No.	%	No.	%	No.	%		
≤ 1	-	-	5	8.6	175	21.0	28188	93.8	28368	91.6
2-3	-	-	-	-	212	25.4	1504	5.0	1716	5.5
4-6	-	-	7	12.1	218	26.1	262	0.9	487	1.6
7-10	1	7.1	8	13.8	59	7.1	8	0.0	76	0.2
> 10	2	14.3	6	10.3	18	2.2	4	0.0	30	0.1
Intubation ¹	6	42.9	22	37.9	153	18.3	92	0.3	273	0.9
Unknown	5	35.7	10	17.2	-	-	-	-	15	0.0
TOTAL	14	100.0	58	100.0	835	100.0	30058	100.0	30965	100.0

Apgar Score at five minutes 21 cases were not recorded.
 Extracted from Midwives' Notification System on 9 May 2011.

2.9 Time to Spontaneous Respiration

Among all live births, 91.7 per cent established spontaneous respiration within the first minute of life (Table 54 and Table 55). The time taken by babies who were intubated during resuscitation to establish spontaneous respiration is not reported.

2.10 Resuscitation

Only 24.5 per cent of live births received some form of resuscitation. Oxygen therapy was provided to 9.0 per cent and suction only to 6.2 per cent of all live births (Table 56).

Other babies required more active resuscitation using the bag and mask technique (5.7 per cent) and endotracheal intubation either alone or with external cardiac massage (1.0 per cent).

Table 56: Resuscitation Methods for Live born Babies in WA 2009

Resuscitation method ¹	No.	% of live births
None	23389	75.5
Suction Only	1915	6.2
Oxygen Therapy	2785	9.0
Bag & Mask	1765	5.7
Intubation	241	0.8
External Cardiac Massage	65	0.2
Other	825	2.7
Total	30985	100.0

Extracted from Midwives' Notification System on 9 May 2011.

Of the live births with Apgar score at five minutes of 8-10, 8.9 per cent received oxygen therapy, 6.3 per cent received suction only and 4.7 per cent had bag and mask resuscitation (Table 57).

Table 57: Resuscitation Methods for Live born Babies and Apgar score at 5 Minutes

Resuscitation methods	Apgar Score at 5 Minutes								Total	
	0		1-3		4-7		8-10			
	No.	%	No.	%	No.	%	No.	%	No.	%
None	-	-	16	27.6	32	3.8	23318	77.6	23372	75.5
Suction Only	-	-	-	-	20	2.4	1895	6.3	1915	6.2
Oxygen Therapy	-	-	-	-	115	13.8	2670	8.9	2785	9.0
Bag & Mask	-	-	6	10.3	348	41.7	1409	4.7	1763	5.7
Intubation	2	14.3	11	19.0	131	15.7	97	0.3	241	0.8
Ext card mass	2	14.3	13	22.4	29	3.5	20	0.1	64	0.2
Other	10	71.4	12	20.7	160	19.2	649	2.2	825	2.7
Total	14	100.0	58	100.0	835	100.0	30058	100.0	30965	100.0

There were 21 cases that did not have resuscitation methods recorded.

Extracted from Midwives' Notification System on 9 May 2011.

2.11 Birth Trauma

Cephalohaematoma and other soft tissue trauma (known as chignon, bruising of scalp, other birth trauma to scalp, unspecified and other birth trauma to skull) were reported in 7.3 per cent (1,492*) of the 20,159 vaginal births in 2009 (Table 58). This includes trauma from application of a vacuum cup or forceps blades during assisted vaginal births.

Table 58: Birth Trauma 2009

Birth Trauma		
Type of Birth Trauma	Frequency	Percent
Birth trauma to facial nerve	1	0.06
Cephalhaematoma due to birth trauma	74	4.67
Chignon due to birth trauma	1100	69.36
Bruising of scalp due to birth trauma	131	8.26
Other birth trauma to scalp	170	10.72
Birth trauma to scalp, unspecified	8	0.5
Other birth trauma to skull	9	0.57
Fracture of clavicle due to birth trauma	3	0.19
Erb's paralysis due to birth trauma	8	0.5
Birth trauma to eye	3	0.19
Birth trauma to face	76	4.79
Other specified birth trauma	3	0.19

*1492 = (74+1100+131+170+8+9)

Extracted from Midwives' Notification System on 9 May 2011.

2.12 Birth Defects

Recording of a birth defect in the Midwives' Notification System provides an initial data source for the WA Register of Developmental Anomalies (Table 59). The number of babies born with musculo-skeletal defects was 11.5 per 1000 live births. Cardiovascular defects were reported for 9.4 per 1000 live births and uro-genital defects were reported for 8.7 per 1000 live births. Ascertainment of birth defects for a birth cohort is not considered complete until 6 years of age. More detailed information is available upon request to the Western Australian Register of Developmental Anomalies (Bower et al, 2009).

Table 5925: Birth Defects of Babies born in WA, 2009

Birth defects	No.	Rate/1000 births
Nervous system anomalies (74000 - 74299)	83	2.7
Congenital eye anomalies (74300 - 74399)	11	0.4
Congenital anomalies of ear face and neck (74400-74499)	56	1.8
Cardiovascular defects (74500 - 74799)	292	9.4
Respiratory defects (74800 - 74899)	26	0.8
Gastro-intestinal defects (74900 - 75199)	137	4.4
Uro-genital defects (75200 - 75399)	269	8.7
Musculo-skeletal defects (75400 - 75699)	355	11.5
Congenital defects of integument (75700 – 75799)	17	0.5
Chromosome defects (75800 - 75899)	174	5.6

(WA Register of Development Anomalies, 2009)

Trend data in Table 60 shows that most birth defects decreased in number between 2005 and 2009. Uro-genital defects decreased from 14.7 per 1000 births in 2005 to 7.7 per 1000 live births in 2008, however it increased to 8.7 per 1000 births in 2009. Other defects, such as Congenital anomalies of ear face and neck, and Congenital defects of integument have decreased significantly every year from 2005 to 2009. The overall rate of birth defects reduced from 65.9 per 1000 live births in 2005 to 41.7 per 1000 live births in 2008. This rate increased in 2009 to 45.5 per 1000 live births.

Table 60: Birth Defects at Birth of Babies born in WA, 2004-2009

Description	2005		2006		2007		2008		2009	
	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate
Nervous system anomalies (74000 - 74299)	131	4.9	110	3.8	92	3.1	94	3.1	83	2.7
Congenital eye anomalies (74300 - 74399)	28	1.0	16	0.6	17	0.6	9	0.3	11	0.4
Congenital anomalies of ear face and neck (74400-74499)	115	4.3	108	3.8	80	2.7	65	2.1	56	1.8
Cardiovascular defects (74500 - 74799)	285	10.6	311	10.8	282	9.4	271	8.9	292	9.4
Respiratory defects (74800 - 74899)	24	0.9	31	1.1	30	1.0	30	1.0	26	0.8
Gastro-intestinal defects (74900 - 75199)	177	6.6	155	5.4	122	4.1	124	4.1	137	4.4
Uro-genital defects (75200 - 75399)	396	14.7	348	12.1	297	9.9	235	7.7	269	8.7
Musculo-skeletal defects (75400 - 75699)	396	14.7	411	14.3	328	10.9	306	10.0	355	11.5
Congenital defects of integument (75700 - 75799)	68	2.5	60	2.1	36	1.2	18	0.6	17	0.5
Chromosome defects (75800 - 75899)	157	5.8	163	5.7	135	4.5	128	4.2	174	5.6
Total	1777	65.9	1713	59.8	1419	47.2	1280	41.7	1420	45.5

Rate: Number of birth defects per 1000 live births

2.13 Special Care

Reporting of special care for newborn babies relates only to those who received care in Level 2 or 3 special care nurseries. Babies who stayed for less than one day are not included. The number of live births who received special care for one day or more was 3,062 (9.9 per cent) among the 30,985 live births (Table 61).

Infants of multiple birth pregnancies received more special care than single birth babies. In 2009, 8.8 per cent of single births (2,652 of 30,305) and 44.9 per cent of infants from multiple births (410 of 914) received this special care. Of single births requiring special care, 24.4 per cent received 8 or more days care, compared to 56.2 per cent of multiple births requiring special care.

Table 6126: Length of Stay in Special Care and Plurality for Live Births in WA 2009

Length of Stay ¹ (days)	Plurality				Total	
	Single		Multiple		No.	%
	No.	%	No.	%		
1	630	23.8	34	8.3	664	21.7
2	459	17.3	29	7.1	488	15.9
3	340	12.8	34	8.3	374	12.2
4	214	8.1	21	5.1	235	7.7
5	182	6.9	26	6.3	208	6.8
6	96	3.6	17	4.1	113	3.7
7	84	3.2	19	4.6	103	3.4
8-14	276	10.4	90	22.0	366	12.0
15-20	99	3.7	40	9.8	139	4.5
21-28	68	2.6	36	8.8	104	3.4
29-60	120	4.5	34	8.3	154	5.0
61-90	55	2.1	12	2.9	67	2.2
91-180	28	1.1	18	4.4	46	1.5
> 180	1	0.0	-	-	1	0.0
TOTAL	2652	100.0	410	100.0	3062	100.0

¹ Excludes births with less than 24 hours stay in Special Care Nurseries.
Extracted from Midwives' Notification System on 9 May 2011.

2.14 Neonatal Transfers

Inter-hospital transfers were made for 1,510 (4.9 per cent of all live births) babies. This was undertaken so that further and more appropriate care could be provided at teaching hospitals (65.4 per cent for all Neonatal Transfers) and for provision of continued care in another hospital during the neonatal period, prior to being discharged home (Table 62).

Table 62: Neonatal Transfers

Place of Birth	Transferred		Died		Home		Total	
	No.	%	No.	%	No.	%	No.	%
Metro Teaching	987	17.3	39	0.7	4686	82.0	5712	100.0
Metro Department	118	1.6	1	0.0	7365	98.4	7484	100.0
Metro Private	127	1.1	2	0.0	11740	98.9	11869	100.0
Country Regional	193	5.6	7	0.2	3216	94.1	3416	100.0
Country Private	22	2.9	.	.	740	97.1	762	100.0
Country other	52	3.8	.	.	1321	96.2	1373	100.0
Homebirths	1	0.4	.	.	244	99.6	245	100.0
BBA	8	6.7	1	0.8	111	92.5	120	100.0
Other	2	50.0	.	.	2	50.0	4	100.0
Total	1510	4.9	50	0.2	29425	95.0	30985	100.0

Extracted from Midwives' Notification System on 2 November 2009.

2.15 Neonatal Length of Stay

The majority of live born babies (77.6 per cent or 24,052 babies) stayed in their hospital of birth for two to seven days, while 17.2 per cent (or 5,320 babies) stayed for less than 24 hours following birth. An additional 3.2 per cent or 1,001 babies stayed between eight and 14 days while 1.0 per cent or 305 babies stayed for more than 28 days (Table 63).

Birth weight has a significant influence on neonatal length of stay. Babies born with low birthweight spent more days in hospital. In 2009, among the 180 babies who stayed in hospital for 15-20 days, 81.1 per cent had a birthweight lower than 2500 grams. Of the 126 babies staying for 21-28 days in hospital, 86.5 per cent had a birthweight lower than 2500 grams.

Table 63: Length of Stay in hospital and Birthweight of Babies in WA 2009

Birthweight (grams)	Length of Stay (days)						TOTAL
	≤ 1	2-7	8-14	15-20	21-28	> 28	
Number							
< 500	16	4	-	1	-	3	24
500-999	22	5	2	1	4	98	132
1000-1499	16	5	8	18	26	109	182
1500-1999	35	88	118	66	55	38	400
2000-2499	81	745	254	60	24	9	1173
< 2500	170	847	382	146	109	257	1911
2500-2999	737	3752	265	20	10	12	4796
3000-3499	2018	9064	220	4	3	20	11329
3500-3999	1755	7680	94	7	4	13	9553
4000-4499	554	2354	34	3	-	1	2946
≥ 4500	86	355	6	-	-	2	449
TOTAL	5320	24052	1001	180	126	305	30984
Percentage							
< 500	0.3	0.0	-	0.6	-	1.0	0.1
500-999	0.4	0.0	0.2	0.6	3.2	32.1	0.4
1000-1499	0.3	0.0	0.8	10.0	20.6	35.7	0.6
1500-1999	0.7	0.4	11.8	36.7	43.7	12.5	1.3
2000-2499	1.5	3.1	25.4	33.3	19.0	3.0	3.8
< 2500	3.2	3.5	38.2	81.1	86.5	84.3	6.2
2500-2999	13.9	15.6	26.5	11.1	7.9	3.9	15.5
3000-3499	37.9	37.7	22.0	2.2	2.4	6.6	36.6
3500-3999	33.0	31.9	9.4	3.9	3.2	4.3	30.8
4000-4499	10.4	9.8	3.4	1.7	-	0.3	9.5
≥ 4500	1.6	1.5	0.6	-	-	0.7	1.4
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Includes homebirths in midwife's care.

There was 1 case where Birthweight was not recorded.

Extracted from Midwives' Notification System on 9 May 2011.

The length of stay in hospital was also influenced by gestation age. Table 64 shows that 87.2 per cent of babies staying in hospital for 15-20 day and 86.1 per cent* of babies in hospital for more than 21 days were born at less than 37 weeks of gestation age (Table 64).

Table 64: Length of Stay in Hospital and Gestation Age of Live Births in WA 2008

Gestation age	Length of Stay (days)						Total
	≤1	2-7	8-14	15-20	21-28	>28	
Number							
20-27 weeks	40	9	1	2	5	98	155
28-32 weeks	35	30	48	42	51	145	351
33-36 weeks	158	1156	472	113	57	15	1971
Less than 37 weeks	233	1195	521	157	113	258	2477
37-43 weeks	5088	22855	480	23	13	47	28506
Total	5321	24050	1001	180	126	305	30983
Percentage							
20-27 weeks	0.8	0	0.1	1.1	4	32.1	0.5
28-32 weeks	0.7	0.1	4.8	23.3	40.5	47.5	1.1
33-36 weeks	3	4.8	47.2	62.8	45.2	4.9	6.4
Less than 37 weeks	4.4	5.0	52.0	87.2	89.7	84.6	8.0
37-43 weeks	95.6	95.0	48	12.8	10.3	15.4	92
Total	100	100	100	100	100	100	100

* 86.1% = (113+258)/(126+305)

Note: There were two cases where the gestation was not recorded.

Extracted from Midwives' Notification System on 9 May 2011.

3 SPECIAL TOPIC: ACHS OBSTETRIC CLINICAL INDICATORS (V6) BY HEALTH REGION

The Australian Council on Health care Standard (ACHS) has been involved in the development of clinical indicators in conjunction with medical colleges, association and societies since 1989. These clinical indicators are increasingly being used to assess and improve the quality of healthcare.

The current report publishes the clinical indicators (version 6) by the health regions. Further information about the clinical indicators can be found at:

<http://www.achs.org.au/clinicalindicators>

3.1 Outcome of Selected Primipara (Indicator 1)

These are comparative rate based indicators addressing the process of patient care.

A selected primipara is defined as a woman who is 20-34 years of age at the time of giving birth; giving birth for the first time; having a single pregnancy; cephalic presentation and at 37-41 weeks gestation.

For the purpose of indicator 1.2, induction of labour is defined as surgical and/or medical induction.

For the purpose of indicator 1.3, instrumental vaginal birth is defined as forceps or vacuum.

Indicators:

CI.1.1: Total number of selected primipara who have a **spontaneous vaginal** birth as a percentage of the total number of selected primipara who give birth.

CI.1.2: Total number of selected primipara who undergo **induction of labour** as a percentage of the total number of selected primipara who give birth.

CI.1.3: Total number of selected primipara who undergo an **instrumental vaginal birth** as a percentage of the total number of selected primipara who give birth.

CI.1.4: Total number of selected primipara undergoing **caesarean section** as a percentage of the total number of selected primipara who gives birth.

Denominator figures are the same for indicators CI.1.1; CI.1.2; CI.1.3; CI.1.4

Table 65 shows the clinical indicators CI.1.1, CI.1.3 and CI.1.4 for 2009 by health region. In 2009, in total, there were 8,696 women defined as selected primipara, of whom 41.0 per cent was described as CI.1.1, 29.3 per cent was CI.1.3 and 29.7 per cent was CI.1.4

Table 65: Clinical Indicators CI.1.1, CI.1.3, CI.1.4 for 2009 (Method of birth)

Health Region of Mother	Delivery						Total	
	Spontaneous (CI. 1.1)		Instrumental vaginal (CI. 1.3)		Caesarean section (CI. 1.4)			
	No.	%	No.	%	No.	%	No.	%
North Metropolitan	1408	38.3	1188	32.3	1077	29.3	3673	100.0
South Metropolitan	1326	40.3	925	28.1	1042	31.6	3293	100.0
Kimberley	61	54.5	13	11.6	38	33.9	112	100.0
Pilbara	84	37.3	63	28.0	78	34.7	225	100.0
Midwest	110	55.8	45	22.8	42	21.3	197	100.0
Wheatbelt	100	43.3	62	26.8	69	29.9	231	100.0
Goldfields	142	56.6	70	27.9	39	15.5	251	100.0
South West	240	47.3	125	24.7	143	28.1	508	100.0
Great Southern	81	45.8	52	29.4	44	24.9	177	100.0
Outside WA/Not Stated	13	44.8	7	24.1	9	31.0	29	100.0
Total	3565	41.0	2550	29.3	2581	29.7	8696	100.0

Extracted from Midwives' Notification System on 9 May 2011.

In 2009, among the 8,696 women defined as selected primipara, there were 3,034 (34.9 per cent) identified as induction (or CI.1.2); 57.0 per cent as spontaneous and 8.1 per cent as no labour (Table 66).

Table 66: Clinical Indicators CI.1.2 for 2009 (Onset of labour)

Health Region of Mother	Onset							
	1. Spontaneous vaginal		2. Induction of labour (CI. 1.2)		3. No labour		Total	
	No	%	No	%	No	%	No	%
North Metropolitan	2002	54.5	1369	37.3	302	8.2	3673	100.0
South Metropolitan	1893	57.5	1087	33.0	312	9.5	3293	100.0
Kimberley	70	62.5	39	34.8	3	2.7	112	100.0
Pilbara	123	54.7	76	33.8	26	11.6	225	100.0
Midwest	119	60.4	73	37.1	5	2.5	197	100.0
Wheatbelt	124	53.7	94	40.7	13	5.6	231	100.0
Goldfields	152	60.6	94	37.5	5	2.0	251	100.0
South West	344	67.9	131	25.8	33	6.5	508	100.0
Great Southern	113	63.8	58	32.8	6	3.4	177	100.0
Outside WA/Not Stated	14	48.3	13	44.8	2	6.9	29	100.0
Total	4954	57.0	3034	34.9	707	8.1	8696	100.0

Extracted from Midwives' Notification System on 9 May 2011.

Table 67 and Table 68 show the trend of clinical indicators CI.1.1, CI.1.3, CI.1.4 and CI.1.2 for 2005-2009, respectively. The trend shows that there was very little change in clinical indicators in five years. Clinical indicator CI.1.1 varied from 43.5 per cent in 2005 to 45.5 per cent in 2007 but the 2009 figure was 41.0 per cent. Clinical indicator CI.1.3 ranged from 25.9 per cent in 2005 to 29.3 per cent in 2009. Clinical indicator CI.1.4 reduced slightly from 30.6 per cent in 2005 to 27.5 per cent in 2008 but in 2009, increased to 29.7 per cent.

Clinical indicator CI.1.2 has varied from 35.9 per cent in 2005 to 33.4 per cent in 2008, in 2009, clinical indicator CI.1.2 was 34.9 per cent (Table 68).

Table 67: Clinical Indicators CI.1.1, CI.1.3, CI.1.4 from 2005-2009 (Method of birth)

Health Region of Mother	2005			2006			2007			2008			2009		
	CI. 1.1 %	CI. 1.3 %	CI. 1.4 %	CI. 1.1 %	CI. 1.3 %	CI. 1.4 %	CI. 1.1 %	CI. 1.3 %	CI. 1.4 %	CI. 1.1 %	CI. 1.3 %	CI. 1.4 %	CI. 1.1 %	CI. 1.3 %	CI. 1.4 %
North Metropolitan	39.1	29.1	31.7	43.8	28.2	28.0	42.9	29.4	27.7	41.4	30.9	27.6	38.3	32.3	29.3
South Metropolitan	43.8	23.5	32.7	44.7	24.4	30.8	44.5	25.5	30.0	43.9	26.9	29.2	40.3	28.1	31.6
Kimberley	62.5	16.1	21.4	54.3	22.4	23.3	63.2	14.3	22.6	54.8	17.0	28.1	54.5	11.6	33.9
Pilbara	48.6	20.2	31.1	48.1	24.3	27.6	53.1	26.8	20.1	49.0	18.9	32.1	37.3	28.0	34.7
Midwest	57.4	20.5	22.1	54.0	26.5	19.4	58.3	19.9	21.8	55.1	25.4	19.5	55.8	22.8	21.3
Wheatbelt	39.4	33.7	26.9	45.5	32.9	21.6	47.2	28.8	24.0	55.0	24.8	20.3	43.3	26.8	29.9
Goldfields	62.4	21.4	16.2	55.6	28.4	16.0	56.0	24.2	19.8	58.3	29.2	12.5	56.6	27.9	15.5
South West	46.6	25.9	27.5	47.2	26.0	26.8	46.4	29.7	23.9	41.6	30.1	28.4	47.2	24.6	28.1
Great Southern	54.3	21.1	24.6	53.6	15.7	30.7	53.3	23.4	23.4	53.1	22.9	24.0	45.8	29.4	24.9
Outside WA/Not Stated	37.5	37.5	25.0	85.7	14.3	.	73.3	6.7	20.0	64.7	23.5	11.8	44.8	24.1	31.0
All	43.5	25.9	30.6	45.6	26.3	28.1	45.5	27.1	27.4	44.2	28.3	27.5	41.0	29.3	29.7

Extracted from Midwives' Notification System on 9 May 2011.

Table 68: Clinical Indicators CI.1.2 from 2005- 2009 (Onset of labour)

Health Region of Mother	2005			2006			2007			2008			2009		
	Spont. vaginal %	CI. 1.2 %	No labour %	Spont. vaginal %	CI. 1.2 %	No labour %	Spont. vaginal %	CI. 1.2 %	No labour %	Spont. vaginal %	CI. 1.2 %	No labour %	Spont. vaginal %	CI. 1.2 %	No labour %
North Metropolitan	51.1	37.3	11.6	55.3	36.0	8.7	56.1	36.4	7.5	56.3	35.6	8.1	54.5	37.3	8.2
South Metropolitan	49.1	36.6	14.3	54.6	34.1	11.3	56.4	33.9	9.7	59.4	32.4	8.2	57.5	33.0	9.5
Kimberley	71.4	25.0	3.6	67.2	29.3	3.4	73.7	26.3	.	62.2	34.1	3.7	62.5	34.8	2.7
Pilbara	58.5	33.9	7.7	64.3	31.9	3.8	56.7	39.2	4.1	62.2	30.6	7.1	54.7	33.8	11.6
Midwest	58.5	37.4	4.1	64.9	32.7	2.4	60.6	37.5	1.9	62.9	33.2	3.9	60.4	37.1	2.5
Wheatbelt	53.4	39.4	7.2	57.2	34.2	8.6	55.0	39.3	5.7	53.5	41.1	5.4	53.7	40.7	5.6
Goldfields	66.2	30.8	3.0	67.7	28.4	3.9	61.9	35.9	2.2	64.2	35.4	0.4	60.6	37.5	2.0
South West	61.9	28.8	9.3	64.7	27.2	8.0	67.6	28.4	4.0	71.6	22.4	5.9	67.7	25.8	6.5
Great Southern	65.1	30.9	4.0	60.8	34.3	4.8	56.9	37.7	5.4	62.6	31.3	6.1	63.8	32.8	3.4
Outside WA/Not Stated	62.5	37.5	.	71.4	28.6	.	60.0	40.0	.	64.7	35.3	.	48.3	44.8	6.9
All	52.7	35.9	11.4	56.9	34.1	9.0	57.6	35.0	7.4	59.2	33.4	7.5	57.0	34.9	8.1

Extracted from Midwives' Notification System on 9 May 2011.

3.2 Vaginal Delivery Following Caesarean Section (Indicator 2)

This is a comparative rate based indicator of vaginal delivery following primary caesarean section addressing the management and outcome of patient care.

CI.2.1: Total number of women **delivering vaginally** following a **previous primary caesarean section** as a percentage of the total number of women delivering who have had a previous primary caesarean section and no intervening pregnancies greater than 20 weeks gestation.

In 2009, there were 4,805 women identified as having previous primary caesarean section, of which only 9.7 per cent delivered vaginally (CI.2.1) and 90.3 per cent had caesarean procedures (Table 69). The highest rate of women delivering vaginally following a previous primary caesarean was in Goldfields (20.6 per cent) and the lowest rate was in Pilbara (7.8 per cent).

Table 69: Clinical Indicator CI.2.1 for 2009

Health Region of Mother	Delivery					
	Caesarean section		Delivering vaginally (CI. 2.1)		Total	
	No	%	No	%	No	%
North Metropolitan	1775	91.2	172	8.8	1947	100.0
South Metropolitan	1687	91.3	161	8.7	1848	100.0
Kimberley	68	91.9	6	8.1	74	100.0
Pilbara	106	92.2	9	7.8	115	100.0
Midwest	100	82.0	22	18.0	122	100.0
Wheatbelt	116	89.9	13	10.1	129	100.0
Goldfields	100	79.4	26	20.6	126	100.0
South West	266	85.0	47	15.0	313	100.0
Great Southern	97	90.7	10	9.3	107	100.0
Outside WA/Not Stated	23	95.8	1	4.2	24	100.0
Total	4338	90.3	467	9.7	4805	100.0

Extracted from Midwives' Notification System on 9 May 2011.

Trend data shows that clinical indicator CI.2.1 was the lowest in 2005 (8.2 per cent) and has increased gradually to 9.7 per cent in 2009. By Health Region, the figures varied from year to year. Six of the nine Health Regions recorded higher figures in 2009 than in 2005. (Table 70).

Table 70: Clinical Indicator CI.2.1 from 2005-2009

Health Region of Mother	2005		2006		2007		2008		2009	
	Caesarean	CI. 2.1	Caesarean	CI. 2.1	Caesarean	CI. 2.1	Caesarean	CI. 2.1	Caesarean	CI. 2.1
	%	%	%	%	%	%	%	%	%	%
North Metropolitan	92.1	7.9	91.8	8.2	91.8	8.2	92.7	7.3	91.2	8.8
South Metropolitan	93.4	6.6	93.1	6.9	92.5	7.5	90.1	9.9	91.3	8.7
Kimberley	91.9	8.1	85.5	14.5	83.1	16.9	91.3	8.7	91.9	8.1
Pilbara	89.4	10.6	85.0	15.0	83.6	16.4	89.3	10.7	92.2	7.8
Midwest	76.4	23.6	84.0	16.0	78.6	21.4	79.6	20.4	82.0	18.0
Wheatbelt	90.1	9.9	92.6	7.4	91.3	8.7	87.8	12.2	89.9	10.1
Goldfields	83.8	16.2	88.2	11.8	77.9	22.1	81.2	18.8	79.4	20.6
South West	90.3	9.7	86.0	14.0	91.1	8.9	89.7	10.3	85.0	15.0
Great Southern	93.8	6.3	92.2	7.8	94.9	5.1	93.6	6.4	90.7	9.3
Outside WA/Not Stated	66.7	33.3	87.5	12.5	77.8	22.2	100.0	.	95.8	4.2
All	91.8	8.2	91.4	8.6	91.1	8.9	90.7	9.3	90.3	9.7

Extracted from Midwives' Notification System on 9 May 2011.

3.3 Major Perineal Tears & Surgical Repair of the Perineum (Indicator 3)

These are comparative rate based indicators on incidence of an intact perineum in primiparous women delivering vaginally and degree of damage to the perineum, addressing the management and outcome of patient care.

A selected primipara is defined as in section 3.1 for indicator 1.

For the purpose of indicators 3.3 and 3.4, any degree of perineal tear is included. For indicator 3.5 and 3.6, surgical repair is defined as suture of the perineum following delivery.

Indicators:

CI.3.1: Total number of selected primipara with an **intact perineum** as a percentage of the total number of selected primipara delivering vaginally.

CI.3.2: Total number of selected primipara undergoing **episiotomy and no perineal tear** as a percentage of the total number of selected primipara delivering vaginally.

CI.3.3: Total number of selected primipara sustaining a **perineal tear and NO episiotomy** as a percentage of the total number of selected primipara delivering vaginally.

CI.3.4: Total number of selected primipara undergoing **episiotomy and sustaining a perineal tear** as a percentage of the total number of selected primipara delivering vaginally.

CI.3.5: Total number of selected primipara undergoing **surgical repair of the perineum for third degree tear** as a percentage of the total number of selected primipara delivering vaginally.

This report does not include CI.3.6 (fourth degree tear) as it is not part of the Midwives' Notification Collection.

The total number of selected primipara delivering vaginally is used as the denominator for CI.3.1; CI.3.2; CI.3.3; CI.3.4; CI.3.5.

In 2009, there were 6,115 women defined as selected primipara, of whom 18.3 per cent were recorded as CI.3.1; 23.3 per cent were identified as CI.3.2. And for CI.3.4 and CI.3.5, there were 9.9 per cent and 4.0 per cent recorded respectively for those clinical indicators (Table 71).

Table 71: Clinical Indicators CI.3.1, CI.3.2, CI.3.4, CI.3.5 for 2009

Health Region of Mother	Perineal										Total	
	Intact (CI. 3.1)		Episiotomy no tear (CI. 3.2)		Episiotomy, tear (CI. 3.4)		Third degree tear (CI. 3.5)		Other			
	No	%	No	%	No	%	No	%	No	%	No	%
North Metropolitan	388	14.9	614	23.7	425	16.4	107	4.1	1062	40.9	2596	100.0
South Metropolitan	427	19.0	541	24.0	113	5.0	91	4.0	1079	47.9	2251	100.0
Kimberley	26	35.1	8	10.8	.	.	4	5.4	36	48.6	74	100.0
Pilbara	36	24.5	42	28.6	10	6.8	4	2.7	55	37.4	147	100.0
Midwest	30	19.4	37	23.9	10	6.5	7	4.5	71	45.8	155	100.0
Wheatbelt	35	21.6	39	24.1	15	9.3	4	2.5	69	42.6	162	100.0
Goldfields	57	26.9	39	18.4	12	5.7	11	5.2	93	43.9	212	100.0
South West	86	23.6	80	21.9	14	3.8	11	3.0	174	47.7	365	100.0
Great Southern	26	19.5	18	13.5	7	5.3	6	4.5	76	57.1	133	100.0
Outside WA/Not Stated	6	30.0	4	20.0	.	.	.	.	10	50.0	20	100.0
Total	1117	18.3	1422	23.3	606	9.9	245	4.0	2725	44.6	6115	100.0

Extracted from Midwives' Notification System on 9 May 2011.

In 2009, there were 2,726 (44.6%) women having sustained a perineal tear and no episiotomy known as Cl.3.3 (Table 72).

Table 72: Clinical Indicator Cl.3.3 for 2009

Health Region of Mother	Perineal				Total	
	Perineal tear, no episiotomy (Cl. 3.3)		Other			
	No	%	No	%	No	%
North Metropolitan	1083	41.7	1513	58.3	2596	100.0
South Metropolitan	1071	47.6	1180	52.4	2251	100.0
Kimberley	39	52.7	35	47.3	74	100.0
Pilbara	51	34.7	96	65.3	147	100.0
Midwest	68	43.9	87	56.1	155	100.0
Wheatbelt	69	42.6	93	57.4	162	100.0
Goldfields	93	43.9	119	56.1	212	100.0
South West	172	47.1	193	52.9	365	100.0
Great Southern	73	54.9	60	45.1	133	100.0
Outside WA/Not Stated	7	35.0	13	65.0	20	100.0
Total	2726	44.6	3389	55.4	6115	100.0

Extracted from Midwives' Notification System on 9 May 2011.

Table 73 and Table 74 show aggregated information for CI.3.1, CI.3.2, CI.3.4, CI.3.5 and CI.3.3 from 2005-2009 by health regions and the WA total.

Table 73: Clinical Indicators CI.3.1, CI.3.2, CI.3.4, CI.3.5 for 2005-2009

Clinical Indicator	Health Region of Mother										All	
	North Metropolitan	South Metropolitan	Kimberley	Pilbara	Midwest	Wheatbelt	Goldfields	South West	Great Southern	Outside WA/Not Stated		
2005	CI. 3.1	16.4	20	25	22.2	24.3	15.8	29.6	22	29.5	50	19.4
	CI. 3.2	34.4	27.7	15.9	23	32.2	34.2	14.8	28.9	19.7	50	29.9
	CI. 3.4	4.6	3.3	1.1	5.6	2.6	5.9	3.6	4.6	4.5	.	4.1
	CI. 3.5	2.6	2.3	1.1	2.4	2.6	2	2	2	2.3	.	2.4
	Other	42.1	46.8	56.8	46.8	38.2	42.1	50	42.6	43.9	.	44.3
2006	CI. 3.1	17.5	19	23.6	18.4	22.9	20.1	25	27.9	27	.	19.5
	CI. 3.2	31.4	27.1	19.1	21.7	34.1	32.8	20.4	23.1	19.1	28.6	28.3
	CI. 3.4	4.2	3.8	4.5	3.9	5.9	5.2	3.7	5.6	2.6	.	4.2
	CI. 3.5	3.2	2.6	2.2	4.6	2.9	2.3	3.7	1.1	5.2	.	2.9
	Other	43.7	47.5	50.6	51.3	34.1	39.7	47.2	42.3	46.1	71.4	45.1
2007	CI. 3.1	17.4	20.7	20.4	16.8	20.7	21.8	27.9	24.3	23.4	8.3	19.8
	CI. 3.2	25.4	23.3	11.7	23.9	25.4	24.7	17.4	24	22.7	8.3	23.9
	CI. 3.4	12.2	4.4	1	3.2	3.6	8.6	2.3	6	5.5	.	7.7
	CI. 3.5	3.6	2.8	1	5.8	5.3	2.9	6.8	1.7	1.6	8.3	3.3
	Other	41.5	48.7	66	50.3	45	42	45.7	44	46.9	75	45.3
2008	CI. 3.1	17.4	20.2	21.6	21.1	23.6	24.2	26.7	22.5	19.9	30.8	19.7
	CI. 3.2	23.7	21.7	15.5	21.8	27.3	25.5	21.9	24.9	16.9	7.7	22.8
	CI. 3.4	14.2	5.2	5.2	6.8	3.6	6.8	3.3	4.1	3.7	.	8.9
	CI. 3.5	3.3	2.4	6.2	3	3	4.3	5.2	2.8	0.7	7.7	3
	Other	41.4	50.5	51.5	47.4	42.4	39.1	42.9	45.6	58.8	53.8	45.7
2009	CI. 3.1	14.9	19	35.1	24.5	19.4	21.6	26.9	23.6	19.5	30	18.3
	CI. 3.2	23.7	24	10.8	28.6	23.9	24.1	18.4	21.9	13.5	20	23.3
	CI. 3.4	16.4	5	.	6.8	6.5	9.3	5.7	3.8	5.3	.	9.9
	CI. 3.5	4.1	4	5.4	2.7	4.5	2.5	5.2	3	4.5	.	4
	Other	40.9	47.9	48.6	37.4	45.8	42.6	43.9	47.7	57.1	50	44.6

Note: KEMH is in the North Metropolitan hence, CI.3.4 and CI.3.5 are skewed against other regions.
 Extracted from Midwives' Notification System on 9 May 2011.

Table 74: Clinical Indicator CI.3.3 for 2005-2009

Health Region of Mother	2005		2006		2007		2008		2009	
	Cl. 3.3	Other	Cl. 3.3	Other	Cl. 3.3	Other	Cl. 3.3	Other	Cl. 3.3	Other
	%	%	%	%	%	%	%	%	%	%
North Metropolitan	40.5	59.5	43.0	57.0	41.7	58.3	41.1	58.9	41.7	58.3
South Metropolitan	44.2	55.8	44.1	55.9	46.2	53.8	46.9	53.1	47.6	52.4
Kimberley	51.1	48.9	48.3	51.7	62.1	37.9	53.6	46.4	52.7	47.3
Pilbara	42.9	57.1	51.3	48.7	51.0	49.0	48.1	51.9	34.7	65.3
Midwest	35.5	64.5	30.6	69.4	42.6	57.4	41.2	58.8	43.9	56.1
Wheatbelt	38.8	61.2	39.1	60.9	39.7	60.3	39.1	60.9	42.6	57.4
Goldfields	44.4	55.6	44.9	55.1	47.0	53.0	42.9	57.1	43.9	56.1
South West	39.1	60.9	40.3	59.7	40.7	59.3	45.3	54.7	47.1	52.9
Great Southern	40.2	59.8	45.2	54.8	41.4	58.6	52.9	47.1	54.9	45.1
Outside WA/Not Stated	.	100.0	57.1	42.9	66.7	33.3	40.0	60.0	35.0	65.0
All	41.8	58.2	43.1	56.9	44.0	56.0	44.1	55.9	44.6	55.4

Extracted from Midwives' Notification System on 9 May 2011.

3.4 General Anaesthesia for Caesarean Section (Indicator 4)

This is a suite of comparative rate based indicators addressing the management of patient care.

CI.4.1: Total number of women having a **general anaesthetic** for a caesarean section.

In 2009, it was recorded that there were 10,241 caesarean cases, of which 35.7 per cent received epidural/caudal; 42.3 per cent used spinal; 17.2 per cent used epidural/spinal and only 4.7 per cent received general anaesthesia (CI.4.1).

Table 75: Clinical Indicator CI.4.1 for 2009

Health Region of Mother	Anaesthetic Type										Total	
	Epidural / caudal		Spinal		General (CI. 4.1)		Epi/spinal		Other			
	No	%	No	%	No	%	No	%	No	%	No	%
North Metropolitan	1595	37.2	1929	45.0	205	4.8	551	12.9	2	0.0	4282	100.0
South Metropolitan	1451	37.2	1522	39.0	124	3.2	805	20.6	3	0.1	3905	100.0
Kimberley	45	23.6	101	52.9	13	6.8	32	16.8	.	.	191	100.0
Pilbara	84	30.2	136	48.9	28	10.1	30	10.8	.	.	278	100.0
Midwest	91	38.6	88	37.3	18	7.6	39	16.5	.	.	236	100.0
Wheatbelt	95	36.4	82	31.4	25	9.6	59	22.6	.	.	261	100.0
Goldfields	72	33.6	97	45.3	16	7.5	28	13.1	1	0.5	214	100.0
South West	158	25.1	238	37.8	28	4.4	204	32.4	2	0.3	630	100.0
Great Southern	43	21.7	126	63.6	19	9.6	10	5.1	.	.	198	100.0
Outside WA/Not Stated	21	45.7	15	32.6	4	8.7	6	13.0	.	.	46	100.0
Total	3655	35.7	4334	42.3	480	4.7	1764	17.2	8	0.1	10241	100.0

Extracted from Midwives' Notification System on 9 May 2011

Table 76 shows aggregated information for CI.4.1 for 2005-2009 by health regions and the WA total. In 2005, the proportion of women having a general anaesthetic for a caesarean section (CI.4.1) was 6.0 per cent and 4.7 per cent was recorded in both 2008 and 2009. Generally the figure has decreased over the 2005-2009 period with the exception of Pilbara and Great Southern.

Table 76: Clinical Indicator CI.4.1 for 2005-2009

Health Region of Mother

Clinical Indicators	Health Region of Mother											
	North Metropolitan	South Metropolitan	Kimberley	Pilbara	Midwest	Wheatbelt	Goldfields	South West	Great Southern	Outside WA/Not Stated	All	
2005	Epi/caudal	45.4	45.1	36.1	37.3	47.9	38.5	36.6	38.3	19.9	33.3	43.5
	Spinal	49	50.3	49.7	55.9	40.7	48.9	51.4	55	71.1	66.7	50.4
	CI. 4.1	5.6	4.6	14.2	6.8	11.3	12.6	12.0	6.7	9	.	6.0
	Other	.	0	.	.	.	.	.	.	.	.	0
2006	Epi/caudal	39.3	43.8	33.1	36.7	48.1	40.6	29.6	22.3	20.6	36.4	39.4
	Spinal	44.7	41.1	54.4	50.8	29.9	42.1	46.2	67.7	61.4	45.5	45.1
	CI. 4.1	4.2	3.6	5	4	7.5	7.7	15.1	5.2	12.3	.	4.6
	Epi/spinal	11.6	11.6	7.5	8.5	13.9	9.6	9	4.8	5.7	18.2	10.8
	Other	0.1	.	.	.	0.5	.	.	.	.	.	0
2007	Epi/caudal	39.6	39.2	29.9	42.7	44.5	39	38.8	18.9	20.4	26.7	37.7
	Spinal	42.6	44.2	50.9	41.2	33.5	41.6	37.5	44.3	58.7	46.7	43.4
	CI. 4.1	4	3.1	7.8	5.2	3.5	7.9	13.4	4	13.8	6.7	4.2
	Epi/spinal	13.9	13.5	11.4	10.9	18.1	11.6	10.3	32.6	7.1	20	14.6
	Other	0	.	.	.	0.4	.	.	0.2	.	.	0
2008	Epi/caudal	38.4	38.4	31.8	35.6	41.4	40.6	31.8	20.2	17.9	34.6	36.5
	Spinal	42.4	42.8	46.8	42.2	36.9	34.2	45.3	30.7	65.5	46.2	42.1
	CI. 4.1	4.4	3.7	7.5	8.7	9.4	2.6	12	5.4	10.8	7.7	4.7
	Epi/spinal	14.7	15	13.9	13.5	12.3	22.6	10.9	43.7	5.8	11.5	16.6
	Other	0.1	0.1	.	.	.	.	.	.	.	.	0
2009	Epi/caudal	37.2	37.2	23.6	30.2	38.6	36.4	33.6	25.1	21.7	45.7	35.7
	Spinal	45	39	52.9	48.9	37.3	31.4	45.3	37.8	63.6	32.6	42.3
	CI. 4.1	4.8	3.2	6.8	10.1	7.6	9.6	7.5	4.4	9.6	8.7	4.7
	Epi/spinal	12.9	20.6	16.8	10.8	16.5	22.6	13.1	32.4	5.1	13	17.2
	Other	0	0.1	.	.	.	.	0.5	0.3	.	.	0.1

Extracted from Midwives' Notification System on 9 May 2011.

3.5 Intrauterine Growth Restriction (Indicator 8)

CI. 8.1: Total number of births with birthweight **less than 2750g at 40 weeks gestation or beyond** as a percentage of the total number of births at 40 weeks gestation or beyond.

In 2009, there were 209 babies with birthweight less than 2750 grams at 40 weeks gestation or beyond (CI.8.1), which accounted for 1.8 per cent of all babies born at 40 weeks or beyond. The percentage for Kimberley (4.1 per cent) was more than double the Statewide figure (Table 77).

Table 77: Clinical Indicator CI.8.1 for 2009

Health Region of Mother	baby Weight					
	Less than 2750g (CI. 8.1)		From 2750g and over		Total	
	No	%	No	%	No	%
North Metropolitan	76	1.7	4312	98.3	4388	100.0
South Metropolitan	65	1.5	4129	98.5	4194	100.0
Kimberley	12	4.1	279	95.9	291	100.0
Pilbara	7	1.9	368	98.1	375	100.0
Midwest	11	2.4	444	97.6	455	100.0
Wheatbelt	8	2.2	364	97.8	372	100.0
Goldfields	9	2.1	412	97.9	421	100.0
South West	14	1.5	926	98.5	940	100.0
Great Southern	7	2.1	331	97.9	338	100.0
Outside WA/Not Stated	.	.	30	100.0	30	100.0
Total	209	1.8	11595	98.2	11804	100.0

Extracted from Midwives' Notification System on 9 May 2011.

Table 78 shows the trend of clinical indicator CI.8.1 from 2005-2009 by health region. Over the past five years, the number reduced slightly from 2.0 per cent in 2005 to 1.6 per cent in 2008 and 1.8 per cent in 2009.

Table 78: Clinical Indicator CI.8.1 from 2005- 2009

Health Region of Mother	2005		2006		2007		2008		2009	
	CI. 8.1	≥ 2750g	CI. 8.1	≥ 2750g	CI. 8.1	≥ 2750g	CI. 8.1	≥ 2750g	CI. 8.1	≥ 2750g
	%	%	%	%	%	%	%	%	%	%
North Metropolitan	1.5	98.5	1.5	98.5	1.7	98.3	1.5	98.5	1.7	98.3
South Metropolitan	1.6	98.4	1.6	98.4	1.7	98.3	1.3	98.7	1.5	98.5
Kimberley	8.3	91.7	4.2	95.8	4.5	95.5	4.2	95.8	4.1	95.9
Pilbara	1.9	98.1	2.1	97.9	1.4	98.6	2.0	98.0	1.9	98.1
Midwest	4.1	95.9	3.5	96.5	2.2	97.8	2.7	97.3	2.4	97.6
Wheatbelt	0.7	99.3	0.8	99.2	2.6	97.4	1.9	98.1	2.2	97.8
Goldfields	2.4	97.6	2.9	97.1	2.3	97.7	2.3	97.7	2.1	97.9
South West	2.9	97.1	1.5	98.5	1.3	98.7	2.0	98.0	1.5	98.5
Great Southern	1.4	98.6	0.3	99.7	1.1	98.9	0.6	99.4	2.1	97.9
Outside WA/Not Stated	.	100.0	.	100.0	.	100.0	.	100.0	.	100.0
All	2.0	98.0	1.7	98.3	1.8	98.2	1.6	98.4	1.8	98.2

Extracted from Midwives' Notification System on 9 May 2011.

3.6 Apgar Score (Indicator 9)

CI. 9.1: Total number of term babies born with an Apgar score of **less than seven at five minutes post delivery** as a percentage of the total number of term babies born.

In 2009, the majority of babies born (99.0 per cent) had an Apgar score from 7-10 at five minutes and only small proportion (0.9 per cent) of term babies were born with an Apgar score of less than seven at five minutes (Table 79).

Table 79: Clinical Indicator CI.9.1 for 2009

Health Region of Mother	Apgar score at 5 minutes						Total	
	Apgar score < 7 (CI. 9.1)		Apgar score 7 - 10		Not stated			
	No	%	No	%	No	%	No	%
North Metropolitan	95	0.8	11352	99.1	4	0.0	11451	100.0
South Metropolitan	74	0.7	10257	99.3	2	0.0	10333	100.0
Kimberley	7	1.2	595	98.5	2	0.3	604	100.0
Pilbara	10	1.3	767	98.5	2	0.3	779	100.0
Midwest	16	1.8	850	98.2	.	.	866	100.0
Wheatbelt	5	0.6	872	99.2	2	0.2	879	100.0
Goldfields	15	1.6	897	98.1	2	0.2	914	100.0
South West	19	1.0	1891	98.8	3	0.2	1913	100.0
Great Southern	12	1.8	651	98.0	1	0.2	664	100.0
Outside WA/Not Stated	1	1.0	104	99.0	.	.	105	100.0
Total	254	0.9	28236	99.0	18	0.1	28508¹	100.0

¹ No. of term babies. i.e. those with gestation of 37 weeks or greater.
Extracted from Midwives' Notification System on 9 May 2011.

Table 80 shows the trend of clinical indicator CI.9.1 for 2005-2009 by health region. The indicator value has increased from 0.7 in 2005 to 0.9 in 2009. The percentage is higher in non-metropolitan regions.

Table 80: Clinical Indicator CI.9.1 from 2005-2009

Health Region of Mother	2005			2006			2007			2008			2009		
	Cl. 9.1	Apgar score	Not stated	Cl. 9.1	Apgar score	Not stated	Cl. 9.1	Apgar score	Not stated	Cl. 9.1	Apgar score	Not stated	Cl. 9.1	Apgar score	Not stated
		7-10			7-10			7-10			7-10			7-10	
%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	
North Metropolitan	0.7	99.2	0.1	0.6	99.3	0.1	0.8	99.1	0.1	0.7	99.2	0.0	0.8	99.1	0.0
South Metropolitan	0.6	99.3	0.0	0.7	99.2	0.0	0.7	99.3	0.0	0.7	99.3	0.0	0.7	99.3	0.0
Kimberley	0.3	99.7	.	1.2	98.6	0.2	1.2	98.6	0.2	2.1	97.9	.	1.2	98.5	0.3
Pilbara	1.0	98.8	0.1	1.3	98.6	0.1	1.3	98.4	0.3	1.8	97.8	0.4	1.3	98.5	0.3
Midwest	1.2	98.8	.	0.6	99.4	.	0.3	99.5	0.1	0.9	99.0	0.1	1.8	98.2	.
Wheatbelt	1.0	98.9	0.1	1.0	99.0	.	0.8	99.0	0.2	0.9	99.0	0.1	0.6	99.2	0.2
Goldfields	0.7	99.2	0.1	1.0	98.9	0.1	1.8	98.1	0.1	1.9	98.0	0.1	1.6	98.1	0.2
South West	0.4	99.6	.	0.6	99.1	0.3	0.9	98.8	0.3	0.5	99.5	.	1.0	98.8	0.2
Great Southern	1.3	98.7	.	1.0	98.8	0.1	0.9	99.0	0.1	1.2	98.6	0.2	1.8	98.0	0.2
Outside WA/Not Stated	.	100.0	.	.	100.0	.	1.9	96.2	1.9	1.4	98.6	.	1.0	99.0	.
All	0.7	99.2	0.1	0.7	99.2	0.1	0.8	99.1	0.1	0.8	99.1	0.1	0.9	99.0	0.1

Extracted from Midwives' Notification System on 9 May 2011.

4 PERINATAL MORTALITY

There were 311 perinatal deaths of 20 weeks or more gestation recorded during 2009 (234 fetal deaths and 77 neonatal deaths).

This represented a perinatal mortality rate of 10.0 per 1000 total births, a fetal death rate of 7.5 per 1000 total births and a neonatal mortality rate of 2.5 per 1000 live births for 2009 (Table 81).

Table 81: Perinatal Mortality and Aboriginality in WA 2009

Type of Death	Aboriginality of mother		Total
	Aboriginal	Non-Aboriginal	
Fetal death rate	13.0	7.2	7.5
Neonatal death rate	7.5	2.2	2.5
Perinatal death rate	20.4	9.3	10.0

Extracted from Midwives' Notification System on 30 May 2011.

The denominator for Fetal and Perinatal deaths is the total births while for Neonatal deaths it is the total of live births.

The perinatal death rate among babies of Aboriginal mothers (20.4 per 1000 births) was more than twice the rate for babies of non-Aboriginal mothers (9.3 per 1000 births) (Table 81).

Trend data indicated that there had been a variation in the perinatal mortality rate over the past 17 years from a high of 11.5 per 1000 total births in 1996 to 8.3 per 1000 total births in 2007, the lowest figure in the period. In this period, for babies with Aboriginal mothers the rate varied from a high of 25.8 per 1000 total births in 1999 to a low of 14.8 in 2007. The perinatal mortality rates for 2009 are very similar to those in 1993 (Table 82).

Table 82: Perinatal Mortality by Aboriginality in WA, 1993-2009

Year of birth	Aboriginality of mother		Total rate
	Aboriginal rate	Non-Aboriginal rate	
1993	20.6	9.4	10.0
1994	24.1	10.3	11.1
1995	21.8	10.0	10.7
1996	21.5	10.9	11.5
1997	25.3	8.3	9.3
1998	21.1	8.4	9.1
1999	25.8	8.8	9.9
2000	24.1	9.8	10.7
2001	17.6	9.0	9.6
2002	25.1	8.0	9.2
2003	23.9	8.6	9.6
2004	15.9	9.4	9.8
2005	19.2	9.5	10.1
2006	24.9	8.5	9.5
2007	14.8	7.9	8.3
2008	19.0	8.6	9.2
2009	20.4	9.3	10.0

Perinatal death rate: number of fetal and neonatal deaths per 1000 total births.

Extracted from Midwives' Notification System on 30 May 2011.

Low birthweight and early gestational age influence perinatal mortality rates. Lower birthweight and gestational age correspond with a higher perinatal death rate (Table 83 and Table 84).

Table 83: Perinatal Mortality and Gestational Age in WA, 2009

Gestation	Fetal death rate	Neonatal death rate	Perinatal death rate
≥ 20 weeks	7.5	2.5	10.0
≥ 22 weeks	5.5	2.3	7.7

Includes babies with lethal congenital abnormalities and all fetal deaths of greater than 20 weeks.

Extracted from Midwives' Notification System on 30 May 2011

Table 84: Perinatal Mortality and Birthweight in WA, 2009

Birthweight	Fetal death rate	Neonatal death rate	Perinatal death rate
≥ 400 grams	5.1	2.2	7.3
≥ 500 grams	4.2	1.8	6.0

Includes babies with lethal congenital abnormalities and all fetal deaths of greater than 20 weeks.

Extracted from Midwives' Notification System on 30 May 2011

Babies with a birthweight less than 500 grams comprised 40 per cent of the perinatal deaths in 2009, and 81.6 per cent of perinatal deaths were babies in a low birthweight category (less than 2500 grams) (Table 85).

Table 85: Birthweight Distribution of Fetal, Neonatal and Perinatal Deaths in WA 2009

Birthweight	Fetal deaths		Neonatal deaths		Perinatal deaths	
	No.	%	No.	%	No.	%
< 500	104	44.4	20	26.3	124	40.0
500–999	47	20.1	18	23.7	65	21.0
1000–1499	15	6.4	4	5.3	19	6.1
1500–1999	13	5.6	7	9.2	20	6.5
2000–2499	19	8.1	6	7.9	25	8.1
< 2500	198	84.6	55	72.4	253	81.6
2500–2999	12	5.1	7	9.2	19	6.1
3000–3499	13	5.6	7	9.2	20	6.5
3500–3999	5	2.1	5	6.6	10	3.2
4000–4499	5	2.1	1	1.3	6	1.9
≥ 4500	1	0.4	1	1.3	2	0.6
Total	234	100.0	76	100.0	310	100.0

There was 1 case where the birth weight was missing in 2009

Neonatal and Infant deaths are not included here. The most recent Infant Mortality report can be found at:

http://www.health.wa.gov.au/publications/documents/perinatal/Perinatal_Infant_Maternal_Mortality_dec2010.pdf

Extracted from Midwives' Notification System on 9 May 2011.

Multiple birth babies are subject to increase mortality due to complications associated with low birthweight and lower gestational age. The perinatal mortality rate for multiple births of 37.2 per 1000 multiple births was more than four times the rate of 9.1 per 1000 single births in 2009 (Table 86).

Table 86: Plurality of Fetal, Neonatal and Perinatal Deaths in WA 2009

Plurality	Fetal deaths		Neonatal deaths		Perinatal deaths	
	No.	Rate	No.	Rate	No.	Rate
Single	213	7.0	64	2.1	277	9.1
Multiple	21	23.0	13	14.6	34	37.2
Total	234	7.5	77	2.5	311	10.0

Fetal death rate, singles: number of single fetal deaths per 1000 single births.

Neonatal death rate, singles: number of single neonatal deaths per 1000 single live births.

Perinatal death rate, singles: number of single fetal and neonatal deaths per 1000 single births.

Fetal death rate, multiples: number of multiple fetal deaths per 1000 multiple births.

Neonatal death rate, multiples: number of multiple neonatal deaths per 1000 multiple live births.

Perinatal death rate, multiples: number of multiple fetal and neonatal deaths per 1000 multiple births.

Extracted from Midwives' Notification System on 30 May 2011.

A neonatal death (the death of a liveborn baby during the first 28 days of life) is more likely to occur before the end of the first day of life. In 2009, 46.8 per cent of neonatal deaths occurred to babies aged less than one day (Table 87).

Table 87: Age at Death for Neonatal Deaths in WA 2009

Age at neonatal death	No.	% of neonatal deaths
< Day 1	36	46.8
Day 1	7	9.1
Day 2	8	10.4
Day 3	5	6.5
Day 4	6	7.8
Day 5	1	1.3
Day 6	2	2.6
Day 8-14	4	5.2
Day 15-21	5	6.5
Day 22-28	3	3.9
Total	77	100.0

Extracted from Midwives' Notification System on 30 May 2011.

Autopsy requests were made for 68.4 per cent of fetal deaths and 44.2 per cent of neonatal deaths. There were 4 perinatal deaths where it was not known if an autopsy had been requested (Table 88).

Table 88: Autopsy Requests for Fetal, Neonatal and Perinatal Deaths in WA, 2009

Autopsy request	Fetal deaths		Neonatal deaths		Perinatal deaths	
	No.	%	No.	%	No.	%
Yes	160	68.4	34	44.2	194	62.4
No	73	31.2	40	51.9	113	36.3
Unknown	1	0.4	3	3.9	4	1.3
Total	234	100.0	77	100.0	311	100.0

Extracted from Midwives' Notification System on 30 May 2011.

The principal causes of fetal deaths were lethal birth defect (35.0 per cent) and extremely low birthweight (<1000 grams) (32.5 per cent). Among neonatal deaths, extremely low birthweight was recorded in 49.4 per cent of cases and lethal birth defect in 31.2 per cent (Table 89).

Table 89: Causes of Fetal and Neonatal deaths in WA 2009

Causes of death	Fetal deaths		Neonatal deaths	
	No.	%	No.	%
Lethal birth defect	82	35.0	24	31.2
Extremely low birthweight (< 1000 grams) ¹	76	32.5	38	49.4
Low birthweight (1000–2499 grams) ²	-	-	8	10.4
Asphyxia	-	-	-	-
Maternal — Obstetric	-	-	-	-
— Medical	1	0.4	-	-
— Hypertension	2	0.9	-	-
Placenta and cord	4	1.7	-	-
Hydrops fetalis	-	-	-	-
Infection	-	-	2	2.6
Sudden Infant Death Syndrome	-	-	-	-
Other	1	0.4	-	-
Unknown	68	29.1	5	6.5
Total	234	100.0	77	100.0

¹ Any non-malformed perinatal death of birthweight less than 1000 grams was included in the extremely low birthweight category.

² Any non-malformed perinatal death of birthweight greater than or equal to 1000 grams and less than 2500 grams was included in the low birthweight category if it was not otherwise defined

Extracted from Midwives' Notification System on 30 May 2011.

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APPENDIX A: GLOSSARY

Age-specific birth rate	The total births (live births and still births) per 1000 to women aged between 15–44 years.
Anaesthesia	Often administered during delivery and differs from analgesia in that it causes the loss of all sensation. It includes loss of touch, loss of certain reflexes and loss of one's ability to move. With general anaesthesia the patient is also asleep.
Analgesia	Often administered during labour to reduce the feeling of pain while allowing sensations of touch, pressure and the ability to move generally to remain intact.
Apgar score	A numerical scoring system applied after birth to evaluate the condition of the baby. It is based on the heart rate, respiration, muscle tone, reflexes and colour. Low scores indicate poor condition.
Augmentation of labour	Refers to the use of medication or other intervention to 'speed up' the process of labour. 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..
Born before arrival (BBA)	A birth that occurs prior to arrival of the mother at the intended place of birth.
Birth defects	Any defect present at birth, probably of developmental origin.
Birthweight	The first weight, measured to the nearest five grams, of the newborn, which is usually obtained within the first hour of birth. <u>Low Birthweight</u> : a birthweight of less than 2500 grams. <u>Very Low Birthweight</u> : a birthweight of less than 1500 grams.
Caesarean section	A delivery of the fetus through an incision in the abdominal wall. <u>Elective caesarean section</u> : a planned procedure prior to onset of labour and before spontaneous rupture of membranes or without any induction procedure. <u>Emergency caesarean section</u> : an unplanned procedure, performed because of a complication. May be performed before the onset of labour or during labour.
Confinement	Pregnancy resulting in at least one birth.
Crude birth rate	The number of live births per 1000 total population.
Epidural	Injection of analgesic agent outside the dura mater which covers the spinal canal.

Episiotomy	An incision of the perineum and vagina to enlarge the vulval orifice
Gestational age	The duration of pregnancy in completed weeks from the first day of the last normal menstrual period.
Fetal death	The complete expulsion or extraction from its mother of a product of conception of at least 20 weeks gestation or 400 grams birthweight, which after separation did not show any sign of life.
Induction of labour	The process of using drugs or other methods to artificially start labour. Induction is carried out so that a baby can be delivered even though labour has not started spontaneously (on its own).
Length of stay	The total number of patient days in hospital at time of discharge. A stay of less than one day (patient admission, birth and discharge on the same day) is counted as one day, in the total days of care. For patients admitted and discharged on different days, the number of days is computed by subtracting the date of admission from the day of separation. For planned home births it is routinely coded as 10 days from date of birth.
Live birth	The complete expulsion or extraction from its mother of a product of conception, irrespective of duration of pregnancy, which after separation shows signs of life.
Mortality rates	<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>
Neonatal death	The death of a liveborn infant within 28 days of birth.
Obstetrician	This refers to specialist obstetricians only.
Other medical officer	Includes General Medical Practitioners with or without obstetric qualifications.
Parity	<p>The total number of live births and fetal deaths of the mother prior to the parturition under consideration.</p> <p><u>Nulliparous</u>: never having completed a pregnancy beyond 20 weeks gestation.</p> <p><u>Multiparous</u>: having completed one or more pregnancies beyond 20 weeks gestation.</p>
Perinatal death	A fetal death or neonatal death.
Perineal status	<p><u>First degree tear</u>: a perineal graze-laceration-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>

Third degree tear: a perineal laceration-tear involving the anal sphincter or rectovaginal septum.

Fourth degree tear: a third degree perineal laceration or tear which also involves the anal mucosa or rectal mucosa.

Plurality

The number of foetuses or babies resulting from the pregnancy. On this basis pregnancy may be classified as single or multiple.

SEIFA index

Using 2001 census data, Statistical Local Areas were allocated to five groups based on the socio-economic-index-for-areas (SEIFA) disadvantage index. SEIFA Group I is classed as having the highest socio-economic status and SEIFA group V as the group with the lowest socio-economic status.

Term Babies

Babies with a gestational age of 37 weeks or greater.

APPENDIX B: SUPPLEMENTARY TABLES

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Table S1: Age of Mother giving birth in WA 1980-2009

Year	Maternal Age						Total	
	≤19		20-34		≥ 35		No.	%
	No.	%	No.	%	No.	%		
1980	1698	8.2	17929	87.1	969	4.7	20596	2.7
1981	1770	8.1	19110	86.9	1100	5.0	21980	2.9
1982	1643	7.4	19271	87.0	1238	5.6	22152	3.0
1983	1577	6.9	19955	87.4	1294	5.7	22826	3.0
1984	1542	6.8	19807	87.2	1354	6.0	22703	3.0
1985	1455	6.3	20062	86.9	1559	6.8	23076	3.1
1986	1535	6.5	20344	86.2	1724	7.3	23603	3.1
1987	1494	6.3	20597	86.2	1804	7.5	23895	3.2
1988	1635	6.6	21084	85.0	2083	8.4	24802	3.3
1989	1586	6.3	21372	85.0	2199	8.7	25157	3.4
1990	1662	6.5	21617	84.1	2423	9.4	25702	3.4
1991	1639	6.6	20600	83.5	2440	9.9	24679	3.3
1992	1574	6.3	20757	83.1	2639	10.6	24970	3.3
1993	1496	6.0	20670	82.8	2807	11.2	24973	3.3
1994	1592	6.3	20515	81.8	2964	11.8	25071	3.3
1995	1521	6.1	20391	81.3	3176	12.7	25088	3.3
1996	1521	6.0	20297	80.6	3374	13.4	25192	3.4
1997	1446	5.8	19898	80.0	3524	14.2	24868	3.3
1998	1520	6.0	19926	78.8	3846	15.2	25292	3.4
1999	1509	5.9	19977	78.7	3891	15.3	25377	3.4
2000	1479	6.0	19366	78.0	3972	16.0	24817	3.3
2001	1422	5.8	19008	77.6	4065	16.6	24495	3.3
2002	1438	5.9	18875	77.4	4084	16.7	24397	3.3
2003	1338	5.5	18557	76.4	4380	18.0	24275	3.2
2004	1389	5.5	19094	76.0	4630	18.4	25113	3.4
2005	1484	5.6	19851	74.8	5191	19.6	26526	3.5
2006	1514	5.4	20960	74.2	5780	20.5	28254	3.8
2007	1512	5.1	21902	73.9	6217	21.0	29631	4.0
2008	1535	5.1	22192	73.4	6509	21.5	30236	4.0
2009	1468	4.8	22887	74.4	6402	20.8	30757	4.1

Extracted from Midwives' Notification System on 9 May 2011.

Table S2: Maternal Aboriginality, WA 1980-2009

Year	Aboriginality of Mother					
	Aboriginal		Non-Aboriginal		Total	
	No.	%	No.	%	No.	%
1980	1030	5.0	19580	95.0	20610	100.0
1981	1110	5.0	20871	95.0	21981	100.0
1982	1123	5.1	21029	94.9	22152	100.0
1983	1142	5.0	21684	95.0	22826	100.0
1984	1185	5.2	21518	94.8	22703	100.0
1985	1247	5.4	21829	94.6	23076	100.0
1986	1239	5.2	22364	94.8	23603	100.0
1987	1336	5.6	22559	94.4	23895	100.0
1988	1436	5.8	23366	94.2	24802	100.0
1989	1439	5.7	23718	94.3	25157	100.0
1990	1548	6.0	24154	94.0	25702	100.0
1991	1468	5.9	23211	94.1	24679	100.0
1992	1422	5.7	23548	94.3	24970	100.0
1993	1442	5.8	23531	94.2	24973	100.0
1994	1439	5.7	23632	94.3	25071	100.0
1995	1455	5.8	23633	94.2	25088	100.0
1996	1431	5.7	23761	94.3	25192	100.0
1997	1564	6.3	23304	93.7	24868	100.0
1998	1508	6.0	23784	94.0	25292	100.0
1999	1600	6.3	23777	93.7	25377	100.0
2000	1597	6.4	23220	93.6	24817	100.0
2001	1627	6.6	22868	93.4	24495	100.0
2002	1652	6.8	22745	93.2	24397	100.0
2003	1527	6.3	22748	93.7	24275	100.0
2004	1556	6.2	23557	93.8	25113	100.0
2005	1698	6.4	24828	93.6	26526	100.0
2006	1788	6.3	26466	93.7	28254	100.0
2007	1805	6.1	27826	93.9	29631	100.0
2008	1722	5.7	28514	94.3	30236	100.0
2009	1749	5.7	29008	94.3	30757	100.0
Total	43885	5.8	706633	94.2	750518	100.0

Extracted from Midwives' Notification System on 9 May 2011

Table S3: Place of Birth of Women giving birth in WA, 1980-2009

Year	Place of Birth													
	Teaching		Public		Private		Home Birth		BBA		Other		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
1980	5126	24.9	10769	52.3	3352	16.3	62	0.3	19	0.1	1282	6.2	20610	100.0
1981	5332	24.3	11747	53.4	4520	20.6	59	0.3	16	0.1	307	1.4	21981	100.0
1982	5249	23.7	11218	50.6	5374	24.3	94	0.4	27	0.1	190	0.9	22152	100.0
1983	4731	20.7	11870	52.0	6065	26.6	99	0.4	9	0.0	52	0.2	22826	100.0
1984	4894	21.6	11234	49.5	6411	28.2	96	0.4	22	0.1	46	0.2	22703	100.0
1985	4666	20.2	11295	48.9	6900	29.9	143	0.6	71	0.3	1	0.0	23076	100.0
1986	4921	20.8	11977	50.7	6483	27.5	174	0.7	48	0.2	.	.	23603	100.0
1987	4625	19.4	12008	50.3	7053	29.5	144	0.6	65	0.3	.	.	23895	100.0
1988	4768	19.2	12360	49.8	7420	29.9	175	0.7	79	0.3	.	.	24802	100.0
1989	4675	18.6	12751	50.7	7478	29.7	176	0.7	77	0.3	.	.	25157	100.0
1990	4677	18.2	13345	51.9	7436	28.9	151	0.6	92	0.4	1	0.0	25702	100.0
1991	4200	17.0	13053	52.9	7204	29.2	145	0.6	77	0.3	.	.	24679	100.0
1992	4301	17.2	13265	53.1	7216	28.9	107	0.4	78	0.3	3	0.0	24970	100.0
1993	4695	18.8	12930	51.8	7161	28.7	102	0.4	81	0.3	4	0.0	24973	100.0
1994	4917	19.6	12841	51.2	7111	28.4	109	0.4	93	0.4	.	.	25071	100.0
1995	4930	19.7	12912	51.5	7055	28.1	96	0.4	95	0.4	.	.	25088	100.0
1996	5074	20.1	12331	48.9	7583	30.1	120	0.5	84	0.3	.	.	25192	100.0
1997	5025	20.2	11925	48.0	7741	31.1	112	0.5	65	0.3	.	.	24868	100.0
1998	4912	19.4	11979	47.4	8200	32.4	101	0.4	100	0.4	.	.	25292	100.0
1999	5150	20.3	11634	45.8	8397	33.1	123	0.5	73	0.3	.	.	25377	100.0
2000	4671	18.8	11312	45.6	8633	34.8	120	0.5	81	0.3	.	.	24817	100.0
2001	4168	17.0	10787	44.0	9316	38.0	137	0.6	87	0.4	.	.	24495	100.0
2002	4267	17.5	10280	42.1	9645	39.5	120	0.5	85	0.3	.	.	24397	100.0
2003	4335	17.9	9970	41.1	9726	40.1	163	0.7	80	0.3	1	0.0	24275	100.0
2004	4426	17.6	10325	41.1	10131	40.3	149	0.6	82	0.3	.	.	25113	100.0
2005	4811	18.1	10950	41.3	10517	39.6	150	0.6	98	0.4	.	.	26526	100.0
2006	5792	20.5	11164	39.5	10997	38.9	194	0.7	107	0.4	.	.	28254	100.0
2007	6008	20.3	11364	38.4	11929	40.3	203	0.7	127	0.4	.	.	29631	100.0
2008	6051	20.0	11636	38.5	12187	40.3	232	0.8	130	0.4	.	.	30236	100.0
2009	5653	18.4	12241	39.8	12492	40.6	245	0.8	126	0.4	.	.	30757	100.0

Extracted from Midwives' Notification System on 9 May 2011.

Table S4: Trend in Smoking in Pregnancy, WA 1999-2009

Year	Smoking in pregnancy				Total	
	Smoking		Non-smoking		No.	%
	No.	%	No.	%		
1999	5737	22.6	19640	77.4	25377	8.7
2000	5260	21.2	19557	78.8	24817	8.5
2001	5256	21.5	19239	78.5	24495	8.4
2002	4933	20.2	19464	79.8	24397	8.3
2003	4584	18.9	19691	81.1	24275	8.3
2004	4308	17.2	20805	82.8	25113	8.6
2005	4523	17.1	22003	82.9	26526	9.1
2006	4941	17.5	23313	82.5	28254	9.7
2007	4885	16.5	24746	83.5	29631	10.1
2008	4661	15.4	25575	84.6	30236	10.3
2009	4456	14.5	26301	85.5	30757	10.5
Total	53544	18.2	240334	81.8	293878	100.0

Extracted from Midwives' Notification System on 9 May 2011.

Table S5: Parity of Women giving birth in WA 1980-2009

Year	Number of Women N	Parity				Average parity
		0 %	1-2 %	3-4 %	≥ 5 %	
1980	18992	39.1	50.8	8.4	1.7	1.63
1981	22221	39.3	51.0	8.4	1.3	1.04
1982	22391	39.5	50.7	8.5	1.2	1.03
1983	23072	39.4	51.2	8.2	1.3	1.03
1984	22963	38.7	51.8	8.3	1.3	1.04
1985	23357	38.2	52.2	8.5	1.2	1.04
1986	23888	38.9	51.4	8.5	1.2	1.04
1987	24206	38.9	51.3	8.5	1.3	1.04
1988	25158	38.6	51.4	8.7	1.3	1.06
1989	25543	39.5	50.2	8.9	1.4	1.05
1990	26019	39.0	50.5	9.2	1.3	1.06
1991	25009	39.7	49.9	9.1	1.3	1.05
1992	25324	38.6	50.8	9.1	1.5	1.06
1993	25336	38.7	50.8	8.9	1.6	1.06
1994	25425	40.0	49.7	8.8	1.5	1.04
1995	25446	40.7	49.2	8.6	1.6	1.03
1996	25584	40.0	50.0	8.5	1.5	1.03
1997	25266	40.4	49.5	8.5	1.6	1.03
1998	25678	40.0	49.7	8.7	1.6	1.03
1999	25770	40.4	49.5	8.4	1.7	1.03
2000	25228	41.3	48.4	8.5	1.9	1.03
2001	24941	40.7	49.3	8.2	1.8	1.02
2002	24785	40.6	49.3	8.4	1.8	1.02
2003	24677	41.3	49.0	7.8	1.9	1.01
2004	25531	41.8	48.6	7.8	1.8	1.00
2005	26979	41.9	48.4	7.8	1.9	1.01
2006	28665	41.8	48.2	8.0	2.0	1.01
2007	30075	41.9	48.4	7.6	2.0	1.00
2008	30673	41.2	49.1	7.9	1.8	1.01
2009	31216	41.9	48.8	7.5	1.8	0.98

Extracted from Midwives' Notification System on 9 May 2011.

Table S6: Onset of Labour of Mother, 1980-2009

Year	Onset of Labour							
	Spontaneous		Induction		No Labour		Total	
	No.	%	No.	%	No.	%	No.	%
1986	14956	63.4	6363	27.0	2284	9.7	23603	100.0
1987	15092	63.2	6277	26.3	2526	10.6	23895	100.0
1988	15826	63.8	6428	25.9	2548	10.3	24802	100.0
1989	15923	63.3	6487	25.8	2747	10.9	25157	100.0
1990	16638	64.7	6180	24.0	2884	11.2	25702	100.0
1991	15815	64.1	6135	24.9	2729	11.1	24679	100.0
1992	15538	62.2	6544	26.2	2888	11.6	24970	100.0
1993	14997	60.1	6872	27.5	3104	12.4	24973	100.0
1994	15092	60.2	6876	27.4	3103	12.4	25071	100.0
1995	15024	59.9	6988	27.9	3076	12.3	25088	100.0
1996	14984	59.5	7036	27.9	3172	12.6	25192	100.0
1997	14428	58.0	7046	28.3	3394	13.6	24868	100.0
1998	14186	56.1	7394	29.2	3712	14.7	25292	100.0
1999	14181	55.9	7552	29.8	3644	14.4	25377	100.0
2000	13745	55.4	7266	29.3	3806	15.3	24817	100.0
2001	12829	52.4	7449	30.4	4217	17.2	24495	100.0
2002	12536	51.4	7314	30.0	4547	18.6	24397	100.0
2003	12266	50.5	7090	29.2	4919	20.3	24275	100.0
2004	12681	50.5	7210	28.7	5222	20.8	25113	100.0
2005	13092	49.4	7595	28.6	5839	22.0	26526	100.0
2006	14424	51.1	7867	27.8	5963	21.1	28254	100.0
2007	15499	52.3	8157	27.5	5975	20.2	29631	100.0
2008	15911	52.6	8059	26.7	6267	20.7	30237	100.0
2009	16027	52.1	8606	28	6124	19.9	30757	100
Total	351754	57	170790	27.7	94691	15.3	617235	100

Extracted from Midwives' Notification System on 9 May 2011.

Table S7: Type of Delivery for Women giving birth in WA, 1980-2009

Year	Type of Delivery											
	Spontaneous Vaginal		Assisted Vaginal		Elective Caesarean		Emergency Caesarean		Other		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
1980	13572	65.9	4732	23.0	1096	5.3	1205	5.8	5	0.0	20610	100.0
1981	14471	65.8	4928	22.4	1250	5.7	1332	6.1	.	.	21981	100.0
1982	14191	64.1	5190	23.4	1406	6.3	1365	6.2	.	.	22152	100.0
1983	14453	63.3	5348	23.4	1488	6.5	1537	6.7	.	.	22826	100.0
1984	14315	63.1	5247	23.1	1560	6.9	1581	7.0	.	.	22703	100.0
1985	14452	62.6	5130	22.2	1804	7.8	1690	7.3	.	.	23076	100.0
1986	14944	63.3	4973	21.1	1851	7.8	1835	7.8	.	.	23603	100.0
1987	15135	63.3	4730	19.8	2063	8.6	1967	8.2	.	.	23895	100.0
1988	16161	65.2	4447	17.9	2198	8.9	1996	8.0	.	.	24802	100.0
1989	16133	64.1	4483	17.8	2357	9.4	2184	8.7	.	.	25157	100.0
1990	16444	64.0	4424	17.2	2493	9.7	2338	9.1	3	0.0	25702	100.0
1991	15963	64.7	4167	16.9	2362	9.6	2187	8.9	.	.	24679	100.0
1992	16028	64.2	4129	16.5	2559	10.2	2254	9.0	.	.	24970	100.0
1993	15873	63.6	3878	15.5	2763	11.1	2459	9.8	.	.	24973	100.0
1994	15935	63.6	3913	15.6	2729	10.9	2494	9.9	.	.	25071	100.0
1995	16207	64.6	3823	15.2	2740	10.9	2318	9.2	.	.	25088	100.0
1996	16119	64.0	3925	15.6	2865	11.4	2283	9.1	.	.	25192	100.0
1997	15755	63.4	3657	14.7	3042	12.2	2414	9.7	.	.	24868	100.0
1998	15792	62.4	3594	14.2	3270	12.9	2636	10.4	.	.	25292	100.0
1999	15772	62.2	3677	14.5	3310	13.0	2618	10.3	.	.	25377	100.0
2000	15095	60.8	3442	13.9	3520	14.2	2760	11.1	.	.	24817	100.0
2001	14617	59.7	3111	12.7	3745	15.3	3022	12.3	.	.	24495	100.0
2002	14138	57.9	3093	12.7	4004	16.4	3162	13.0	.	.	24397	100.0
2003	13832	57.0	2939	12.1	4326	17.8	3178	13.1	.	.	24275	100.0
2004	13753	54.8	3232	12.9	4538	18.1	3590	14.3	.	.	25113	100.0
2005	14180	53.5	3360	12.7	5071	19.1	3917	14.8	.	.	26528	100.0
2006	15373	54.4	3645	12.9	5280	18.7	3956	14.0	.	.	28254	100.0
2007	15920	53.7	4019	13.6	5289	17.8	4405	14.9	.	.	29633	100.0
2008	15897	52.6	4272	14.1	5486	18.1	4581	15.2	-	-	30236	100.0
2009	16038	52.1	4480	14.6	5300	17.2	4939	16.1	-	-	30757	100.0

Extracted from Midwives' Notification System on 9 May 2011.

Table S8: Genders of Births in WA, 1980-2009

Year	Gender of birth							
	Male		Female		Indeterminate		Total	
	No.	%	No.	%	No.	%	No.	%
1980	10671	51.3	10144	48.7	-	-	20815	2.7
1981	11580	52.1	10641	47.9	-	-	22221	2.9
1982	11473	51.2	10918	48.8	-	-	22391	2.9
1983	11975	51.9	11097	48.1	-	-	23072	3.0
1984	11860	51.6	11103	48.4	-	-	22963	3.0
1985	11928	51.1	11429	48.9	-	-	23357	3.1
1986	12345	51.7	11541	48.3	2	0.0	23888	3.1
1987	12477	51.5	11726	48.4	3	0.0	24206	3.2
1988	12970	51.6	12185	48.4	3	0.0	25158	3.3
1989	13041	51.1	12502	48.9	-	-	25543	3.4
1990	13416	51.6	12602	48.4	1	0.0	26019	3.4
1991	12775	51.1	12234	48.9	-	-	25009	3.3
1992	13073	51.6	12249	48.4	2	0.0	25324	3.3
1993	13101	51.7	12233	48.3	2	0.0	25336	3.3
1994	13014	51.2	12403	48.8	8	0.0	25425	3.3
1995	13137	51.6	12302	48.3	7	0.0	25446	3.3
1996	13192	51.6	12389	48.4	3	0.0	25584	3.4
1997	13034	51.6	12231	48.4	1	0.0	25266	3.3
1998	13095	51.0	12583	49.0	-	-	25678	3.4
1999	13147	51.0	12623	49.0	-	-	25770	3.4
2000	12768	50.6	12460	49.4	-	-	25228	3.3
2001	12837	51.5	12104	48.5	-	-	24941	3.3
2002	12618	50.9	12167	49.1	-	-	24785	3.3
2003	12625	51.2	12052	48.8	-	-	24677	3.2
2004	13060	51.2	12471	48.8	-	-	25531	3.4
2005	13762	51.0	13217	49.0	-	-	26979	3.5
2006	14489	50.5	14170	49.4	6	0.0	28665	3.8
2007	15460	51.4	14614	48.6	1	0.0	30075	4.0
2008	15636	51.0	15035	49.0	2	0.0	30673	4.0
2009	16065	51.5	15150	48.5	1	0.0	31216	4.1

Extracted from Midwives' Notification System on 9 May 2011.

Table S9: Plurality of Birth WA, 1980-2009

Year	Plurality									
	Single		Twin		Triplet		Other Multiple		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
1980	20406	98.0	406	2.0	3	0.0	.	.	20815	100.0
1981	21744	97.9	468	2.1	9	0.0	.	.	22221	100.0
1982	21917	97.9	462	2.1	12	0.1	.	.	22391	100.0
1983	22585	97.9	472	2.0	15	0.1	.	.	23072	100.0
1984	22450	97.8	492	2.1	21	0.1	.	.	22963	100.0
1985	22803	97.6	530	2.3	24	0.1	.	.	23357	100.0
1986	23328	97.7	532	2.2	24	0.1	4	0.0	23888	100.0
1987	23592	97.5	590	2.4	24	0.1	.	.	24206	100.0
1988	24462	97.2	648	2.6	48	0.2	.	.	25158	100.0
1989	24797	97.1	676	2.6	57	0.2	13	0.1	25543	100.0
1990	25389	97.6	618	2.4	12	0.0	.	.	26019	100.0
1991	24355	97.4	636	2.5	18	0.1	.	.	25009	100.0
1992	24628	97.3	660	2.6	36	0.1	.	.	25324	100.0
1993	24624	97.2	670	2.6	42	0.2	.	.	25336	100.0
1994	24728	97.3	666	2.6	27	0.1	4	0.0	25425	100.0
1995	24739	97.2	680	2.7	27	0.1	.	.	25446	100.0
1996	24817	97.0	720	2.8	39	0.2	8	0.0	25584	100.0
1997	24486	96.9	738	2.9	30	0.1	12	0.0	25266	100.0
1998	24916	97.0	732	2.9	30	0.1	.	.	25678	100.0
1999	25002	97.0	720	2.8	39	0.2	9	0.0	25770	100.0
2000	24418	96.8	774	3.1	36	0.1	.	.	25228	100.0
2001	24061	96.5	844	3.4	36	0.1	.	.	24941	100.0
2002	24012	96.9	764	3.1	9	0.0	.	.	24785	100.0
2003	23881	96.8	774	3.1	18	0.1	4	0.0	24677	100.0
2004	24703	96.8	804	3.1	24	0.1	.	.	25531	100.0
2005	26085	96.7	858	3.2	36	0.1	.	.	26979	100.0
2006	27852	97.2	786	2.7	27	0.1	.	.	28665	100.0
2007	29197	97.1	848	2.8	30	0.1	.	.	30075	100.0
2008	29806	97.2	848	2.8	15	0.0	4	0.0	30673	100.0
2009	30305	97.1	902	2.9	12	0.0	.	.	31219	100.0

Extracted from Midwives' Notification System on 9 May 2011.

