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# **PERINATAL STATISTICS IN WESTERN AUSTRALIA**

Fourth Annual Report  
of the Western Australian Midwives'  
Notification System  
1986

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**WESTERN AUSTRALIAN MIDWIVES' SYSTEM  
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## 1. INTRODUCTION

Each year, comprehensive data on the women confined and babies delivered in Western Australia, is collected by the Maternal and Child Health Studies Unit of the Epidemiology Branch of the Health Department of Western Australia.

The information is obtained from the Notification of Case Attended Form 2, commonly known as the Midwives' Form.

The Midwives' Notification System has been in existence since 1974. It has continued to be developed and refined over the years to the point where Western Australia has access to extensive information covering the demographic characteristics of the women, pregnancy, labour and delivery, and details of neonatal events.

This is the Fourth Annual Report on Perinatal Statistics in Western Australia and represents the 1986 birth cohort.

These reports provide an invaluable source of data on a yearly basis showing changes in trends, such as the increase in maternal age of primigravid women and the increase in triplet births. These changes have enormous impact on the provision of services and the statistics presented provide a valid base on which to make planning decisions.

As the only obstetric teaching hospital in the State, King Edward Memorial Hospital for Women has a vested interest in the ongoing production of these reports and the accuracy of information contained therein.



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## 2. SUMMARY

During 1986, there were midwives' forms for 23,561 women who gave birth to 23,839 babies. Only those births with a birthweight of 500 grams are included in this report.

There were 23,290 women who had a singleton pregnancy and 271 with a multiple pregnancy. Of these women, 262 had a twin pregnancy, eight women had a triplet pregnancy and one woman had a set of quadruplets. (Tree Diagram 1)

Mortality proportions were identified by plurality for the 1986 Birth Cohort. The overall perinatal mortality for multiple births was more than five times greater than for singleton births. The stillbirth proportion for multiple births was 20.0/1000 and 5.8/1000 for singleton births. The neonatal death proportion for multiple livebirths was eight times greater than for singleton births. (Tree Diagram 2)

There were 48 babies born before arrival at hospital, although they were planned hospital births, and 39.6% of these were to aboriginal mothers.

Although the majority of births occurred in hospital, there was a continued increase in the number of planned births at home, now 0.7% of the total births. (Tree Diagram 3)

The overall fertility rate amongst aboriginal women was more than double that of non-aboriginals and in the 15 to 19 year age group the aboriginal fertility rate was more than eight times greater. (Table 12)

Over two thirds of the total women confined had no complication of pregnancy recorded, however, 10.7% had either pre eclampsia or hypertension of pregnancy which indicates a significant level of morbidity. (Table 13)

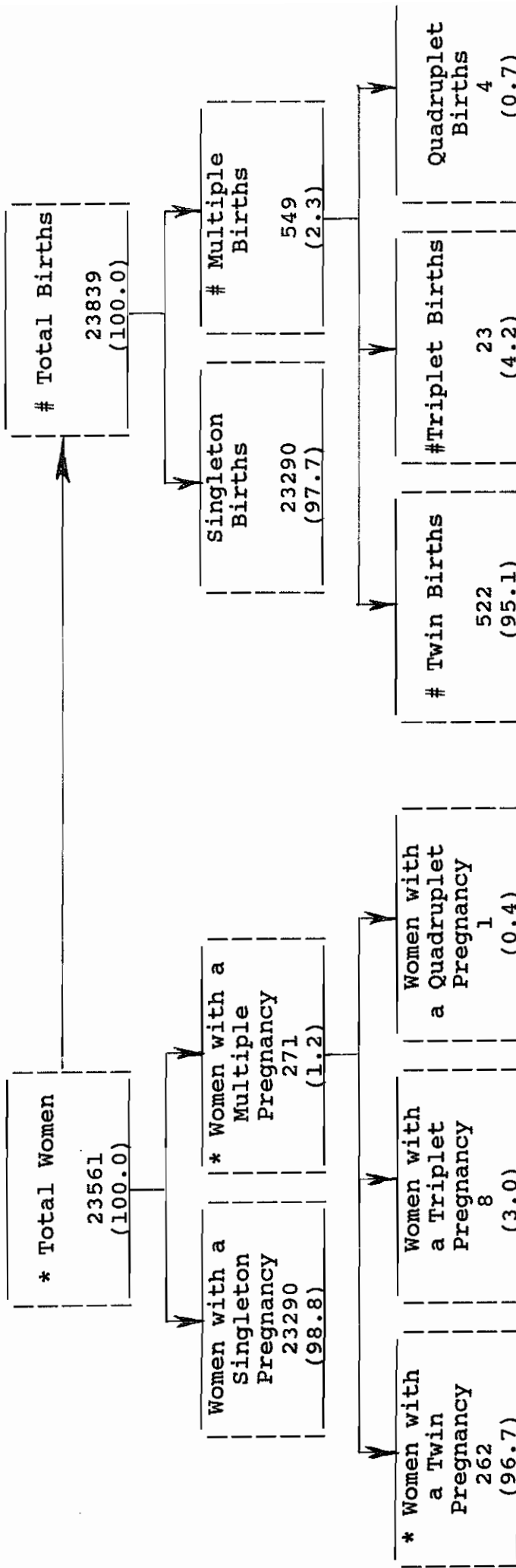
Of the total women confined, more than one in four had an induction of labour and another 9.7% did not experience labour at all. (Table 14)

Seventy percent of those women who had a breech presentation prior to delivery had a caesarean delivery. (Table 16)

Caesarean sections in Western Australia continued to increase with 15.7% of all women being delivered by this method. (Table 17) Of these women, 1,107 (30%) had a previous history of caesarean section.

TREE DIAGRAM 1

PREGNANCIES AND BIRTHS IN WESTERN AUSTRALIA, 1986



Excludes births less than 500 grams birthweight.

\* Includes 2 women with a twin pregnancy and one with a triplet pregnancy where one twin and one triplet weighed less than 500 grams birthweight.

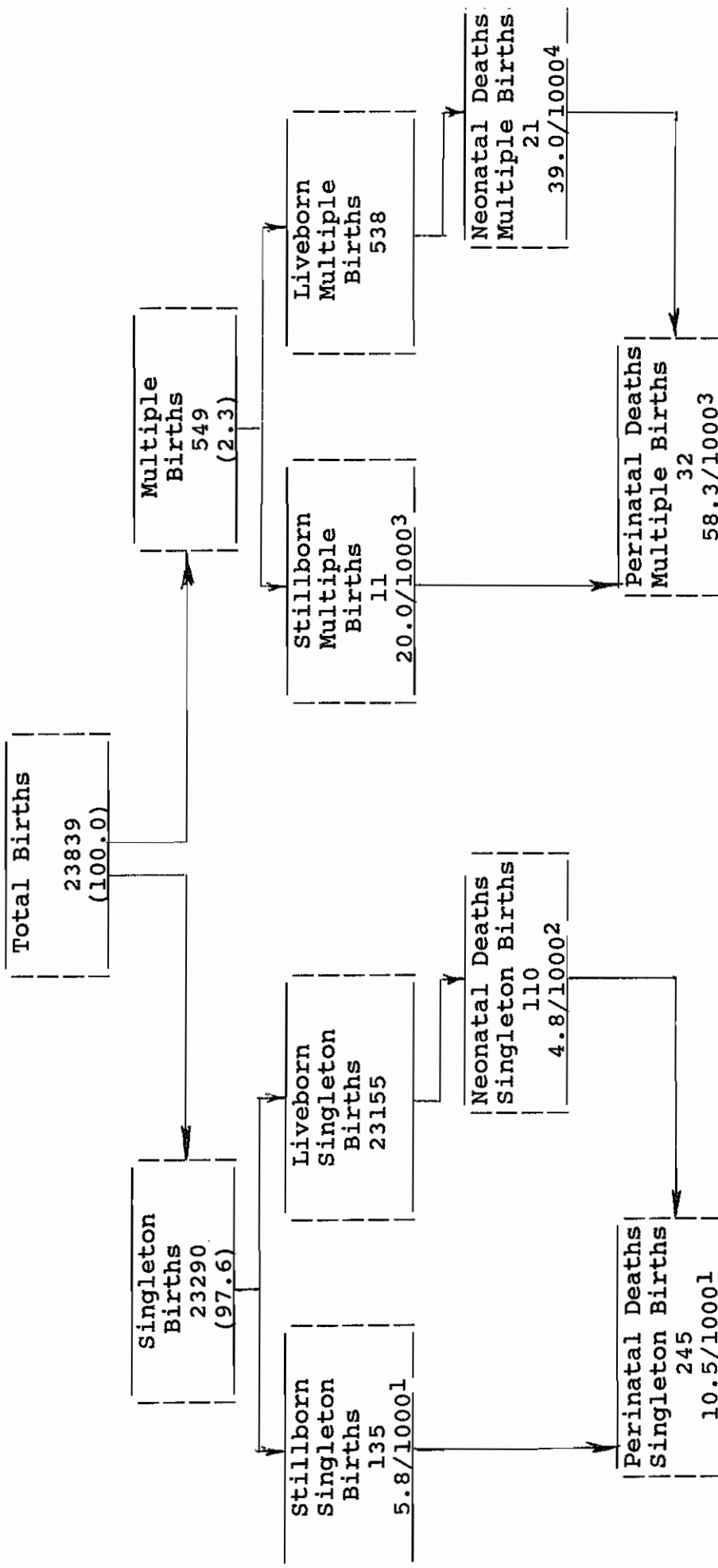
# Includes 2 single twin births and two triplets whose birthweight was 500 grams or more.

SOURCE: MIDWIVES' NOTIFICATION SYSTEM



TREE DIAGRAM 2

PLURALITY OF BIRTHS AND PERINATAL DEATHS IN WESTERN AUSTRALIA, 1986



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

There was one maternal death during 1986 and the maternal mortality proportion in Western Australia was 0.04/1000 livebirths. (5 Selected Western Australian Statistics).

Livebirths in Western Australia from 1975 to 1986, based on birth registrations are included in Figure VII.

During 1986 there were 23 triplet births. There has been a marked increase since 1980. (Table 21)

Six percent of all births weighed less than 2500grams at birth. When examined by maternal race 11.8% of babies born to aboriginal women were of low birthweight. (Table 28) More than two thirds of the total stillbirths were of low birthweight. (Table 29)

Preterm birth (less than 37 weeks gestation) occurred in 1,869 (7.8%) of the total births. (Table 32). When examined by plurality, 44.6% of the multiple births were preterm. (Table 32.2)

Special care was required for 7.6% of the total births during 1986 and one in three of these babies had a stay of one day or less. (Table 35)

The majority of births resulted in a length of stay of between two to seven days after birth and another 20% were longer than eight days. (Table 36)

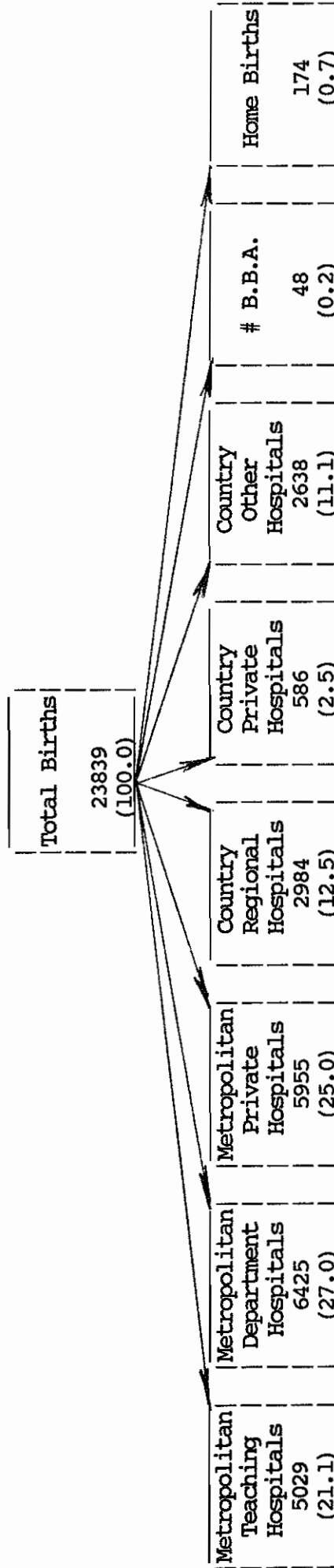
Amongst the 23,839 births, 146 were stillborn and 129 of the livebirths died within the first twenty eight days of life. (Table 37) Almost two thirds of the neonatal deaths occurred within the first day of life. (Table 43)

Most causes of stillbirth were unknown. This included asphyxia, placental insufficiency and cord around neck. For neonatal deaths the major causes were low birthweight (less than 2500 grams) and lethal congenital malformations. (Table 44)

Autopsies were requested for 60% of stillbirths and only 55% of neonatal deaths. (Table 45)

TREE DIAGRAM 3

PLACE OF DELIVERY FOR ALL BIRTHS IN WESTERN AUSTRALIA, 1986



Excludes births less than 500 grams birthweight.

# B.B.A. (born before arrival).

SOURCE: MIDWIVES' NOTIFICATION SYSTEM

### 3. DEFINITIONS

#### Apgar Score

A numerical scoring system applied after birth to evaluate the condition of the baby. It is based on the heart rate, respiration, muscle tone, reflexes and colour. Low scores indicate poor condition. The five minute score only is recorded on the Midwives' Form 2.

#### Birthweight

The first weight, measured to the nearest five grams, of the newborn which is usually obtained within the first hour of birth.

Low Birthweight - A birthweight of less than 2500 grams.

Very Low Birthweight - A birthweight less than 1500 grams.

#### Caesarean Section

A delivery of the fetus through an incision in the abdominal wall.

Elective Caesarean Section - Is a planned procedure prior to onset of labour and before spontaneous rupture of membranes or without any induction procedure.

Emergency Caesarean Section - The decision to perform a caesarean section, for a complication either before the onset of labour or during labour, whether the onset of labour was spontaneous or following induction.

#### Congenital Malformation

Any defect present at birth, probably of developmental origin.

#### Crude Birth Rate

The number of livebirths per 1000 person-years of total population.

#### Fertility Rate

The total births per 1000 women-years to women aged between 15-44 years.

#### Length of Stay

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.

#### Livebirth

The complete expulsion or extraction from its mother of a product of conception, irrespective of duration of pregnancy, which after separation shows signs of life.

### **Mortality Proportions**

**Maternal Mortality** - is the number of maternal deaths per 1000 livebirths in a year.

**Stillbirth** - is the number of stillbirths per 1000 total births in a year.

**Neonatal Mortality** - is the number of neonatal deaths per 1000 livebirths in a year.

**Perinatal Mortality** - is the number of stillbirths and neonatal deaths per 1000 total births in a year.

### **Neonatal Death**

The death of a liveborn infant within 28 days of birth.

### **Parity**

The total number of livebirths and stillbirths of the mother prior to the parturition under consideration.

### **Perinatal Death**

Is a stillbirth or neonatal death.

### **Plurality**

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

**Race** - refers to mother's racial group

**Caucasian** - includes all persons of caucasoid (European) heritage.

**Aboriginal** - includes persons of Australian- Aboriginal heritage (Australoid) or of mixed Aboriginal-caucasian heritage.

**Other** - includes Asian, Indian, Polynesian, etc.

### **Stillbirth**

Is 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.

#### 4. DATA COLLECTION

This is the Fourth 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, doctors or hospitals.

This report contains information on the women and their babies delivered in Western Australia during the 1986 calendar year. Only those pregnancies which resulted in a final product of conception being equal to or greater than 500 grams birthweight have been included. However, there were two women with a twin pregnancy and one with a triplet pregnancy included in the data where one twin and one triplet baby weighed less than 500 grams birthweight. (These babies have been excluded from the data in this report)

To assist with standardisation of the information collected on the Midwives' Form 2, Guidelines for the Completion of Case Attended Form 2 (Midwives' Form) were distributed in late 1985 to midwives and all Western Australian hospitals with obstetric beds.<sup>1</sup>

When the Notification of Case Attended (Midwives') Form 2 are received by the Maternal and Child Health Studies Unit, Epidemiology Branch, 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 (ICD-9) to code morbidity and once this is complete the forms are sent for data processing and computing.<sup>2</sup>

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.

Perinatal mortality identified from the Midwives' Notification System prior to 1984, were based on the year of death.

The Western Australian Branch of the Bureau of Statistics provided the population estimates used in this report.

With continued improvements to the computer system, it is now possible to readily identify information specifically for women, singleton births, multiple births or total births as required.

Additional tabulations are available upon request to:

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5. SELECTED WESTERN AUSTRALIAN STATISTICS, 1983-1986

	<u>1983</u>	<u>1984</u>	<u>1985</u>	<u>1986</u>
<u>Obstetric Intervention Proportions</u>				
(based on all confinements)				
Induction/1000 Confinements	256.9	245.5	257.9	269.4
Caesarean Section/1000 Confinements	132.7	138.6	151.7	156.4
Elective Caesarean/1000 Confinements	65.3	68.8	78.4	78.6
Emergency Caesarean/1000 Confinements	67.4	69.8	73.3	77.9
<u>Fertility Rate</u>				
All Women/1000 Women-Years	71.4	69.3	69.7	70.1
Aboriginal Women/1000 Women-Years	147.2	139.2	145.4	138.9
Non-Aboriginal Women/1000 Women-Years	69.7	67.4	67.7	68.3
<u>Crude Birth Rate/1000 Person-Years</u>	16.9	15.6	16.4	16.6
<u>Low Birthweight (less than 2500 grams birthweight)</u>				
Low Birthweight Births/1000 Total Births	63.4	68.3	62.6	60.0
Low Birthweight Singleton Births/1000 Singleton Births	53.2	49.4	51.0	49.0
Low Birthweight Multiple Births/1000 Multiple Births	542.0	457.4	549.2	530.1
<u>Maternal Mortality/1000 Livebirths</u>	0.04	0.04	0.04	0.04
<u>Perinatal Mortality</u>				
<u>Stillbirths -</u>				
singleton births/1000 singleton births			6.4	6.1
multiple births/1000 multiple births			6.1	5.8
			22.3	20.0
<u>Neonatal Mortality -</u>				
singleton births/1000 singleton livebirths			4.7	5.4
multiple births/1000 multiple livebirths			4.1	4.7
			33.8	37.2
<u>Perinatal Mortality -</u>				
singleton births/1000 singleton births			11.1	11.5
multiple births/1000 multiple births			10.1	10.5
			53.8	56.5

6. WESTERN AUSTRALIAN PERINATAL MORTALITY BY CERTAIN BIRTHWEIGHT AND GESTATION, 1986

6.1 PERINATAL MORTALITY USING BIRTHWEIGHT CRITERIA

Birthweight	Perinatal Mortality		
	Stillbirth Proportion/ 1000 Total Births	Neonatal Death Proportion/ 1000 Livebirths	Perinatal Death Proportion/ 1000 Total Births
≥ 400 grams	7.7	5.9	13.5
≥ 500 grams <sup>1</sup> National Definition of *W.H.O.	6.1	5.4	11.5
≥ 1000 grams <sup>2</sup> International Definition of *W.H.O.	3.9	3.5	7.4

6.2 PERINATAL MORTALITY USING GESTATION CRITERIA

Gestation	Perinatal Mortality		
	Stillbirth Proportion/ 1000 Total Births	Neonatal Death Proportion/ 1000 Livebirths	Perinatal Death Proportion/ 1000 Total Births
≥ 20 weeks	7.7	5.9	13.6
≥ 22 weeks <sup>1</sup> National Definition of *W.H.O.	6.8	5.7	12.5
≥ 28 weeks <sup>2</sup> International Definition of *W.H.O.	4.5	5.3	9.8

\* W.H.O. - World Health Organisation

<sup>1</sup> This is the definition of W.H.O. National Statistics

<sup>2</sup> This is the definition of W.H.O. International Statistics

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



## 7. MATERNAL DEMOGRAPHIC INFORMATION

### 7.1 Age

Almost two thirds of the women confined in Western Australia during 1986 were aged between 20 to 29. Teenagers were identified in 6.5% of the total women and another 172 (0.7%) were aged 40 years or more. Amongst those women with a multiple pregnancy eight (2.9%) were less than 20 years of age and one woman was aged forty or more. (Table 1)

Maternal age has been recorded in individual years for those women less than twenty because of the large number of requests received for this information.

**TABLE 1: AGE AND PLURALITY OF WOMEN CONFINED IN WESTERN AUSTRALIA, 1986**

Maternal Age	Plurality				Total	
	Singleton		Multiple		No.	%
	No.	%	No.	%		
≤ 13	1	0.0	0	0.0	1	0.0
14	20	0.1	0	0.0	20	0.1
15	57	0.2	0	0.0	57	0.2
16	156	0.7	0	0.0	156	0.7
17	297	1.3	2	0.7	299	1.3
18	400	1.7	3	1.1	403	1.7
19	593	2.5	3	1.1	596	2.5
						6.5
20 - 24	5902	25.3	49	18.1	5951	25.3
25 - 29	9075	39.0	130	48.0	9205	39.1
30 - 34	5093	21.9	61	22.5	5154	21.9
35 - 39	1525	6.5	22	8.1	1547	6.6
40 - 44	163	0.7	1	0.4	164	0.7
≥ 45	8	0.0	0	0.0	8	0.0
<b>Total</b>	<b>23290</b>	<b>100.0</b>	<b>271</b>	<b>100.0</b>	<b>23561</b>	<b>100.0</b>

Excludes births less than 500 grams birthweight.

### 7.2 Race

Although the majority of women confined in 1986 were caucasian, 5.2% of the total were aboriginal and 5.5% were of "other" races. Twelve aboriginal women (0.97%) and nine (0.69%) of "other" races (e.g., Indian, Asian, Polynesian, etc) had a multiple pregnancy compared with 1.2% of caucasian women. (Table 2)

**TABLE 2: RACE AND PLURALITY OF WOMEN CONFINED IN WESTERN AUSTRALIA, 1986**

Maternal Race	Plurality				Total	
	Singleton		Multiple		No.	%
	No.	%	No.	%		
Caucasian	20778	89.2	250	92.3	21028	89.2
Aboriginal	1222	5.3	12	4.4	1234	5.2
Other	1290	5.5	9	3.3	1299	5.5
<b>Total</b>	<b>23290</b>	<b>100.0</b>	<b>271</b>	<b>100.0</b>	<b>23561</b>	<b>100.0</b>

Excludes births less than 500 grams birthweight.  
Other races include Indian, Asian, Polynesian, etc.

### 7.3 Conjugal State

Almost twelve percent of all women confined in Western Australia during 1986 were unsupported, either single, widowed or separated. Of these, 10.0% were single and 1.7% were recorded as either separated, divorced or widowed. For those women with a multiple pregnancy, 10% were unsupported. (Table 3)

**TABLE 3: CONJUGAL STATE AND PLURALITY OF WOMEN CONFINED IN WESTERN AUSTRALIA, 1986**

Conjugal State	Plurality				Total	
	Singleton		Multiple		No.	%
	No.	%	No.	%		
Single	2344	10.1	23	8.5	2367	10.0
Married/defacto	20559	88.3	244	90.0	20803	88.3
*Other	387	1.7	4	1.5	391	1.7
<b>Total</b>	<b>23290</b>	<b>100.0</b>	<b>271</b>	<b>100.0</b>	<b>23561</b>	<b>100.0</b>

Excludes births less than 500 grams birthweight.  
\* Other includes separated, divorced and widowed.

#### 7.4 Statistical Division of Residence

Two thirds of the total women confined in 1986 lived in the Perth Statistical Division. Figures for the other statistical divisions of the State showed that 8.6% were resident in the South West, 4.5% in the Pilbara, 4.3% in the Central and only 1.8% in the Upper Great Southern Statistical Division. Those women who had a multiple pregnancy, 66.4% lived in the Perth Statistical Division, 6.3% in the Pilbara, 7.7% in the South West and 4.8% in South Eastern Divisions. (Table 4, Figure 1)

There were 22 women whose usual place of residence was given as outside Western Australia. There may have been a number of Western Australian women who were confined in other states during 1986 for whom we have no data.

**TABLE 4: STATISTICAL DIVISION OF RESIDENCE AND PLURALITY OF WOMEN CONFINED IN WESTERN AUSTRALIA, 1986**

Statistical Division of Residence	Plurality				Total	
	Singleton		Multiple		No.	%
	No.	%	No.	%		
Perth	15576	66.9	180	66.4	15756	66.9
South West	2006	8.6	21	7.7	2027	8.6
Lower Great Southern	772	3.3	11	4.1	783	3.3
Upper Great Southern	414	1.8	6	2.2	420	1.8
Midlands	970	4.2	8	3.0	978	4.2
South Eastern	961	4.1	13	4.8	974	4.1
Central	994	4.3	10	3.7	1004	4.3
Pilbara	1045	4.5	17	6.3	1062	4.5
Kimberley	530	2.3	5	1.8	535	2.3
Outside W.A.	22	0.1	0	0.0	22	0.1
<b>Total</b>	<b>23290</b>	<b>100.0</b>	<b>271</b>	<b>100.0</b>	<b>23561</b>	<b>100.0</b>

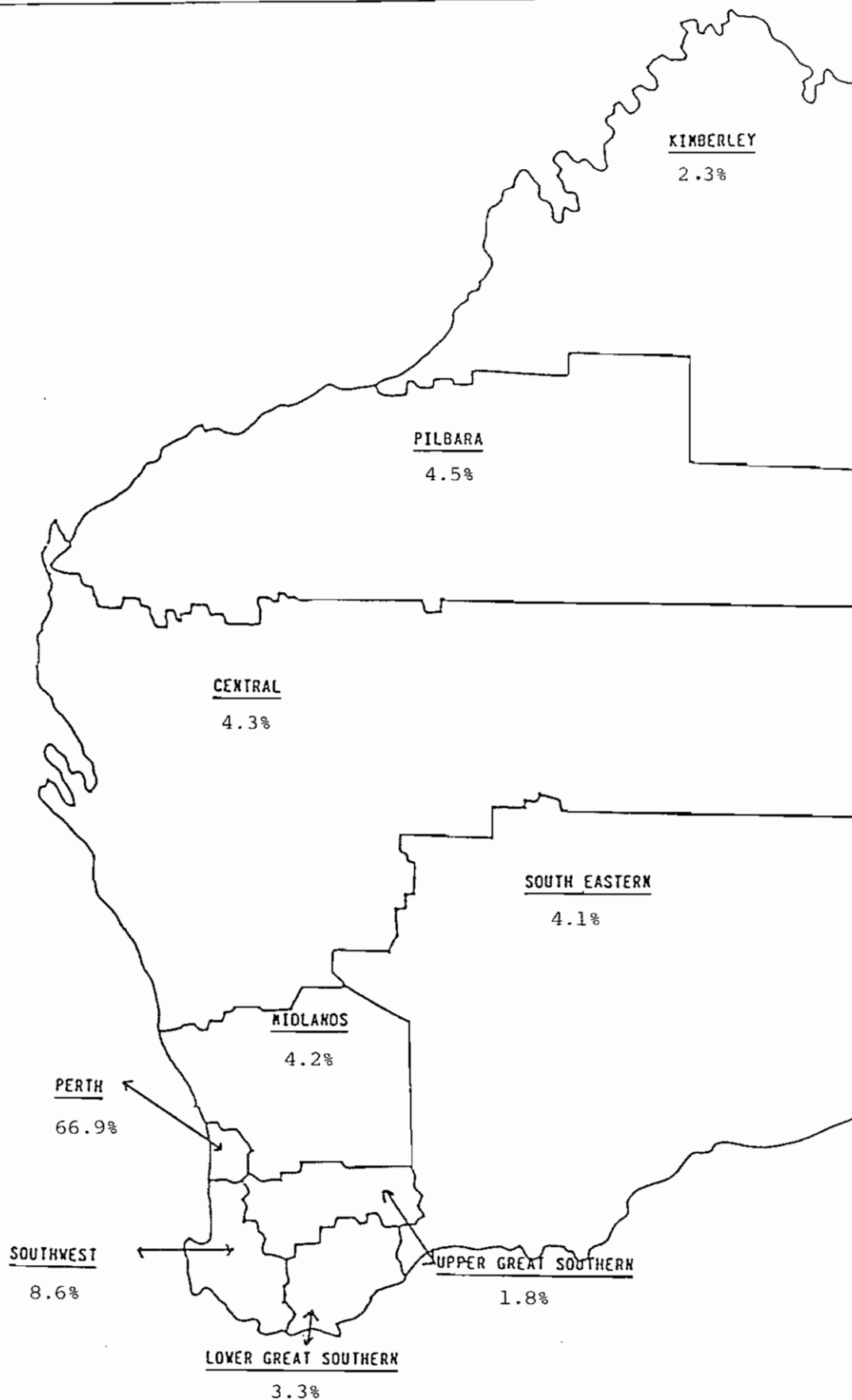
Excludes births less than 500 grams birthweight.

#### 7.5 Place of Confinement

Of the 23,839 total births in 1986, 99.1% occurred in hospital. There were 222 non-hospital births, of which, 48 babies were Born Before Arrival at Hospital (BBA) and 174 were planned homebirths.

Figure I

STATISTICAL DIVISION OF RESIDENCE OF WOMEN CONFINED IN WESTERN AUSTRALIA, 1986



Excludes births less than 500 grams birthweight and those 22 mothers resident outside Western Australia.

Source: Midwives Notification System.

Hospitals have been grouped into categories within the metropolitan and country areas because no such identification is ever published from the data. Non-hospital births are separately identified as planned homebirths and those B.B.A. births. (Table 5)

Seventy three percent of total births were in Metropolitan hospitals . Of these, 21.1% occurred in a metropolitan obstetric teaching hospital, 27% were in metropolitan departmental (government) hospitals and 25.0% in private hospitals. Almost 48% of the multiple births born in 1986, including the quadruplets were delivered in the main obstetric teaching hospital. There were 38.3% of the multiple births delivered in metropolitan departmental and private hospitals.

**TABLE 5: PLACE OF CONFINEMENT AND PLURALITY OF BIRTHS IN WESTERN AUSTRALIA, 1986**

Place of Birth	Plurality				Total	
	Singleton		Multiple		No.	%
	No.	%	No.	%		
<u>Metropolitan</u>						
<sup>1</sup> Teaching	4766	20.5	263	47.9	5029	21.1
Department	6327	27.2	98	17.9	6425	27.0
Private	5843	25.1	112	20.4	5955	25.0
<u>Country</u>						
<sup>2</sup> Regional	2946	12.6	38	6.9	2984	12.5
Private	572	2.5	14	2.6	586	2.5
<sup>3</sup> Other	2614	11.2	24	4.4	2638	11.1
<u>Non-Hospital</u>						
Home Births	174	0.7	0	0.0	174	0.7
*BBA	48	0.2	0	0.0	48	0.2
<b>Total</b>	<b>23290</b>	<b>100.0</b>	<b>549</b>	<b>100.0</b>	<b>23839</b>	<b>100.0</b>

Excludes births less than 500 grams birthweight.

\* BBA (born before arrival at hospital).

<sup>1</sup> Teaching Hospital - University Medical School (Teaching Hospital Act 1955).

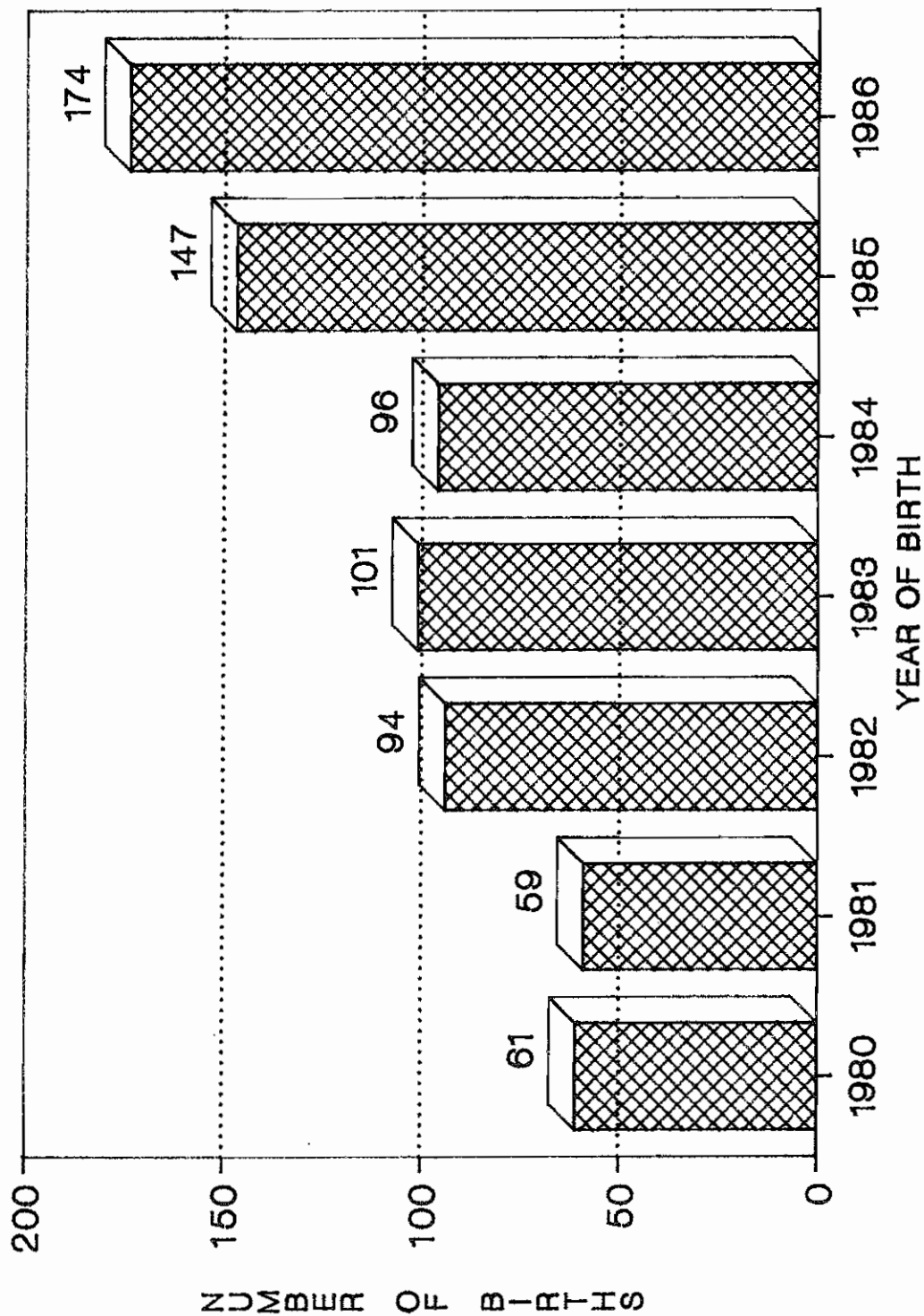
<sup>2</sup> Country Regional Hospital - Government Hospital with private and public beds.

<sup>3</sup> Other Country Hospital - includes Government and Board Hospitals.

Homebirths continued to increase during 1986, to 0.7% of the total births whereas in 1980 only 0.3% of the births were born as a planned homebirth. (Table 6, Figure II)

Figure II

### HOME BIRTHS IN WESTERN AUSTRALIA 1980-1986



Excludes births less than 500 grams birthweight.  
Source: Midwives' Notification System.

**TABLE 6: HOMEBIRTHS IN WESTERN AUSTRALIA 1980-1986**

	No. <sup>1</sup>	% of total births in W.A.
1980	61	0.3
1981	59	0.3
1982	94	0.4
1983	101	0.4
1984	96	0.4
1985	147	0.6
1986	174	0.7

<sup>1</sup> Excludes planned homebirths transferred either antepartum or intrapartum to hospital.  
SOURCE: MIDWIVES' NOTIFICATION SYSTEM

Additional information on those women who had planned to have a homebirth but were either referred during pregnancy or transferred during labour has been collated since July 1985. This information has been collected with the co-operation of the homebirth midwives in Western Australia. (Table 7, Appendix B)

There were 25 women who had planned a homebirth during 1986 but because a complication developed they were either referred/transferred during pregnancy (24.0%) or labour, (76%). (Table 7) As the statistics are based on place of birth, these women and their babies are included amongst hospital births.

**TABLE 7: REFERRAL/TRANSFER OF WOMEN WHO PLANNED A HOMEBIRTH IN WESTERN AUSTRALIA IN 1986**

Time of Referral/Transfer	No.	%
Antepartum	6	24.0
Intrapartum	19	76.0
<b>Total</b>	<b>25</b>	<b>100.0</b>

An Epidemiological Comparison of Home and Hospital Births in Western Australia is presently being conducted, using midwives' data and involving homebirth midwives, hospital records and questionnaires.

## 8. PREGNANCY PROFILE

### 8.1 Previous Pregnancies

More than a third of the total women confined in 1986 were having their first baby. Of those women with a multiple pregnancy, 36.5% were identified as nulliparous. Almost one in ten women had a parity of three or more. (Table 8)

**TABLE 8: PARITY AND PLURALITY OF WOMEN CONFINED IN WESTERN AUSTRALIA, 1986**

Parity	Plurality				Total	
	Singleton		Multiple		No.	%
	No.	%	No.	%		
0	9069	38.9	99	36.5	9168	38.9
1 - 2	11981	51.4	136	50.2	12117	51.4
3 - 4	1972	8.5	31	11.4	2003	8.5
≥ 5	268	1.2	5	1.9	273	1.2
<b>Total</b>	<b>23290</b>	<b>100.0</b>	<b>271</b>	<b>100.0</b>	<b>23561</b>	<b>100.0</b>

Excludes births less than 500 grams birthweight.

Of the 9168 nulliparous women, 13.4% were identified as teenagers (19 years or less of age), 70.6% were aged 20 to 29 years. Amongst the 172 women aged forty or more, 18 were having their first baby. There were two teenagers who had a parity of three or more, and 273 women who had a parity of five or more. (Table 9)

**TABLE 9: PARITY AND AGE OF WOMEN CONFINED IN WESTERN AUSTRALIA, 1986**

Maternal Age	Parity								Total	
	0		1 - 2		3 - 4		≥ 5		No.	%
	No.	%	No.	%	No.	%	No.	%		
< 14	21	0.2	0	0.0	0	0.0	0	0.0	21	0.1
15 - 19	1207	13.2	302	2.5	2	0.1	0	0.0	1511	6.4
20 - 24	3081	33.6	2681	22.1	187	9.3	2	0.7	5951	25.3
25 - 29	3395	37.0	5101	42.1	653	32.6	56	20.5	9205	39.1
30 - 34	1169	12.8	3118	25.7	757	37.8	110	40.3	5154	21.9
35 - 39	277	3.0	837	6.9	347	17.3	86	31.5	1547	6.6
40 - 44	17	0.2	76	0.6	53	2.6	18	6.6	164	0.7
≥ 45	1	0.0	2	0.0	4	0.2	1	0.4	8	0.0
<b>Total</b>	<b>9168</b>	<b>100.0</b>	<b>12117</b>	<b>100.0</b>	<b>2003</b>	<b>100.0</b>	<b>273</b>	<b>100.0</b>	<b>23561</b>	<b>100.0</b>

Excludes births less than 500 grams birthweight.



**TABLE 10: AGE OF PRIMIGRAVID WOMEN CONFINED IN WESTERN AUSTRALIA, 1980-1986**

Maternal Age	Year of Confinement													
	1980		1981		1982		1983		1984		1985		1986	
	Nb.	%	Nb.	%	Nb.	%	Nb.	%	Nb.	%	Nb.	%	Nb.	%
< 15	20	0.3	23	0.3	20	0.2	22	0.3	12	0.2	24	0.4	21	0.3
15	49	0.8	51	0.7	44	0.6	44	0.6	41	0.6	45	0.7	54	0.8
16	146	2.4	152	2.2	129	1.8	129	1.8	138	2.0	131	1.9	143	2.0
17	230	3.7	269	3.9	248	3.5	239	3.4	227	3.3	210	3.1	232	3.3
18	321	5.2	330	4.7	316	4.5	267	3.8	279	4.1	248	3.7	261	3.7
19	391	6.3	409	5.9	384	5.5	349	4.9	327	4.8	331	4.9	339	4.8
20	438	7.1	485	7.0	453	6.5	413	5.8	374	5.5	366	5.4	363	5.2
21	468	7.6	561	8.1	498	7.1	561	7.9	475	7.0	465	6.9	407	5.8
22	534	8.6	594	8.5	641	9.2	632	8.9	549	8.1	526	7.8	508	7.2
23	570	9.2	661	9.5	591	8.5	598	8.4	576	8.5	567	8.4	547	7.8
24	555	9.0	657	9.4	591	8.5	651	9.2	601	8.9	544	8.0	577	8.2
25	535	8.6	593	8.5	595	8.5	663	9.3	577	8.5	592	8.7	604	8.6
26	469	7.6	517	7.4	546	7.8	551	7.8	587	8.7	549	8.1	584	8.3
27	377	6.1	414	5.9	465	6.6	453	6.4	473	7.0	510	7.5	560	8.0
28	305	4.9	332	4.8	377	5.4	410	5.8	404	6.0	398	5.9	438	6.2
29	224	3.6	260	3.7	314	4.5	339	4.8	336	5.0	334	4.9	370	5.3
30	171	2.8	189	2.7	226	3.2	219	3.1	222	3.3	253	3.7	255	3.6
31	108	1.7	131	1.9	162	2.3	178	2.5	158	2.3	210	3.1	222	3.2
32	102	1.6	107	1.5	114	1.6	113	1.6	138	2.0	134	2.0	144	2.0
33	65	1.0	75	1.1	90	1.3	90	1.3	89	1.3	92	1.4	115	1.6
34	39	0.6	64	0.9	64	0.9	61	0.9	68	1.0	71	1.0	88	1.3
35	24	0.4	31	0.4	54	0.8	48	0.7	53	0.8	75	1.1	72	1.0
36	15	0.2	20	0.3	25	0.4	30	0.4	23	0.3	50	0.7	52	0.7
37	12	0.2	15	0.2	18	0.3	18	0.3	17	0.3	24	0.4	26	0.4
38	8	0.1	8	0.1	8	0.1	12	0.2	15	0.2	10	0.1	20	0.3
39	7	0.1	6	0.1	11	0.2	11	0.2	11	0.2	6	0.1	14	0.2
40	7	0.1	2	0.0	3	0.0	1	0.0	6	0.1	7	0.1	3	0.0
> 40	8	0.1	4	0.0	6	0.1	6	0.1	7	0.1	6	0.1	8	0.1
Total	6198	100.0	6960	100.0	6993	100.0	7108	100.0	6783	100.0	6778	100.0	7027	100.0

Excludes births less than 500 grams birthweight.

When maternal age was examined for primigravid women confined during 1980-1986 it showed a steady change towards woman having their first pregnancies at older ages in 1986 than they did in 1980. (Table 10, Figure III).

Aboriginal women had a much higher parity than non-aboriginal women. (Table 11) Almost 40% of caucasian women and those of "other" races were experiencing their first baby compared with only 29% for aboriginal women.

**TABLE 11: PARITY AND RACE OF WOMEN CONFINED IN WESTERN AUSTRALIA, 1986**

Parity	Race						Total	
	Caucasian		Aboriginal		Other		No.	%
	No.	%	No.	%	No.	%		
0	8306	39.5	359	29.1	503	38.7	9168	38.9
1 - 2	10908	51.9	544	44.1	665	51.2	12117	51.4
3 - 4	1649	7.8	235	19.0	119	9.2	2003	8.5
≥ 5	165	0.8	96	7.8	12	0.9	273	1.2
<b>Total</b>	<b>21028</b>	<b>100.0</b>	<b>1234</b>	<b>100.0</b>	<b>1299</b>	<b>100.0</b>	<b>23561</b>	<b>100.0</b>

Excludes births less than 500 grams birthweight.

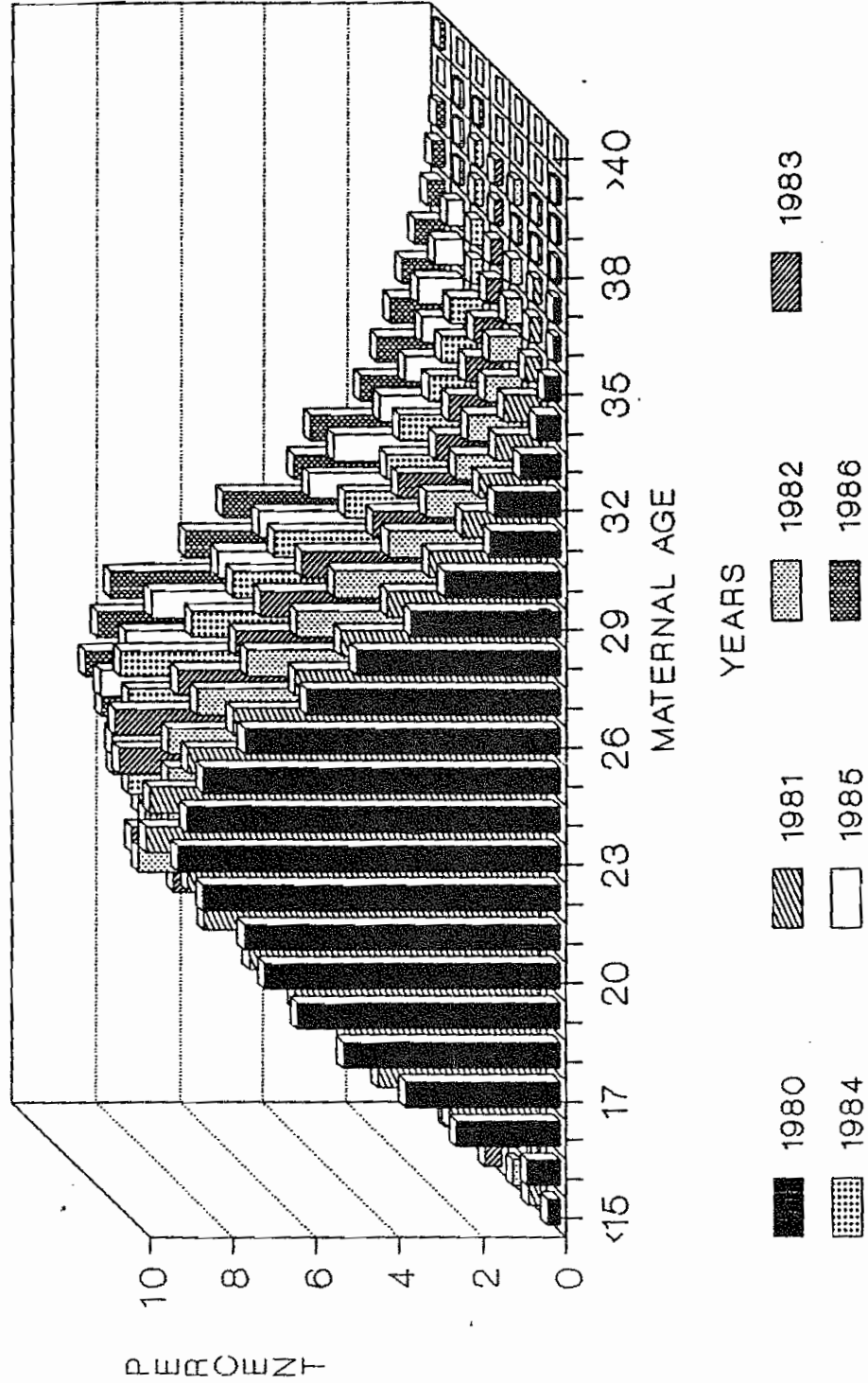
## 8.2 Fertility Rates

Age-specific fertility rates in the aboriginal and non-aboriginal sub-populations and the total population are shown in Table 12. These results are based on the total births in 1986 and projected population totals from Hicks<sup>3</sup> and 1981 Census data.

Overall, the fertility rate amongst aboriginals is more than double that of non-aboriginals. Amongst the 15 to 19 year age group, aboriginal fertility is eight times greater and for the 40 to 44 year group it is almost double. The rates are similar for aboriginals and non-aboriginals in the 25-34 year age group. (Figure IV)

Figure III

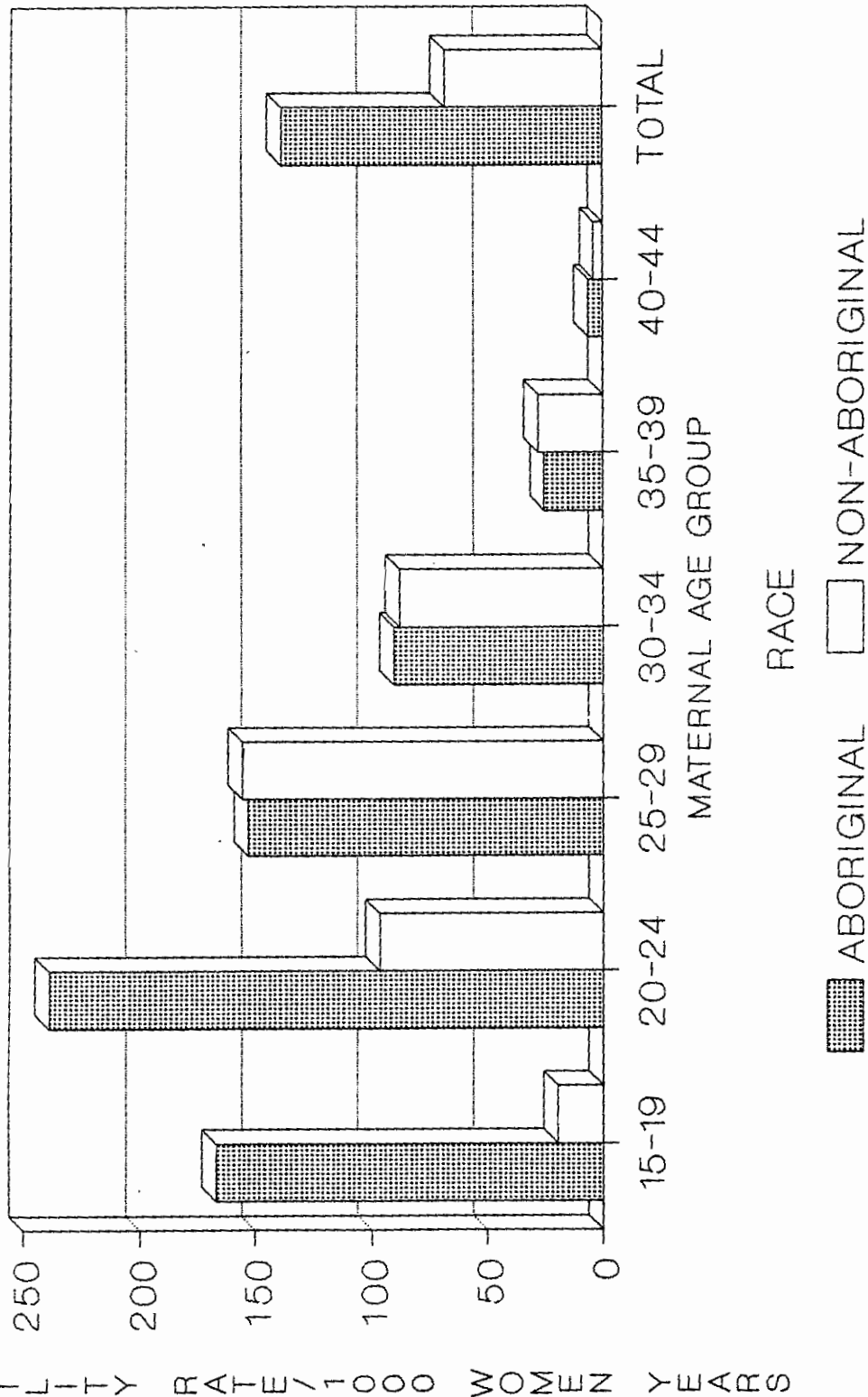
MATERNAL AGE OF PRIMIGRAVID WOMEN  
 CONFINED IN WESTERN AUSTRALIA 1980-1986



Excludes births less than 500 grams birthweight.  
 Source: Midwives' Notification System.

# FERTILITY RATES<sup>1</sup> OF ABORIGINAL AND NON-ABORIGINAL WOMEN IN WESTERN AUSTRALIA, 1986

Figure IV



Excludes births less than 500 grams birthweight.

<sup>1</sup>Fertility Rate: Total Births/1000 Women Years

Source: Midwives Notification System, Australia Bureau of Statistics, Hicks, D, Western Australia Aboriginal Statistics, 1983.

**TABLE 12: FERTILITY RATES<sup>1</sup> OF ABORIGINAL, NON-ABORIGINAL AND TOTAL WOMEN CONFINED IN WESTERN AUSTRALIA, 1986**

Maternal Age	Aboriginal			Non-Aboriginal			Total		
	Births	Popu- lation	Fertility Rate <sup>1</sup>	Births	Popu- lation	Fertility Rate <sup>1</sup>	Births	Popu- lation	Fertility Rate <sup>1</sup>
15 - 19	388	2321	167.2	1131	58178	19.4	1519	60499	25.1
20 - 24	463	1937	239.0	5536	57370	96.5	5999	59307	101.2
25 - 29	239	1559	153.3	9100	58540	155.4	9339	60099	155.4
30 - 34	108	1195	90.4	5112	58305	87.7	5220	59500	87.7
35 - 39	26	1032	25.2	1541	55471	27.8	1567	56503	27.7
40 - 44	5	805	6.2	160	42795	3.7	165	43600	3.8
<b>Total</b>	<b>1229</b>	<b>8849</b>	<b>138.9</b>	<b>22580</b>	<b>330659</b>	<b>68.3</b>	<b>23809</b>	<b>339508</b>	<b>70.1</b>

Excludes births less than 500 grams birthweight.

<sup>1</sup> Fertility Rate : Total Births/1000 Woman-Years.

### 8.3 Complications of Pregnancy

Almost seventy percent of all women confined during 1986 had no complication of their pregnancy.

The most common pregnancy complication identified was pre-eclampsia, occurring in 7.6% of the total women confined, however, for women with multiple pregnancy it was recorded for 17.7%. In addition to this, there were 720 (3.1%) women recorded as having unspecified hypertension, 219 (0.9%) with anaemia of pregnancy identified and another 422 (1.8%) women had an unspecified genito-urinary tract infection. (Table 13)

**TABLE 13: SELECTED COMPLICATIONS OF PREGNANCY AND PLURALITY OF WOMEN CONFINED IN WESTERN AUSTRALIA, 1986**

	Plurality				Total	
	Singleton		Multiple		No.	% <sup>3</sup>
	No.	% <sup>1</sup>	No.	% <sup>2</sup>		
None	16174	69.4	107	39.5	16281	69.1
<u>Complication</u>						
Threatened Abortion	930	4.0	17	6.3	947	4.0
Urinary Tract Infection	891	3.8	7	2.6	898	3.8
Pre-eclampsia	1750	7.5	48	17.7	1798	7.6
A.P.H. - placenta praevia	152	0.7	4	1.5	156	0.7
- abruptio	159	0.7	7	2.6	166	0.7
- other	447	1.9	11	4.1	458	1.9
Premature Rupture of Membranes	688	3.0	34	12.5	722	3.1
Other	3349	14.4	95	35.1	3444	14.6

Excludes births less than 500 grams birthweight.

<sup>1</sup> Percentage of women with a singleton pregnancy.

<sup>2</sup> Percentage of women with a multiple pregnancy.

Although it was thought that complications of pregnancy may be under reported by midwives, the validation study undertaken in 1987 showed that they were well reported, except for premature rupture of the membranes (less than 95% accurate). This was due to confusion between definitions of premature and preterm rupture of membranes.<sup>4</sup>

#### **8.4 Medical Conditions**

There were 46 (0.2%) women confined during 1986 who were identified as having pre-existing diabetes. Another 105 women had epilepsy (0.4%) and 64 (0.3%) thyroid disease. Asthma was recorded for 497 (2.1%) cases and 10 women were recorded as having renal disease.

The 1987 Validation Study of the Midwives' Notification System recommended examples of medical conditions should be listed on the Notification of Case Attended Form 2, to improve ascertainment.<sup>4</sup> This was also recommended by the recent committee to review the Midwifery Regulations.<sup>5</sup>

## 9. LABOUR AND DELIVERY

### 9.1 Onset of Labour

Almost two thirds of the total women confined during 1986 established labour spontaneously. For those women with a multiple pregnancy only 47.6% had a spontaneous onset of labour. Augmentation of labour either by oxytocin or artificial rupture of membranes or both was required by 28.3% of those women who had a spontaneous onset of labour. Twenty seven percent of the total women and 30% of those with a multiple pregnancy had an induction of labour. Almost one in ten of the total women and more than one in five with a multiple pregnancy did not experience labour. (Table 14)

**TABLE 14: ONSET OF LABOUR AND PLURALITY OF WOMEN CONFINED IN WESTERN AUSTRALIA, 1986**

Onset of Labour	Plurality				Total	
	Singleton		Multiple		No.	%
	No.	%	No.	%		
Spontaneous	14800	63.5	129	47.6	14929	63.4
Induced	6266	26.9	82	30.3	6348	26.9
No labour	2224	9.4	60	22.1	2284	9.7
<b>Total</b>	<b>23290</b>	<b>100.0</b>	<b>271</b>	<b>100.0</b>	<b>23561</b>	<b>100.0</b>
<b>Spontaneous Augmented</b>	<b>4197</b>	<b>18.0 (28.4)<sup>1</sup></b>	<b>34</b>	<b>12.5 (26.4)<sup>1</sup></b>	<b>4231</b>	<b>18.0 (28.3)<sup>1</sup></b>

Excludes births less than 500 grams birthweight.

<sup>1</sup> Percentage in parentheses is augmentation/spontaneous onset.

During 1986 there were 79 (0.3%) women identified as having had a failed induction of labour.

From 1981 to 1985 in Western Australia, the number of women having an induction of labour has remained around 25-27% of the total confinements.

Information on augmentation of labour has previously been given as a percentage of the total confinements. In this report this method has been continued but additional figures on the augmentation for only those women who commenced labour spontaneously have been also included. (Table 15)

**TABLE 15: INTERVENTION OF LABOUR OF WOMEN CONFINED IN WESTERN AUSTRALIA, 1981-1986**

Year	Obstetric Intervention		
	Induction % of women	% of women with a spontaneous onset	Augmentation % of women
1981	25.7	19.1	13.5
1982	24.8	21.1	14.3
1983	25.7	27.2	14.2
1984	24.6	23.1	15.6
1985	25.8	25.6	16.6
1986	26.9	28.3	18.0

Excludes births less than 500 grams birthweight.

Due to the difficulty with definition of induction and augmentation amongst midwives, these data may have been inaccurately recorded over the past few years. The option of augmentation has been removed from the question on onset of labour on the midwives' form from January 1987 and will possibly be included as a separate question with a future review of the form.

## 9.2 Presentation (singleton births only)

The presentation for 23,290 singleton births were identified as 22,239 vertex, 905 breech, and 146 "other" presentations. (Table 16)

The majority of cephalic presentations were delivered vaginally, however for those who presented as a breech, 70.7% were delivered by caesarean section (42.5% elective and 28.2% emergency caesarean section). (Table 16)



**TABLE 16: PRESENTATION AND TYPE OF DELIVERY FOR SINGLETON BIRTHS  
IN WESTERN AUSTRALIA, 1986**

Type of Delivery	Presentation						Total	
	Cephalic		Breech		Other		No.	%
	No.	%	No..	%	No.	%		
Normal	14799	66.5	0	0.0	25	17.1	14824	63.6
Vacuum	1977	8.9	0	0.0	4	2.7	1981	8.5
Forceps	2622	11.8	0	0.0	7	4.8	2629	11.3
Breech Manoeuvre	0	0.0	265	29.3	0	0.0	265	1.1
<u>Caesarean</u>								
Elective	1385	6.2	385	42.5	36	24.7	1806	7.8
Emergency	1456	6.5	255	28.2	74	50.7	1785	7.7
<b>Total</b>	<b>22239</b>	<b>100.0</b>	<b>905</b>	<b>100.0</b>	<b>146</b>	<b>100.0</b>	<b>23290</b>	<b>100.0</b>

Excludes: births less than 500 grams birthweight, and two unknown presentations.

### 9.3 Type of Delivery

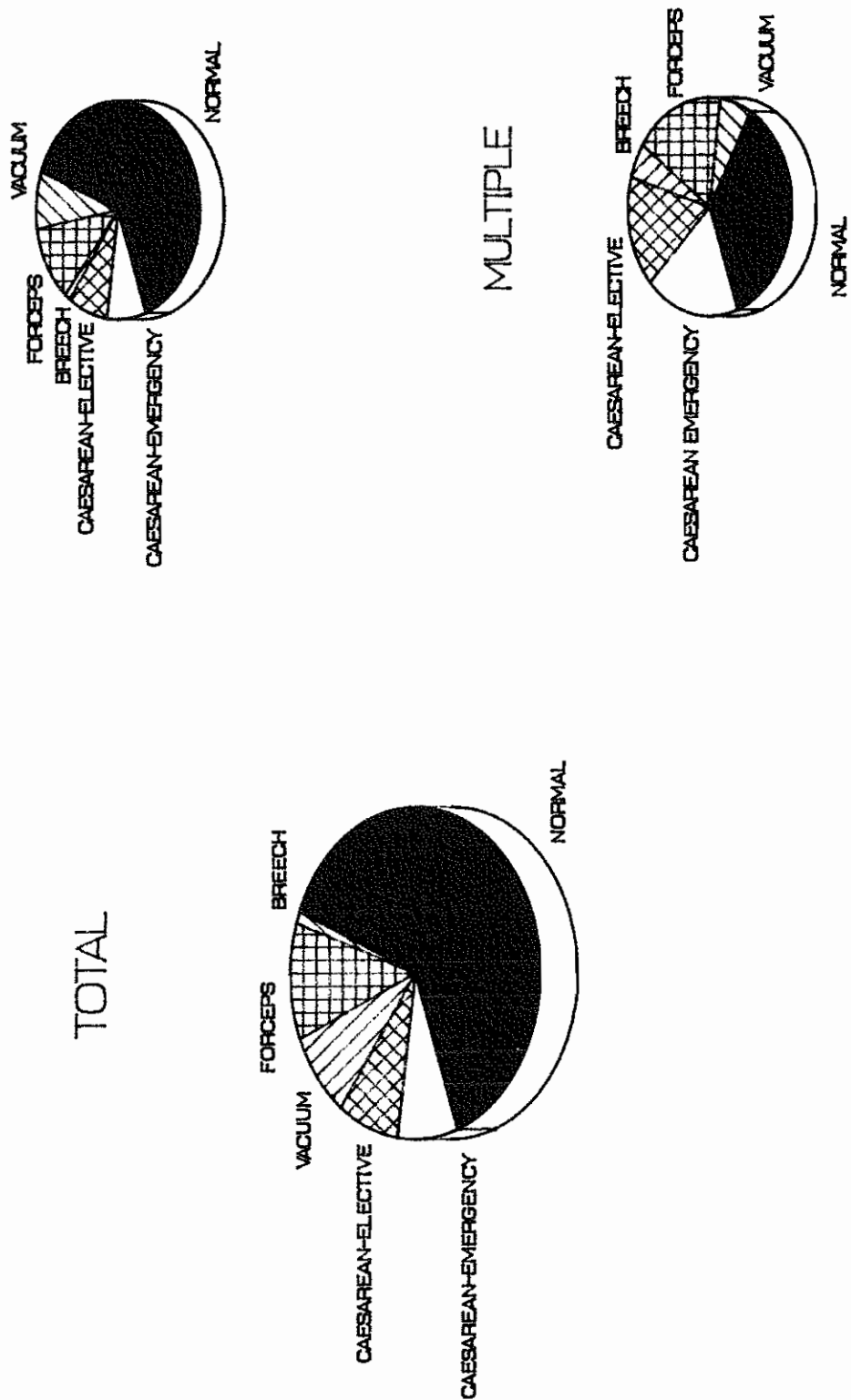
Almost two thirds of the total women confined in 1986 had a normal delivery. Vaginal instrumental deliveries occurred in one in five of the total confinements with 8.5% of women having a vacuum extraction and 11.4% a forcep delivery. There is slightly less total vaginal instrumental deliveries than in 1985.<sup>6</sup>

For those women with a multiple pregnancy just over one third experienced a normal delivery and 35.1% had a caesarean section. (Table 17, Figure V).

Of the 3686 women who had a caesarean delivery in 1986, 1,107 (30%) had a history of a previous caesarean section.

Figure V

# TYPE OF DELIVERY AND PLURALITY OF WOMEN CONFINED IN WESTERN AUSTRALIA, 1986



Excludes births less than 500 grams birthweight.  
Source: Midwives' Notification System.

**TABLE 17: TYPE OF DELIVERY AND PLURALITY OF WOMEN CONFINED IN WESTERN AUSTRALIA, 1986**

Type of Delivery	Plurality				Total	
	Singleton		Multiple		No.	%
	No.	%	No.	%		
Normal	14824	63.6	98	36.2	14922	63.3
Vacuum	1981	8.5	17	6.3	1998	8.5
Forceps	2630	11.3	47	17.3	2677	11.4
Breech Manoeuvre	264	1.1	14	5.2	278	1.2
<u>Caesarean Section</u>						
Elective	1806	7.8	45	16.6	1851	7.9
Emergency	1785	7.7	50	18.5	1835	7.8
<b>Total</b>	<b>23290</b>	<b>100.0</b>	<b>271</b>	<b>100.0</b>	<b>23561</b>	<b>100.0</b>

Excludes births less than 500 grams birthweight.

The percentage of caesarean deliveries in Western Australia has continued to increase and in 1986 15.7% of women were delivered by this method. (Table 18, Figure VI) This increase is not only occurring within Western Australia but also in other Australian states and overseas. Data from South Australia in 1986 reported caesarean section rates of 19.3% and Victoria in 1985 15.5%.<sup>7,8</sup>

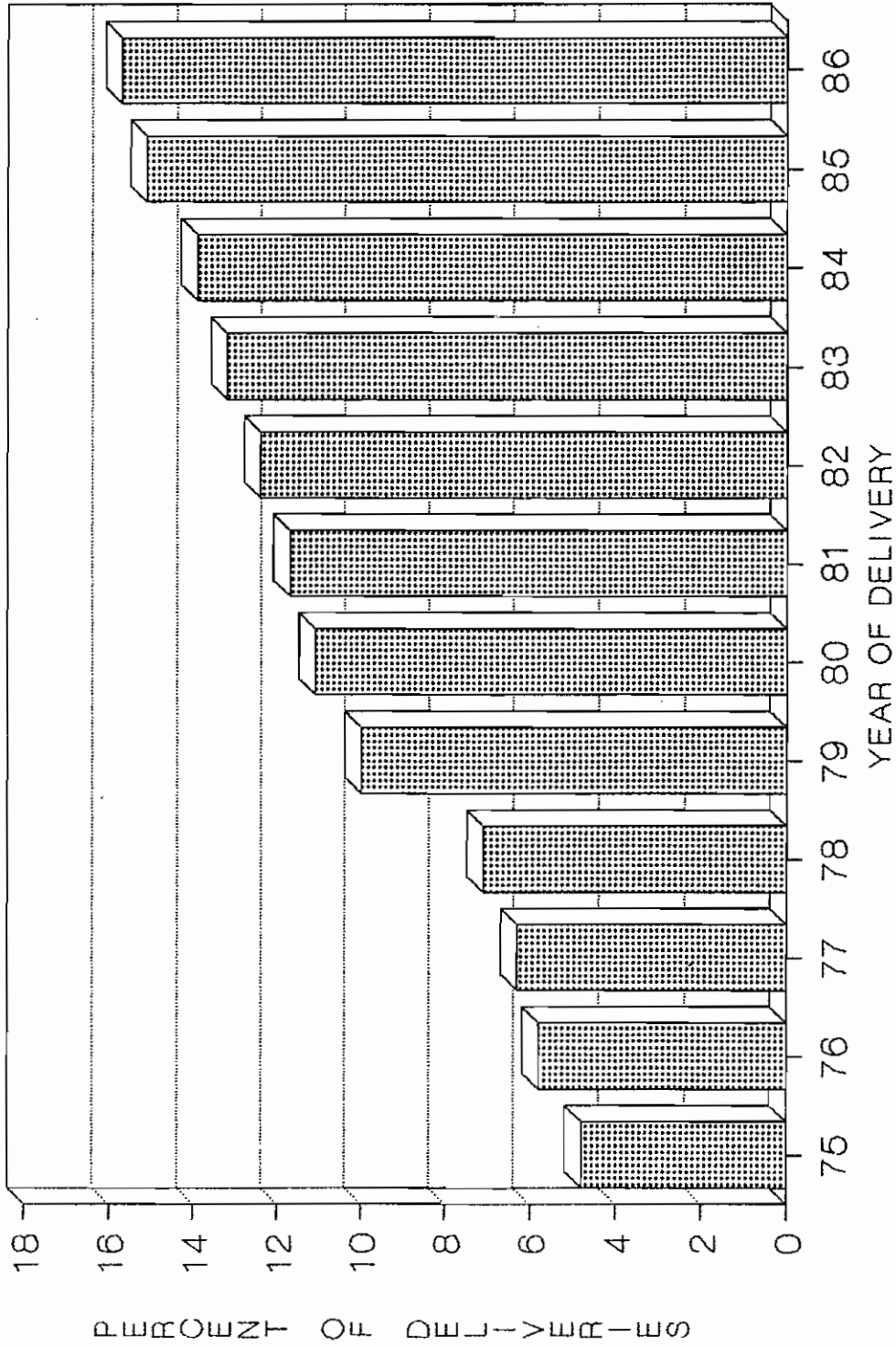
**TABLE 18: CAESAREAN SECTION IN WOMEN CONFINED IN WESTERN AUSTRALIA, 1975-1986**

Year of Delivery	% of all Women
1975	4.8
1976	5.8
1977	6.3
1978	7.1
1979	10.0
1980	11.1
1981	11.7
1982	12.4
1983	13.2
1984	13.9
1985	15.1
1986	15.7

Excludes births less than 500 grams birthweight.

CEASAREAN SECTIONS IN WESTERN AUSTRALIA 1975-1986

Figure VI



Excludes births less than 500 grams birthweight.  
Source: Midwives' Notification System.

#### 9.4 Hours of Established Labour

The recorded length of labour varied amongst those women who had a spontaneous onset and those who were induced. Almost half the women who had an induction experienced between one to four hours of labour whereas slightly more than half the women with a spontaneous onset had between five to 12 hours of labour. There were 66 women or 0.3% of the total whose labour was recorded as more than 24 hours duration. (Table 19)

**TABLE 19: HOURS OF ESTABLISHED LABOUR BY ONSET OF LABOUR OF WOMEN CONFINED IN WESTERN AUSTRALIA, 1986**

Hours of Labour	Onset of Labour			
	Spontaneous		Induction	
	No.	%	No.	%
1 - 4	5829	39.0	3001	47.3
5 - 12	7917	53.0	3073	48.4
13 - 18	944	6.3	232	3.7
19 - 24	163	1.1	33	0.5
> 24	64	0.4	9	0.1
Unknown	12	0.1	0	0.0
<b>Total</b>	<b>14929</b>	<b>100.0</b>	<b>6348</b>	<b>100.0</b>

Excludes: births less than 500 grams birthweight, and 2,284 (9.7%) women who did not experience labour.

#### 9.5 Complications of Labour and Delivery

For just over half the women confined in 1986, there were no complications of labour or delivery recorded. However, only 46.5% of those women with a multiple pregnancy had no complications.

Of those women identified with a complication, fetal distress was recorded for 12.7% singleton pregnancies and only 3.3% of the women with a multiple pregnancy. Cephalopelvic disproportion was identified for almost 6% of the total women but amongst those with a multiple pregnancy only 2.9%.

Other complications included; 338 (1.4%) women with hypertension; 39 (0.2%) women with severe pre-eclampsia and two women were recorded as having had an eclamptic fit.

Prolonged first stage of labour was identified in 24 cases, prolonged second stage in 311 (1.3%) women and unspecified prolonged labour occurred in 152 (0.6%) women. Perineal tears were identified as first degree in 99 (0.4%) cases, second degree in 61 (0.3%) cases and 110 (0.5%) women had a third degree tear.

Primary postpartum haemorrhage was recorded for 442 (1.9%) women and retained placenta in 316 (1.3%) of women.

These data suggest significant morbidity in child bearing women. Even allowing for some under-reporting, the Validation Study undertaken in 1987 identified conditions which were recorded more than 90% accurate, such as fetal distress, prolapsed cord, failure to progress, persistent occipitoposterior position, intra/postpartum haemorrhage, elevated blood pressure in labour and previous caesarean section. Other complications which were recorded in the medical record and not reported by midwives included shoulder dystocia, trial of scar, retained placenta and high head at term in primigravidae.<sup>4</sup>

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 Guidelines for the Completion of the Notification of Case Attended Forms and ongoing education and feedback to midwives.<sup>1</sup>

**TABLE 20: SELECTED COMPLICATIONS OF LABOUR AND DELIVERY AND PLURALITY OF WOMEN CONFINED IN WESTERN AUSTRALIA, 1986**

	Plurality				Total	
	Singleton		Multiple		No.	% 3
	No.	% 1	No.	% 2		
None	12333	53.0	126	46.5	12459	52.9
<u>Complication</u>						
Precipitate Delivery	1341	5.8	19	7.0	1360	5.8
Fetal Distress	2967	12.7	9	3.3	2976	12.6
Prolapsed Cord	51	0.2	6	2.2	57	0.2
Cord Tightly Around Neck	1499	6.4	7	2.6	1506	6.4
Cephalopelvic Disproportion	1361	5.8	8	3.0	1369	5.8
Other	6255	26.9	109	40.2	6364	27.0

Excludes births less than 500 grams birthweight.

<sup>1</sup> Percentage of women with a singleton pregnancy.

<sup>2</sup> Percentage of women with a multiple pregnancy.

<sup>3</sup> Percentage of total women.

## 10. BABY CHARACTERISTICS

### 10.1 Births

Notification of Case Attended Form 2 (Appendix 1) were received for 23,839 births of 500 grams birthweight or more which occurred in Western Australia during 1986. Amongst these births, 23,693 (99.4%) babies were liveborn, 146 were stillborn and there were 129 neonatal deaths.

There were 23,290 singleton births and 549 multiple births consisting of 522 twins, 23 triplets and 4 quadruplets. (Tree Diagram 1) Since 1980, the number of triplet births has increased in Western Australia and there has also been a slight increase in the number of twins.<sup>9</sup> (Table 21)

**TABLE 21: PLURALITY OF BIRTHS IN WESTERN AUSTRALIA, 1980 - 1986**

Year of Birth	Plurality				Total
	Singleton	Twin	Triplet	Quadruplet	
1980	20380	399	2 <sup>1</sup>	-	20781
1981	21714	464	9	-	22187
1982	21869	458	12	-	22339
1983	22546	464 <sup>2</sup>	15	-	20325
1984	22412	487 <sup>3</sup>	18	-	22917
1985	22749	515 <sup>4</sup>	24	-	23288
1986	23290	522	23 <sup>1</sup>	4	23839

Excludes births less than 500 grams birthweight

<sup>1</sup> Excludes one triplet less than 500 grams birthweight

<sup>2</sup> Includes four single twins whose birthweight was 500 grams or more

<sup>3</sup> Includes three single twins whose birthweight was 500 grams or more

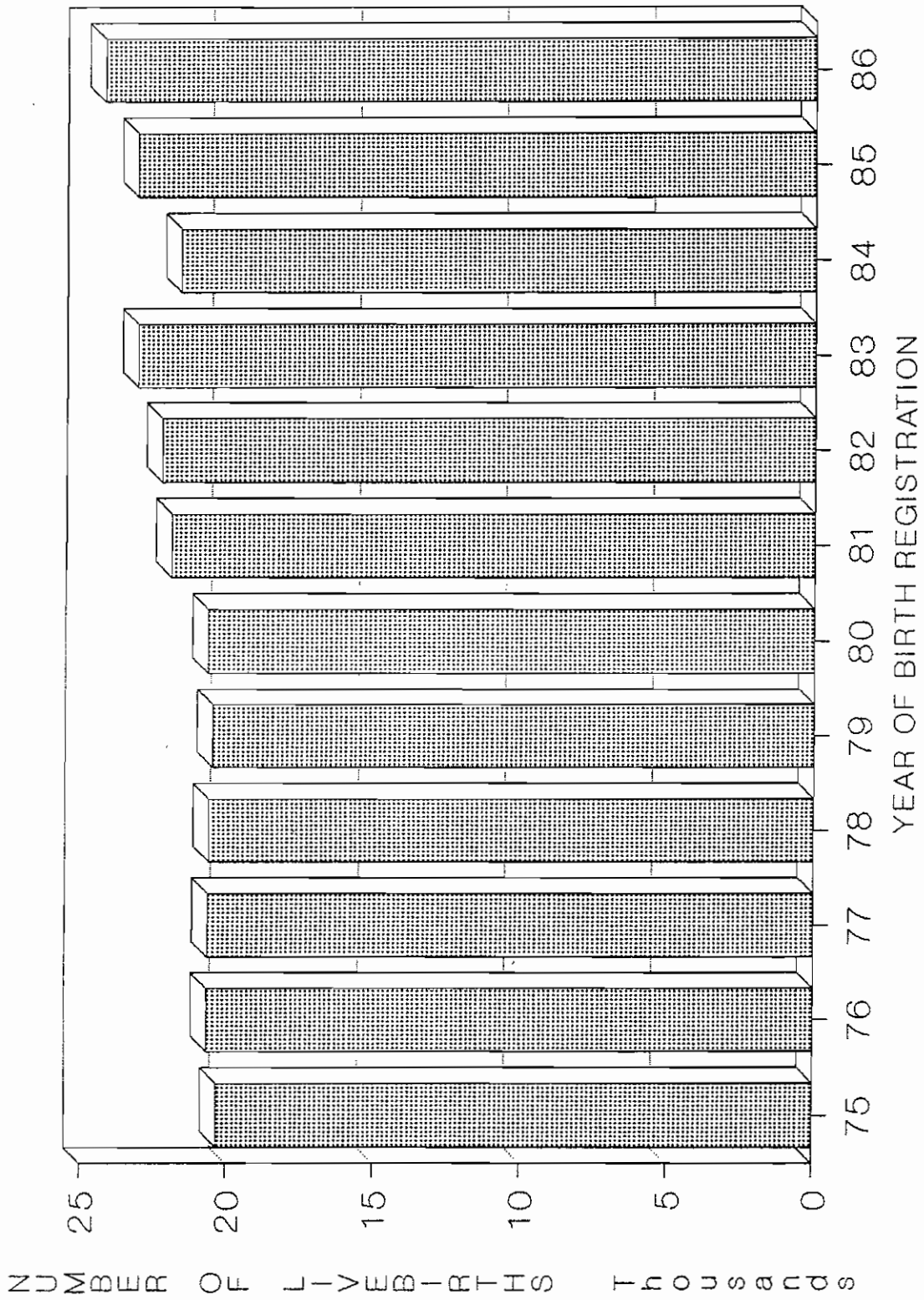
<sup>4</sup> Includes one single twin whose birthweight was 500 grams or more.

### 10.2 Livebirths

Using information from the Australian Bureau of Statistics, the number of livebirths occurring in Western Australia have increased. (Table 22, Figure VII) The crude birthrate has remained steady or around 16.5/1000 since 1978. Thus the rise in total births reflects the increase in Western Australia's population rather than individual women having more children.

LIVEBIRTHS IN WESTERN AUSTRALIA 1975-1986

Figure VII



1975-1986 Numbers based on State of residence.  
 Source: Australian Bureau of Statistics.



### 10.3 Crude Birth Rate

The crude birth rate was 16.6/1000 livebirths in 1986. This is based on birth registrations from the Australian Bureau of Statistics and Register Generals' Office. (Table 22, Figure VIII)

**TABLE 22: LIVEBIRTHS AND CRUDE BIRTH RATES IN WESTERN AUSTRALIA, 1975-1986**

	Livebirths	Population <sup>1</sup>	Birth Rate <sup>2</sup> / 1000
1975	20338	1155499	17.6
1976	20670	1178928	17.5
1977	20651	1204454	17.1
1978	20611	1227903	16.8
1979	20469	1246800	16.4
1980	20652	1269270	16.3
1981	21900	1301238	16.8
1982	22261	1336588	16.7
1983	23087	1363890	16.9
1984	21625	1384224	15.6
1985	23109	1407817	16.4
1986	24236	1457992	16.6

<sup>1</sup> Mean resident population.

<sup>2</sup> Livebirths per 1000 total population.

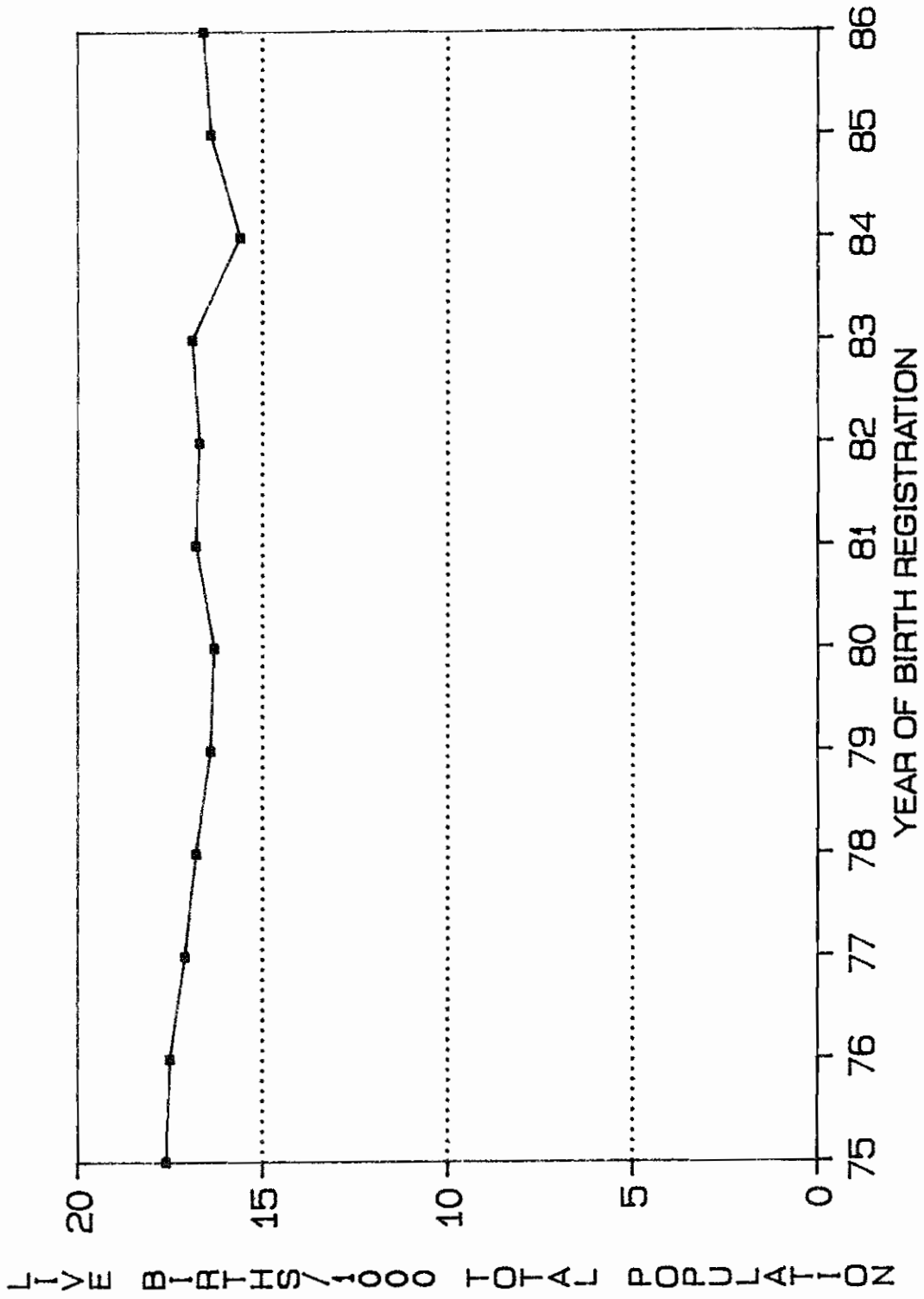
Source: Australian Bureau of Statistics

### 10.4 Sex

There were 12,322 male births and 11,516 female births and one baby of indeterminate sex born during 1986. Males represented 51.7% of the total births. The sex ratio was 1.07 males per 1000 females. (Table 23)

Figure VIII

CRUDE BIRTH RATE<sup>1</sup> IN WESTERN AUSTRALIA 1975-1986



<sup>1</sup> Crude Birth Rate: Livebirths per 1000 total population.  
Source: Australian Bureau of Statistics.

**TABLE 23: CONDITION AT BIRTH AND SEX OF BIRTHS IN WESTERN AUSTRALIA, 1986**

Sex	Condition at Birth				Total	
	Stillbirth		Livebirth		No.	%
	No.	%	No.	%		
Male	66	45.2	12256	51.7	12322	51.7
Female	79	53.4	11437	48.3	11516	48.3
Indeterminate	1	0.7	0	0.0	1	0.0
<b>Total</b>	<b>146</b>	<b>100.0</b>	<b>23693</b>	<b>100.0</b>	<b>23839</b>	<b>100.0</b>

Excludes births less than 500 grams birthweight.

### 10.5 Condition at Birth

Of the total 23,839 births, 23,693 were liveborn. There were 146 stillbirths and 129 livebirths who died within the first 28 days of birth. When condition was examined by sex for all births it showed 45.2% of the stillbirths were male. (Table 23)

Eleven percent of stillbirths and 5.2% of livebirths were to aboriginal mothers. (Table 24) Over the past decade there has been dramatic improvement in the aboriginal stillbirth proportion and in 1986 the aboriginal stillbirth proportion was 12.8/1000 total births.

**TABLE 24: CONDITION AT BIRTH AND MATERNAL RACE OF BIRTHS IN WESTERN AUSTRALIA, 1986**

Race	Condition at Birth				Total Births		Stillbirth Proportion/1000 Total Births
	Stillbirth		Livebirth		No.	%	
	No.	%	No.	%			
Caucasian	123	84.2	21162	89.3	21285	89.3	5.8
Aboriginal	16	11.0	1230	5.2	1246	5.2	12.8
Other	7	4.8	1301	5.5	1308	5.5	5.4
<b>Total</b>	<b>146</b>	<b>100.0</b>	<b>23693</b>	<b>100.0</b>	<b>23839</b>	<b>100.0</b>	

Excludes births less than 500 grams birthweight.

When the place and condition of birth were examined for all births it showed more than 70% of the stillbirths were delivered in hospitals in the metropolitan area. Almost half of the stillbirths were in the metropolitan obstetric teaching hospital. This reflects excellent referral patterns of high risk mothers for delivery in Western Australia. (Table 25)

**TABLE 25: PLACE OF BIRTH AND CONDITION AT BIRTH IN WESTERN AUSTRALIA, 1986**

Place of Birth	Condition at Birth				Proportion/ 1000 Total Births	Total	
	Livebirth		Stillbirth			No.	%
	No.	%	No.	%			
<u>Metropolitan</u>							
<sup>1</sup> Teaching	4957	20.9	72	49.3	14.3	5029	21.1
Department	6402	27.0	23	15.8	3.6	6425	27.0
Private	5939	25.1	16	10.9	2.7	5955	25.0
<u>Country</u>							
<sup>2</sup> Regional	2966	12.5	18	12.3	6.0	2984	12.5
Private	583	2.5	3	2.1	5.1	586	2.5
<sup>3</sup> Other	2626	11.1	12	8.2	4.5	2638	11.1
<u>Non-Hospital</u>							
*BBA	47	0.2	1	0.7	20.8	48	0.2
Home Births	173	0.7	1	0.7	5.7	174	0.7
<b>Total</b>	<b>23693</b>	<b>100.0</b>	<b>146</b>	<b>100.0</b>	<b>6.1</b>	<b>23839</b>	<b>100.0</b>

\* BBA (born before arrival at hospital).

Excludes births less than 500 grams birthweight.

<sup>1</sup> Teaching Hospital - University Medical School (Teaching Hospital Act 1955).

<sup>2</sup> Country Regional Hospital - Government Hospital with private and public beds.

<sup>3</sup> Other Country Hospital - includes Government and Board Hospitals.

#### 10.6 Apgar Score at Five Minutes

The majority of livebirths (95.8%) had a recorded Apgar score at five minutes of 8-10, and 983 (4.1%) livebirths had an Apgar score of seven or less. Apgar score was not recorded for 16 livebirths during 1986. (Table 26)

**TABLE 26: APGAR SCORE AT FIVE MINUTES AND TIME TO SPONTANEOUS RESPIRATION OF LIVEBIRTHS IN WESTERN AUSTRALIA, 1986**

Apgar Score	Time to Spontaneous Respiration										Intubation <sup>1</sup>		Unknown		Total	
	≤ 1		2 - 3		4 - 6		7 - 10		> 10		No.	%	No.	%	No.	%
	No.	%	No.	%	No.	%	No.	%	No.	%						
1 - 3	25	0.1	4	0.3	7	1.6	13	14.9	2	50.0	26	11.0	0	0.0	77	0.3
4 - 7	325	1.5	198	12.9	191	43.5	62	71.3	2	50.0	128	54.0	0	0.0	906	3.8
8 - 10	21026	98.3	1332	86.8	241	54.9	12	13.8	0	0.0	83	35.0	0	0.0	22694	95.8
Unknown	6	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	10	100.0	16	0.1
<b>Total</b>	<b>21382</b>	<b>100.0</b>	<b>1534</b>	<b>100.0</b>	<b>439</b>	<b>100.0</b>	<b>87</b>	<b>100.0</b>	<b>4</b>	<b>100.0</b>	<b>237</b>	<b>100.0</b>	<b>10</b>	<b>100.0</b>	<b>23693</b>	<b>100.0</b>

Excludes births less than 500 grams birthweight and also 146 stillbirths.

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

### 10.7 Time to Spontaneous Respiration

Ninety eight percent of all livebirths were recorded as having established spontaneous respiration within the first minute of life. Eight percent of livebirths required two to six minutes to establish respirations and 91 babies (0.4%) took seven minutes or more. There were 237 (1.0%) livebirths who required intubation immediately following delivery. (Table 26)

### 10.8 Resuscitation

Resuscitation at birth was not required for seven in every ten births. Active resuscitation such as intubation or bag and mask was used for almost 6.0% of births and another 21.5% births were given oxygen only.

When resuscitation and Apgar Score was examined it showed that 54.5% of the babies with an Apgar Score of 1-3 and 41.1% of those with an Apgar of 4-7 were intubated. (Table 27).

**TABLE 27: RESUSCITATION METHODS AND APGAR SCORE AT FIVE MINUTES OF LIVEBIRTHS IN WESTERN AUSTRALIA, 1986**

Resuscitation	Apgar Score at 5 Minutes						Unknown		Total	
	1 - 3		4 - 7		8 - 10		No.	%	No.	%
	No.	%	No.	%	No.	%				
None	17	22.1	62	6.8	16441	72.4	1	6.3	16521	69.7
Oxygen Only	5	6.5	269	29.7	4815	21.2	0	0.0	5089	21.5
Intubation	42	54.5	372	41.1	517	2.3	0	0.0	931	3.9
Bag and Mask	6	7.8	106	11.7	284	1.3	0	0.0	396	1.7
Other	7	9.1	97	10.7	637	2.8	0	0.0	741	3.1
Unknown	0	0.0	0	0.0	0	0.0	15	93.7	15	0.1
<b>Total</b>	<b>77</b>	<b>100.0</b>	<b>906</b>	<b>100.0</b>	<b>22694</b>	<b>100.0</b>	<b>16</b>	<b>100.0</b>	<b>23693</b>	<b>100.0</b>

Excludes births less than 500 grams birthweight and 146 stillbirths.

### 10.9 Birthweight

Almost seventy percent of all births weighed between 3000 to 3999 grams at birth. The percentage of low birthweight babies (less than 2500 grams) was 6.0% of the total births and 1.2% were of low birthweight (less than 1500 grams).

Amongst the aboriginal births 11.8% were low birthweight, which was more than twice than for the caucasian births where only 5.6% were of low birthweight (less than 2500 grams). (Table 28)

**TABLE 28: BIRTHWEIGHT DISTRIBUTION AND MATERNAL RACE OF BIRTHS IN WESTERN AUSTRALIA, 1986**

Birthweight (Grams)	Maternal Race						Total	
	Caucasian		Aboriginal		Other		No.	%
	No.	%	No.	%	No.	%		
500 - 999	107	0.5	15	1.2	15	1.1	137	0.6
1000 - 1499	133	0.6	12	1.0	6	0.5	151	0.6
1500 - 1999	239	1.1	27	2.2	9	0.7	275	1.2
2000 - 2499	724	3.4	92	7.4	52	4.0	868	3.6
2500 - 2999	3212	15.1	269	21.6	244	18.7	3725	15.6
3000 - 3499	8012	37.6	472	37.9	510	39.0	8994	37.7
3500 - 3999	6506	30.6	269	21.6	357	27.3	7132	29.9
4000 - 4499	2056	9.7	72	5.8	99	7.6	2227	9.3
≥ 4500	296	1.4	17	1.4	16	1.2	329	1.4
UNKNOWN	0	0.0	1	0.1	0	0.0	1	0.0
<b>Total</b>	<b>21285</b>	<b>100.0</b>	<b>1246</b>	<b>100.0</b>	<b>1308</b>	<b>100.0</b>	<b>23839</b>	<b>100.0</b>

Excludes births less than 500 grams birthweight.

**TABLE 29: BIRTHWEIGHT DISTRIBUTION AND CONDITION AT BIRTH OF TOTAL BIRTHS IN WESTERN AUSTRALIA, 1986**

Birthweight (Grams)	Condition at Birth				Total	
	Livebirths		Stillbirths		No.	%
	No.	%	No.	%		
500 - 999	84	0.4	53	36.3	137	0.6
1000 - 1499	132	0.6	19	13.0	151	0.6
1500 - 1999	264	1.1	11	7.5	275	1.2
2000 - 2499	851	3.6(5.7)	17	11.6(68.4)	868	3.6(6.0)
2500 - 2999	3712	15.7	13	8.9	3725	15.6
3000 - 3499	8979	37.9	15	10.3	8994	37.7
3500 - 3999	7123	30.1	9	6.2	7132	29.9
4000 - 4499	2222	9.4	5	3.4	2227	9.3
≥ 4500	326	1.4	3	2.1	329	1.4
UNKNOWN	0	0.0	1	0.7	1	0.0
<b>Total</b>	<b>23693</b>	<b>100.0</b>	<b>146</b>	<b>100.0</b>	<b>23839</b>	<b>100.0</b>

**TABLE 29.1 SINGLETON BIRTHS IN WESTERN AUSTRALIA, 1986**

Birthweight (Grams)	Condition at Birth				Total	
	Livebirths		Stillbirths		No.	%
	No.	%	No.	%		
500 - 999	64	0.3	49	36.3	113	0.5
1000 - 1499	101	0.4	16	11.9	117	0.5
1500 - 1999	206	0.9	10	7.4	216	0.9
2000 - 2499	679	2.9(4.5)	15	11.1(66.7)	694	3.0(4.9)
2500 - 2999	3542	15.3	12	8.9	3554	15.3
3000 - 3499	8901	38.4	15	11.1	8916	38.3
3500 - 3999	7114	30.7	9	6.7	7123	30.6
4000 - 4499	2222	9.6	5	3.7	2227	9.6
≥ 4500	326	1.4	3	2.2	329	1.4
UNKNOWN	0	0.0	1	0.7	1	0.0
<b>Total</b>	<b>23155</b>	<b>100.0</b>	<b>135</b>	<b>100.0</b>	<b>23290</b>	<b>100.0</b>

**TABLE 29.2 MULTIPLE BIRTHS IN WESTERN AUSTRALIA, 1986**

Birthweight (Grams)	Condition at Birth				Total	
	Livebirths		Stillbirths		No.	%
	No.	%	No.	%		
500 - 999	20	3.7	4	36.4	24	4.4
1000 - 1499	31	5.8	3	27.3	34	6.2
1500 - 1999	58	10.8	1	9.1	59	10.7
2000 - 2499	172	32.0(52.3)	2	18.2(90.9)	174	31.7(53.0)
2500 - 2999	170	31.6	1	9.1	171	31.1
3000 - 3499	78	14.5	0	0.0	78	14.2
3500 - 3999	9	1.7	0	0.0	9	1.6
4000 - 4499	0	0.0	0	0.0	0	0.0
≥ 4500	0	0.0	0	0.0	0	0.0
<b>Total</b>	<b>538</b>	<b>100.0</b>	<b>11</b>	<b>100.0</b>	<b>549</b>	<b>100.0</b>

Excludes births less than 500 grams birthweight.

When condition at birth, plurality and birthweight were examined for all births. More than two thirds of all stillbirths weighed less than 2500 grams whereas for the livebirths only 5.7% were of low birthweight. (Table 29)

Amongst the singleton births, 4.5% of the liveborn and 67.2% of stillbirths were of low birthweight (less than 2500 grams). (Table 29.1)

For multiple births more than half the livebirths and almost all the stillbirths were of low birthweight (less than 2500 grams). (Table 29.2)

When the categories of low birthweight were examined for total births from 1980 to 1986 it showed that during this time births less than 1000 grams represented 0.5-0.6% of the total births. For those babies whose birthweight was less than 1500 grams the percentage varied from 1.0% to 1.6% of the total births. Overall those babies who weighed less than 2500 grams, accounted for 5.8% to 6.3% of the total births. There were no obvious trends towards fewer low birthweight births. (Table 30, Figure IX)

**TABLE 30: LOW BIRTHWEIGHT CATEGORIES IDENTIFIED AMONGST THE TOTAL BIRTHS IN WESTERN AUSTRALIA, 1980-1986**

Year of Birth	Low Birthweight <sup>1</sup> Categories (grams)						Total Births
	<1000		<1500		<2500		
	No.	% <sup>2</sup>	No.	% <sup>2</sup>	No.	% <sup>2</sup>	
1980	105	0.5	242	1.2	1212	5.8	20770
1981	101	0.5	230	1.0	1289	5.8	22191
1982	115	0.5	353	1.6	1299	5.8	22343
1983	129	0.6	274	1.2	1461	6.3	23029
1984	105	0.5	266	1.2	1382	6.0	22917
1985	134	0.6	294	1.3	1457	6.3	23288
1986	137	0.6	288	1.2	1431	6.0	23839

Excludes births less than 500 grams birthweight.

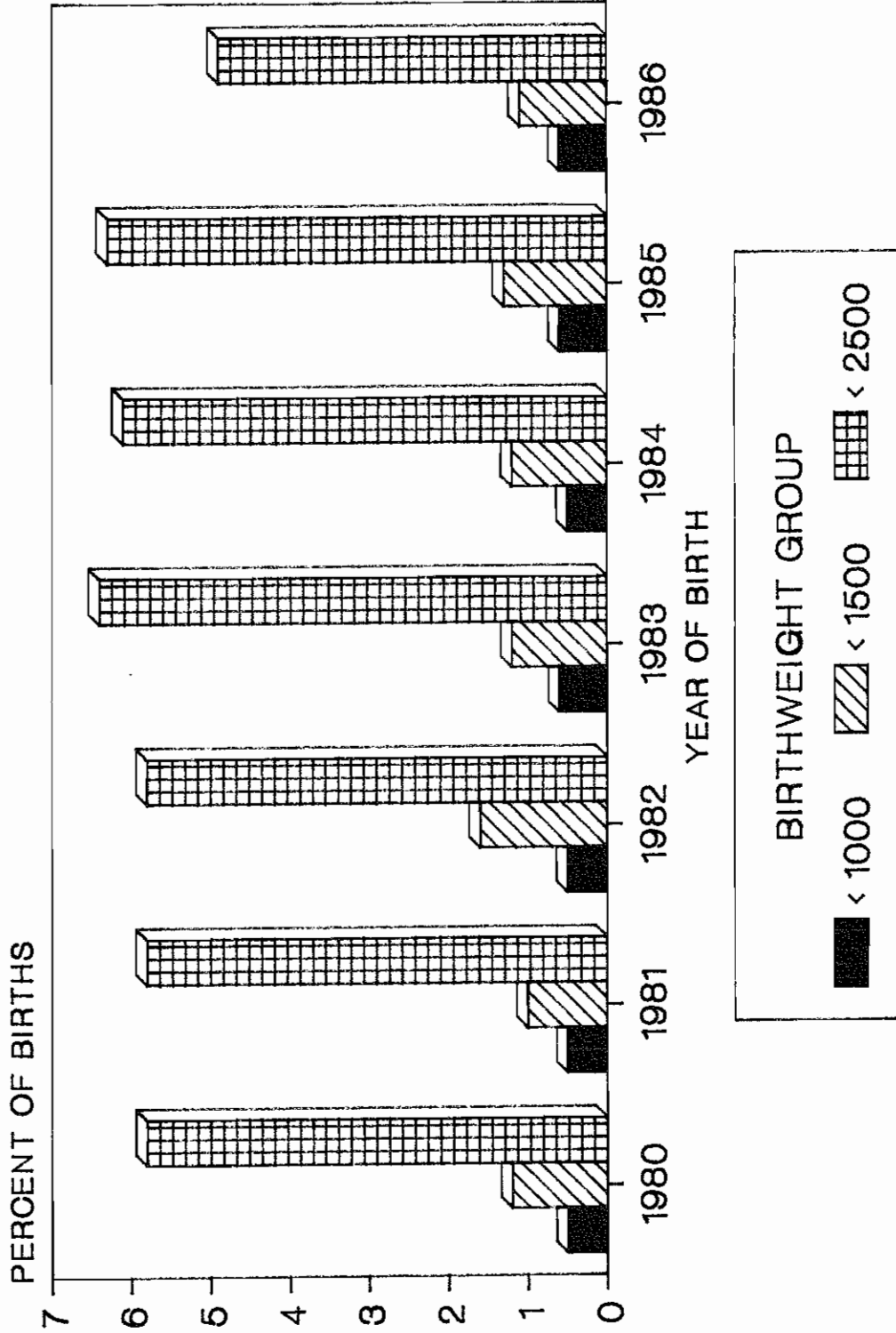
<sup>1</sup> Low birthweight - births less than 2500 grams birthweight.

<sup>2</sup> Percentages of the total births.



Figure IX

**LOW BIRTHWEIGHT<sup>1</sup> IDENTIFIED  
FOR TOTAL BIRTHS IN WESTERN AUSTRALIA  
1980-1986**



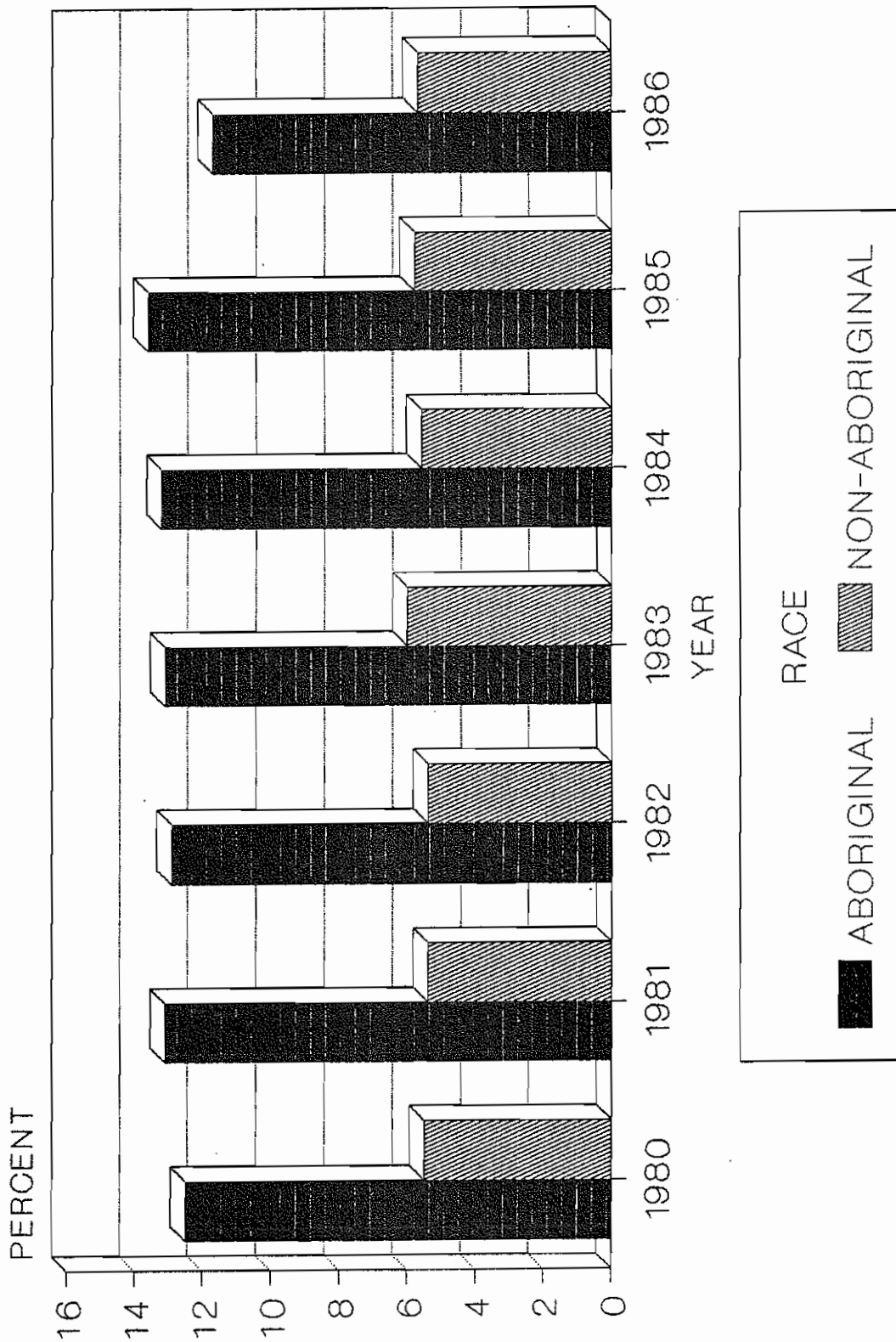
Excludes births less than 500 grams birthweight

<sup>1</sup>Low birthweight less than 2500 grams birthweight

Source: Midwives' Notification System

**LOW BIRTHWEIGHT<sup>1</sup>, IDENTIFIED FOR  
ABORIGINAL & NON-ABORIGINAL BIRTHS  
IN WESTERN AUSTRALIA, 1980-1986**

Figure X



Excludes births less than 500 grams  
<sup>1</sup>Low Birthweight - less than 2500 grams birthweight  
 Source: Midwives' Notification System

Low birthweight (less than 2500 grams) was identified for aboriginal and non-aboriginal births from 1980 to 1986. Although the percentages have been reasonably stable, the aboriginal low birthweight continues to be double that of the non-aboriginal babies. (Table 31, Figure X)

**TABLE 31: LOW BIRTHWEIGHT<sup>1</sup> AMONGST ABORIGINAL AND NON-ABORIGINAL BIRTHS IN WESTERN AUSTRALIA, 1980-1986**

Year of Birth	Aboriginal			Non-Aboriginal		
	Total Births	LBW <sup>1</sup> No.	%	Total Births	LBW <sup>1</sup> No.	%
1980	1036	130	12.5	19734	1082	5.5
1981	1118	146	13.1	21073	1143	5.4
1982	1129	146	12.9	21214	1153	5.4
1983	1149	151	13.1	21876	1310	6.0
1984	1192	157	13.2	21725	1225	5.6
1985	1249	170	13.6	22039	1287	5.8
1986	1245	146	11.7	22592	1285	5.7

Excludes births less than 500 grams birthweight.

<sup>1</sup> Low birthweight - less than 2500 grams birthweight.

#### 10.10 Gestation

Preterm birth (less than 37 weeks gestation) occurred in 1,869 (7.8%) of the total births. (Table 32) When examined for singleton births only, 1,624 (7.0%) babies were preterm. (Table 32.1) Of the 549 multiple births, 245 (44.6%) were also preterm. (Table 32.2) Data on gestational age was computerised from the mother's date of last normal menstrual period. There were 100 unknown cases. Additional information on gestational age from clinical examination of the baby at birth is available from the 1986 midwives' data.

**TABLE 32: GESTATION AND BIRTHWEIGHT OF TOTAL BIRTHS IN WESTERN AUSTRALIA, 1986**

Birthweight (Grams)	Gestation (weeks)						Total							
	< 22		22 - 27		28 - 32		33 - 36		37 - 42		≥ 43			
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%		
500 - 999	5	100.0	95	79.8	30	10.3	4	0.3	1	0.0	0	0.0	135	0.6
1000 - 1499	0	0.0	19	16.0	89	30.7	36	2.5	3	0.0	1	0.2	148	0.6
1500 - 1999	0	0.0	1	0.8	104	35.9	128	8.8	38	0.2	1	0.2	272	1.1
2000 - 2499	0	0.0	0	0.0	31	10.7	380	26.1	445	2.1	3	0.6	859	3.6
2500 - 2999	0	0.0	2	1.7	17	5.9	478	32.9	3152	14.8	50	9.3	3699	15.6
3000 - 3499	0	0.0	1	0.8	12	4.1	286	19.7	8467	39.7	203	37.8	8969	37.6
3500 - 3999	0	0.0	0	0.0	6	2.1	110	7.6	6790	31.8	198	36.9	7104	29.8
4000 - 4499	0	0.0	1	0.8	1	0.3	29	2.0	2125	10.0	69	12.9	2225	9.3
≥ 4500	0	0.0	0	0.0	0	0.0	4	0.3	312	1.5	12	2.2	328	1.4
<b>Total</b>	<b>5</b>	<b>100.0</b>	<b>119</b>	<b>100.0</b>	<b>290</b>	<b>100.0</b>	<b>1455</b>	<b>100.0</b>	<b>21333</b>	<b>100.0</b>	<b>537</b>	<b>100.0</b>	<b>23739</b>	<b>100.0</b>

Excludes 100 babies with unknown Gestational age

**TABLE 32.1 GESTATION AND BIRTHWEIGHT OF SINGLETON BIRTHS IN WESTERN AUSTRALIA, 1986**

Birthweight (Grams)	Gestation (weeks)						Total							
	< 22		22 - 27		28 - 32		33 - 36		37 - 42		≥ 43			
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%		
500 - 999	5	100.0	79	79.0	23	9.5	3	0.2	1	0.0	0	0.0	111	0.5
1000 - 1499	0	0.0	16	16.0	66	27.2	29	2.3	2	0.0	1	0.2	114	0.5
1500 - 1999	0	0.0	1	1.0	90	37.0	92	7.2	29	0.1	1	0.2	213	0.9
2000 - 2499	0	0.0	0	0.0	28	11.5	287	22.5	367	1.8	3	0.6	685	3.0
2500 - 2999	0	0.0	2	2.0	17	7.0	442	34.6	3017	14.4	50	9.3	3528	15.1
3000 - 3499	0	0.0	1	1.0	12	4.9	281	22.0	8394	39.9	203	37.8	8891	38.2
3500 - 3999	0	0.0	0	0.0	6	2.5	109	8.5	6782	32.3	198	36.9	7095	30.5
4000 - 4499	0	0.0	1	1.0	1	0.4	29	2.3	2125	10.1	69	12.9	2225	9.6
≥ 4500	0	0.0	0	0.0	0	0.0	4	0.3	312	1.5	12	2.2	328	1.4
UNKNOWN	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	100	0.4
<b>Total</b>	<b>5</b>	<b>100.0</b>	<b>100</b>	<b>100.0</b>	<b>243</b>	<b>100.0</b>	<b>1276</b>	<b>100.0</b>	<b>21029</b>	<b>100.0</b>	<b>537</b>	<b>100.0</b>	<b>23290</b>	<b>100.0</b>

Excludes 100 babies with unknown Gestational age

**TABLE 32.2 GESTATION AND BIRTHWEIGHT OF MULTIPLE BIRTHS IN WESTERN AUSTRALIA, 1986**

Birthweight (Grams)	Gestation (weeks)				Total					
	22 - 27		28 - 32		33 - 36		37 - 42			
	No.	%	No.	%	No.	%	No.	%		
500 - 999	16	84.2	7	14.9	1	0.6	0	0.0	24	4.4
1000 - 1499	3	15.8	23	48.9	7	3.9	1	0.3	34	6.2
1500 - 1999	0	0.0	14	29.8	36	20.1	9	3.0	59	10.8
2000 - 2499	0	0.0	3	6.4	93	52.0	78	25.7	174	31.7
2500 - 2999	0	0.0	0	0.0	36	20.1	135	44.4	171	31.2
3000 - 3499	0	0.0	0	0.0	5	2.8	73	24.0	78	14.2
3500 - 3999	0	0.0	0	0.0	1	0.6	8	2.6	9	1.6
4000 - 4499	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
≥ 4500	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
<b>Total</b>	<b>19</b>	<b>100.0</b>	<b>47</b>	<b>100.0</b>	<b>179</b>	<b>100.0</b>	<b>304</b>	<b>100.0</b>	<b>549</b>	<b>100.0</b>

Excludes births less than 500 grams birthweight

Excludes births less than 500 grams birthweight.

**TABLE 33: BIRTHS IDENTIFIED WITH CONGENITAL MALFORMATIONS IN WESTERN AUSTRALIA, 1986**

DIAGNOSTIC CATEGORY (and B.P.A. Code)	1985	
	No.	<sup>1</sup> Rate
<b>NERVOUS SYSTEM DEFECTS (74000 - 74299)</b>	61	2.6
Neural Tube Defects (74000 - 74209)	41	1.7
Microcephaly (74210)	5	
Congenital Hydrocephalus (74230 - 74239) (excludes hydrocephalus associated with N.T.D.)	5	
<b>CARDIOVASCULAR DEFECTS (74500 - 74799)</b>	117	4.9
Transposition of Great Vessels (74510 - 74519)	12	
Tetralogy of Fallot (74520)	8	
Ventricular Septal Defect (74540 - 74549)	55	2.3
Atrial Septal Defect (74550 - 74559)	20	0.8
Hypoplastic Left Heart Syndrome (74670)	5	
Patent Ductus Arteriosus (74700)	22	0.9
Coarctation of Aorta (74710 - 74719)	14	
<b>RESPIRATORY SYSTEM DEFECTS (74800 - 74899)</b>	36	1.5
Hypoplasia/Dysplasia of Lung (74850 - 74858)	18	0.8
<b>GASTRO-INTESTINAL DEFECTS (74900 - 75199)</b>	129	5.4
Cleft Palate Only (74900 - 74909)	14	
Cleft Lip Only (74910 - 74919)	11	) 1.4
Cleft Lip and Palate (74920 - 74929)	22	
Tracheo-Oesophageal Fistula, Oesophageal Atresia, Oesophageal Stenosis (75030 - 75038)	6	
Pyloric Stenosis (75050-75058)	42	1.8
Stenosis/Atresia Anus (75123 - 75124)	7	
<b>URO-GENITAL DEFECTS (75200 - 75399)</b>	125	5.3
Undescended Testis (treated) (75250 - 75253)	19	0.8
Hypospadias (75260)	62	2.6
Renal Agenesis or Dysgenesis (75300 - 75301)	7	
Ureteric Reflux (75348)	7	
<b>MUSCULO-SKELETAL DEFECTS (7540 - 75699)</b>	258	10.8
Congenital Dislocation of Hip (75430 - 75431)	132	5.5
Talipes (75450 - 75473)	44	1.8
Polydactyly (75500 - 75509)	21	0.9
Syndactyly (75510 - 75519)	7	
Reduction Deformities Upper and/or Lower Limbs (75520 - 75549)	9	
Diaphragmatic Hernia (75661)	6	
Exomphalos (75670)	8	
Gastroschisis (75671)	6	
Achondroplasia (75650)	0	
Osteogenesis Imperfecta (75650)	1	
<b>CHROMOSOME DEFECTS (75800 - 75899)</b>	44	1.8
Down Syndrome (75800 - 75809)	32	1.3
Trisomy 13 (75810 - 75819)	4	
Trisomy 18 (75820 - 75829)	1	
Turner's Syndrome (75860 - 75861, 75869)	1	
<b>OTHER</b>		
Congenital Rubella (77100)	1	
Cystic Fibrosis (27700)	3	
Phenylketonuria (27010)	1	

<sup>1</sup> Rate per 1000 total births.

Rates have not been calculated where number of cases with defect is less than 15.

SOURCE: CONGENITAL MALFORMATIONS REGISTRY

### 10.11 Congenital Malformations

Data on selected congenital malformations included in this report are made available by the Western Australian Congenital Malformations Registry.<sup>9</sup> (Table 33)

When a congenital malformation is recorded on the Notification of Case Attended (Midwives') Form 2, it provides the basic data source for the Congenital Malformations Registry.

Reports and further details on congenital malformations in Western Australia are available upon request to the Registry.

### 10.12 Birth Trauma

There were very few babies reported with major birth trauma and the most common birth trauma identified was injuries to the scalp in 5.4% of all livebirths. This included cephalhaematoma and chignon from vacuum extraction. "Other" injuries were identified in 53 babies. (Table 34)

**TABLE 34: BIRTH TRAUMA AMONGST LIVEBIRTHS IN WESTERN AUSTRALIA, 1986**

Birth Trauma	No.	% of Livebirths
Subdural and Cerebral Haemorrhage	1	0.0
Injuries to Scalp	1273	5.4
Fracture of Clavicle	13	0.1
Other Injuries to Skeleton	2	0.0
Facial Nerve Injury	13	0.1
Injury to Brachial Plexus	12	0.1
Other	53	0.2

Excludes births less than 500 grams birthweight.

### 10.13 Special Care

Although there are difficulties relating to the definition and location of special care units in Western Australia, data from the Midwives' system indicating special care have been included to identify the need of services for newborn babies. Unfortunately, it is not possible from the current data to differentiate the babies who received neonatal intensive care.

Amongst the 23,693 livebirths, a total of 1,789 (7.6%) babies required special care, 1,641 were singleton births and 148 were multiple births.

Almost a third of the babies requiring special care were there for one day or less, whereas almost 10% stayed more than 28 days. Multiple births had a longer stay in special care units than singleton births. (Table 35)

**TABLE 35: PLURALITY AND LENGTH OF STAY IN SPECIAL CARE OF LIVEBIRTHS IN WESTERN AUSTRALIA, 1986**

Length of Stay (days)	Plurality				Total	
	Singleton		Multiple		No.	%
	No.	%	No.	%		
1	531	32.4	18	12.2	549	30.7
2	264	16.1	12	8.1	276	15.4
3	159	9.7	12	8.1	171	9.6
4	121	7.4	1	0.7	122	6.8
5	104	6.3	9	6.1	113	6.3
6	61	3.7	3	2.0	64	3.6
7	45	2.7	10	6.8	55	3.1
8 - 14	126	7.7	17	11.5	143	8.0
15 - 20	47	2.9	11	7.4	58	3.2
21 - 28	48	2.9	12	8.1	60	3.4
> 28	135	8.2	43	29.1	178	9.9
<b>Total</b>	<b>1641</b>	<b>100.0</b>	<b>148</b>	<b>100.0</b>	<b>1789</b>	<b>100.0</b>

Excludes births less than 500 grams birthweight.

TABLE 36: LENGTH OF STAY BY BIRTHWEIGHT DISTRIBUTION OF LIVEBIRTHS IN WESTERN AUSTRALIA, 1986

Birthweight (grams)	LENGTH OF STAY (Days)										Total			
	≤ 1		2 - 7		8 - 14		15 - 20		21 - 28		> 28		No.	%
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%		
500 - 999	42	6.1	5	0.0	1	0.0	2	1.3	1	1.1	33	15.4	84	0.4
1000 - 1499	24	3.5	5	0.0	2	0.0	5	3.2	12	13.6	84	39.3	132	0.6
1500 - 1999	31	4.5	32	0.2	59	1.4	25	16.1	45	51.1	72	33.6	264	1.1
2000 - 2499	44	6.4	400	2.2	314	7.3	62	40.0	21	23.9	10	4.7	851	3.6
2500 - 2999	120	17.3	2824	15.5	738	17.1	20	12.9	6	6.8	4	1.9	3712	15.7
3000 - 3499	215	31.0	7246	39.7	1492	34.7	21	13.5	1	1.1	4	1.9	8979	37.9
3500 - 3999	162	23.4	5740	31.5	1198	27.8	15	9.7	1	1.1	7	3.3	7123	30.1
4000 - 4499	48	6.9	1739	9.5	430	10.0	4	2.6	1	1.1	0	0.0	2222	9.4
≥ 4500	7	1.0	248	1.4	70	1.6	1	0.6	0	0.0	0	0.0	326	1.4
Total	693	100.0	18239	100.0	4304	100.0	155	100.0	88	100.0	214	100.0	23693	100.0

Excludes births less than 500 grams birthweight



#### **10.14 Neonatal Transfers**

These data include emergency transfers immediately following birth to specialised centres and also those babies who were transferred to another hospital prior to being discharged home.

Of the 23,693 livebirths, 1387 (5.9%) babies were transferred to another hospital after birth.

#### **10.15 Length of Stay**

The majority of births stayed between two to seven days and another 4,761 (20%) were longer than eight or more days. Of these 214 babies stayed more than 28 days. When length of stay and birthweight were examined for all livebirths, it showed 693 babies had a stay of less than one day. Of these 141 (20.3%) weighed less than 2500 grams. Half of the births weighing less than 1000 grams birthweight had less than one days stay. (Table 36)

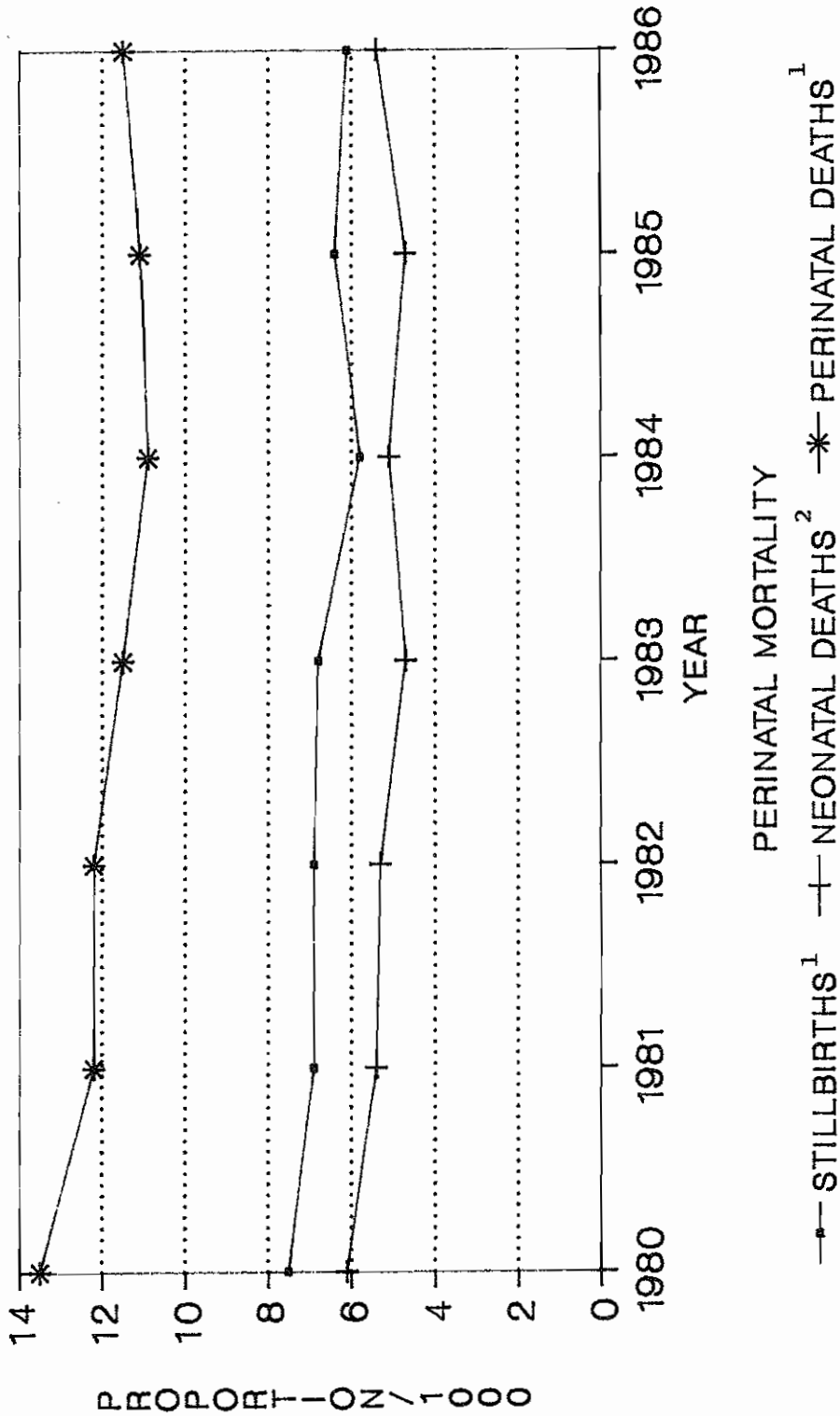
#### **10.16 Perinatal Mortality**

There were 146 stillbirths and 129 livebirths who died within 28 days of birth during 1986. The perinatal mortality proportion for Western Australia was 11.5/1000 total births.

Perinatal mortality in this report is based on the year of birth cohort, whereas prior to 1984 it was based on the year of death. (Table 37, Figure XI)

**STILLBIRTHS, NEONATAL AND PERINATAL MORTALITY PROPORTIONS IN WESTERN AUSTRALIA, 1980-1986**

Figure XI



Excludes births less than 500 grams birthweight.  
<sup>1</sup> Stillbirths and Perinatal Deaths/1000 Total Births  
<sup>2</sup> Neonatal Deaths/1000 Livebirths  
 Note: 1980-1983 data based on year of death.  
 1984-1986 data based on year of birth.

Source: Midwives' Notification System  
 Registrar General's Office

**TABLE 37: STILLBIRTHS, NEONATAL AND PERINATAL MORTALITY PROPORTIONS IN WESTERN AUSTRALIA, 1980-1986**

Year	Perinatal Mortality					
	Stillbirths		Neonatal Deaths		Total	
	No.	Proportion/ 1000 Total Births	No.	Proportion/ 1000 Live Births	No.	Proportion/ 1000 Total Births
1980	155	7.5	125	6.1	280	13.5
1981	153	6.9	118	5.4	271	12.2
1982	155	6.9	118	5.3	273	12.2
1983	157	6.8	108	4.7	265	11.5
1984 <sup>1</sup>	134	5.8	116	5.1	250	10.9
1985 <sup>1</sup>	150	6.4	109	4.7	259	11.1
1986 <sup>1</sup>	146	6.1	129	5.4	275	11.5

Excludes births less than 500 grams birthweight.

<sup>1</sup> Data based on year of birth.

When stillbirth, neonatal and perinatal mortality were examined by maternal race it showed the aboriginal mortality proportions to be double that of the non-aboriginal births. (Table 38)

**TABLE 38: STILLBIRTHS, NEONATAL AND PERINATAL MORTALITY PROPORTIONS BY MATERNAL RACE IN WESTERN AUSTRALIA, 1986**

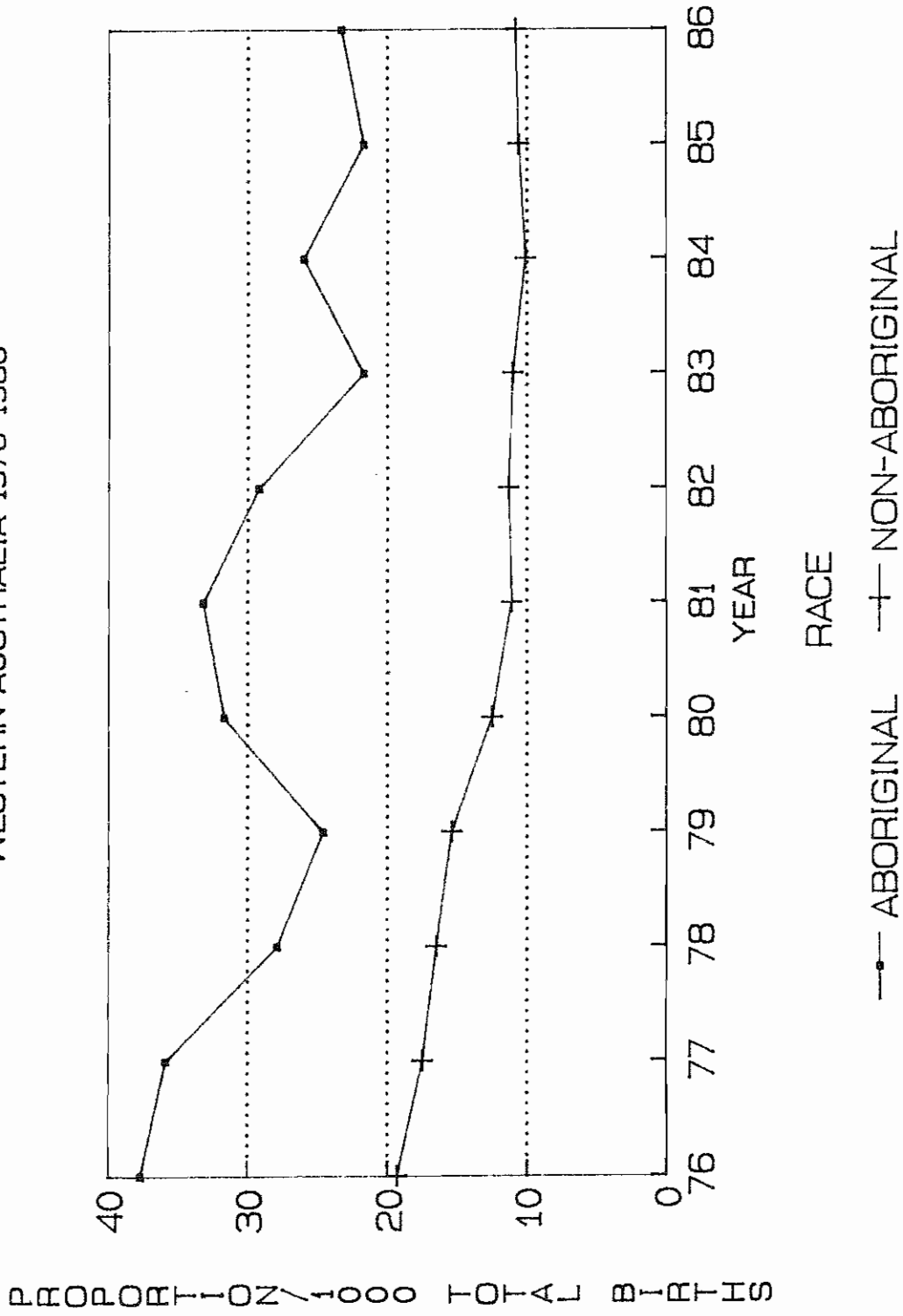
Type Of Death	Maternal Race			Total
	Caucasian	Aboriginal	Other	
Stillbirth/ 1000 total births	5.7	12.8	5.4	6.1
Neonatal/ 1000 total livebirths	5.1	10.6	6.9	5.4
Perinatal/ 1000 total births	10.8	23.3	12.2	11.5

Excludes births less than 500 grams birthweight.

Data from 1976 to 1986 on stillbirth, neonatal and perinatal mortality proportions in Western Australia shows there has been an overall decline during this decade and in fact the proportions have begun to plateau particularly for non-aboriginal births. The proportion of aboriginal stillbirths and non-aboriginal neonatal deaths during 1986, have shown a slight increase. (Table 39, Figure XII)

Figure XII

PERINATAL MORTALITY IDENTIFIED IN  
 ABORIGINAL & NON-ABORIGINAL BIRTHS IN  
 WESTERN AUSTRALIA 1976-1986



Excludes births less than 500 grams birthweight.  
 Note: 1976-1983 data based on year of death.  
 1984-1986 data based on year of birth.  
 Source: Midwives' Notification System, Registrar General's Office.

**TABLE 39: STILLBIRTHS, NEONATAL AND PERINATAL MORTALITY PROPORTIONS BY ABORIGINAL AND NON-ABORIGINAL BIRTHS IN WESTERN AUSTRALIA, 1976-1986**

Year	Stillbirth <sup>1</sup> Proportion		Neonatal Mortality <sup>2</sup> Proportion		Perinatal Mortality <sup>1</sup> Proportion	
	Aboriginal	Non-Aboriginal	Aboriginal	Non-Aboriginal	Aboriginal	Non-Aboriginal
1976	19.3	11.0	18.7	8.4	37.7	19.3
1977	18.0	9.2	18.3	8.4	35.9	17.5
1978	10.2	9.3	17.8	7.3	27.9	16.5
1979	14.2	8.3	10.4	7.1	24.6	15.4
1980	11.5	7.2	20.4	5.3	31.7	12.5
1981	19.7	6.2	13.7	4.9	33.2	11.1
1982	14.2	6.6	15.3	4.8	29.2	11.3
1983	12.2	6.5	9.7	4.4	21.7	11.0
1984	13.4	5.4	11.9	3.5	26.0	10.1
1985	11.2	5.7	10.5	4.4	21.7	10.6
1986	12.8	5.7	10.6	5.2	23.3	10.8

Excludes births less than 500 grams birthweight.

<sup>1</sup> Stillbirth/perinatal mortality proportions/1000 total births.

<sup>2</sup> Neonatal mortality proportions/1000 livebirths.

More than a third of stillbirths and neonatal deaths had a birthweight less than 1000 grams. Overall, 68% of stillbirths and 63% of neonatal deaths weighed less than 2500 grams at birth. (Table 40)

**TABLE 40: BIRTHWEIGHT DISTRIBUTION OF STILLBIRTHS, NEONATAL AND PERINATAL DEATHS IN WESTERN AUSTRALIA, 1986**

Birthweight (Grams)	Perinatal Deaths				Total	
	Stillbirths		Neonatal Deaths		No.	%
	No.	%	No.	%		
500 - 999	53	36.3	46	35.7	99	36.0
1000 - 1499	19	13.0	14	10.9	33	12.0
1500 - 1999	11	7.5	15	11.6	26	9.5
2000 - 2499	17	11.6	6	4.7	23	8.4
2500 - 2999	13	8.9	19	14.7	32	11.6
3000 - 3499	15	10.3	14	10.9	29	10.5
3500 - 3999	9	6.2	12	9.3	21	7.6
≥ 4000	8	5.5	3	2.3	11	4.0
Unknown	1	0.7	0	0.0	1	0.4
<b>Total</b>	<b>146</b>	<b>100.0</b>	<b>129</b>	<b>100.0</b>	<b>275</b>	<b>100.0</b>

Excludes births less than 500 grams birthweight.

Amongst the 549 multiple births, there were 31 perinatal deaths. Of these, 11 were stillborn and 20 were neonatal deaths. (Table 41)

The stillbirth proportion for multiple births, of 20.0/1000 total multiple births, was almost four times greater than for singleton births.

The neonatal mortality proportion for multiple births was almost nine times greater than for singleton births (see Section 5 Selected Western Australian Statistics).

**TABLE 41: PLURALITY OF STILLBIRTHS, NEONATAL AND PERINATAL DEATHS AMONGST BIRTHS IN WESTERN AUSTRALIA, 1986**

Plurality	Perinatal Mortality				Total	
	Stillbirths		Neonatal Deaths		No.	%
	No.	% <sup>1</sup>	No.	% <sup>2</sup>		
Singleton	135	5.8	109	4.7	244	10.5
Multiple	11	20.0	20	37.2	31	56.5
<b>Total</b>	<b>146</b>	<b>6.1</b>	<b>129</b>	<b>5.4</b>	<b>275</b>	<b>11.5</b>

Excludes births less than 500 grams birthweight.

<sup>1</sup> Stillbirth/Perinatal mortality proportions:

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

<sup>2</sup> Neonatal mortality proportions:

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

When stillbirths were examined by the time of death, it showed 58% occurred antepartum, 28% were intrapartum and time of stillbirth was unknown in 21 cases. (Table 42)

**TABLE 42: TIME OF DEATH OF STILLBIRTHS IN WESTERN AUSTRALIA, 1986**

Time Of Death	No.	%
Antepartum	85	58.2
Intrapartum	41	28.1
Unknown	20	13.7
<b>Total</b>	<b>146</b>	<b>100.0</b>

Excludes births less than 500 grams birthweight.

Almost two thirds of the neonatal deaths occurred within the first day of life and 20% were after the first week of life. (Table 43)

**TABLE 43: AGE AT NEONATAL DEATH AMONGST LIVEBIRTHS IN WESTERN AUSTRALIA, 1986**

Age At Neonatal Death	No.	% of Neonatal Deaths
< Day 1	49	38.0)
Day 1	32	24.8) 62.8%
Day 2	7	5.4
Day 3	6	4.7
Day 4	2	1.6
Day 5	3	2.3
Day 6	1	0.8
Day 7	3	2.3
Day 8-14	12	9.3
Day 15-21	8	6.2
Day 22-28	6	4.7
<b>Total</b>	<b>129</b>	<b>100.0</b>

Excludes births less than 500 grams birthweight.

The major cause of death amongst the stillbirths was due to unknown causes in 30.1% of cases. Included in this unknown category are asphyxia, placental insufficiency and cord around neck.<sup>10</sup>

The major causes of the neonatal deaths were low birth weight (less than 2500 grams) in 39.5% and lethal congenital malformations in 43.4% of cases. (Table 44)

**TABLE 44: CAUSES OF STILLBIRTHS AND NEONATAL DEATHS IN WESTERN AUSTRALIA, 1986**

Cause of Death	<sup>1</sup> Stillbirths		<sup>2</sup> Neonatal Deaths	
	No.	%	No.	%
Lethal Congenital Malformations	22	15.1	56	43.4
Extremely low birthweight (<1000grams)	46	31.5	0	0.0
Low birthweight (<2500grams)	0	0.0	51	39.5
Asphyxia	0	0.0	6	4.7
Maternal	0	0.0	2	1.6
Obstetric	2	1.4	0	0.0
Medical	0	0.0	0	0.0
Hypertension	4	2.7	0	0.0
Placenta & Cord	20	13.7	0	0.0
Hydrops fetalis	0	0.0	3	2.3
Infection	0	0.0	0	0.0
S.I.D.S.	0	0.0	8	6.2
Other	8	5.5	2	1.6
Unknown	44	30.1	1	0.8
<b>Total</b>	<b>146</b>	<b>100.0</b>	<b>129</b>	<b>100.0</b>

Excludes births less than 500 grams birthweight.

<sup>1</sup> Any non-malformed stillbirth of birthweight less than 1000 grams was included in the extremely low birthweight category

<sup>2</sup> Any non-malformed neonatal death of birthweight less than 2500 grams was included in the low birthweight category.

SOURCE: MIDWIVES' NOTIFICATION SYSTEM

Autopsies were requested for 60% of stillbirths and only 55% of neonatal deaths. For 40 perinatal deaths, it was unknown whether an autopsy was requested. (Table 45, Figure XIII)

**TABLE 45: AUTOPSY REQUESTS FOR STILLBIRTHS AND NEONATAL DEATHS IN WESTERN AUSTRALIA, 1986**

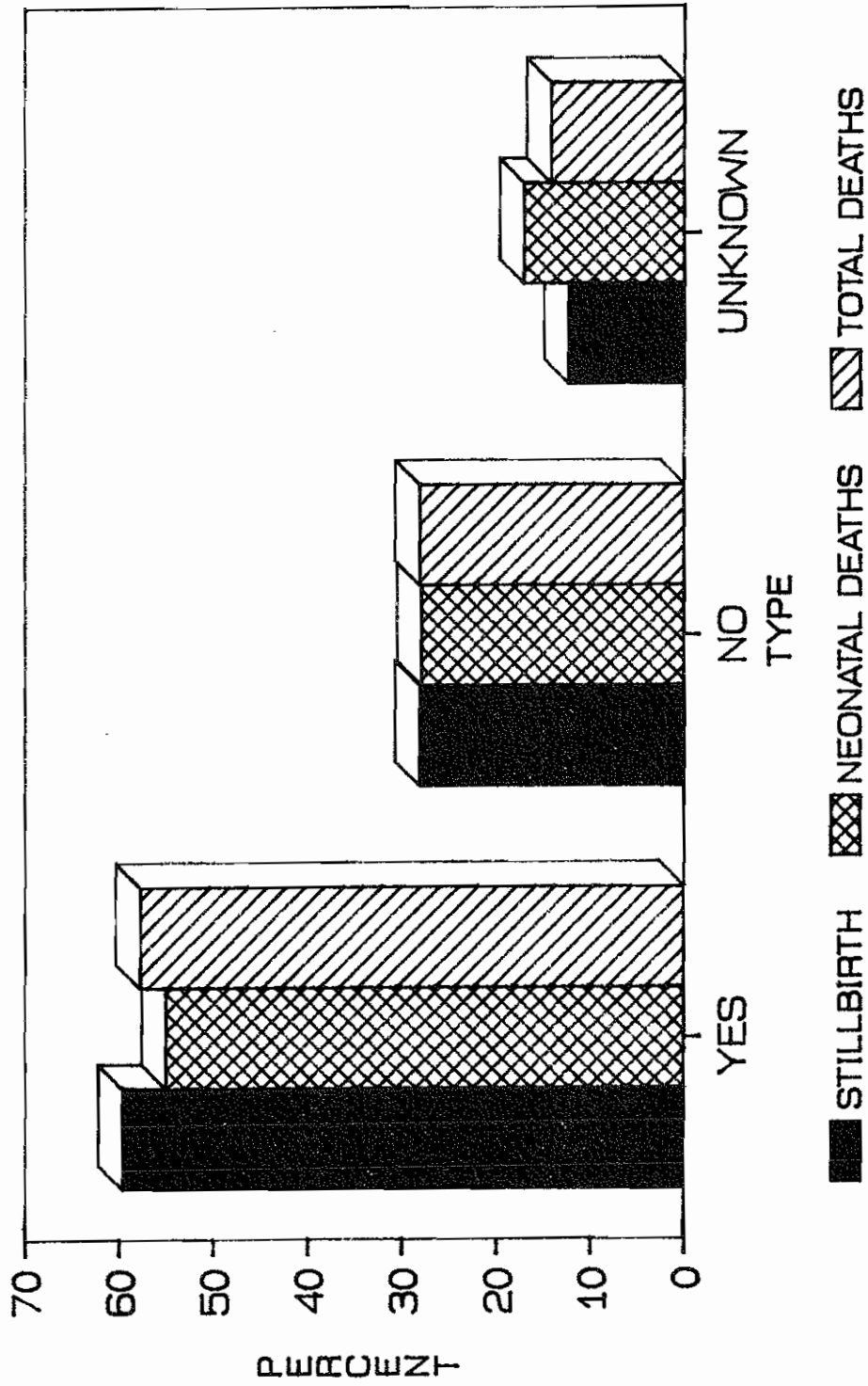
	Perinatal Deaths				Total	
	Stillbirths		Neonatal Death		No.	%
	No.	%	No.	%		
Yes	87	59.6	71	55.0	158	57.5
No	41	28.1	36	27.9	77	28.0
Unknown	18	12.3	22	17.1	40	14.5
<b>Total</b>	<b>146</b>	<b>100.0</b>	<b>129</b>	<b>100.0</b>	<b>275</b>	<b>100.0</b>

Excludes births less than 500 grams birthweight.



Figure XIII

**AUTOPSY REQUESTS FOR STILLBIRTHS AND  
NEONATAL DEATHS IN WESTERN AUSTRALIA  
1986**



Excludes births less than 500 grams birthweight.

Source: Midwives' Notification System  
Registrar General's Office.

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NOTIFICATION OF CASE ATTENDED 1 Hospital .....

PARTICULARS RELATING TO MOTHER

PRINT  
IN  
BLOCK  
LETTERS

2 SURNAME		6 UNIT RECORD No.	
3 FORENAMES		7 BIRTH DATE	
4 ADDRESS OF USUAL RESIDENCE		8 POSTCODE	
5 MAIDEN NAME			

9 Current Conjugal State:

single ( ) 1

married (incl. de facto) ( ) 2

other [ ]

10 Race:

Caucasian ( ) 1

Aboriginal (full or part) ( ) 2

Other ( ) 3

11 Height (cms) [ ] [ ] [ ]

**PREGNANCY**

PREVIOUS PREGNANCIES (excluding this pregnancy)

Total number of [ ] [ ]

12 Previous Pregnancies [ ] [ ]

13 Previous children now living [ ] [ ]

14 born alive, now dead [ ] [ ]

15 stillborn [ ] [ ]

**THIS PREGNANCY**

16 Date of LMP [ ] [ ] [ ] [ ] [ ] [ ]

17 This date certain ( ) 1  
not certain ( ) 2

18 Expected due date [ ] [ ] [ ] [ ] [ ] [ ]

19 Complications of Pregnancy:

Threatened abortion (under 20 weeks) [ ] A

urinary tract infection [ ] B

pre eclampsia [ ] C

APH - placenta praevia [ ] D

- abruptio [ ] E

- other [ ] F

prem. rupture of membranes [ ] G

20 other ..... H

21 Medical Conditions:

[ ] [ ] [ ] [ ] [ ] [ ]

**LABOUR AND DELIVERY**

23 Onset of Labour:

spontaneous [ ] A

induced [ ] B

no labour [ ] D

24 Presentation:

vertex ( ) 1

breech ( ) 2

other ( ) 3

25 Type of Delivery:

normal [ ] A

vacuum - successful [ ] B

- failed [ ] C

forceps - successful [ ] D

- failed [ ] E

breech manoeuvre [ ] F

caesarean - elective [ ] G

- emergency [ ] H

Anaesthesia:

none [ ]

general [ ] A

epidural spinal [ ] B

other [ ] C

26 Hours of established labour: [ ] [ ]

27 Complications of Labour, Delivery:

(Include reason for Caesarean)

precipitate delivery [ ] A

foetal distress [ ] B

prolapsed cord [ ] C

cord tight around neck [ ] D

cephalopelvic disproportion [ ] E

28 other ..... F

**BABY**

Separate Form for each Baby

Adoption Yes ( ) No ( )

33 Birth Date: [ ] [ ] [ ] [ ] [ ] [ ]

34 Time (24 hr. clock) [ ] [ ] [ ] [ ]

35 Plurality:

single birth ( ) 1

first twin ( ) 2

second twin ( ) 3

other multiple birth: ( ) 4

36 (specify baby number... of... )

37 Sex: male ( ) 1  
female ( ) 2

38 Condition: liveborn ( ) 1  
stillborn ( ) 2

39 Birthweight (grams) [ ] [ ] [ ] [ ] [ ] [ ]

40 Length (cms) [ ] [ ] [ ] [ ]

41 Time to establish unassisted regular breathing (mins) [ ] [ ] [ ] [ ]

42 Resuscitation:

none [ ] 0

intubation [ ] 3

oxygen only [ ] 8

other ..... [ ]

43 Apgar Score (5 mins) [ ] [ ] [ ] [ ]

Estimated Gestation (weeks) [ ] [ ] [ ] [ ]

44 Congenital Anomalies .....

45 Birth Trauma (Eg. cephalhaematoma)

[ ] [ ] [ ] [ ] [ ] [ ]

**BABY'S SEPARATION DETAILS**

Date of Discharge 29 Transfer or Death [ ] [ ] [ ] [ ] [ ] [ ]

Neonatal Blood Screening No ( )

30 Type of Separation:

Discharged home ( ) 1

Died ( ) 2

Transferred to ( ) 3

31 Special Care (whole days only) [ ] [ ] [ ] [ ]

32 Separate HA22 for baby: yes, attached ( ) 2

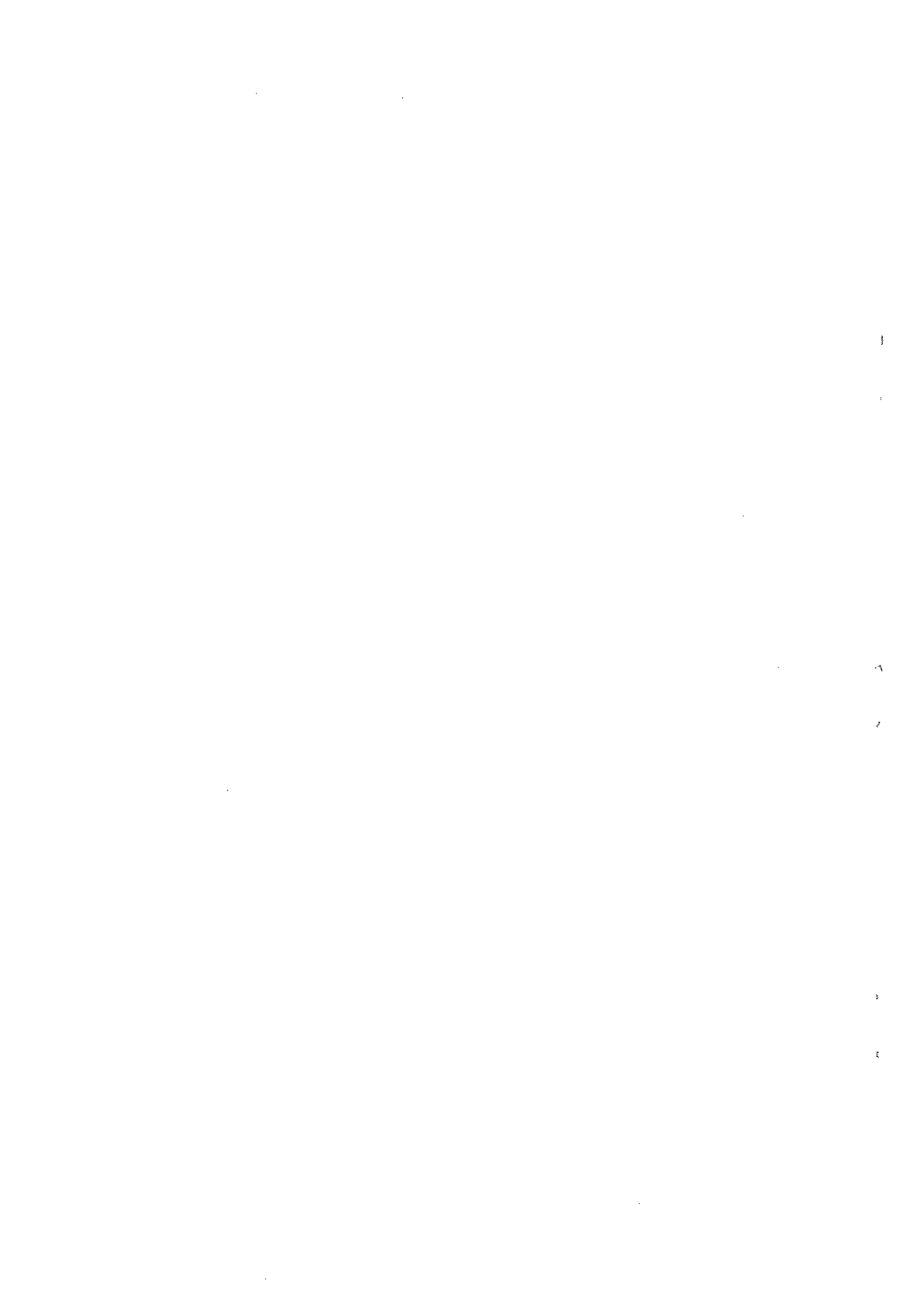
COMPLETE SECTION ON SEPARATION  
Attach to Mother and Baby's Inpatient Summaries (HA22). Forward to Health Statistics P.O. Box 8172 Stirling Street, PERTH 6001 after discharge of Mother and/or baby whichever is later

**MIDWIFE**

Name .....

Signature .....

22 Reg. No. .... Date .....



Ms Diane Moore  
Co-Ordinator  
Maternal and Child Health Studies  
Epidemiology Branch  
Health Department of Western Australia

Appendix B

This is to advise that,

SURNAME: \_\_\_\_\_ DATE OF BIRTH: \_\_\_/\_\_\_/\_\_\_

FORENAMES: \_\_\_\_\_

ADDRESS: \_\_\_\_\_

\_\_\_\_\_ POSTCODE: \_\_\_\_\_

GRAVIDA                      PARITY (including this delivery)

had planned to have a home birth but was transferred to hospital -  
a) before onset of labour; or  
b) during labour (indicate whichever is appropriate) because of the  
following indications:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Transferred to Hospital: \_\_\_\_\_

on \_\_\_/\_\_\_/\_\_\_

Reception on Admission to Hospital

Nursing Staff: \_\_\_\_\_

\_\_\_\_\_

Medical Staff: \_\_\_\_\_

\_\_\_\_\_

The outcome was: \_\_\_\_\_

\_\_\_\_\_

NAME OF MIDWIFE: \_\_\_\_\_

(please print)

DATE: \_\_\_/\_\_\_/\_\_\_

**GUIDELINES FOR CONFIDENTIALITY**

**AND RELEASE OF MIDWIVES' NOTIFICATION SYSTEM DATA**

1. Responsibility for the confidentiality of the Midwives' Notification data lies ultimately with the Commissioner of Health.
2. All staff are instructed regarding the need for and maintenance of confidentiality. The Maternal & Child Health Studies Unit staff are responsible to the Executive Director for ensuring that confidentiality is maintained and such standards are kept.
3. All routine reports from the collection are in statistical form without identification of individual patients, doctors or hospitals.
4. Non-routine release of tabulated, non personally-identified data from the Midwives' Notification System is the responsibility of and at the discretion of the Coordinator of the Maternal & Child Health Studies Unit.
5. Access to patient identifiers by other than Unit staff or approved research personnel will be given only by the express permission of the Coordinator, on the advice of the Confidentiality of Health Statistics Committee.

Such permission will be granted only if:

- i) It is considered unlikely to harm the patients or parents concerned in any way.
- ii) The research project or proposed use of the data is of high quality and will benefit the public health.

Should permission be granted for the release of personal identifiers, the following requirements will be made:

- a) That only minimum identification necessary to the proposed use be given (eg. for a case record review project in teaching hospitals, only unit medical record number would be supplied);

- b) That the use of the data be under the supervision of an approved person.
  - c) That the data be handled according to the code of confidentiality set down by the Confidentiality of Health Statistics Committee, particularly no confidential data to be released to any third party;
  - d) That no approach be made directly to patients or their parents without:
    - i) The knowledge and consent of all the notifiers of that patient to the Unit;
    - ii) The knowledge and consent of the patient's present primary care physician (insofar as this person can be identified).
6. All persons who have access to name identified data for routine maintenance of the System or for research purposes shall complete a signed declaration binding them to respect the confidentiality of the information obtained therein, and to follow this code of practice.
7. The penalty for a proven case of breach of confidentiality is dismissal.
8. Final reports or papers for publication are to be vetted by the Coordinator Maternal & Child Health Studies Unit before publication.

