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PERINATAL STATISTICS IN WESTERN AUSTRALIA

Eleventh Annual Report
of the Western Australian Midwives'
Notification System
1993

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FOREWORD

This Eleventh Annual Report adds further to a public health information system of which all Western Australian health care providers, educators, researchers and consumers should be grateful. The wealth of information contained within this report makes it relevant to all those who work in this field.

The Western Australian reproductive population has in recent years demonstrated a remarkable consistency of effort. The number of women who gave birth in this state during the years 1992 and 1993 were 24918 and 24916 respectively. However, the average age of the women at the time of child bearing continues to increase with more women in the 35+ years age group and fewer in the 20-34 years group.

It is pleasing to see that the perinatal mortality rate continues to fall with an overall rate of 7.3 per 1000 births. Rates of Aboriginal stillbirth and neonatal mortality remain approximately double those of non-Aboriginals although there has been some improvements in outcome for aboriginal births since the previous year.

This data set provides a valuable insight into Western Australian life. More than two-thirds of women who gave birth during 1993 lived in the metropolitan region and, of the women in the Central Midland's Health Region, more than one half delivered elsewhere.

As in most regions of the developed world, the rate of medical intervention in childbirth has continued to rise. Rates for induction of labour have remained relatively constant over the last decade but the rate of caesarean section now exceeds 20%. Of these abdominal deliveries in Western Australia during 1993, one-third were repeat caesarean sections. Of all women who had a previous caesarean section or uterine surgery and who gave birth during this year, only 9.8% delivered vaginally. This low rate of vaginal birth after caesarean section is outstanding and indicates that the concept of "once a caesarean, always a caesarean" is far more prevalent in Western Australia than many of us had previously thought. It is clear that a reduction in the rate of caesarean section will require a commitment to deliver vaginally a much greater proportion of those women who have previously had an abdominal delivery. Mechanisms by which this may be achieved should be addressed.

Several new items are included in this report. Data are presented on episiotomy rates which indicate that only one-third of women who delivered vaginally did not require some form of vaginal or perineal repair after delivery. Valuable information on Vitamin K administration to the neonate is also included. During the year concern that intramuscular Vitamin K injection may be carcinogenic resulted in a rising trend in oral use, followed by a return to parental administration as concern for the intramuscular route lessened.

Congratulations to Vivien Gee and her team on yet another wonderful report on perinatal outcomes in Western Australia. In addition, special thanks are extended to the many midwives throughout Western Australia who have collected the data and without whom this report would not have been possible.



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Sincere thanks are also extended to:

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1. SUMMARY

The Midwives' Notification System compiles information on all births in Western Australia. This Report presents data on births in 1993 and also describes trends from 1984-1993.

In 1993, 24,916 women gave birth in Western Australia. The number of teenage mothers was 1490 (6.0%) and the number of mothers aged 35 years or more was 2795 (11.2%). The fertility rate of women aged 15-19 years has declined slightly over the past decade from 26.4 births per 1000 women-years in 1984 to 24.1 in 1993. Amongst women aged 35-44 years, the fertility rate has increased from 14.4 births per 1000 women-years in 1984 to 21.5 in 1993. Most births occur to women aged 20-34 years, and in 1993 the fertility rate in this group was 103.8 births per 1000 women-years. Overall, the fertility rate declined during the decade.

Most mothers were of caucasian racial origin (87.3%). Aboriginal women comprised 5.7% of mothers and women of all other races comprised 7.0%. Fertility rates among Aboriginal women are on average twice as high as fertility rates among non-Aboriginal women.

Most mothers have their babies in hospital. In 1993, 99.3% of mothers delivered in hospital and there were only 102 (0.4%) planned home confinements.

Whereas 69.1% of women reported being resident in the metropolitan area, 74.5% of confinements occurred in metropolitan hospitals. This indicates the movement of women from the country to deliver in the metropolitan area. Women from country regions close to the metropolitan area were more likely to travel to Perth for delivery than women in distant country regions. The proportion of confinements in the country hospitals has declined slightly from 27.1% in 1984 to 24.8% in 1993.

A total of 25,266 babies (of birthweight $\geq 500\text{g}$) were born in 1993. Whilst most of these babies (97.3%) resulted from singleton pregnancies, there were 692 babies resulting from twin or triplet pregnancies. One pregnancy in every 72 was a multiple pregnancy. There were no quadruplet or quintuplet pregnancies recorded in 1993.

Labour was spontaneous in onset for 60.0% of mothers and induced for 27.5%. A further 12.5% of women did not experience labour.

The rate of caesarean section in 1993 was 21.0%. This figure has risen from 13.9% in 1984, and represents one of the most striking features of modern obstetrics. Of the 1838 women in 1993 recorded as having had a previous caesarean section or other uterine surgery, 1658 (90.2%) were delivered by caesarean section and 180 (9.8%) delivered vaginally.

Spontaneous vaginal delivery occurred for 63.5% of mothers and a further 15.5% had an assisted vaginal delivery (forceps, vacuum extraction or breech manoeuvre).

Although 60.0% of mothers had a spontaneous onset of labour, only 28.7% of mothers proceeded through labour without augmentation and achieved a spontaneous vaginal delivery. Thus, less than a third of births occurred without intervention to the processes of labour or delivery.

Another feature of modern obstetrics is the increased use of epidural analgesia and anaesthesia. In 1993, a total of 8671 (34.8%) mothers received an epidural at some stage during labour and delivery. Among women delivering by elective caesarean section, 83.9% had an epidural anaesthetic. The number of women receiving a general anaesthetic at some stage during labour and delivery was 1283 (5.1%). It should be noted that some hospitals conducting booked deliveries do not offer an epidural service.

A significant proportion of pregnant women have pre-existing medical conditions. In 1993, the most common of these conditions was asthma, affecting 6.4% of mothers. Epilepsy was recorded for 0.6% and hepatitis B for 0.3% of mothers.

Complications of pregnancy were recorded for 39.1% of women. The most common complications were threatened abortion in early pregnancy (6.7%) and pre-eclampsia (8.3%).

One of the most important factors affecting the survival of a baby is birthweight. In 1993, most babies (67.1%) weighed 3000-3999g at birth, and the average birthweight was 3353g. The percentage of low birthweight (<2500g) babies was 6.2%, and this percentage has been static over the decade.

Most liveborn babies (79.9%) stayed in their hospital of birth for between two and seven days after birth. Two hundred and thirty babies had a length of stay of more than four weeks. There are substantial costs attached to extended lengths of stay, particularly when care in a neonatal intensive care unit is involved.

Among the babies born in 1993 there were 123 stillbirths and 62 neonatal deaths, giving a perinatal mortality rate of 7.3 perinatal deaths/1000 total births. The perinatal mortality rate has declined significantly over the decade, from 10.9/1000 in 1984.

Babies of Aboriginal mothers fare considerably worse than babies of non-Aboriginal women. The percentage of low birthweight Aboriginal babies (12.4% in 1993) is approximately double that of non-Aboriginal babies (5.9% in 1993). Mortality rates of Aboriginal babies are more than double the non-Aboriginal rates. The Aboriginal perinatal mortality rate in 1993 was 13.2/1000 compared with 7.0/1000 among non-Aboriginal babies. There has been some improvement in Aboriginal perinatal mortality over the decade.

The maternal mortality rate remains very low at 0.04 maternal deaths/1000 livebirths in 1992. There were a total of 13 maternal deaths during the decade: these deaths include deaths due to obstetric causes as well as deaths from other causes such as accidents, suicide and pre-existing medical conditions.

2. INTRODUCTION

This is the Eleventh Annual Report on Perinatal Statistics in Western Australia from the Midwives' Notification System. All routine reports from the collection are in statistical form without identification of individual patients, midwives, doctors or hospitals.

This report contains information on women and their babies delivered in Western Australia during the 1993 calendar year. Only those pregnancies which resulted in a final product of conception having a birthweight equal to or greater than 500 grams have been included. Notifications were received for 70 babies whose birthweight was less than 500 grams.

To assist with standardisation of the information collected on the Midwives' Form 2, a second Edition of 'Guidelines for Completion of the Notification of Case Attended Midwives Form 2'¹ was distributed in late 1989. These Guidelines were sent to midwives and all Western Australian hospitals with obstetric beds for use in collection of data in 1990 and subsequent years.

When the Notification of Case Attended (Midwives') Form 2 are received by the Maternal and Child Health Studies Unit, the information is checked for completeness and, if necessary, followed up for additional details. The information is then transcribed into a coded format, using the World Health Organisation - International Classification of Diseases, 9th Revision Clinical Modification² (ICD-9-CM) to code morbidity. Once this coding is complete, the data are entered to create the computer data base. A validation study of the 1992 data was published in July 1994.

To ensure the complete ascertainment of perinatal deaths within Western Australia, information is collated from the Midwives' Notification System, Hospital Morbidity System, Registrar General's Office and Community and Child Health Services. This is then manually linked to the birth cohort.

Population estimates based on census data were obtained from the Western Australian Branch of the Bureau of Statistics.

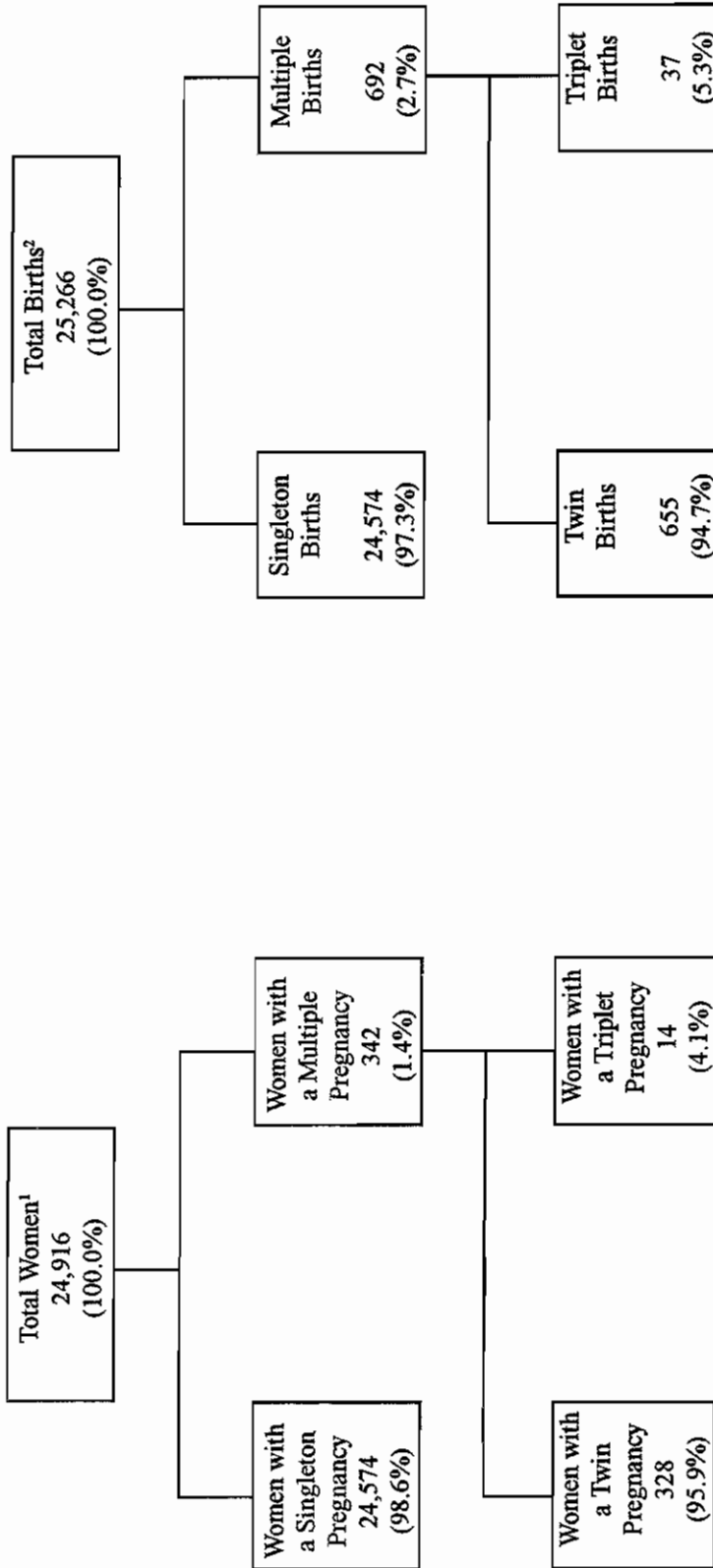
Additional tabulations are available upon request to:

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TREE DIAGRAM 1

PREGNANCIES AND BIRTHS IN WESTERN AUSTRALIA, 1993



Excludes births less than 500 grams birthweight.

¹ Includes one woman with a twin pregnancy where one twin weighed less than 500 grams birthweight.

² Includes one single twin birth whose birthweight was 500 grams or more.

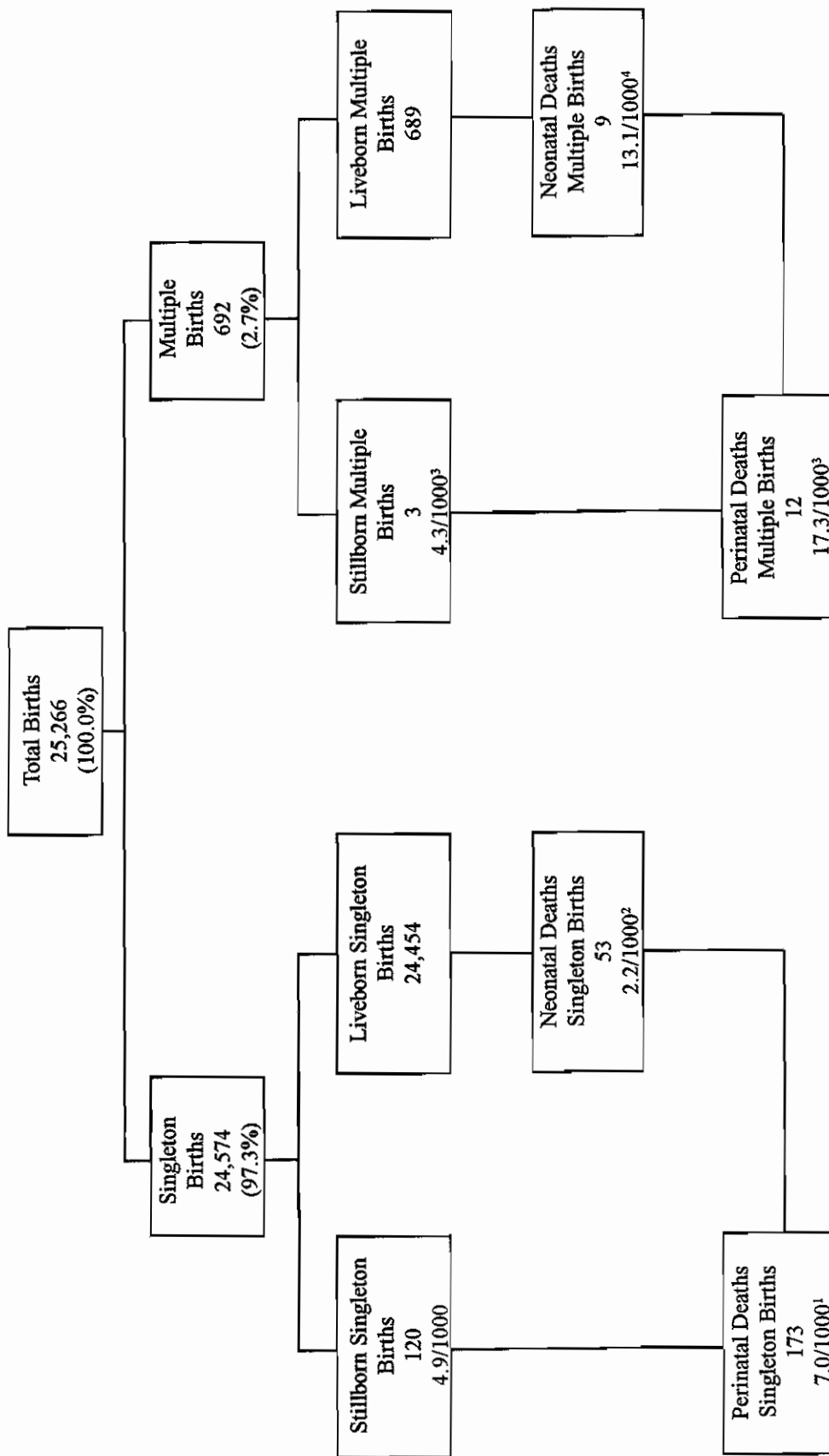
¹Includes three women with a triplet pregnancy where one or more triplet weighed less than 500 grams birthweight.

²Includes four triplet babies whose birthweight was 500 grams or more.

SOURCE: MIDWIVES' NOTIFICATION SYSTEM

TREE DIAGRAM 2

PLURALITY OF BIRTHS AND PERINATAL DEATHS IN WESTERN AUSTRALIA, 1993



Excludes births less than 500 grams birthweight.

¹/1000 total singleton births ²/1000 singleton livebirths

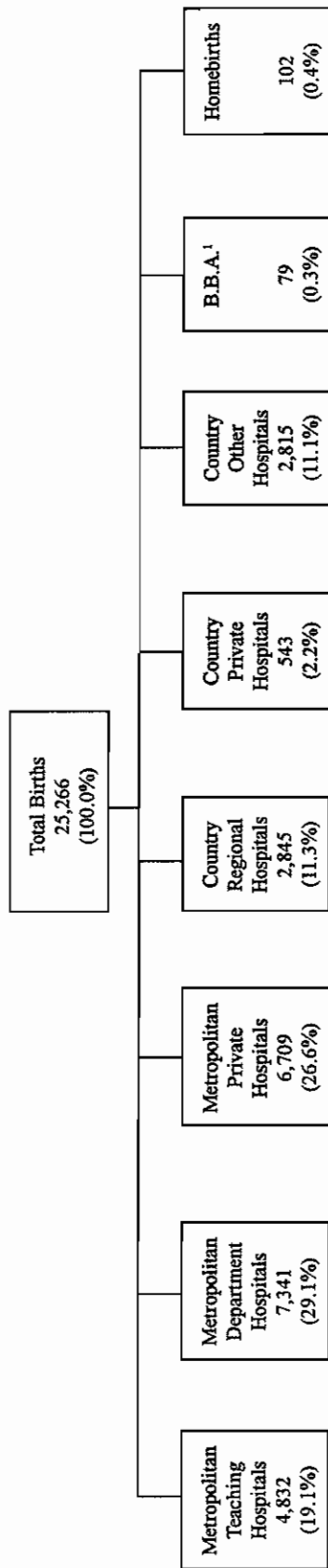
³/1000 total multiple births ⁴/1000 multiple livebirths

SOURCE: MIDWIVES' NOTIFICATION SYSTEM
REGISTRAR GENERAL'S OFFICE

HOSPITAL MORBIDITY SYSTEM
COMMUNITY AND CHILD HEALTH SERVICES

TREE DIAGRAM 3

PLACE OF DELIVERY FOR ALL BIRTHS IN WESTERN AUSTRALIA, 1993



Excludes births less than 500 grams birthweight.

¹ B.B.A. (born before arrival)

SOURCE: MIDWIVES' NOTIFICATION SYSTEM

3. MATERNAL DEMOGRAPHIC INFORMATION

3.1 Age

There were 24916 women confined in Western Australia during 1993. The range of maternal age for these women was 13 to 46 years with a mean age of 28.0 years. Women aged between 20 and 34 years represented 82.8% of all women confined. Young women aged 19 years or less represented 6.0% of total women confined with the 35 year and older group increasing to 11.2% from 10.6% in 1992 and 9.9% in 1991. Among Aboriginal mothers, 27.7% of births were to teenagers whereas 4.8% of births to caucasian mothers were to teenagers (Table 1). Trend data for maternal age are provided in Section 7 (Table 51).

TABLE 1:

AGE AND RACE OF WOMEN CONFINED IN WESTERN AUSTRALIA, 1993

Maternal Age	Race						Total	
	Caucasian		Aboriginal		Other			
	No.	%	No.	%	No.	%	No.	%
≤14	4	-	9	0.6	-	-	13	-
15	23	0.1	30	2.1	-	-	53	0.2
16	87	0.4	61	4.3	3	0.2	151	0.6
17	192	0.9	88	6.2	7	0.4	287	1.2
18	312	1.4	100	7.0	14	0.8	426	1.7
19	425	2.0	108	7.6	27	1.6	560	2.3
<19	1043	4.8	396	27.7	51	2.9	1490	6.0
20-24	4239	19.5	534	37.3	254	14.6	5027	20.2
25-29	7585	34.9	291	20.4	528	30.4	8404	33.7
30-34	6464	29.7	157	11.0	579	33.3	7200	28.9
35-39	2119	9.7	44	3.1	281	16.2	2444	9.8
40-44	290	1.3	8	0.6	46	2.7	344	1.4
<45	7	-	-	-	-	-	7	-
TOTAL	21747	100.0	1430	100.0	1739	100.0	24916	100.0

Excludes births less than 500 grams birthweight.
Mean = 28.0 years. Standard Deviation = 5.3 years.

3.2 Race

Ethnic grouping of women identified the majority (87.3%) of women confined as caucasian. The remaining thirteen percent was comprised of Aboriginal women (5.7%) and women of 'other' races (7.0%).

There were 1739 women confined whose race was identified as 'other' than caucasian or Aboriginal. Examination of a 10% sample of women in this group showed 69.3% to be of Asian racial origin and 4.5% of Maori or Pacific Islander racial origin.

3.3 Conjugal State

More than ten percent of all women confined in Western Australia during 1993 were reported to be socially unsupported, being either single, widowed, separated or divorced. Single women represented the largest unsupported group (10.0%). For women with multiple pregnancy 7.6% were unsupported (Table 2). Trend data for the conjugal state of women confined are provided in Section 7 (Table 51).

TABLE 2:

CONJUGAL STATE AND PLURALITY OF WOMEN CONFINED IN WESTERN AUSTRALIA, 1993

Conjugal State	Plurality				Total	
	Singleton		Multiple			
	No.	%	No.	%	No.	%
Single	2462	10.0	21	6.1	2483	10.0
Married/Defacto	21907	89.2	316	92.4	22223	89.2
Other ¹	205	0.8	5	1.5	210	0.8
TOTAL	24574	100.0	342	100.0	24916	100.0

Excludes births less than 500 grams birthweight.

¹ Other includes separated, divorced and widowed.

3.4 Health Region

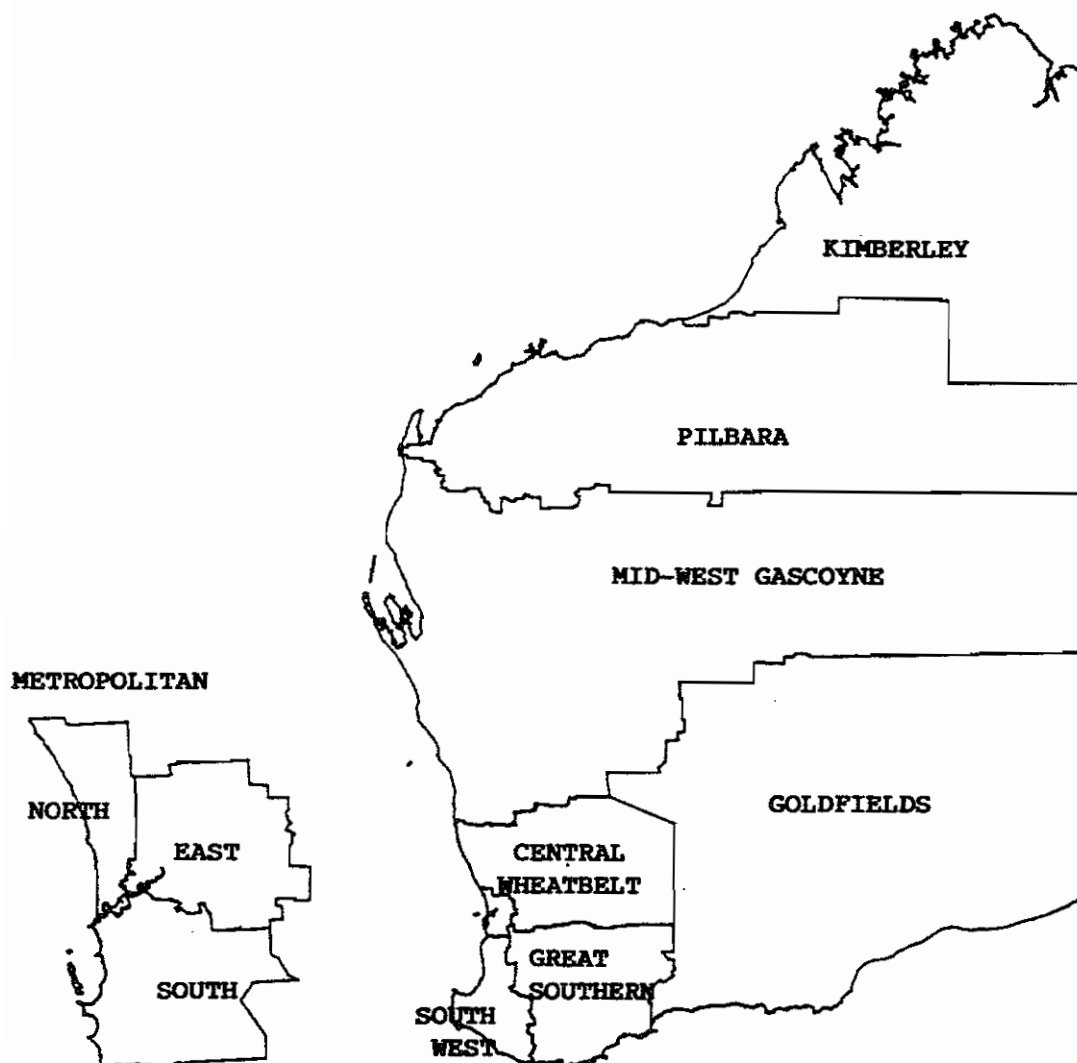
More than two thirds (69.0%) of women confined in 1993 gave their residential address as being within the three Metropolitan Health Regions. There were 30.9% of women confined whose usual place of residence was within the seven Country Health Regions and 25 women (0.1%) who were not residents of Western Australia.

Among Aboriginal women confined, 32.9% were Metropolitan residents and 67.1% were residents of country regions (Table 3).

Information on Western Australian women confined in other States and outside Australia during 1993 is not included in this report.

FIGURE 1

**HEALTH REGION OF RESIDENCE OF WOMEN CONFINED
IN WESTERN AUSTRALIA, 1993**



HEALTH REGION		%
Metropolitan:	North	21.5
	East	22.7
	South	24.9
Total Metropolitan		69.1
Country:	South-West	8.8
	Great Southern	4.4
	Central	3.3
	Goldfields	4.5
	Mid-West Gascoyne	4.4
	Pilbara	3.4
	Kimberley	2.2
Total Country		30.9

Excludes births less than 500 grams birthweight and those 25 (0.1%) mothers resident outside Western Australia.

SOURCE: Midwives' Notification System

TABLE 3:

HEALTH REGION OF RESIDENCE AND RACE OF WOMEN CONFINED IN WESTERN AUSTRALIA, 1993

Health Region	Race						Total	
	Caucasian		Aboriginal		Other		No.	%
	No.	%	No.	%	No.	%	No.	%
Metropolitan								
North	4752	21.9	122	8.5	470	27.0	5344	21.5
East	4929	22.7	194	13.6	538	30.9	5661	22.7
South	5573	25.6	155	10.8	468	26.9	6196	24.9
Country								
South West	2084	9.6	59	4.1	43	2.5	2186	8.8
Great Southern	1019	4.7	59	4.1	23	1.3	1101	4.4
Central Wheatbelt	740	3.4	56	3.9	16	0.9	812	3.3
Goldfields	954	4.4	125	8.7	41	2.4	1120	4.5
Mid-West	850	3.9	197	13.8	38	2.2	1085	4.4
Gascoyne	622	2.9	130	9.1	88	5.1	840	3.4
Pilbara	209	1.0	328	22.9	9	0.5	546	2.2
Kimberley								
Outside WA	15	0.1	5	0.4	5	0.3	25	0.1
TOTAL	21747	100.0	1430	100.0	1739	100.0	24916	100.0

Excludes births less than 500 grams birthweight.

Metropolitan Regions

There were 24916 women confined in Western Australian hospitals during 1993, of whom 18561 (74.5%) were confined in hospitals within the metropolitan area (Table 6). These included 17,032 (68.4%) women resident in the metropolitan area, a further 1,512 (6.1%) women with a country residential address and 17 (0.1%) women resident outside Western Australia (Table 4).

Consideration of the maternal usual place of residence within Health Regions in relation to place of confinement, showed that most women were confined at hospitals within the region of their residence. The referral rate of women to metropolitan teaching hospitals influenced the numbers within the North Metropolitan Region.

Of women resident in the North Metropolitan Region 94.9% were confined at hospitals within the area. Of these 20.2% were confined at a metropolitan teaching hospital and 74.7% at other hospitals in the area.

In the East Metropolitan Region, less than (45.0%) of women were confined in the region, 28.4% in a metropolitan teaching hospital and a further 22.9% in the North Metropolitan Region.

For women residing in the South Metropolitan Region, 60.4% were confined in hospitals within the area with a further 21.2% confined in a metropolitan teaching hospital (Table 4, Figure II).

TABLE 4:

MATERNAL RESIDENCE AND BIRTH HOSPITAL IN METROPOLITAN HEALTH REGION FOR WOMEN CONFINED IN WESTERN AUSTRALIA, 1993

Maternal Residence Management Regions	BIRTH HOSPITALS IN MANAGEMENT REGIONS													
	North Metro Teaching		Other		East Metro		South Metro		Country		Non Hospital		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
North Metro	1077	20.2	3994	74.7	174	3.3	59	1.1	6	0.1	34	0.6	5344	100.0
East Metro	1610	28.4	1298	22.9	2545	45.0	159	2.8	13	0.2	36	0.6	5661	100.0
South Metro	1311	21.2	416	6.7	646	10.4	3743	60.4	27	0.4	53	0.9	6196	100.0
Total	3998	23.2	5708	33.2	3365	19.6	3961	23.0	46	0.3	123	0.7	17201	100.0

Excludes births less than 500 grams birthweight.

Country Regions

One quarter, 6,174 (24.8%) of women confined in Western Australian hospitals during 1993 were confined in country hospitals (Table 6). There were a further 1,512 (6.1%) women, with a country residential address, confined in metropolitan hospitals. This indicates the movement of women from the country to deliver in the metropolitan area. Women living in country regions closer to the city are more likely to travel to Perth for delivery than women in distant country regions.

TABLE 5:

MATERNAL RESIDENCE AND BIRTH HOSPITAL IN HEALTH REGIONS FOR WOMEN CONFINED IN COUNTRY AREAS OF WESTERN AUSTRALIA, 1993

Health Region of Maternal Residence	Birth Hospitals in Health Regions											
	Internal		Metropolitan				Country		Non Hosp		Total	
	No.	%	Teaching No.	%	Other No.	%	No.	%	No.	%	No.	%
Country												
South West	1799	82.3	159	7.3	201	9.2	10	0.5	17	0.8	2186	100.0
Great Southern	896	81.4	74	6.7	103	9.4	19	1.7	9	0.8	1101	100.0
Central	392	48.3	110	13.5	297	36.6	10	1.2	3	0.3	812	100.0
Goldfields	947	84.6	65	5.8	73	6.5	28	2.5	7	0.6	1120	100.0
Mid-West	851	78.4	139	6.3	85	7.8	6	0.6	4	0.2	1085	100.0
Pilbara	670	79.8	63	7.5	90	10.7	13	1.5	4	0.5	840	100.0
Kimberley	479	87.7	39	7.1	14	2.6	1	0.2	13	2.4	546	100.0
Total	6034	78.5	649	8.4	863	11.2	87	1.1	57	0.7	7690	100.0
Non W.A.	-	-	9	36.0	8	32.0	7	28.0	1	4.0	25	100.0

Excludes births less than 500 grams birthweight.

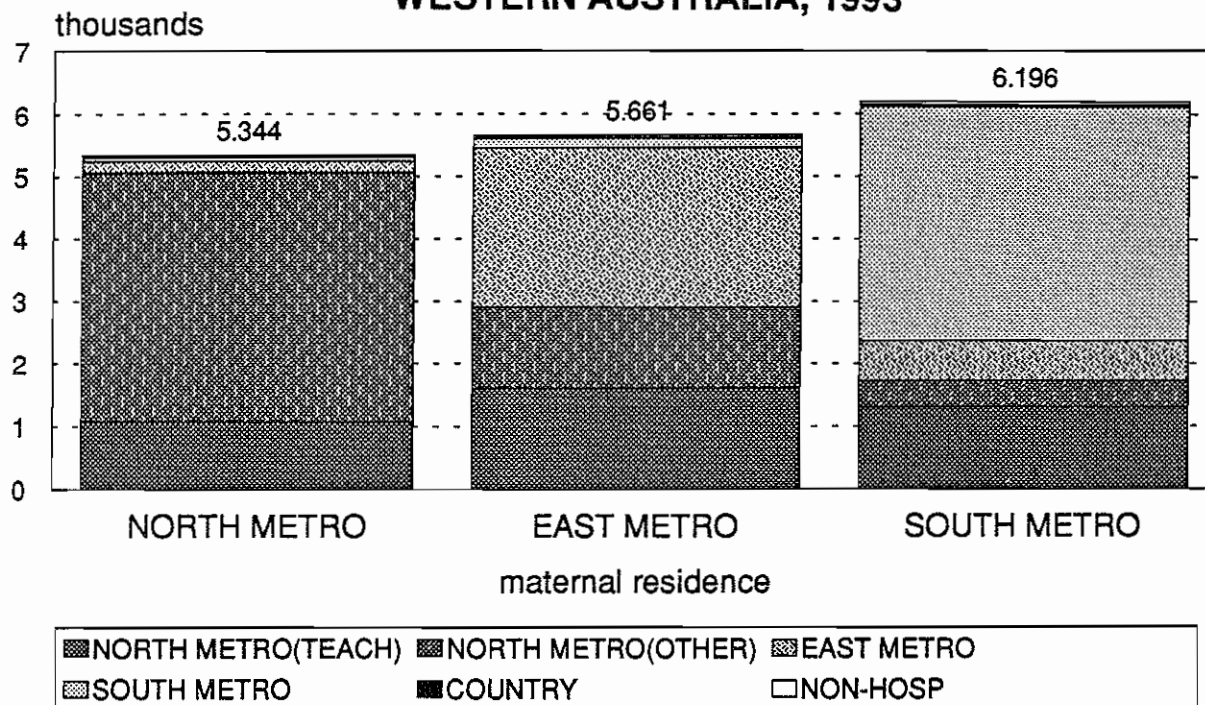
3.5 Place of Confinement

During 1993 there were 24,916 women confined in Western Australia. Of these, 99.3% gave birth in metropolitan or country hospitals. Non-hospital births included 79 babies born before arrival at hospital (BBA) and 102 babies born at home as planned. Trend data for the past 10 Years are available in section 7 (Table 51).

Of the total confinements, 74.5% were in metropolitan hospitals. These included 18.7% occurring in a metropolitan teaching hospital, 29.3% in metropolitan Departmental (Government) hospitals and 26.6% in private metropolitan hospitals. The majority (91.5%) of multiple births in 1993 occurred in metropolitan hospitals, with 48.8% being delivered in a teaching hospital (Table 6).

FIGURE I

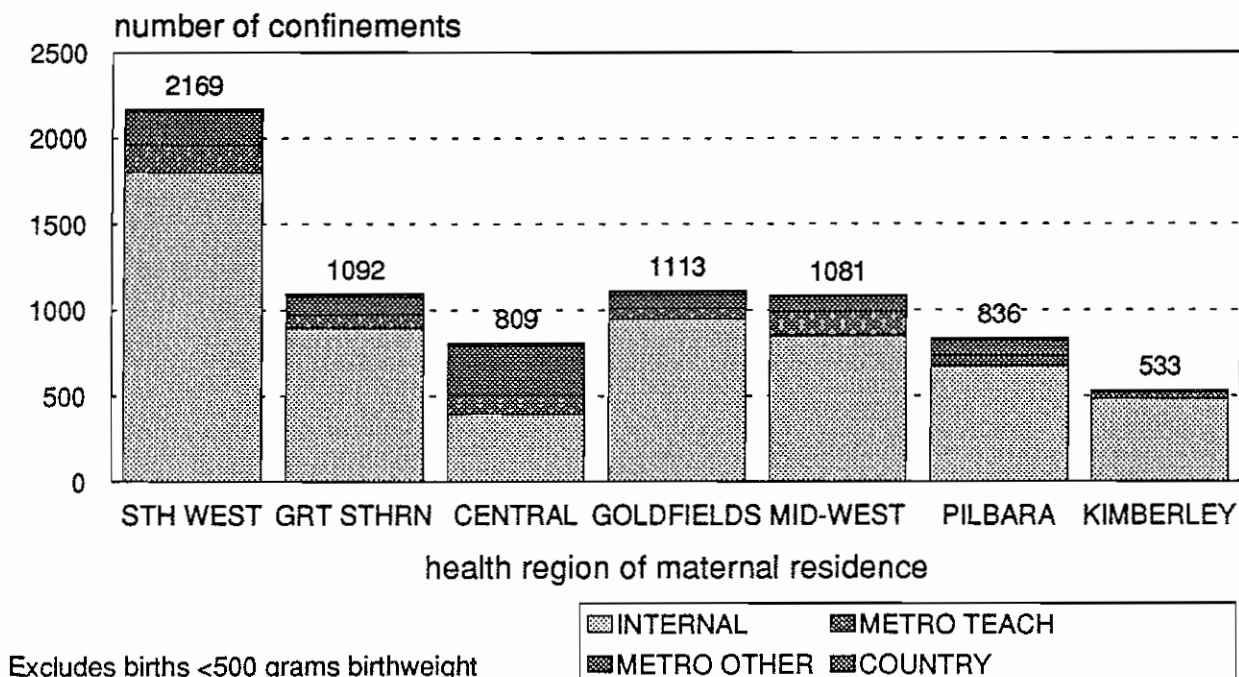
**HOSPITAL BIRTHS AND MATERNAL RESIDENCE
METROPOLITAN HEALTH REGIONS
WESTERN AUSTRALIA, 1993**



Excludes births <500 grams birthweight.
SOURCE: MIDWIVES' NOTIFICATION SYSTEM

FIGURE II

**HOSPITAL BIRTHS AND MATERNAL RESIDENCE
IN COUNTRY HEALTH REGIONS OF WESTERN AUSTRALIA, 1993**



Excludes births <500 grams birthweight

TABLE 6:

PLACE OF CONFINEMENT AND PLURALITY OF WOMEN CONFINED IN WESTERN AUSTRALIA, 1993

Place of Confinement	Plurality				Total	
	Singleton		Multiple			
	No.	%	No.	%	No.	%
<u>Metropolitan</u>						
Teaching ¹	4489	18.3	167	48.8	4656	18.7
Department	7241	29.5	50	14.6	7291	29.3
Private	6518	26.5	96	28.1	6614	26.6
<u>Country</u>						
Regional ²	2803	11.4	21	6.1	2824	11.3
Private	537	2.2	3	0.9	540	2.2
Other ³	2805	11.4	5	1.5	2810	11.3
<u>Non-Hospital</u>						
Homebirths	102	0.4	-	-	102	0.4
BBA ⁴	79	0.3	-	-	79	0.3
TOTAL	24574	100.0	342	100.0	24916	100.0

Excludes births less than 500 grams birthweight

- 1 Teaching Hospital - University Medical School (Teaching Hospitals Act 1955).
- 2 Country Regional Hospital - Government Hospital with private and public beds.
- 3 Other country hospitals - includes Government and Board Hospitals.
- 4 BBA (born before arrival at hospital).

Homebirth numbers were reduced from 151 (0.6%) in 1990 and 145 (0.6%) in 1991, to 107 (0.4%) in 1992 and 102 (0.4%) in 1993. Trend data on planned homebirths over the past decade are provided in section 7 (Table 51).

The Department received notification that an additional 26 women had planned a homebirth but because of complications were either referred or transferred during pregnancy (7 women) or labour (19 women). These women and their babies are included in hospital birth statistics.

Two other women who delivered at home, received medical attention in hospital for management of difficulties with the third stage of labour and/or for postpartum haemorrhage.

4. PREGNANCY PROFILE

4.1 Previous Pregnancies

More than a third (38.7%) of women confined in 1993 were confined for the first time. The range of previous confinements extended to eleven with a mean of 1.06. The percentage of caucasian women confined for the first time (39.3%) was higher than for Aboriginal women confined for the first time (28.8%). However among women having their fifth or more child, the percentage of Aboriginal women (8.5%) was far greater than for caucasian women (1.1%) (Table 7).

The highest number of recorded previous pregnancies was nineteen.
(Mean = 1.6 previous pregnancies. Standard Deviation = 1.6)

TABLE 7:

PARITY AND RACE OF WOMEN CONFINED IN WESTERN AUSTRALIA, 1993

Parity	Race						Total	
	Caucasian		Aboriginal		Other		No.	%
	No.	%	No.	%	No.	%	No.	%
0	8543	39.3	412	28.8	688	39.6	9643	38.7
1-2	11184	51.4	610	42.7	879	50.6	12673	50.9
3-4	1772	8.2	287	20.1	154	8.9	2213	8.9
≥5	248	1.1	121	8.5	18	1.0	387	1.6
TOTAL	21747	100.0	1430	100.0	1739	100.0	24916	100.0

Excludes births less than 500 grams birthweight.

Of the 9643 nulliparous women, 1182 (12.3%) were identified as teenagers (19 years or less) and 82.8% were aged 20 to 34 years. Amongst the 351 women aged forty or more, 61 (17.4%) were having their first baby.

Teenage mothers were 79.3% nulliparous and 20.6% had a parity of 1-4. There were 5 teenagers who had a parity of three or more. Among the 351 women confined aged 40 years or more 61 (17.4%) were nulliparous, 161 (45.9%) had a parity of 1-2, 90 (25.6%) a parity of 3-4 and 36 (10.3%) a parity of 5 or more (Table 8).

TABLE 8:**PARITY AND AGE OF WOMEN CONFINED IN WESTERN AUSTRALIA, 1993**

Maternal Age	Maternal Age							
	≤19		20-34		≥35		Total	
	No.	%	No.	%	No.	%	No.	%
0	1182	79.3	7935	38.5	526	18.8	9643	38.7
1-2	303	20.3	10792	52.3	1578	56.5	12673	50.9
3-4	5	0.3	1662	8.1	546	19.5	2213	8.9
5+	-	-	242	1.2	145	5.2	387	1.6
TOTAL	1490	100.0	20631	100.0	2795	100.0	24916	100.0

Excludes births less than 500 grams birthweight.

Trends in births by socio-economic status can now be assessed for mothers living in all areas of the state of Western Australia. Using Census data, postcodes have been allocated to four equal sized socio-economic status levels. This is a fairly crude scale, but nevertheless demonstrates differences.

The numbers of births in the quartiles vary from 5963 to 6474. Differences in maternal age and parity were investigated. Table 9 shows the percentages of women confined, living in Western Australia who were at the extremes of the reproductive age range, i.e. 17 years and below or 35 years and above. The percentage of young women, 17 years and below, in the lowest socio-economic group (41.6%) was three times that for women of the same age in the highest socio-economic group (12.0%). This trend was reversed for older women, 35 years and above, where the percentage of women in the highest socio-economic group (33.2%) was far greater than that for women in the lowest socio-economic group (2.1%).

To investigate the trend in grand multiparity by socio-economic status, the proportion of women of parity ≥5 was calculated. Of the grand multiparas, 15.2% were in the highest socio-economic group and 35.7% were in the lowest (Table 9).

TABLE 9:

SOCIO-ECONOMIC STATUS AND MATERNAL AGE AND PARITY OF WOMEN CONFINED IN WESTERN AUSTRALIA, 1993

Socio-Economic Status	Women Confined		Maternal Age						Parity	
			≤17 years		18-34 years		≥35 years		≥5 babies	
	n	%	n	% ²	n	% ²	n	% ²	n	% ²
I (Highest)	6306	25.3	60	0.2	5316	21.4	927	3.7	59	0.2
II	5963	24.0	81	0.3	5274	21.2	608	2.4	91	0.4
III	6474	26.0	151	0.6	5683	22.8	640	2.6	99	0.4
IV (Lowest)	6151	24.7	208	0.8	5327	21.4	616	2.4	138	0.6
TOTAL	24891	100.0	500	2.0	21600	86.8	2791	11.2	387	1.6

Excludes births less than 500 grams birthweight and 25 women whose place of residence was outside Western Australia.

¹ Socio-economic status is derived from a postcode indicator constructed by the Australian Bureau of Statistics using 1986 census data. Postcodes were allocated to four equal-sized socio-economic status levels by Mr Richard Hockey.

² Percentage of all women confined.

4.2 Fertility Rates

Age-specific fertility rates in the Aboriginal and non-Aboriginal sub-populations and the total population are shown in Table 10. The population estimates used were derived from data from the 1991 census. Difficulties in estimation of Aboriginal populations are recognised where underenumeration may occur. Therefore the reader may wish to adjust the denominators in accord with the directive of Hicks.⁴

Overall, the fertility rate among Aboriginal women (125.7/1000) was more than double that of non-Aboriginal women (62.1/1000). Among the 15 to 19 year age group the fertility rate of Aboriginal women (164.0/1000) was eight times the rate for non-Aboriginal women (18.5/1000). For those women in the 20 to 34 year age group the rate for Aboriginal women (151.3/1000) was far greater than that for non-Aboriginal women (102.2/1000). The rates for Aboriginal women (21.4/1000) and non-Aboriginal women (21.5/1000) in the 35 to 44 year age group were similar (Table 10, Figure IV).

Trend data on fertility rates among Aboriginal and non-Aboriginal women are provided in section 7, Table 51.

TABLE 10:

FERTILITY RATES¹ OF ABORIGINAL AND NON-ABORIGINAL WOMEN IN WESTERN AUSTRALIA, 1993

Maternal Age	Aboriginal			Non-Aboriginal			Total		
	Births	Population	Fertility Rate ¹	Births	Population	Fertility Rate ¹	Births	Population	Fertility Rate ¹
15-19	389	2372	164.0	1091	58924	18.5	1480	61296	24.1
20-24	538	2487	216.3	4549	64516	70.5	5087	67003	75.9
25-29	296	2264	130.7	8215	62150	132.2	8511	64414	132.1
30-34	159	1814	87.7	7160	68286	104.9	7319	70100	104.4
35-39	45	1402	32.1	2450	66740	36.7	2495	68142	36.6
40-44	8	1074	7.4	346	63107	5.5	354	64181	5.5
TOTAL	1435	11413	125.7	23811	383723	62.1	25246	395136	63.9

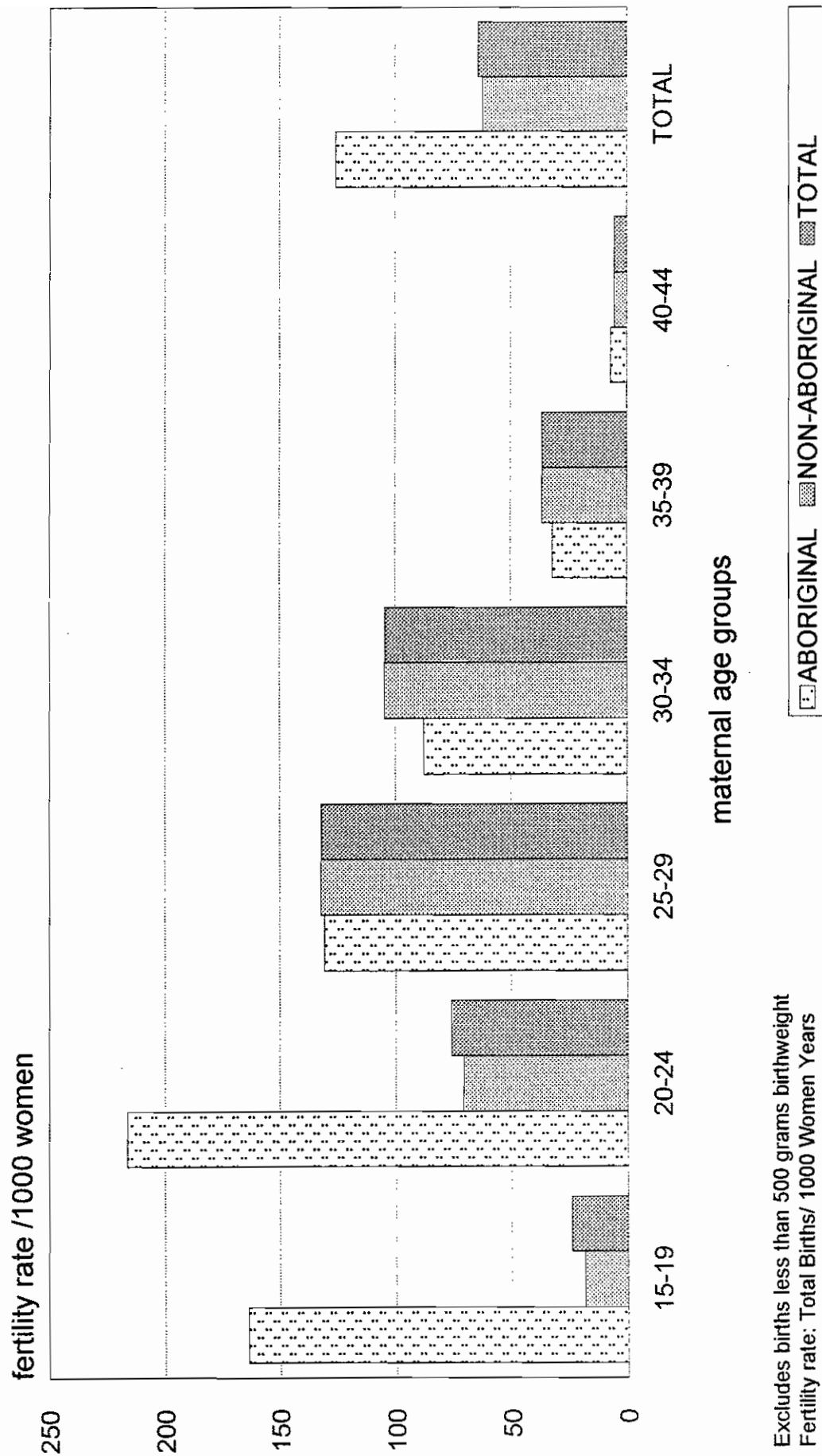
Excludes births less than 500 grams birthweight.

¹ Fertility Rate: Total births/1000 women-years of women aged 15-44 years

SOURCE:

Estimated Resident Population By Age, Sex And Aboriginality / HDWA January 1994
Midwives' Notification System.

FIGURE IV
FERTILITY RATES OF ABORIGINAL AND NON-ABORIGINAL WOMEN
WESTERN AUSTRALIA, 1993



Excludes births less than 500 grams birthweight

Fertility rate: Total Births/ 1000 Women Years

SOURCE: Midwives' Notification System and HDWA January 1994

4.3 Complications of Pregnancy

Over half (60.9%) of all women confined during 1993 were recorded as having no complications of pregnancy (Table 11).

Pre-eclampsia was reported in 2076 (8.3%) women. Of the women with multiple pregnancy, the proportion with pre-eclampsia was twice that for women with singleton pregnancies (Table 11). Among 'other' complications there were 265 (1.1%) women recorded as having unspecified hypertension, 330 (1.3%) with anaemia of pregnancy, 646 (2.6%) with a viral or bacterial genito-urinary tract infection, 267 (1.1%) with retarded fetal growth and 576 (2.3%) with symptoms of gestational diabetes.

TABLE 11:

SELECTED COMPLICATIONS OF PREGNANCY ACCORDING TO PLURALITY OF WOMEN CONFINED IN WESTERN AUSTRALIA, 1993

	Plurality				Total	
	Singleton		Multiple		No.	% ³
	No.	% ¹	No.	% ²		
Complications of Pregnancy (NB a woman may have > 1 complication)						
Threatened Abortion	1655	6.7	21	6.1	1676	6.7
Urinary Tract Infection	1285	5.2	17	5.0	1302	5.2
Pre-eclampsia	2007	8.2	69	20.2	2076	8.3
APH - placenta praevia	177	0.7	1	0.3	178	0.7
APH - abruptio	189	0.8	5	1.5	194	0.8
APH - other	730	3.0	18	5.3	748	3.0
Premature Rupture of Membranes	1066	4.3	44	12.9	1110	4.5
Other	4451	18.1	185	54.1	4636	18.6
No Complications of Pregnancy	15089	61.4	79	23.1	15168	60.9

Excludes births less than 500 grams birthweight.

APH = Antepartum haemorrhage

¹ Percentage of women with a singleton pregnancy

² Percentage of women with a multiple pregnancy

³ Percentage of women confined

Although in the past, it was thought that 'other' complications of pregnancy may be under-reported by midwives, the Validation Study³ of 1992 data undertaken in 1994 showed that they were well reported, being 89% accurate.

4.4 Medical Conditions

There were 4989 reported instances of pre-existing medical complications recorded among the 24,916 women confined during 1993. Of these, 1591 (6.4%) of women confined were reported as asthmatic, 138 (0.6%) as epileptic, 93 (0.4%) as having pre-existing diabetes and 194 (0.8%) with known thyroid disorders (Table 12).

TABLE 12:

**PRE-EXISTING MEDICAL CONDITIONS FOR WOMEN CONFINED
IN WESTERN AUSTRALIA, 1993**

	No.	% of Women Confined
<u>Medical Conditions</u>		
<i>(NB a woman may have >1 medical condition)</i>		
Asthma	1591	6.4
Cardiac Murmurs	206	0.8
Genital Herpes	207	0.8
Essential Hypertension	220	0.9
Thyroid Disorders	194	0.8
Epilepsy	138	0.6
Urinary Tract Infections	101	0.4
Anaemia	110	0.4
Infertility	56	0.2
Bronchial Disorders	79	0.3
Hepatitis B	84	0.3
Vaginal Infections	98	0.4
Spinal Deformities	59	0.2
Pre-existing Diabetes	93	0.4
Depressive Disorders	128	0.5
<u>No Medical Conditions</u>	19927	80.0

Excludes births less than 500 grams birthweight.

5. LABOUR AND DELIVERY

5.1 Onset of Labour

Over half (60.0%) of women confined during 1993 established labour spontaneously. Among women with multiple pregnancy 36.3% had a spontaneous onset of labour.

Induction of labour occurred for 27.5% of women. One hundred and thirteen (33.0%) women with multiple pregnancy underwent induction of labour (Table 13).

TABLE 13:

ONSET OF LABOUR AND PLURALITY OF WOMEN CONFINED IN WESTERN AUSTRALIA, 1993

Onset of Labour	Plurality				Total	
	Singleton		Multiple		No.	%
	No.	%	No.	%	No.	%
Spontaneous	14844	60.4	124	36.3	14968	60.0
Induced	6739	27.4	105	30.7	6844	27.5
No labour	2991	12.2	113	33.0	3104	12.5
TOTAL	24574	100.0	342	100.0	24916	100.0

Excludes births less than 500 grams birthweight.

There were 95 women reported as having had a failed induction of labour during 1993.

From 1981 to 1989 the number of women in Western Australia having an induction of labour remained between 25-27% of total confinements⁵. This percentage reduced to 24.0% in 1990 and 24.8% in 1991 before rising again to 26.7% in 1992 and 27.5% in 1993.

5.2 Augmentation of Labour

There were 5985 (24.0%) women whose labour was augmented by surgical and/or medical intervention following spontaneous onset of the labour.

Assessment of these cases showed that augmentation of labour for 4158 (16.7%) women was followed by a spontaneous vaginal delivery, 1322 (5.3%) women required an assisted vaginal delivery and 505 (2.0%) women an emergency caesarean section.

Of the 14968 women for whom onset of labour was spontaneous, 5985 (40.0%) had labour augmented and 8983 (60.0%) did not.

It is of interest to note that less than one third (7142, 28.7%) of women established labour following spontaneous onset, received no augmentation of labour and achieved a spontaneous vaginal delivery (Table 14).

TABLE 14:

ONSET AND AUGMENTATION OF LABOUR AND TYPE OF DELIVERY FOR WOMEN CONFINED IN WESTERN AUSTRALIA, 1993

Labour (women confined)	Type of delivery								Total	
	Spontaneous Vaginal		Assisted Vaginal		Elective Caesarean		Emergency Caesarean			
Spontaneous onset no Augmentation	7142	28.7	1046	4.2	-	-	795	3.2	8983	36.0
Spontaneous onset and Augmentation	4158	16.7	1322	5.3	-	-	505	2.0	5985	24.0
Induced onset	4525	18.2	1501	6.0	-	-	818	3.3	6844	27.5
No labour	-	-	-	-	2763	11.1	341	1.4	3104	12.5
TOTAL	15825	63.5	3869	15.5	2763	11.1	2459	9.9	24916	100.0

Excludes births less than 500 grams birthweight.

Women with multiple pregnancies are classified according to the features of the first twin/triplet.

5.3 Presentation

The presentation for the 24574 singleton confinements was identified as 23471 (95.5%) vertex, 970 (3.9%) breech, and 133 (0.5%) "other" presentations (Table 15).

Vertex presentations of singleton births were delivered vaginally in 82.4% of cases during 1993.

More than three quarters (83.8%) of total singleton births presenting by the breech were delivered by caesarean section (53.4% elective and 30.4% emergency caesarean section) (Table 15).

TABLE 15:

PRESENTATION AND TYPE OF DELIVERY FOR SINGLETON BIRTHS IN WESTERN AUSTRALIA, 1993

Type of Delivery	Presentation						Total	
	Vertex		Breech		Other			
	No.	%	No.	%	No.	%	No.	%
Normal	15698	66.9	20	2.1	13	9.8	15731	64.0
Vacuum	2115	9.0	-	-	3	2.3	2118	8.6
Forceps	1535	6.5	-	-	5	3.8	1540	6.3
Breech Manoeuvre	-	-	137	14.1	-	-	137	0.6
Elective Caesarean	2115	9.0	518	53.4	40	30.1	2673	10.9
Emergency Caesarean	2008	8.6	295	30.4	72	54.1	2375	9.7
TOTAL	23471	100.0	970	100.0	133	100.0	24574	100.0

Excludes births less than 500 grams birthweight.

5.4 Type of Delivery

Less than two thirds (63.5%) of the total women confined in 1993 had a spontaneous vaginal delivery. Vaginal deliveries were assisted for approximately one in six total confinements with 8.6% of women having a vacuum extraction and 6.4% a forcep delivery (Table 16, Figure V).

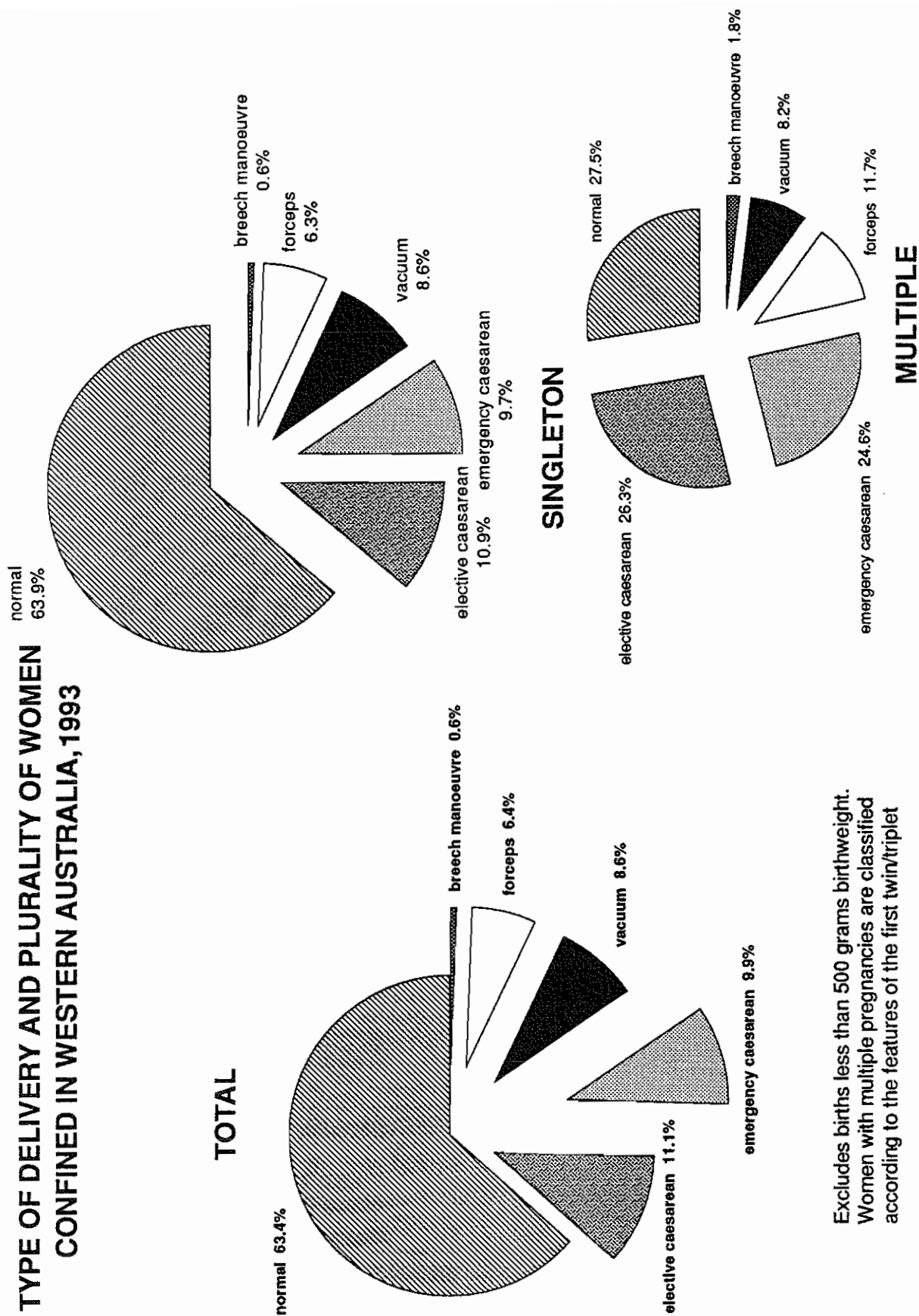
The type of delivery for each woman with multiple pregnancy was classified according to features of labour and delivery for the first twin/triplet. While eleven of the fourteen women with triplet pregnancies were delivered by caesarean section there were three women for whom the first twin was delivered vaginally and the second by emergency caesarean section.

Among women with a twin pregnancy, 163 (49.7%) were delivered by caesarean section, 73 (22.3%) had assisted vaginal deliveries and 92 (28.0%) delivered spontaneously.

Of the 5222 women who were delivered by caesarean section during 1993, almost one third (31.8%) had had a previous caesarean section delivery or other uterine surgery. Overall there were 1838 women confined recorded as having had a previous caesarean section delivery or other uterine surgery. Of these 1658 (90.2%) were delivered by caesarean section, 70 (3.8%) had assisted vaginal deliveries and 110 (6.0%) had a spontaneous vaginal delivery.

FIGURE V

**TYPE OF DELIVERY AND PLURALITY OF WOMEN
CONFINED IN WESTERN AUSTRALIA, 1993**



Excludes births less than 500 grams birthweight.
Women with multiple pregnancies are classified according to the features of the first twin/triplet

TABLE 16:

TYPE OF DELIVERY AND PLURALITY OF WOMEN CONFINED IN WESTERN AUSTRALIA, 1993

Type of Delivery	Plurality						Total	
	Singleton Pregnancy		Twin Pregnancy		Triplet Pregnancy			
	No.	%	No.	%	No.	%	No.	%
Normal	15731	64.0	92	28.1	2	14.3	15825	63.5
Vacuum	2118	8.6	28	8.5	-	-	2146	8.6
Forceps	1541	6.3	39	11.9	1	7.1	1581	6.4
Breech Manoeuvre	136	0.6	6	1.8	-	-	142	0.6
Elective Caesarean	2673	10.9	85	25.9	5	35.7	2763	11.1
Emergency Caesarean	2375	9.7	78	23.8	6	42.9	2459	9.9
TOTAL	24574	100.0	328	100.0	14	100.0	24916	100.0

Excludes births less than 500 grams birthweight.

Women with multiple pregnancies are classified according to the features of the first twin/triplet.

The incidence of caesarean section in Western Australia⁵ gradually increased over the past decade from 13.9% in 1984 and 19.3% in 1992 to 21.0% in 1993 (Table 51). The incidence of caesarean section elsewhere in Australia is as follows: Victoria⁶ 18.1% in 1992, Northern Territory⁷ 18.4% in 1992, South Australia⁸ 22.1% in 1992, New South Wales⁹ 16.6% in 1991, Australian Capital Territory⁹ 17.8% in 1991, Tasmania⁹ 16.7% in 1991 and Queensland⁹ 20.5% in 1991.

Consideration of the type of delivery of women confined and maternal parity shows that among nulliparous women, almost half (49.4%) had a spontaneous vaginal delivery, 28.4% required an assisted vaginal delivery and 22.3% were delivered by caesarean section. Among women with a parity of 5 or more, 80.1% delivered spontaneously and 16.0% had caesarean sections (Table 17).

TABLE 17:

TYPE OF DELIVERY AND PARITY OF WOMEN CONFINED IN WESTERN AUSTRALIA, 1993

Type of Delivery	Parity								Total	
	0		1-2		3-4		≥5			
Spontaneous Vaginal	4760	49.4	9044	71.4	1711	77.3	310	80.1	15825	63.5
Assisted Vaginal	2737	28.4	1023	8.1	94	4.3	15	3.9	3869	15.5
Caesarean Emergency	695	7.2	1798	14.2	239	10.8	31	8.0	2763	11.1
Caesarean Elective	1451	15.1	808	6.4	169	7.6	31	8.0	2459	9.9
TOTAL	9643	100.0	12673	100.0	2213	100.0	387	100.0	24916	100.0

Excludes births less than 500 grams birthweight.

Women with multiple pregnancies are classified according to the features of the first twin/triplet.

The indications for caesarean section were assessed by examination of complications of labour and delivery. For the 5222 women confined by caesarean section 8312 complications of labour and delivery were recorded. The distribution of complications is shown in Table 19. All women had at least one complication recorded and 44.8% had more than one complication recorded (Table 18).

TABLE 18:

FREQUENCY OF COMPLICATIONS OF LABOUR AND DELIVERY FOR WOMEN CONFINED BY CAESAREAN SECTION IN WESTERN AUSTRALIA, 1993

Number of complications of labour and delivery	Women confined by caesarean section	
1	2881	55.2
2	1720	32.9
3	493	9.4
4	116	2.2
5	12	0.2
TOTAL	5222	100.0

Assessment of complications of labour and delivery for women confined by caesarean section showed previous caesarean section or other uterine surgery (19.9%) and cephalopelvic disproportion (16.9%) as the principal indications for caesarean section confinement (Table 19).

TABLE 19:

COMPLICATIONS OF LABOUR AND DELIVERY FOR WOMEN CONFINED BY CAESAREAN SECTION IN WESTERN AUSTRALIA, 1993

Complications of Labour and Delivery	Caesarean Section				Total	
	Emergency		Elective			
	n	%	n	%	n	%
Umbilical Cord Complications	130	2.9	39	1.0	169	2.0
Cephalopelvic Disproportion	656	14.8	746	19.3	1402	16.9
Breech and other Malpresentations	424	9.5	638	16.5	1062	12.8
Previous Caesarean Section or other uterine surgery	297	6.7	1361	35.2	1658	19.9
Fetal Distress	812	18.3	45	1.2	857	10.3
Pregnancy Induced Disorders	624	14.0	434	11.2	1058	12.7
Obstruction or delayed labour	233	5.2	19	0.5	252	3.0
Abnormal Forces of Labour	578	13.0	-	-	578	7.0
Placental Disorders/Haemorrhage	526	11.8	294	7.6	820	9.9
Medical/Physiological	88	2.0	18	0.5	106	1.3
Infection	47	1.1	71	1.8	118	1.4
Previous poor obst. and / or reprod history	19	0.4	145	3.7	164	2.0
Other	10	0.2	58	1.5	68	0.8
TOTAL	4444	100.0	3868	100.0	8312	100.0

Note: The number of complications exceeds the number of women confined by caesarean section.

Of those women confined by caesarean section in Western Australia during 1993, the highest proportion were at metropolitan obstetric teaching and private hospitals. Overall, elective caesarean sections comprised 11.1% and emergency caesarean section 9.9% of women confined (Table 20).

TABLE 20:

PLACE OF CONFINEMENT AND CAESAREAN SECTION FOR WOMEN CONFINED IN WESTERN AUSTRALIA, 1993

Place of Birth	Caesarean Section						Total women confined		
	Elective women confined			Emergency women confined					
	No.		%	No.		%	No.	%	
Metropolitan									
Teaching	436	4656	9.4	687	4656	14.7	1123	4656	24.1
Departmental	726	7291	10.0	593	7291	8.1	1319	7291	18.1
Private	1059	6614	16.0	725	6614	11.0	1784	6614	90.7
Country									
Regional	272	2824	9.6	276	2824	9.8	548	2824	19.4
Private	81	540	15.0	53	540	9.8	134	540	24.8
Other	189	2810	6.7	125	2810	4.4	314	2810	11.2
Non Hospital	-	181	-	-	181	-	-	181	-
TOTAL	2763	24916	11.1	2459	24916	9.9	5222	24916	21.0

Excludes births less than 500 grams birthweight.

Caesarean section confinements increased with maternal age. This trend was found in nearly all categories of hospitals.

5.5 Anaesthesia/analgesia

There were 4809 (19.3%) women confined who received no pharmacological anaesthesia/analgesia during labour and delivery. Of these, 96.0% had a spontaneous vaginal delivery.

An epidural was administered to 8671 (34.8%) of women confined.

Lumbar epidural nerve blocks can be used for analgesia in labour and for anaesthesia during caesarean delivery, manual removal of a retained placenta or for perineal repair. The timing of an epidural is not recorded by the Midwives' Notification System data collection. Therefore this report cannot always determine the sequence of events. For example, if a woman has an epidural and a ten hour labour followed by a caesarean section, it is not recorded whether the epidural was administered during the labour for analgesia or late in the labour specifically to provide anaesthesia for the caesarean section.

In 1993, 2459 women had an emergency caesarean section and of these 1749 (71.1%) women had an epidural anaesthetic alone, and 100 (4.1%) had both an epidural and a general anaesthetic. Of the women delivering by elective caesarean section, 2282 (82.6%) had an epidural anaesthetic alone.

Epidurals were administered to 2284 women whose labour resulted in an assisted vaginal delivery and to 2219 women having a spontaneous vaginal delivery. A total of 1283 (5.1%) women received a general anaesthetic at some time during labour and delivery.

The recording of anaesthesia/analgesia during labour and delivery includes those procedures required for the third stage of labour. This explains in part the use of general anaesthesia for women with assisted or spontaneous vaginal deliveries (Table 21).

The category of anaesthesia/analgesia recorded as 'other' includes narcotic sedation IM or IV, inhalants and caudal or pudendal nerve blocks (Table 21).

TABLE 21:

ANAESTHESIA/ANALGESIA AND TYPE OF DELIVERY FOR WOMEN CONFINED IN WESTERN AUSTRALIA, 1993

Type of Anaesthesia/ Analgesia	Type of Delivery								Total	
	Emergency Caesarean		Elective Caesarean		Assisted Vaginal		Spontaneous Vaginal			
	No.	%	No.	%	No.	%	No.	%	No.	%
None	-	-	-	-	190	0.8	4619	18.5	4809	19.3
Epidural	1749	7.0	2282	9.2	2282	9.2	2215	8.9	8528	34.2
General	610	2.5	444	1.8	26	0.1	60	0.2	1140	4.6
Epidural and General	100	0.4	37	0.2	2	-	4	-	143	0.6
Other	-	-	-	-	1369	5.5	8927	35.8	10296	41.3
TOTAL	2459	9.9	2763	11.1	3869	15.5	15825	63.5	24916	100.0

Excludes births less than 500 grams birthweight.

Women with multiple pregnancies are classified according to the features of the first twin/triplet.

5.6 Hours of Established Labour

The recorded length of labour varied amongst those women who had a spontaneous onset and those whose labour was induced. Almost half (46.3%) of the women who had an induction of labour experienced between five and twelve hours of labour and more than half (52.7%) of the women with a spontaneous onset had between 5 and 12 hours of labour. There were 83 women (0.3%) of the total whose labour was recorded as more than 24 hours duration (Table 22).

TABLE 22:**HOURS OF ESTABLISHED LABOUR AND ONSET OF LABOUR OF WOMEN CONFINED IN WESTERN AUSTRALIA, 1993**

Hours of Labour	Onset of Labour			
	Spontaneous		Induction	
	No.	%	No.	%
<1	310	2.1	221	3.2
1-4	5280	35.5	3131	45.8
5-12	7893	52.7	3171	46.3
13-18	1148	7.7	272	4.0
19-24	241	1.6	41	0.6
>24	75	0.5	8	0.1
TOTAL	14968	100.0	6844	100.0

Excludes births less than 500 grams birthweight, 3104 (12.5%) women who did not experience labour, and 21 women for whom hours of established labour was not known.

Examination of type of delivery and hours of established labour showed that more than half (44.4%) of women confined had a labour lasting between 5 and 12 hours and of these 69.1% resulted in spontaneous delivery. Twelve percent of women did not establish in labour being confined by either elective or emergency caesarean section (Table 23).

5.7 Complications of Labour and Delivery

There were no complications of labour or delivery recorded for one third (39.2%) of the women confined in 1993. However, for women with multiple pregnancies only 17.0% of women were reported to have had no complications.

Among those women identified as having had a complication, fetal distress was recorded for 15.3% of singleton pregnancies and 9.6% of multiple pregnancies. Cephalopelvic disproportion was identified for 5.6% of all women confined (Table 24).

Other complications included 359 (1.4%) women with hypertension and 162 (0.7%) women with severe pre-eclampsia.

Prolonged first stage of labour was identified in 59 women (0.3% of those women who established labour or 0.2% of total women confined).

The second stage of labour was reported to be prolonged for 771 women (3.5% of women with established labour or 3.1% of total women confined). There were 52 additional women reported to have had prolonged labour with unspecified stage (0.2% of women with established labour or 0.2% of total women confined).

TABLE 23:

TYPE OF DELIVERY AND HOURS OF ESTABLISHED LABOUR FOR WOMEN CONFINED IN WESTERN AUSTRALIA, 1993

Type of Delivery	No Labour		<1		1-4		5-12		13-18		19-24		>24		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Normal	-	-	-	-	7355	87.5	7641	69.1	659	46.4	113	40.1	36	43.4	15804	63.5
Vacuum	-	-	-	-	386	4.6	1427	12.9	268	18.9	53	18.8	12	14.5	2146	8.6
Forceps	-	-	-	-	238	2.8	1078	9.7	215	15.1	42	14.9	8	9.6	1582	6.4
Breech Manoeuvre	-	-	-	-	67	0.8	63	0.6	9	0.6	2	0.7	1	1.2	142	0.6
Elective Caesarean	2743	89.0	-	-	-	-	-	-	-	-	-	-	-	-	2763	11.1
Emergency Caesarean	341	11.0	531	100.0	365	4.3	855	7.7	269	18.9	72	25.5	26	31.3	2459	9.9
TOTAL	3104	100.0	531	100.0	8411	100.0	11064	100.0	1420	100.0	282	100.0	83	100.0	24895	100.0

Excludes births less than 500 grams birthweight.

Excludes 21 women for whom the length of labour was unknown.

These data suggest significant morbidity in child bearing women. Furthermore, the Validation Study of the Midwives' Notification System⁴ data indicated that complications of labour and delivery tend to be under-reported.

Attempts to improve the completeness of this information continue with the follow-up system for missing or incomplete information and with the provision of the Guidelines¹ and ongoing education and feedback to midwives.

TABLE 24:

SELECTED COMPLICATIONS OF LABOUR AND DELIVERY AND PLURALITY OF WOMEN CONFINED IN WESTERN AUSTRALIA, 1993

	Plurality				Total	
	Singleton		Multiple		No.	% ³
	No.	% ¹	No.	% ²	No.	% ³
<u>Complications of Labour and Delivery</u> <i>(NB a woman may have > 1 complication)</i>						
Precipitate Delivery	1242	5.1	5	1.5	1247	5.0
Fetal Distress	3756	15.3	33	9.6	3789	15.2
Prolapsed Cord	57	0.2	3	0.9	60	0.2
Cord Tightly Around Neck	1888	7.7	7	2.0	1895	7.6
Cephalopelvic Disproportion	1384	5.6	1	0.3	1385	5.6
Post Partum Haemorrhage	1841	7.5	83	24.3	1924	7.7
Other	9146	37.2	249	72.8	9395	37.7
<u>No Complications of Labour and Delivery</u>	9714	39.5	58	17.0	9772	39.2

Excludes births less than 500 grams birthweight.

¹ Percentage of women with a singleton pregnancy.

² Percentage of women with a multiple pregnancy.

³ Percentage of total women.

5.8 Repair of Perineum and/or Vagina

There were 11,258 (45.5%) of all women confined or 6050 (30.7%) of women delivering vaginally who did not require any form of perineal or vaginal repair following delivery. Among women who did, 5910 (23.7%) had an episiotomy repaired, 6000 (24.1%) a first or second degree tear and for 294 (1.2%) a third or fourth degree tear needed repair. A further 1454 (5.8%) women were reported to have had repair of other vaginal and/or labial trauma (Table 25).

TABLE 25

TYPE OF DELIVERY AND REPAIR OF PERINEUM AND/OR VAGINA OF WOMEN CONFINED IN WESTERN AUSTRALIA, 1993

Type of Delivery	Repair of Perineum and/or Vagina							Total
	None	Episiotomy	1° or 2° Tear	3° or 4° Tear	Other			
Normal	5720	3330	5295	120	1360	93.5	15825	63.5
Vacuum	231	1216	556	71	72	5.0	2146	8.6
Forceps	55	1271	133	102	20	1.4	1581	6.4
Breech Manoeuvre	44	81	14	1	2	0.1	142	0.6
Elective Caesarean	2763	-	-	-	-	-	2763	11.1
Emergency Caesarean	2445	12	2	-	-	-	2459	9.9
Total	11258	5910	6000	294	1454	100.0	24916	100.0

6. BABY CHARACTERISTICS

6.1 Births

A Notification of Case Attended Form 2 (Appendix A) was received for 25,266 births of 500 grams birthweight or more in 1993.

Singleton births numbered 24574 (97.3%) and multiple births 692 (2.7%). The 692 multiple births comprised 655 twins, (including one twin whose sibling's birthweight was <500 grams), and 37 triplets (including five triplets whose siblings' birthweights were <500 grams) (Tree Diagram 1).

The rates for high order multiple births gradually increased this decade until 1989 and then declined. For example, the rate of triplet births increased from 18 (0.08%) babies in 1984 to 54 (0.21%) in 1989. The number decreased to 32 (0.12%) in 1992 and rose to 37 (0.15%) in 1993. Much of the variation in the multiple birth rates has been due to infertility treatments. Further information on trends in multiple births over the past 10 years is provided in section 7 (Table 51).

6.2 Livebirths

The number of livebirths in Western Australia increased gradually over the ten year period from 1981-1990⁵. In 1991 there was a 4.0% decrease in the actual number from the 1990 figure followed by a 1.4% increase in the 1991 actual number for 1992. The actual number remained the same in 1993. (Table 51, Figure VIII).

6.3 Crude Birth Rate

The crude birth rate was 15.0/1000 population in 1993. This calculation is based on livebirth numbers from the Midwives' Notification System and population data from the Australian Bureau of Statistics, Cat.No 3101.0 (Table 51, Figure IX).

6.4 Sex

There were 13063 (51.7%) male births and 12203 (48.3%) female births during 1993. (A male:female ratio of 1.07)

The assessment of condition at birth showed that 61.0% of stillbirths and 51.7% of livebirths were male.

6.5 Condition at Birth

Of the total 25,266 births, 25,143 were liveborn and 123 were stillborn (Table 26).

There were significant racial differences in stillbirth rates. (Caucasian 4.4/1000 total Caucasian births, Aboriginal 8.3/1000 total Aboriginal births and for babies of women of 'Other' races 8.0/1000 total births. Table 26). Trend data for stillbirth rates and maternal race are provided in section 7 (Table 51).

TABLE 26:

CONDITION AT BIRTH AND MATERNAL RACE OF BIRTHS IN WESTERN AUSTRALIA, 1993

Race	Condition at Birth				Total Births		Stillbirth Proportion/1000 Total Births
	Livebirth		Stillbirth		No.	%	
	No.	%	No.	%			
Caucasian	21973	87.4	97	78.9	22070	87.4	4.4
Aboriginal	1432	5.7	12	9.8	1444	5.7	8.3
Other	1738	6.9	14	11.4	1752	6.9	8.0
TOTAL	25143	100.0	123	100.0	25266	100.0	4.9

Excludes births less than 500 grams birthweight.

The majority of stillbirths (81.3%) were delivered in metropolitan hospitals and almost half (46.3%) in a metropolitan obstetric teaching hospital. This reflects the referral for delivery to a tertiary centre of mothers with high risk pregnancies or with fetal death in utero (Table 27).

TABLE 27:

PLACE OF BIRTH AND CONDITION AT BIRTH IN WESTERN AUSTRALIA, 1993

Place of Birth	Condition at Birth				Stillbirth Rate/1000 Total Births	Total	
	Livebirth		Stillbirth			No.	%
	No.	%	No.	%			
Metropolitan							
¹ Teaching	4775	19.0	57	46.3	11.8	4832	19.1
Department	7315	29.1	26	21.1	3.5	7341	29.1
Private	6692	26.6	17	13.8	2.5	6709	26.6
Country							
² Regional	2832	11.3	13	10.6	4.6	2845	11.3
Private	541	2.2	2	1.6	3.7	543	2.2
³ Other	2807	11.2	8	6.5	2.8	2815	11.1
Non-Hospital							
⁴ BBA	79	0.3	-	-	-	79	0.3
Homebirths	102	0.4	-	-	-	102	0.4
TOTAL	25143	100.0	123	100.0	4.9	25266	100.0

Excludes births less than 500 grams birthweight.

¹ Teaching Hospital - University Medical School (Teaching Hospital Act 1955).

² Country Regional Hospital - Government Hospital with private and public beds.

³ Other Country Hospitals - includes Government District and Board Hospitals.

⁴ BBA (born before arrival at hospital).

6.6 Apgar Score at One Minute and Five Minutes

More than two thirds of livebirths (72.9%) had a recorded Apgar Score at one minute of 8-10, while 565 (2.2%) livebirths had an Apgar Score of three or less at one minute of life (Table 28).

TABLE 28:

APGAR SCORE AT ONE MINUTE AND TIME TO SPONTANEOUS RESPIRATION OF LIVEBIRTHS IN WESTERN AUSTRALIA, 1993

Time to Spontaneous Respiration	Apgar Score at 1 Minute								Total	
	0		1-3		4-7		8-10		No.	%
	No.	%	No.	%	No.	%	No.	%		
≤1	-	-	17	3.0	3557	57.4	17827	97.2	21401	85.3
2-3	-	-	83	14.7	1883	30.4	455	2.5	2421	9.6
4-6	-	-	132	23.4	315	5.1	16	0.1	463	1.8
7-10	-	-	21	3.7	44	0.7	3	-	68	0.3
>10	-	-	8	1.4	3	-	1	-	12	-
Intubation ¹	-	-	304	53.8	393	6.3	30	0.2	727	2.9
TOTAL	-	-	565	100.0	6195	100.0	18332	100.0	25092	100.0

Excludes births less than 500 grams birthweight.

Excludes 51 liveborn babies for whom Apgar Score at 1 minute and/or T.S.R. was unknown.

¹ These babies were intubated at birth and time to spontaneous respiration was not recorded.

The majority of livebirths, (96.4%) had a recorded Apgar Score at five minutes of 8-10, and 860 (3.4%) livebirths had an Apgar Score of seven or less at five minutes of life (Table 29).

TABLE 29:

APGAR SCORE AT FIVE MINUTES AND TIME TO SPONTANEOUS RESPIRATION OF LIVEBIRTHS IN WESTERN AUSTRALIA, 1993

Time to Spontaneous Respiration	Apgar Score at 5 Minute								Total	
	0		1-3		4-7		8-10		No.	%
	No.	%	No.	%	No.	%	No.	%		
≤1	-	-	-	-	134	16.2	21271	87.8	21405	85.3
2-3	-	-	-	-	173	20.9	2248	9.3	2421	9.6
4-6	-	-	3	8.8	135	16.3	325	1.3	463	1.8
7-10	-	-	2	5.9	57	6.9	9	-	68	0.3
>10	-	-	2	5.9	9	1.1	1	-	12	-
Intubation ¹	-	-	27	79.4	318	38.5	382	1.6	727	2.9
TOTAL	-	-	34	100.0	826	100.0	24236	100.0	25096	100.0

Excludes births less than 500 grams birthweight.

Excludes 47 liveborn babies for whom Apgar Score at 5 minutes and/or T.S.R. was unknown.

¹ These babies were intubated at birth and time to spontaneous respiration was not recorded.

6.7 Time to Spontaneous Respiration

Eighty five percent of all livebirths were recorded as having established spontaneous respiration within the first minute of life. Eleven percent of livebirths required between two and six minutes to establish respirations and 80 babies (0.3%) needed seven minutes or more. There were 727 (2.9%) livebirths who were intubated following delivery and for these the time to establish spontaneous respiration is unknown (Table 29).

6.8 Resuscitation

Almost one third (32.1%) of the 25,143 liveborn babies in 1993 received some form of resuscitation at birth. Those babies who received no resuscitation numbered 17067 (67.9%). Resuscitation procedures such as intubation or bag and mask were used for 2455 (9.8%) of births and another 4789 (19.0%) babies received oxygen only.

When resuscitation and Apgar Scores at 5 minutes were examined it was found that 67.5% of the babies with an Apgar Score of 1-3 and 38.5% of those with an Apgar Score of 4-7 were intubated (Table 30).

TABLE 30:

RESUSCITATION METHODS AND FIVE MINUTE APGAR SCORE OF LIVEBIRTHS IN WESTERN AUSTRALIA, 1993

Resuscitation	Apgar Score at 5 Minutes								Total	
	0		1-3		4-7		8-10		No.	%
	No.	%	No.	%	No.	%	No.	%		
None	2	100.0	6	15.0	20	2.4	17004	70.2	17067	67.9
Oxygen Only	-	-	1	2.5	154	18.6	4634	19.1	4789	19.0
Intubation	-	-	27	67.5	318	38.5	382	1.6	727	2.9
Bag and Mask	-	-	3	7.5	296	35.8	1429	5.9	1728	6.9
Other	-	-	3	7.5	39	4.7	789	3.3	831	3.3
TOTAL	2	100.0	40	100.0	827	100.0	24238	100.0	25107	100.0

Excludes births less than 500 grams birthweight.

Excludes 36 babies for whom Apgar Score at 5 minutes was unknown.

6.9 Birthweight

Over two thirds (67.1) of all babies born weighed between 3000 and 3999 grams at birth and the average birthweight was 3353 grams. The percentage of low birthweight babies (less than 2500 grams) was 6.2% and very low birthweight (less than 1500 grams) was 1.1% of the total births. Information on low birthweight trends for the past 10 years is provided in section 7 (Table 51).

Low birthweight among Aboriginal births was 12.4%, more than twice that of caucasian births of whom only 5.8% were low birthweight (Table 31).

TABLE 31:

BIRTHWEIGHT DISTRIBUTION AND MATERNAL RACE OF BIRTHS IN WESTERN AUSTRALIA, 1993

Birthweight (Grams)	Maternal Race						Total	
	Caucasian		Aboriginal		Other		No.	%
	No.	%	No.	%	No.	%	No.	%
500 - 999	91	0.4	18	1.3	5	0.3	114	0.5
1000 - 1499	111	0.5	32	2.2	16	0.9	159	0.6
1500 - 1999	248	1.1	28	1.9	20	1.4	296	1.2
2000 - 2499	834	3.8	101	7.0	73	4.2	1008	4.0
<2500	1284	5.8	179	12.4	114	6.5	1577	6.2
2500 - 2999	3207	14.5	338	23.4	388	22.2	3933	15.6
3000 - 3499	8173	37.0	516	35.7	721	41.2	9410	37.2
3500 - 3999	6845	31.1	305	21.1	400	22.8	7550	29.9
4000 - 4499	2203	10.1	91	6.3	113	6.5	2407	9.5
≥4500	358	1.6	15	1.0	16	0.9	389	1.5
TOTAL	22070	100.0	1444	100.0	1752	100.0	25266	100.0

Excludes births less than 500 grams birthweight.

Mean = 3353 grams. Standard Deviation = 578 grams.

Consideration of condition at birth showed that livebirths represented 99.5% and stillbirths 0.5% of total births.

Among the 1577 low birthweight babies (less than 2500 grams birthweight), 1498 (95.0%) were liveborn and 79 (5.0%) were stillborn. This meant that while 64.2% of stillbirths were of low birthweight only 6.0% of livebirths were in the low birthweight category (Table 32).

Singleton births showed similar percentages to total births. Among low birthweight babies there were 1149 livebirths and 76 stillbirths. For stillbirths 63.3% were low birthweight and among livebirths 4.7% were in this category (Table 33).

For multiple births, there were 349 liveborn and 3 stillborn in the low birthweight group. All stillborn multiple births were of low birthweight (Table 34).

When categories of low birthweight were examined from 1984 to 1993 it was apparent that during this time births less than 1000 grams represented 0.3% to 0.7% of the total births. For those babies whose birthweight was less than 1500 grams the percentage varied from 0.9% to 1.3% of the total births. Those babies who weighed less than 2500 grams accounted for between 6.0% and 6.3% of the total births, the exception being an increase in 1989 to 6.6%, largely due to the increased number of multiple births during that year (section 7, Table 51).

TABLE 32:

BIRTHWEIGHT DISTRIBUTION AND CONDITION AT BIRTH OF TOTAL BIRTHS IN WESTERN AUSTRALIA, 1993

Birthweight (Grams)	Condition at Birth				Total	
	Livebirths		Stillbirths		No.	%
	No.	%	No.	%		
500 - 999	82	0.3	32	26.0	114	0.5
1000 - 1499	143	0.6	16	13.0	159	0.6
1500 - 1999	281	1.2	15	12.2	296	1.2
2000 - 2499	992	4.0	16	13.0	1008	4.0
<2500	1498	6.0	79	64.2	1577	6.2
2500 - 2999	3915	15.6	18	14.6	3933	15.6
3000 - 3499	9397	37.4	13	10.6	9410	37.2
3500 - 3999	7541	30.0	9	7.3	7550	29.9
4000 - 4499	2405	9.6	2	1.6	2407	9.5
≥4500	387	1.5	2	1.6	389	1.5
TOTAL	25143	100.0	123	100.0	25266	100.0

Excludes births less than 500 grams birthweight

TABLE 33:

SINGLETON BIRTHS IN WESTERN AUSTRALIA, 1993

Birthweight (Grams)	Condition at Birth				Total	
	Livebirths		Stillbirths		No.	%
	No.	%	No.	%		
500 - 999	56	0.2	32	26.7	88	0.4
1000 - 1499	103	0.4	14	11.7	117	0.5
1500 - 1999	195	0.8	14	11.7	209	0.9
2000 - 2499	795	3.3	16	13.3	811	3.3
<2500	1149	4.7	76	63.3	1255	5.0
2500 - 2999	3673	15.0	18	15.0	3691	15.0
3000 - 3499	9314	38.1	13	10.8	9327	38.0
3500 - 3999	7527	30.8	9	7.5	7536	30.7
4000 - 4499	2404	9.8	2	1.7	2406	9.8
≥4500	387	1.6	2	1.7	389	1.6
TOTAL	24454	100.0	120	100.0	24574	100.0

Excludes births less than 500 grams birthweight

TABLE 34:

MULTIPLE BIRTHS IN WESTERN AUSTRALIA, 1993

Birthweight (Grams)	Condition at Birth				Total	
	Livebirths		Stillbirths		No.	%
	No.	%	No.	%	No.	%
500 - 999	26	3.8	-	-	26	3.8
1000 - 1499	40	5.8	2	66.7	42	6.1
1500 - 1999	86	12.5	1	33.3	87	12.6
2000 - 2499	197	28.6	-	-	197	28.5
<2500	349	50.7	3	100.0	352	50.9
2500 - 2999	242	35.1	-	-	242	35.0
3000 - 3499	83	12.1	-	-	83	12.0
3500 - 3999	14	2.0	-	-	14	2.0
4000 - 4499	1	0.2	-	-	1	0.1
≤4500	-	-	-	-	-	-
TOTAL	689	100.0	3	100.0	692	100.0

Excludes births less than 500 grams birthweight

Trend data on low birthweight for babies of Aboriginal and non-Aboriginal women from 1984 to 1993 are provided in section 7. These indicate that although the percentages have been reasonably stable, Aboriginal low birthweight is on average more than twice that for babies of non-Aboriginal women (Table 51, Figure VII).

6.10 Gestation

Preterm birth (less than 37 weeks gestation) occurred for 1752 (6.9%) of the total births in 1993 (Table 35). When examined for singleton births only, 1401 (5.7) babies were preterm (Table 36). Of the 692 multiple births, half (352, 50.9%) were preterm (Table 37).

Gestational age was estimated by clinical assessment of each newborn infant by the attending midwife.

TABLE 35:

GESTATION AND BIRTHWEIGHT OF TOTAL BIRTHS IN WESTERN AUSTRALIA, 1993

Birthweight (Grams)	Gestation Weeks										Total	
	20 - 27		28 - 32		33 - 36		37 - 42		≥43		No.	%
	No.	%	No.	%	No.	%	No.	%	No.	%		
500 - 999	89	84.0	25	9.5	-	-	-	-	-	-	114	0.5
1000 - 1499	17	16.0	117	44.5	20	1.5	5	-	-	-	159	0.6
1500 - 1999	-	-	91	34.6	168	12.2	37	0.2	-	-	296	1.2
2000 - 2499	-	-	27	10.3	510	36.9	471	2.2	-	-	1008	4.0
<2500	106	100.0	260	98.8	698	50.5	513	2.2	-	-	1577	6.2
2500 - 2999	-	-	2	0.8	498	36.0	3433	14.6	-	-	3933	15.6
3000 - 3499	-	-	1	0.4	162	11.7	9241	39.3	6	35.3	9410	37.2
3500 - 3999	-	-	-	-	21	1.5	7522	32.0	7	41.2	7550	29.9
4000 - 4499	-	-	-	-	4	0.3	2399	10.2	4	23.5	2407	9.5
≥4500	-	-	-	-	-	-	389	1.7	-	-	389	1.5
TOTAL	106	100.0	263	100.0	1383	100.0	23497	100.0	17	100.0	25266	100.0

Excludes births < 500 grams birthweight.

TABLE 36:

GESTATION AND BIRTHWEIGHT OF SINGLETON BIRTHS IN WESTERN AUSTRALIA, 1993

Birthweight (Grams)	Gestation Weeks										Total	
	20 - 27		28 - 32		33 - 36		37 - 42		≥43		No.	%
	No.	%	No.	%	No.	%	No.	%	No.	%		
500 - 999	69	86.3	19	9.5	-	-	-	-	-	-	88	0.4
1000 - 1499	11	13.7	87	43.5	14	1.3	5	-	-	-	117	0.5
1500 - 1999	-	-	65	32.5	115	10.3	29	0.1	-	-	209	0.9
2000 - 2499	-	-	26	13.0	383	34.2	402	1.7	-	-	811	3.3
<2500	80	100.0	197	98.5	512	45.8	436	1.8	-	-	1225	5.0
2500 - 2999	-	-	2	1.0	430	38.4	3259	14.1	-	-	3691	15.0
3000 - 3499	-	-	1	0.5	155	13.8	9165	39.6	6	35.3	9327	38.0
3500 - 3999	-	-	-	-	20	1.8	7509	32.4	7	41.2	7536	30.7
4000 - 4499	-	-	-	-	4	0.4	2398	10.4	4	23.5	2406	9.8
≥4500	-	-	-	-	-	-	389	1.7	-	-	389	1.6
Total	80	100.0	200	100.0	1121	100.0	23156	100.0	17	100.0	24574	100.0

Excludes births < 500 grams birthweight.

TABLE 37:

GESTATION AND BIRTHWEIGHT OF MULTIPLE BIRTHS IN WESTERN AUSTRALIA, 1993

Birthweight (Grams)	Gestation Weeks										Total	
	20 - 27		28 - 32		33 - 36		37 - 42		≥ 43		No.	%
	No.	%	No.	%	No.	%	No.	%	No.	%		
500 - 999	20	76.9	6	9.5	-	-	-	-	-	-	26	3.8
1000 - 1499	6	23.1	30	47.6	6	2.3	-	-	-	-	42	6.1
1500 - 1999	-	-	26	41.3	53	20.2	8	2.4	-	-	87	12.6
2000 - 2499	-	-	1	1.6	127	48.5	69	20.2	-	-	197	28.5
<2500	26	100.0	63	100.0	186	71.0	77	22.6	-	-	352	50.9
2500 - 2999	-	-	-	-	68	26.0	174	51.0	-	-	242	35.0
3000 - 3499	-	-	-	-	7	2.7	76	22.3	-	-	83	12.0
3500 - 3999	-	-	-	-	1	0.4	13	3.8	-	-	14	2.0
4000 - 4499	-	-	-	-	-	-	1	0.3	-	-	1	0.1
≥4500	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL	26	100.0	63	100.0	262	100.0	341	100.0	-	-	692	100.0

Excludes births < 500 grams birthweight.

6.11 Vitamin K - Administration of first dose

Monitoring of the administration mode of Vitamin K commenced mid year in 1993. During the second half of 1993 the majority of babies (83.3%) received their first dose of Vitamin K orally. However, as the year progressed the percentage of babies receiving Vitamin K IM/IV/IA increased from 3.1% in July to 19.7% in December 1993 (Table 38).

TABLE 38:

ADMINISTRATION OF VITAMIN K FIRST DOSE IN WESTERN AUSTRALIA, JULY - DECEMBER 1993

Month of Birth	Mode of Administration								Total	
	Oral		IMI/IV/IA		Not Given		Unknown		No.	%
	No.	%	No.	%	No.	%	No.	%		
July	1907	88.6	67	3.1	82	3.8	97	4.5	2153	100.0
August	1788	88.3	80	4.0	45	2.2	113	5.6	2026	100.0
September	2000	86.5	105	4.5	46	2.0	160	6.9	2311	100.0
October	1831	85.5	182	8.5	49	2.3	80	3.7	2142	100.0
November	1498	75.7	325	16.4	34	1.7	123	6.2	1980	100.0
December	1522	74.4	403	19.7	30	1.5	91	4.4	2046	100.0
Total	10546	83.3	1162	9.2	286	2.3	664	5.2	12658	100.0

* Excludes births less than 500 grams birthweight

6.12 Birth Defects

Data on selected birth defects included in this report are made available by the Western Australian Birth Defects Registry¹⁰ (Table 39).

Recording of a birth defects on the Notification of Case Attended (Midwives) Form 2, provides an initial data source for the Birth Defects Registry. Reports and further details on birth defects in Western Australia are available upon request to the Registry.

TABLE 39:

BIRTHS IDENTIFIED WITH BIRTH DEFECTS IN WESTERN AUSTRALIA, 1989-1993

Diagnostic Category (and British Paediatric Association Code)	1989		1990		1991		1992		1993	
	No.	Rate ¹	No.	Rate ¹	No.	Rate ¹	No.	Rate ¹	No.	Rate ¹
Nervous System Defects (74000-74299)	100	3.9	90	3.5	103	4.1	86	3.4	82	3.2
Cardiovascular Defects (74500-74799)	243	9.5	301	11.6	246	9.8	271	10.7	273	10.8
Respiratory System Defects (74800-74899)	22	0.9	12	-	23	0.9	14	0.6	25	1.0
Gastro-Intestinal Defects (74900-75199)	177	6.9	161	6.2	128	5.1	159	6.3	144	5.7
Uro-Genital Defects (75200-75399)	367	14.3	353	13.6	328	13.1	295	11.6	218	8.6
Musculo-Skeletal Defects (75400-75699)	335	13.1	329	12.6	359	14.3	344	13.6	326	12.9
Chromosome Defects (75800-75899)	58	2.3	71	2.7	81	3.2	82	3.2	88	3.5

¹ Rate per 1000 total births. (Preliminary data).

Rates have not been calculated where number of cases with defect is less than 13.

SOURCE: Birth Defects Registry.

6.13 Special Care

Although there are difficulties relating to the definition of special care units in Western Australia, data from the Midwives' Notification System indicating special care have been included to identify the need of services for newborn babies. It is not possible from the current data to differentiate those babies who received neonatal intensive care. In an attempt to resolve this difficulty, data on Special Care provided in this report relates only to babies admitted to Level 2 or Level 3 Special Care nurseries.

Among the 25,143 livebirths, a total of 1016 (4.0%) babies were reported to have received special care for one day or more. Of these, 814 were singleton births (80.1%) and 202 (19.9%) were multiple births. The rates for these babies were 33.3/1000 singleton livebirths and 293.2/1000 multiple livebirths.

Eighteen percent of babies admitted to special care nurseries stayed more than 28 days and 72 (7.0%) babies stayed longer than 60 days. Multiple birth babies stayed longer in special care units, with 65.3% staying 8 days or more. Babies whose length of stay in Special Care Nurseries was less than one day are not recorded (Table 40).

TABLE 40:

PLURALITY AND LENGTH OF STAY IN SPECIAL CARE OF LIVEBIRTHS IN WESTERN AUSTRALIA, 1993

Length ¹ of Stay (Days)	Plurality				Total	
	Singleton		Multiple		No.	%
	No.	%	No.	%		
1	208	25.6	26	12.9	234	23.0
2	64	7.9	13	6.4	77	7.6
3	53	6.5	7	3.5	60	5.9
4	40	4.9	8	4.0	48	4.7
5	36	4.4	7	3.5	43	4.2
6	30	3.7	2	1.0	32	3.2
7	24	3.0	7	3.5	31	3.1
8-14	138	17.0	37	18.3	175	17.2
15-20	57	7.0	23	11.4	80	7.9
21-28	45	5.5	11	5.5	56	5.5
29-60	73	9.0	35	17.3	108	10.6
61-90	29	3.6	17	8.4	46	4.5
91-180	16	2.0	8	4.0	24	2.4
>180	1	0.1	1	0.5	2	0.2
TOTAL	814	100.0	202	100.0	1016	100.0

Excludes births less than 500 grams birthweight.

¹Excludes babies with <24 hour length of stay in Special Care Nurseries.

6.14 Neonatal Transfers

Among the 25,143 livebirths, 1142 (4.5%) babies were transferred to another hospital after birth. The overall length of hospital stay following a baby's transfer from the hospital of birth is not recorded on the Midwives' Notification System.

These data include emergency inter-hospital transfers to special care units immediately following birth and those babies who were transferred to another hospital prior to being discharged home.

6.15 Length of Stay

The majority of liveborn babies (20082, 79.9%) stayed in their hospital of birth from two to seven days and another 3075 (12.2%) stayed between 8 and 28 days. A further 230 (0.9%) babies stayed longer than 28 days (Table 41).

The length of stay of those babies who were neither transferred nor died in the hospital of birth is shown on Table 42. Among these surviving liveborn babies, 2861 (11.9%) stayed 8 to 28 days and 174 (0.7%) stayed for longer than 28 days.

TABLE 41:

LENGTH OF STAY IN HOSPITAL OF BIRTH AND BIRTHWEIGHT DISTRIBUTION OF LIVEBIRTHS IN WESTERN AUSTRALIA, 1993

Birthweight (Grams)	Length of Stay (Days)										Total	
	≥1	2-7	8-14	15-20	21-28	≥28	No.	%	No.	%	No.	%
500 - 999	26	2	2	-	-	-	52	22.6	82	0.3		
1000 - 1499	13	4	2	10	15	99	143	43.0	143	0.6		
1500 - 1999	28	44	77	52	35	45	281	19.6	281	1.2		
2000 - 2499	59	530	287	88	22	6	992	2.6	992	4.0		
<2500	126	580	368	150	72	202	1498	87.8	1498	6.0		
2500 - 2999	289	3018	561	32	8	7	3915	3.0	3915	15.6		
3000 - 3499	659	7798	907	19	3	11	9397	4.8	9397	37.4		
3500 - 3999	510	6354	658	12	-	7	7541	3.0	7541	30.0		
4000 - 4499	155	2017	228	2	1	2	2405	0.9	2405	9.6		
≥4500	17	315	54	-	-	1	387	0.4	387	1.5		
TOTAL	1756	20082	2776	215	84	230	25143	100.0	25143	100.0		

Excludes births less than 500 grams birthweight
Includes homebirths in midwives' care

TABLE 42:

LENGTH OF STAY IN HOSPITAL BY BIRTHWEIGHT DISTRIBUTION OF SURVIVING LIVEBIRTHS IN WESTERN AUSTRALIA, 1993

Birthweight (Grams)	Length of Stay (Days)												Total	
	≤1	2-7	8-14	15-20	21-28	≥28	No.	%	No.	%	No.	%	No.	%
500 - 999	-	-	-	-	-	-	35	20.1	-	-	35	20.1	35	0.2
1000 - 1499	-	3	1	2	2	3.0	72	41.4	2	3.0	72	41.4	80	0.3
1500 - 1999	-	26	37	34	25	41.7	35	20.1	25	41.7	35	20.1	157	0.7
2000 - 2499	14	469	221	77	22	36.7	4	2.3	22	36.7	4	2.3	807	3.4
<2500	14	480	259	113	49	81.7	146	83.9	49	81.7	146	83.9	1079	4.5
2500 - 2999	194	2927	546	29	7	11.7	7	4.0	29	16.8	7	4.0	3710	15.5
3000 - 3499	522	7672	892	19	3	5.0	11	6.3	19	11.0	11	6.3	9119	38.1
3500 - 3999	425	6244	653	10	-	-	7	4.0	10	5.8	7	4.0	7339	30.6
4000 - 4499	128	1982	226	2	1	1.7	2	1.1	2	1.2	2	1.1	2341	9.8
≥4500	9	313	52	-	-	-	1	0.6	-	-	1	0.6	375	1.6
TOTAL	1292	19636	2628	173	60	100.0	174	100.0	60	100.0	174	100.0	23963	100.0

Excludes births less than 500 grams birthweight

Excludes inter-hospital transfers (n=1142) and deaths in hospital of birth (n=38).

Includes homebirths in midwives' care

6.16 Perinatal Mortality

There were 123 stillbirths and 62 neonatal deaths of babies born during 1993. The perinatal mortality rate for Western Australia was 7.3/1000 total births.

Perinatal mortality calculations in recent reports are based on the year of birth whereas prior to 1984 they were based on the year of death. Trend data for perinatal mortality over the last 10 years are provided in section 7 (Table 51, Figure X).

Tables 43 and 44 give perinatal mortality rates using World Health Organisation definitions.

The perinatal mortality rate in 1993 for babies of Aboriginal women (13.2/1000) was almost twice that for babies born to non-Aboriginal women (7.0/1000) (Table 45 and Table 51, Figure XI).

TABLE 43:

WESTERN AUSTRALIAN PERINATAL MORTALITY USING BIRTHWEIGHT CRITERIA, 1993

Birthweight	Stillbirth Rate/1000 Total Births	Neonatal Death Rate/1000 Livebirths	Perinatal Death Rate/1000 Total Births
≥400 grams*	5.5	2.9	8.4
≥500 grams*	4.9	2.5	7.3

* International Definition of World Health Organisation

TABLE 44:

WESTERN AUSTRALIAN PERINATAL MORTALITY USING GESTATION CRITERIA, 1993

Gestation	Stillbirth Rate/1000 Total Births	Neonatal Death Rate/1000 Livebirths	Perinatal Death Rate/1000 Total Births
≥20 weeks*	6.9	3.1	10.0
≥22 weeks*	6.1	2.7	8.9

*International Definition of World Health Organisation

SOURCE: MIDWIVES' NOTIFICATION SYSTEM
HOSPITAL MORBIDITY SYSTEM
COMMUNITY AND CHILD HEALTH SYSTEM
REGISTRAR GENERAL'S OFFICE

TABLE 45:

STILLBIRTHS, NEONATAL AND PERINATAL MORTALITY RATES BY MATERNAL RACE IN WESTERN AUSTRALIA, 1993

Type of Death	Maternal Race			Total
	Caucasian	Aboriginal	Other	
Stillbirth/1000 total births	4.4	8.3	8.0	4.9
Neonatal/1000 livebirths	2.2	4.9	3.1	2.5
Perinatal/1000 total births	6.6	13.2	9.7	7.3

Excludes births less than 500 grams birthweight

Data from 1976 to 1993 on stillbirth, neonatal and perinatal mortality rates in Western Australia shows there has been an overall decline during this decade. Aboriginal rates have declined but remain approximately double the non-Aboriginal figures (Table 51).

More than one third (36.8%) of perinatal deaths had a birthweight of less than 1000 grams. Overall 64.2% of stillbirths and 91.9% of neonatal deaths weighed less than 2500 grams at birth (Table 46).

TABLE 46:

BIRTHWEIGHT DISTRIBUTION OF STILLBIRTHS, NEONATAL AND PERINATAL DEATHS IN WESTERN AUSTRALIA, 1993

Birthweight (grams)	Stillbirths		Neonatal Deaths		Perinatal Deaths	
	No.	%	No.	%	No.	%
500 - 999	32	26.0	36	58.1	68	36.8
1000 - 1499	16	13.0	4	6.5	20	10.8
1500 - 1999	15	12.2	7	11.3	22	11.9
2000 - 2499	16	13.0	10	16.1	26	14.1
<2500	79	64.2	57	91.9	136	73.5
2500 - 2999	18	14.6	3	4.8	21	11.4
3000 - 3499	13	10.6	9	14.5	22	11.9
3500 - 3999	9	7.3	2	3.2	11	5.9
≥4000	4	3.2	1	1.6	5	2.7
Total	123	100.0	62	100.0	185	100.0

Excludes births less than 500 grams birthweight.

Amongst the 692 multiple births, there were 12 perinatal deaths. Of these, 3 were stillborn and 9 were neonatal deaths (Table 47).

The stillbirth rate for multiple births (4.3/1000) was similar to that for singleton births (4.9/1000).

The neonatal mortality rate for multiple births (13.1/1000) was six times that for singleton births (2.2/1000) (Table 47).

TABLE 47:

PLURALITY OF STILLBIRTHS, NEONATAL AND PERINATAL DEATHS AMONGST BIRTHS IN WESTERN AUSTRALIA, 1993

Plurality	Stillbirths		Neonatal Deaths		Perinatal Deaths	
	No.	Rate ¹	No.	Rate ²	No.	Rate ¹
Singleton	120	4.9	53	2.2	173	7.0
Multiple	3	4.3	9	13.1	12	17.3
TOTAL	123	4.9	6.2	2.5	185	7.3

Excludes births less than 500 grams birthweight.

¹ Stillbirth/Perinatal mortality rates:

- singleton births/1000 singleton births
- multiple births/1000 multiple births

² Neonatal mortality rates:

- singleton births/1000 singleton livebirths
- multiple births/1000 multiple livebirths

When stillbirths were examined by time of death, 78.0% occurred antepartum, 13.0% were intrapartum and timing of stillbirth was unknown in 8.9% of cases.

Almost one half (46.8%) of the neonatal deaths occurred within the first day of life (Table 48).

The causes of death of stillborn babies are in many cases unknown (21.1%). Extremely low birthweight (less than 1000 grams birthweight) contributed in 18.7% of cases and 17.9% resulted from lethal congenital malformations.

The principal causes of death of neonates are reported to be low birthweight 43.6% and lethal congenital malformations 45.2% (Table 49).

TABLE 48:

AGE AT DEATH FOR NEONATAL DEATHS IN WESTERN AUSTRALIA, 1993

Age at Neonatal Death	No.	% of Neonatal Deaths
< Day 1	29	46.8
Day 1	4	6.5
Day 2	3	4.8
Day 3	4	6.5
Day 4	3	4.8
Day 5	1	1.6
Day 6	2	3.2
Day 7	1	1.6
Day 8-14	7	11.3
Day 15-21	5	8.1
Day 22-28	3	4.8
TOTAL	62	100.0

Excludes births less than 500 grams birthweight.

TABLE 49:

CAUSES OF STILLBIRTHS AND NEONATAL MORTALITY IN WESTERN AUSTRALIA, 1993

Causes of Death	Stillbirths ¹		Neonatal Deaths ²	
	No.	%	No.	%
Lethal Birth Defects	22	17.9	28	45.2
Extremely low birthweight (<1000 grams)	23	18.7	20	32.3
Low birthweight (1000-2499 grams)	8	6.5	7	11.3
Asphyxia	10	8.1	2	3.2
Maternal- Obstetric	6	4.8	1	1.6
Maternal - Medical	5	4.1	-	-
Maternal - Hypertension	-	-	-	-
Placenta & Cord	23	18.7	-	-
Hydrops fetalis	-	-	-	-
Infection	-	-	-	-
S.I.D.S.	-	-	2	3.2
Other	-	-	-	-
Unknown	26	21.1	2	3.2
TOTAL	123	100.0	62	100.0

Excludes births less than 500 grams birthweight.

- 1 Any non-malformed stillbirth of birthweight less than 1000 grams was included in the extremely low birthweight category.
- 2 Any non-malformed neonatal death of birthweight less than 2500 grams was included in the low birthweight category.

It is known that autopsies were requested for 69.9% of stillbirths and 43.5% of neonatal deaths. In the case of 16 (8.6%) perinatal deaths it is unknown whether an autopsy was requested (Table 50).

TABLE 50:

AUTOPSY REQUESTS FOR STILLBIRTHS AND NEONATAL DEATHS IN WESTERN AUSTRALIA, 1993

	Stillbirths		Neonatal Deaths		Perinatal Deaths	
	No.	%	No.	%	No.	%
Yes	86	69.9	27	43.5	113	61.1
No	29	23.6	27	43.5	56	30.3
Unknown	8	6.5	8	12.9	16	8.6
TOTAL	123	100.0	62	100.0	185	100.0

Excludes births less than 500 grams birthweight.

7. BIRTH TRENDS 1984 - 1993

The collection of perinatal data in Western Australia over the past decade has enabled production of trend data which is of considerable value for health planners and researchers.

7.1 Maternal Age

The majority of women bearing children are aged 20-34 years. Over the past 10 years, this percentage showed a steady decline from 87.3% in 1984 to 82.8% in 1993.

A corresponding increase is evident among women aged 35 years or more with the percentage rising from 6.0% in 1984 to 11.2% in 1993 (Table 51).

7.2 Primiparous Women

Women having their first baby represented 38.7% of all women confined in 1993. This percentage has remained stable over the past 10 years with the highest percentage 39.7% in 1991 and the lowest percentage 38.1% in 1985 (Table 51).

7.3 Conjugal State of Women

The majority of women are reported to be in a married or defacto relationship at time of confinement. This percentage has remained relatively stable ranging between 90.0% in 1984 and 87.7% in 1987. The percentage of women recorded as single rose slightly from 8.5% in 1984 to 10.0% in 1993. A few women each year identify as widowed/divorced or separated. The percentage for this group has reduced from 1.6% in 1984 to 0.8% over the past ten years (Table 51).

7.4 Fertility Rates

The fertility rate of women aged between 15-44 years has reduced from 69.3/1000 in 1984 to 63.9/1000 in 1993.

Evaluation of different age groups show that among women aged between 20-34 years, the group with highest fertility rates, the rate decreased from 111.5/1000 in 1984 to 103.8/1000 in 1993. Another group showing a less significant reduction in fertility rate were those women aged 15-19 years, where the rate declined from 26.4/1000 in 1984 to 24.1/1000 in 1993.

Examination of differences in race for fertility rates show that over a ten year period, the fertility rate among non-Aboriginal women declined from 67.4/1000 in 1984 to 62.1/1000 in 1993. The rate for women identified as Aboriginal, although much higher, also reduced over the same ten year period from 139.2/1000 in 1984 to 125.7/1000 in 1993 (Table 51).

7.5 Type of Delivery

The percentage of spontaneous vaginal deliveries changed very little over the past ten years from 63.0% in 1984 to 63.5% in 1993. A more pronounced change is the reduction in assisted vaginal deliveries from 23.1% in 1984 to 15.5% in 1993, and the corresponding continual rise in the percentage of caesarean sections from 6.9% elective and 7.0% emergency in 1984 to 11.1% elective and 9.9% emergency in 1993 (Table 51).

7.6 Place of Confinement

The majority of confinements take place at hospitals within the metropolitan region. Over the past decade, the percentage of these births rose gradually from 72.1% in 1984 to 74.5% in 1993.

Non-hospital births, either planned or unplanned, remain few in number with the percentage of 0.7% in 1984 rising gradually to 1.0% in 1988 and declining again to 0.7% in 1993 (Table 51).

7.7 Planned Homebirths

The percentage showed little change, ranging between 0.4% and 0.7% per year over the past decade (Table 51).

7.8 Crude Birth Rate

The crude birth rate for Western Australia shows a consistent downward trend from 15.6/1000 in 1984 to 15.0/1000 in 1993. This decline reflects a similar reduction in the National Crude Birth Rate (Table 51, Figure IX).

7.9 Plurality of Births

Multiple birth percentages rose over the ten year period from 2.2% in 1984 to 2.7% in 1993. The percentage peaked in 1989 (2.9%) with an increased number of high order multiple births due to the influence of reproductive technology practice at that time. Increased plurality of births also impacted on percentages of low birthweight babies and perinatal mortality rates (Table 51).

7.10 Low Birthweight

The percentage of low birthweight babies showed little change between 1984 and 1993, being about 6.0%. However, in 1989 the percentage of 6.6% was influenced by the high percentage of multiple birth babies.

The differences between racial groups was influential on the low birthweight percentages. Among babies of women identified as non-Aboriginal the percentage of low birthweight remained stable with 5.6% in 1984 and 5.9% in 1993 and was in accord with the overall trend. The percentage of low birthweight babies of Aboriginal mothers remains approximately twice that of babies born to non-Aboriginal women.

TABLE 51:

BIRTH TRENDS IN WESTERN AUSTRALIA - 1984 TO 1993

	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
WOMEN CONFINED										
Maternal Age (%)										
12-17 years	2.3	2.1	2.3	2.0	2.2	2.2	2.0	2.1	2.1	2.0
12-19 years	6.7	6.7	6.5	6.2	6.6	6.3	6.5	6.6	6.3	6.0
20-34 years	87.3	86.9	86.2	86.2	85.0	85.0	84.1	83.5	83.1	82.8
35+ years	6.0	6.8	7.3	7.5	8.4	8.7	9.4	9.9	10.6	11.2
Primiparous Women (%)	38.7	38.1	38.9	38.9	38.6	39.5	39.0	39.7	38.7	38.7
Conjugal State of Women (%)										
Single	8.5	9.0	10.0	10.6	10.5	10.0	10.0	10.0	9.5	10.0
Married/Defacto	90.0	89.4	88.3	87.7	88.3	89.1	88.9	89.2	89.7	89.2
Other	1.6	1.6	1.7	1.7	1.2	0.9	1.1	0.8	0.8	0.8
Fertility Rate/1000 Women - Years										
Women Aged: 15-19 years	26.4	24.5	25.1	23.4	24.9	24.1	25.3	25.5	25.3	24.1
20-34 years	111.5	113.7	114.9	110.0	110.1	108.2	106.8	100.3	104.1	103.8
35-44 years	14.4	16.2	17.3	16.8	18.4	18.5	19.5	18.9	20.3	21.5
Aboriginal Women	139.2	145.4	138.9	136.6	149.7	138.4	144.3	132.7	128.8	125.7
Non-Aboriginal Women	67.4	67.7	68.3	64.9	65.0	64.0	63.4	60.0	62.2	62.1
Total	69.3	69.7	70.1	66.8	67.2	66.0	65.6	62.0	64.0	63.9
Type of Delivery (%)										
Spontaneous Vaginal	63.0	62.7	63.3	63.3	65.1	64.1	64.0	64.7	64.2	63.5
Assisted Vaginal	23.1	22.2	21.1	19.8	17.9	17.8	17.2	16.9	16.5	15.5
Caesarean Elective	6.9	7.8	7.9	8.7	8.9	9.4	9.7	9.6	10.3	11.1
Caesarean Emergency	7.0	7.3	7.8	8.2	8.1	8.7	9.1	8.9	9.0	9.9
Place of Confinement (%)										
Metropolitan Hospital	72.1	72.5	72.9	73.5	73.6	73.9	73.2	73.5	74.0	74.5
Country Hospital	27.1	26.5	26.2	25.6	25.4	25.1	25.8	25.6	25.3	24.8
Non Hospital	0.7	0.9	0.9	0.9	1.0	1.0	1.0	1.0	0.7	0.7
Planned Homebirths (%)	0.4	0.6	0.7	0.6	0.7	0.7	0.6	0.6	0.4	0.4

TABLE 51: BIRTH TRENDS IN WESTERN AUSTRALIA - 1984 TO 1993 (Continued)

	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
BIRTHS										
Livebirths (Number)	22783	23138	23692	24005	24961	25344	25826	24801	25143	25143
Crude Birth Rate/1000 Persons-Years	15.6	16.4	16.6	15.4	16.3	15.7	15.8	15.2	15.1	15.0
Plurality (%)										
Single births	97.8	97.7	97.7	97.5	97.3	97.1	97.6	97.4	97.3	97.3
Multiple births	2.2	2.3	2.3	2.5	2.7	2.9	2.4	2.6	2.7	2.7
Low Birthweight (%)										
Aboriginal	13.2	13.6	11.7	10.5	13.1	10.8	10.8	14.4	11.3	12.4
Non-Aboriginal	5.6	5.8	5.7	5.9	5.7	6.3	5.7	5.7	6.0	5.9
Total	6.0	6.3	6.0	6.2	6.1	6.6	6.0	6.2	6.3	6.2
Very Low Birthweight (%)										
Aboriginal	2.9	3.2	2.2	1.9	2.4	2.2	1.5	2.8	1.8	3.5
Non-Aboriginal	1.1	1.2	1.2	1.1	1.1	1.2	0.9	1.0	1.1	0.9
Total	1.2	1.3	1.2	1.1	1.2	1.3	0.9	1.1	1.1	1.1
MORTALITY										
Maternal/1000 livebirths	0.04	0.04	0.04	0.08	0.04	0.04	0.12	0.04	0.04	N/A
Perinatal/1000 births										
Aboriginal	26.0	21.7	23.3	14.9	20.1	19.4	13.6	16.2	21.7	13.2
Non-Aboriginal	10.1	10.6	10.9	9.5	8.1	9.6	7.5	7.6	7.6	7.0
Total	10.9	11.1	11.5	9.8	8.8	10.2	7.9	8.1	8.4	7.3
Stillbirths/1000 births										
Aboriginal	13.4	11.2	12.8	9.7	8.3	11.7	7.7	11.5	11.9	8.3
Non-Aboriginal	5.4	6.2	5.7	5.3	4.4	5.0	4.3	5.0	4.1	4.7
Total	5.8	6.4	6.1	5.6	4.7	5.4	4.5	5.4	4.6	4.9
Neonatal/1000 livebirths										
Aboriginal	11.9	10.5	10.6	5.3	11.9	7.7	5.9	4.8	9.9	4.9
Non-Aboriginal	3.5	4.4	5.2	4.2	3.7	4.6	3.2	2.6	3.5	2.3
Total	5.1	4.7	5.4	4.3	4.2	4.8	3.4	2.7	3.8	2.5

Excludes births less than 500 grams birthweight.

SOURCES:

MIDWIVES' NOTIFICATION SYSTEM

Population Denominators: AUSTRALIAN BUREAU OF STATISTICS Catalogue No.3101.0

Maternal Mortality Rates: Annual Report of the Maternal Mortality Committee

The low birthweight percentage among babies of Aboriginal mothers showed less consistency and remained far greater (13.2% in 1984 to peak at 14.4% in 1991) than for other groups (Table 51, Figure VII).

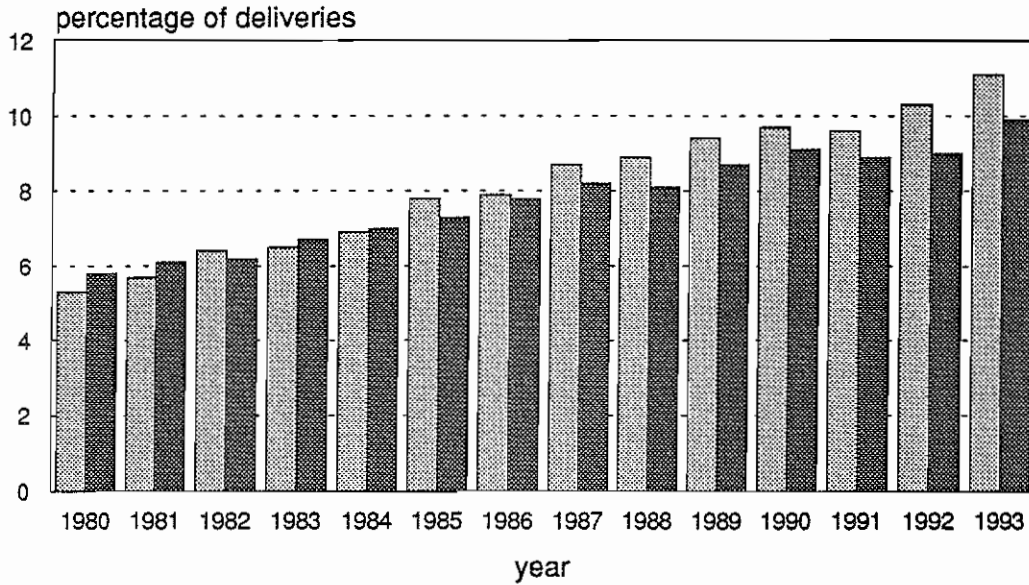
7.11 Maternal Mortality

The maternal mortality rate in Western Australia is extremely low, with only 13 maternal deaths occurring during the past decade, giving an average rate of 0.06 per 1000 livebirths (Table 51).

7.12 Perinatal Mortality

There has been a most favourable reduction in the rates of perinatal deaths over the past decade. These reduced from 10.9/1000 in 1984 to 7.3/1000 in 1993. Neonatal mortality rates declined from 5.1/1000 in 1984 to 2.5/1000 in 1993, a far greater reduction than the stillbirth rate (Table 51, Figure X).

FIGURE VI
CAESAREAN SECTIONS
WESTERN AUSTRALIA, 1980-1993



Excludes births <500 grams birthweight.
 SOURCE: MIDWIVES' NOTIFICATION SYSTEM

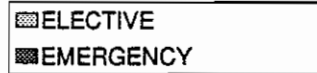
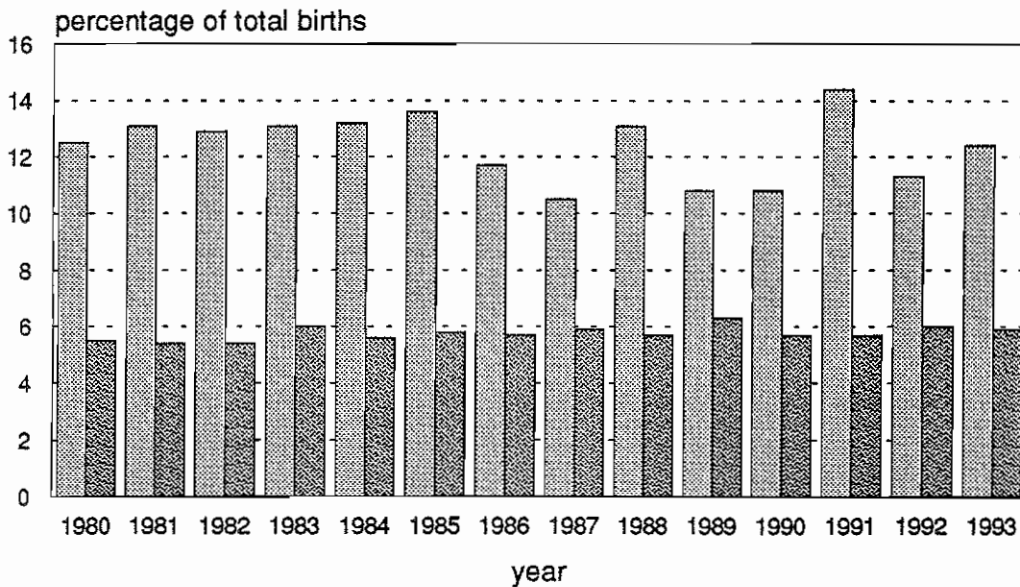


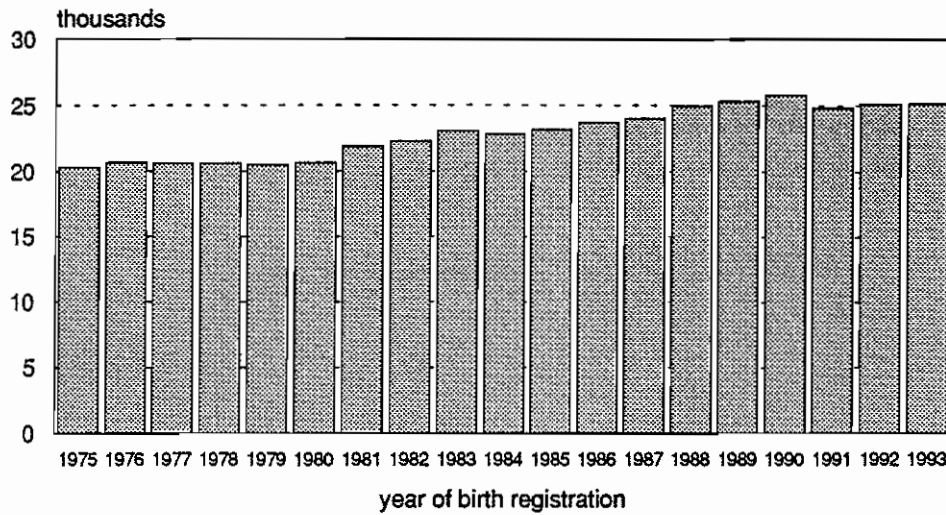
FIGURE VII
LOW BIRTHWEIGHT AND MATERNAL RACE
WESTERN AUSTRALIA, 1980-1993



Excludes births <500 grams birthweight.
 Low Birthweight <2500 grams birthweight.
 SOURCE: MIDWIVES' NOTIFICATION SYSTEM

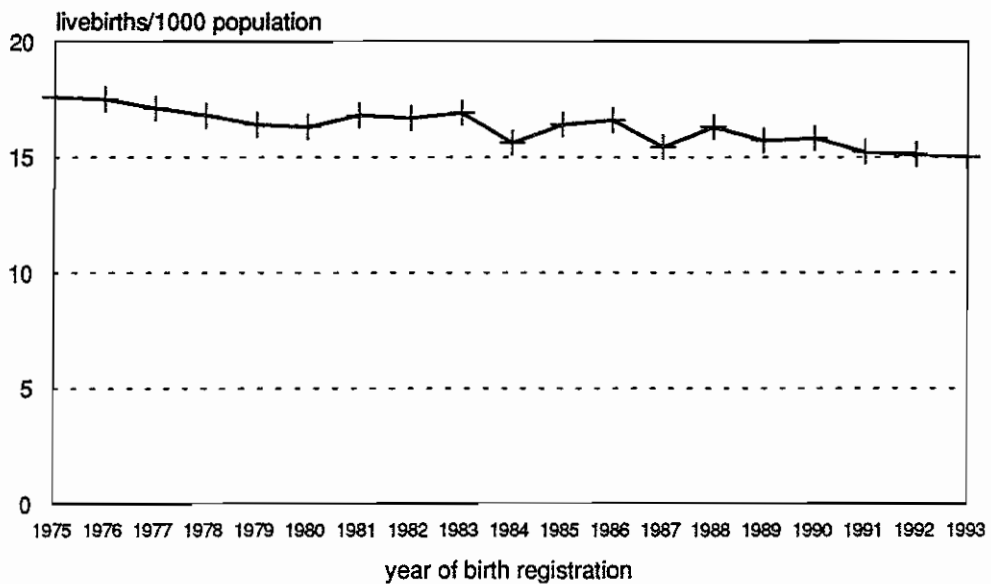


FIGURE VIII
LIVEBIRTHS IN WESTERN AUSTRALIA
1975-1993



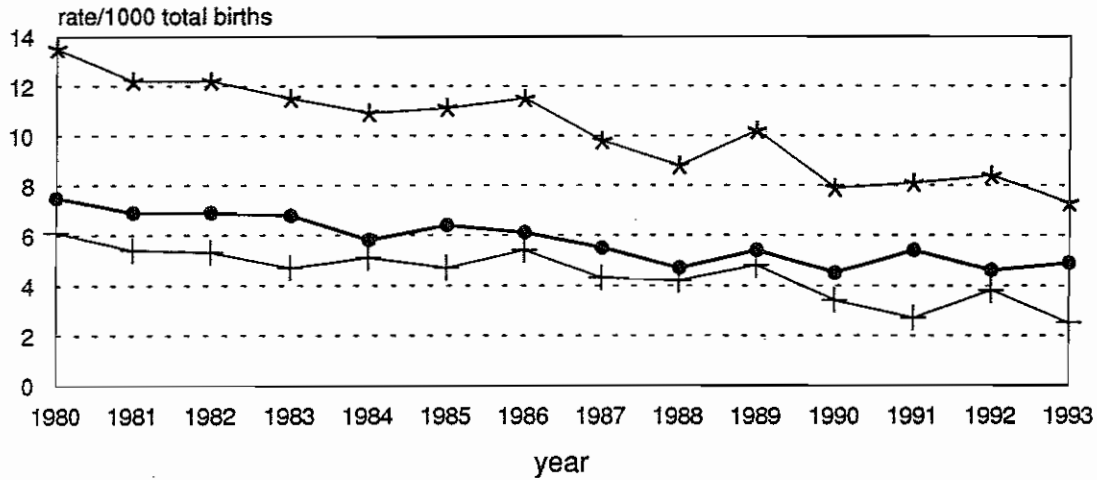
Numbers based on State of residence
 SOURCE: AUSTRALIAN BUREAU OF STATISTICS

FIGURE IX
CRUDE BIRTH RATE IN WESTERN AUSTRALIA
1975-1993



crude birth rate: livebirths per 1000 total population
 SOURCE: AUSTRALIAN BUREAU OF STATISTICS

FIGURE X
PERINATAL MORTALITY RATES
WESTERN AUSTRALIA 1980-1993



Excludes births less than 500 grams birthweight.
 Stillbirths and Perinatal Deaths/1000 Total Births.
 Neonatal Deaths/1000 Livebirths.
 Perinatal Deaths/1000 Births.
 Note: 1980-1983 data based on year of death
 1984-1993 data based on year of birth.
 SOURCE: Midwives' Notification System, Registrar General's Office.

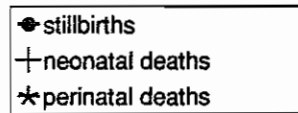
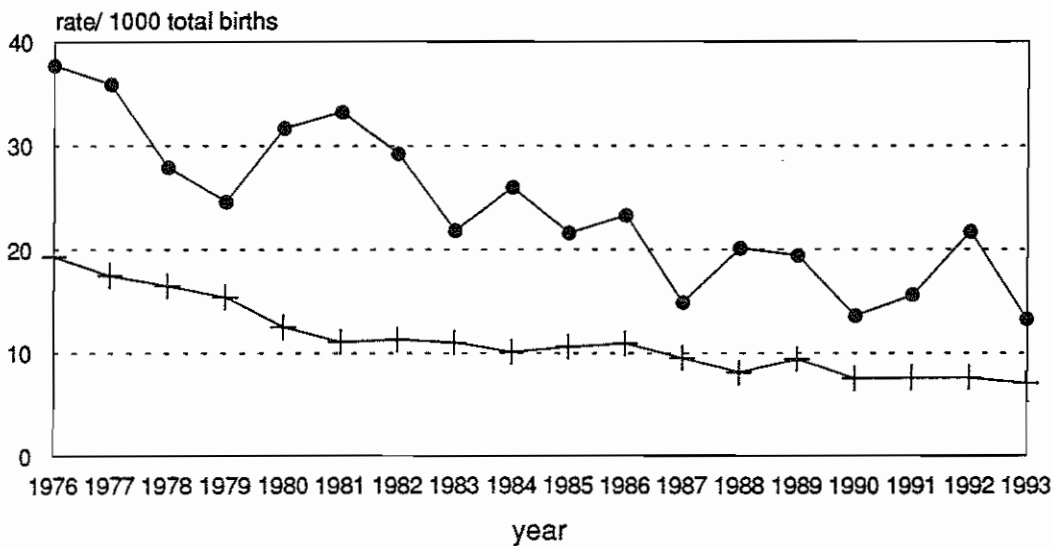


FIGURE XI
PERINATAL MORTALITY BY MATERNAL RACE
IN WESTERN AUSTRALIA 1976-1993



Excludes births less than 500 grams birthweight.
 Perinatal Deaths/1000 Total Births.
 Note: 1980-1983 data based on year of death.
 1984-1993 data based on year of birth.
 SOURCE: Midwives' Notification System, Registrar General's Office



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APPENDIX 'A'

DEFINITIONS

<u>Apgar Score</u>	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.
<u>Birth Defects</u>	Any defect present at birth, probably of developmental origin.
<u>Birthweight</u>	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.
<u>Caesarean Section</u>	<p>A delivery of the fetus through an incision in the abdominal wall.</p> <p><u>Elective Caesarean Section</u> - Is a planned procedure prior to onset of labour and before spontaneous rupture of membranes or without any induction procedure.</p> <p><u>Emergency Caesarean Section</u> - Is an unplanned procedure, performed because of a complication. May be performed before the onset of labour or during labour.</p>
<u>Crude Birth Rate</u>	The number of livebirths per 1000 person-years of total population.
<u>Fertility Rate</u>	The total births (livebirths and stillbirths) per 1000 women-years to women aged between 15-44 years.
<u>Length of Stay</u>	The total number of patient days in hospital at time of discharge. A stay of less than 1 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 homebirths it is routinely coded as 10 days from date of birth.

<u>Livebirth</u>	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.
<u>Mortality Rates</u>	<p><u>Maternal Mortality</u> - the number of maternal deaths per 1000 livebirths in a year.</p> <p><u>Stillbirth</u> - the number of stillbirths per 1000 total births in a year.</p> <p><u>Neonatal Mortality</u> - the number of neonatal deaths per 1000 livebirths in a year.</p> <p><u>Perinatal Mortality</u> - the number of stillbirths and neonatal deaths per 1000 total births in a year.</p>
<u>Neonatal Death</u>	The death of a liveborn infant within 28 days of birth.
<u>Parity</u>	The total number of livebirths and stillbirths of the mother prior to the parturition under consideration.
	<u>Nulliparous</u> - never having completed a pregnancy beyond 20 weeks gestation.
<u>Perinatal Death</u>	A stillbirth or neonatal death.
<u>Plurality</u>	The number of fetuses or babies resulting from the pregnancy. On this basis pregnancy may be classified as singleton or multiple.
<u>Race</u>	Refers to mother's racial group
	<u>Caucasian</u> - includes all persons of caucasoid (European) heritage.
	<u>Aboriginal</u> - includes persons of Australian Aboriginal heritage (Australoid) or of mixed Aboriginal caucasian heritage or of mixed Aboriginal and other heritage.
	<u>Other</u> - includes Asian, Indian, Polynesian, etc.
<u>Stillbirth</u>	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.

APPENDIX B

MR 15

Health Act (Midwifery Nurses) Regulations Form 2
NOTIFICATION OF CASE ATTENDED

Hospital

PARTICULARS RELATING TO MOTHER

PRINT
IN
BLOCK
LETTERS

SURNAME		UNIT RECORD No.	
FORENAMES		BIRTH DATE	
ADDRESS OF USUAL RESIDENCE		POSTCODE	
MAIDEN NAME		TELEPHONE NUMBER	

Current Conjugal State:

1. single

2. married (incl. de facto) or other (please specify)

Race:

1. Caucasian

2. Aboriginal (full or part)

3. Other (please specify)

Height (cms)

PREGNANCY

PREVIOUS PREGNANCIES (excluding this pregnancy)

Total Number of:

Previous Pregnancies

Previous children now living

born alive, now dead

stillborn

THIS PREGNANCY

Date of LMP

This date: 1. certain 2. not certain

Expected due date

Complications of Pregnancy:

threatened abortion (under 20 weeks) A

urinary tract infection B

pregnancy induced hypertension C

APH -placenta praevia D

-abruptio E

-other F

prem. rupture of membranes G

other H

Medical Conditions:

Procedures/Treatments:

fertility drug treatment (incl drugs used for IVF/GIFT etc) A

cervical suture B

CVS/placental biopsy C

amniocentesis D

ultrasound E

CTG - antepartum/intrapartum F

LABOUR AND DELIVERY

Onset of Labour:

A. spontaneous B. induced

D. no labour

Augmentation of Labour:

1. no 2. yes

Presentation:

1. vertex 2. breech

3. other (please specify)

Type of Delivery:

normal A

vacuum -successful B

-failed C

forceps -successful D

-failed E

breech manoeuvre F

*caesarean -elective G

-emergency H

Anaesthesia/Analgesia:

none Z

general A

epidural/spinal B

other (please specify) C

Hours of established labour:

Complications of Labour, Delivery:

*Include reason for caesarean

precipitate delivery A

fetal distress B

prolapsed cord C

cord tight around neck D

cephalopelvic disproportion E

PPH (>500mls) G

other F

Repair Perineum and/or Vagina:

1. none 2. episiotomy

3. 1° or 2° tear 4. 3° or 4° tear

5. other (please specify)

BABY

Separate Form for each Baby

Adoption Yes () No ()

Birth Date:

Time (24 hour clock)

Plurality:

1. single birth 2. first twin

3. second twin 4. multiple birth (specify baby number _____)

Sex:

1. male 2. female

Condition:

1. liveborn 2. stillborn

Birthweight (grams)

Length (cms)

Head circumference (cms)

Time to establish unassisted regular breathing (mins)

Resuscitation:

0. none 3. intubation

5. bag & mask 8. oxygen only

other (please specify)

Apgar Score 1 min

5 min

Estimated Gestation (weeks)

Vitamin K - first dose given

1. oral 2. IMI 3. nil

Birth Defects

Birth Trauma (eg. cephalhaematoma)

BABY'S SEPARATION DETAILS

Date of Discharge

Transfer or Death

Type of Separation:

1. discharged home 2. died

3. transferred to

Special Care (wholedays only)

COMPLETE SECTION ON SEPARATION
Attach to Mother and Baby's Inpatient Summaries (HA22).
Forward to Health Services Statistics and Epidemiology
Branch, Health Dept of Western Australia P.O. Box 8172,
Stirling Street, PERTH 6849 after discharge of mother
and/or baby whichever is later. Guidelines for completion
of this form available from above address.

AP/194-20MSETS

MIDWIFE

Name

Signature

Reg. No. Date

HEALTH DEPARTMENT COPY

