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PERINATAL STATISTICS IN WESTERN AUSTRALIA

**Eighth Annual Report
of the Western Australian Midwives'
Notification System
1990**

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FOREWORD

This eighth annual edition of *Perinatal Statistics in Western Australia* makes a further valuable contribution to our understanding of trends in the health of mothers and babies. The perinatal statistical collection in WA is one of the best managed and most productive public health information systems in Australia. It is also one of the most timely, with this report being published within twelve months of the close of the year under review.

A number of data items and standard tabulations have been included for the first time for 1990. These include maternal profile according to socio-economic status; the identification of cases of augmentation of labour; and information on methods of pain control.

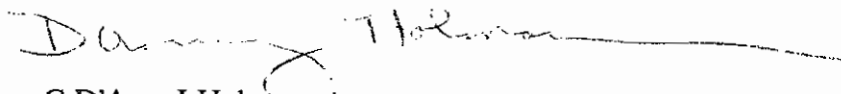
Some important observations made in the pages of the report include the following: First in the year 1990 the maternal mortality rate was 0.12 per 1,000 livebirths. This represents three maternal deaths and only one of these was due to direct obstetric causes. It is a reflection on the high standard of obstetric and midwifery practice in WA that three maternal deaths in one year is a number we have come to regard as unusually high. Other indicators of service quality (and socio-economic development) such as stillbirth and neonatal mortality in 1990 were the lowest on record.

The reader's attention is drawn to continuation of the trend towards mature age parenting, especially in the upper socio-economic sections of the population. A major concern arising from this phenomenon is its effects on the demand for reproductive technology and other medical interventions needed by some older couples to assist in achieving pregnancy. Career and socio-economic aspirations of both men and women are thought to underlie this trend. However, it is likely that too little information is available in the community about the personal problems and financial burden caused by infertility to enable people to make fully informed decisions about their career and life plans. There are, of course, other potential social effects of an increase in mature age parenting, such as the capacity for the next generation to participate in the care of the elderly 30-40 years into the future. We are essentially ignorant about the import and implications of these effects.

A third important observation has been the reduction in the number of triplets and higher plurality births in 1990 compared with the previous two years. More responsible application of reproductive technology, especially with respect to the number of embryos transferred during treatment, is the most likely explanation for this welcome trend.

Finally, the separate identification of augmentation of labour on the notification form has enabled the number of spontaneous vaginal deliveries, without induction or augmentation of labour, to be counted. These comprised 32.5% of all confinements, a figure which some may find to be surprisingly high. Nevertheless, caesarean section as a proportion of all confinements continues to increase.

There are many other valuable items of information in the eighth annual report, which I have no doubt will receive close attention from the providers, researchers and consumers of maternity services. I congratulate Ms Gee and her staff for the quality and timeliness of their work, and commend the pages of the report to all those with an interest in maternal and child health in Western Australia.



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Sincere thanks are also extended to:

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- . The Information Technology Branch for maintenance of the computer program;
- . The Registrar General's Office for providing additional information on births and perinatal deaths in Western Australia;
- . The Western Australian Branch of the Bureau of Statistics for providing Western Australian population figures;
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SELECTED WESTERN AUSTRALIAN STATISTICS, 1983-1990

	1983	1984	1985	1986	1987	1988	1989	1990
Obstetric Intervention Proportions (based on all confinements)								
Induction/1000 Confinements	256.9	245.5	257.9	269.4	262.2	258.9	257.5	239.8
Caesarean Section/1000 Confinements	132.7	138.6	151.7	156.4	169.0	169.4	180.8	188.3
Elective Caesarean/1000 Confinements	65.3	68.8	78.4	78.6	86.5	88.8	93.9	97.2
Emergency Caesarean/1000 Confinements	67.4	69.8	73.3	77.9	82.5	80.6	86.9	91.1
Fertility Rate								
Confinements/1000 Women-Years	71.4	69.3	69.7	70.1	66.8	66.3	65.0	64.8
Aboriginal Confinements/1000 Aboriginal Women-Years	147.2	139.2	145.4	138.9	136.6	148.5	136.9	143.4
Non-Aboriginal Confinements/1000 Non-Aboriginal Women-Years	69.7	67.4	67.7	68.3	64.9	64.1	63.1	62.6
Crude Birth Rate/1000 Person-Years								
	16.9	15.6	16.4	16.6	15.6	16.3	15.7	15.4
Low Birthweight (less than 2500 grams birthweight)								
Low Birthweight Births/1000 Total Births	63.4	60.3	62.6	60.0	61.6	61.3	66.7	60.1
Low Birthweight Singleton Births/1000 Singleton Births	53.2	49.4	51.0	49.0	49.8	48.8	51.6	49.2
Low Birthweight Multiple Births/1000 Multiple Births	542.0	457.4	549.2	530.1	523.3	515.6	537.9	509.8
Maternal Mortality/1000 Livebirths								
	0.04	0.04	0.04	0.04	0.08	0.04	0.04	0.12
Perinatal Mortality								
Stillbirths								
stillbirths/1000 births			6.4	6.1	5.5	4.7	5.4	4.5
singleton stillbirths/1000 singleton births			6.1	5.8	5.0	4.6	5.2	4.4
multiple stillbirths/1000 multiple births			22.3	20.0	25.0	8.9	13.6	11.4
Neonatal Mortality								
neonatal deaths/1000 livebirths			4.7	5.4	4.3	4.2	4.8	3.4
singleton neonatal deaths/1000 singleton livebirths			4.1	4.7	3.9	3.2	3.9	3.1
multiple neonatal deaths/1000 multiple livebirths			33.8	37.2	20.5	40.5	33.0	14.8
Perinatal Mortality								
perinatal deaths/1000 births			11.1	11.5	9.8	8.8	10.2	7.9
singleton perinatal deaths/1000 singleton births			10.1	10.5	8.9	7.7	9.1	7.5
multiple perinatal deaths/1000 multiple births			53.8	56.5	46.1	49.0	46.1	26.1

Source: Maternal Mortality 1990. Giles P.F.H. personal communication.
Excludes births less than 500 grams birthweight.

1. INTRODUCTION

This is the Eighth 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 1990 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 75 babies whose birthweight was less than 500 grams.

To assist with standardisation of the information collected on the Midwives' Form 2 a 2nd Edition of 'Guidelines for the completion of Case Attended Form 2' (Midwives' Form) was distributed in late 1989 to midwives and all Western Australian hospitals with obstetric beds¹ for use in collection of 1990 data.

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 Revision² (ICD-9) to code morbidity and once this is complete the forms are sent for data processing and computing.

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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2. SUMMARY

Midwives' forms received by this Department indicate that 25,944 babies with birthweight \geq 500 grams were born during 1990 in Western Australia.

This represents an increase of 1.8% in total birth numbers from the previous twelve months. The crude birth rate of 15.4 per 1000 population has decreased by 0.3/1000 from the 1989 statistic (Table 31).

This report includes statistics on only those babies whose birthweight was equal to or greater than 500 grams. There were an additional 75 babies with recorded birthweight of less than 500 grams.

Of the 25,637 women confined, 25,330 (98.8%) had a singleton pregnancy with the remaining 307 (1.2%) women having multiple pregnancies. Multiple births resulted from 303 twin and 4 triplet pregnancies. There were no quadruplet or quintuplet pregnancies recorded.

The incidence of multiple birth pregnancies decreased from 357 (1.4%) to 307 (1.2%) and the number of multiple birth babies reduced from 738 (2.9%) to 614 (2.4%) due to a reduction in the number of high multiple births from 1989 (Tree Diagram 1).

The average age of women at confinement was 27.6 years, with a range of 12 years to 49 years, and for primiparous women the average age at confinement was 25.6 years with a range of 12 years to 46 years (Table 1 and Table 2).

Evaluation of socio-economic status and maternal age of women resident in Perth metropolitan area showed that for young women (\leq 17 years), 0.2% were in the highest and 0.6% were in the lowest group. For older women (\geq 35 years) the trend was reversed with 3.4% in the highest and 1.6% in the lowest group (Table 12).

Most confinements (99.0%) occurred in hospital. Babies born before arrival for planned hospital confinements occurred in 92 cases representing 0.4% of overall births. There were 151 (0.6%) planned home confinements during 1990 (Tree Diagram 3).

Overall the fertility rate for women of Aboriginal race (143.4/1000) was more than double that of non-Aboriginal women (62.6/1000). The fertility rate of teenage Aboriginal women (153.6/1000) was seven times that of teenage non-Aboriginal women (19.8/1000) (Table 15).

Almost two-thirds of the total women confined had no complication of pregnancy recorded. Pre-eclampsia was recorded for 1582 (6.2%) of women which indicates a significant level of morbidity (Table 16).

Induction of labour was performed for 24.0% of women confined while 11.2% were confined without establishing labour (Table 17).

Augmentation of labour by surgical and/or medical intervention following spontaneous onset of labour occurred for 6141 (24.0%) women confined (Table 18).

Investigation of the use of anaesthesia/analgesia for women during confinement showed that 29.3% had an epidural, 5.5% a general anaesthetic and 0.6% a combination of both. An additional 25.7% women did not receive pharmacological anaesthesia/analgesia during labour and delivery (Table 26).

Of those women whose pregnancy was of breech presentation prior to delivery 79.5% were confined by caesarean section (Table 19).

There was a decrease in the incidence of spontaneous vaginal delivery from 64.7% in 1989 to 64.0% in 1990. The proportion of women confined with assisted vaginal delivery has reduced slightly over the same period (Table 20).

The caesarean section proportion of confinements increased from 16.9% in 1988 and 18.1% in 1989 to 18.8% in 1990 (Table 21).

Among all babies born during 1990, the average birthweight was 3358 grams. Six percent weighed less than 2500 grams at birth although among Aboriginal women 10.8% of births were low birthweight (Table 38).

Preterm birth (less than 37 weeks gestation) occurred for 1649 (6.4%) of the total births (Table 44). Of the multiple births, 46.9% were preterm (Table 46).

Special neonatal care was received by 5.2% of total births during 1990. Of those admitted to special care, 11.6% stayed more than 28 days (Table 49).

The majority of babies (79.7%) stayed in the hospital of their birth between two and seven days after birth and another 15.9% stayed eight days or longer (Table 50).

Among the 25,944 births, 118 were stillborn and 87 of those liveborn died within the first twenty eight days of life (Table 52). More than half (54.0%) of the neonatal deaths occurred during the first day of life (Table 60).

Among multiple births, the stillbirth rate decreased from 13.6/1000 in 1989 to 11.4/1000 in 1990. More noticeably the neonatal death rate among multiple births decreased from 33.0/1000 to 14.8/1000 over the same period.

Causes of stillbirth included extremely low birthweight (20.3%) and lethal congenital malformations (12.7%). Stillbirths of unknown cause represented 39.8% of the total. For neonatal deaths, the major causes were complications of low birthweight (36.8%) and lethal congenital malformations (46.0%) (Table 61).

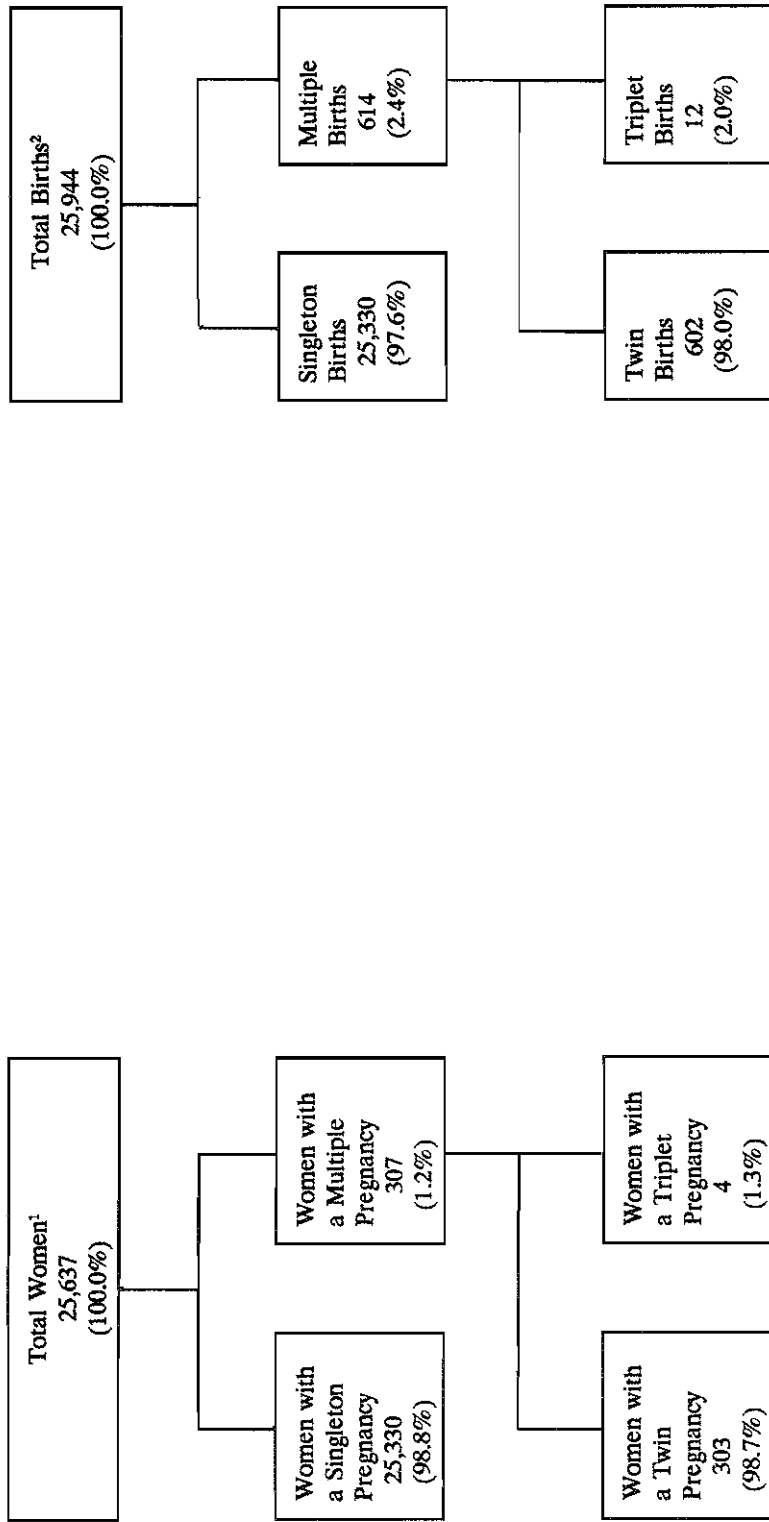
Autopsies were requested for 67.8% of stillbirths and 50.6% of neonatal deaths (Table 62).

Mortality rates were identified by plurality for the 1990 birth cohort. The overall perinatal mortality rate for multiple births (26.1/1000) was three times that for singleton births (7.5/1000).

The stillbirth rate for multiple births was 11.4/1000 compared with 4.4/1000 for singleton births. For neonatal deaths the rate for multiple births (14.8/1000) was five times that of singleton births (3.1/1000) (Tree Diagram 2).

TREE DIAGRAM 1

PREGNANCIES AND BIRTHS IN WESTERN AUSTRALIA, 1990



Excludes births less than 500 grams birthweight.

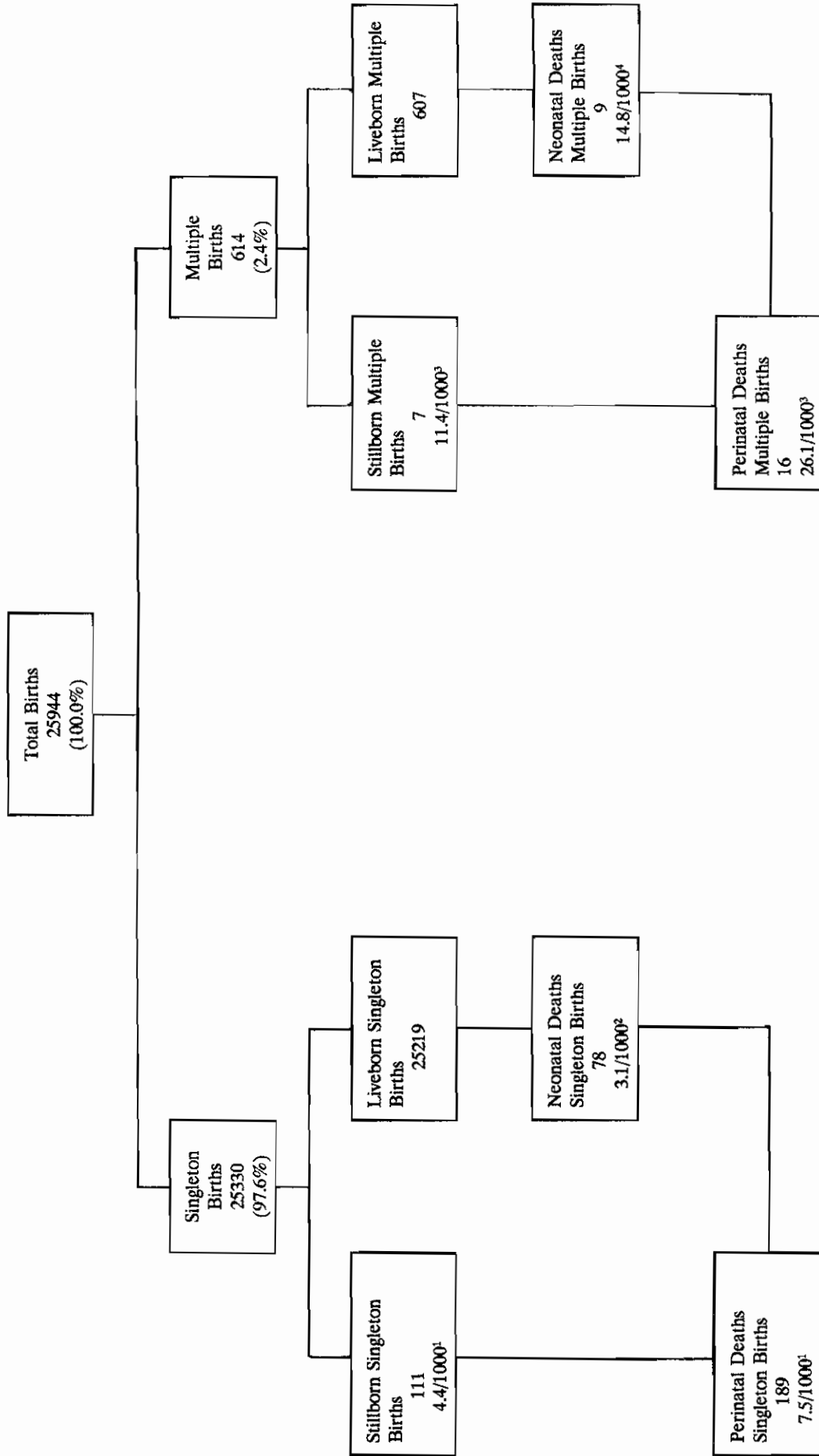
¹ Includes two women with a twin pregnancy where one twin weighed less than 500 grams birthweight.

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

SOURCE: MIDWIVES' NOTIFICATION SYSTEM

TREE DIAGRAM 2

PLURALITY OF BIRTHS AND PERINATAL DEATHS IN WESTERN AUSTRALIA, 1990



Excludes births less than 500 grams birthweight.

¹ /1000 total singleton births

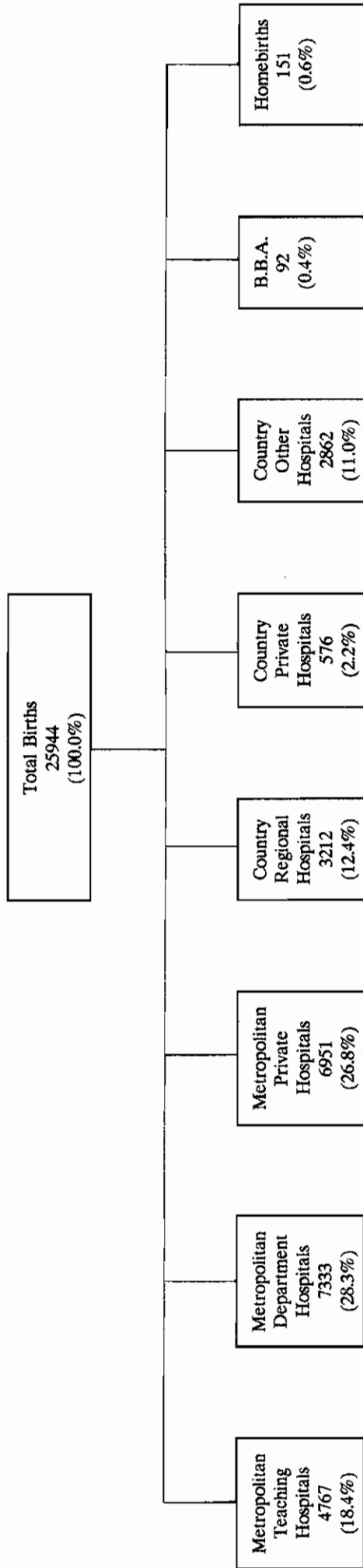
² /1000 total multiple births

³ /1000 singleton livebirths

⁴ /1000 multiple livebirths

TREE DIAGRAM 3

PLACE OF DELIVERY FOR ALL BIRTHS IN WESTERN AUSTRALIA, 1990



Excludes births less than 500 grams birthweight.

1 B.B.A. (born before arrival at hospital).

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.

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 - Is an unplanned procedure, performed because of a complication. May be performed before the onset of labour or during labour.

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 confinements 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 Rates

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

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

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

Perinatal Mortality - 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.

Nulliparous - never having completed a pregnancy beyond 20 weeks gestation.

Perinatal Death

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 or of mixed Aboriginal and other heritage.

Other - includes Asian, Indian, Polynesian, etc.

Stillbirth

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. MATERNAL DEMOGRAPHIC INFORMATION

4.1 Age

There were 25,637 women confined in Western Australia during 1990. The range of maternal age for these women was 12 years to 49 years with a mean age of 27.6 years. Women aged between 20 and 34 years represented 84.1% of all women confined. Young women aged 19 years or less represented 6.5% of total women confined with the 35 year and older group increasing to 9.4% from 8.7% in 1989. Of the women with multiple pregnancies 9 (3.0%) were less than 20 years of age and 42 (13.8%) were 35 years or older (Table 1).

The ages of younger women have been reported in individual years due to interest in teenage confinements.

TABLE 1: AGE AND PLURALITY OF WOMEN CONFINED IN WESTERN AUSTRALIA, 1990

Maternal Age	Plurality				Total	
	Singleton		Multiple		No.	%
	No.	%	No.	%		
≤14	20	0.1	-	-	20	0.1
15	48	0.2	-	-	48	0.2
16	156	0.6	-	-	156	0.6
17	285	1.1	2	0.7	287	1.1
18	508	2.0	4	1.3	512	2.0
19	630	2.5	3	1.0	633	2.5
20-24	5410	21.4	45	14.7	5455	21.3
25-29	9225	36.4	105	34.2	9330	36.4
30-34	6675	26.4	106	34.5	6781	26.5
35-39	2065	8.2	36	11.7	2101	8.2
40-44	297	1.2	6	2.0	303	1.2
≥45	11	-	-	-	11	-
TOTAL	25330	100.0	307	100.0	25637	100.0

Excludes births less than 500 grams birthweight.

Mean = 27.6 years. Standard Deviation = 5.2 years.

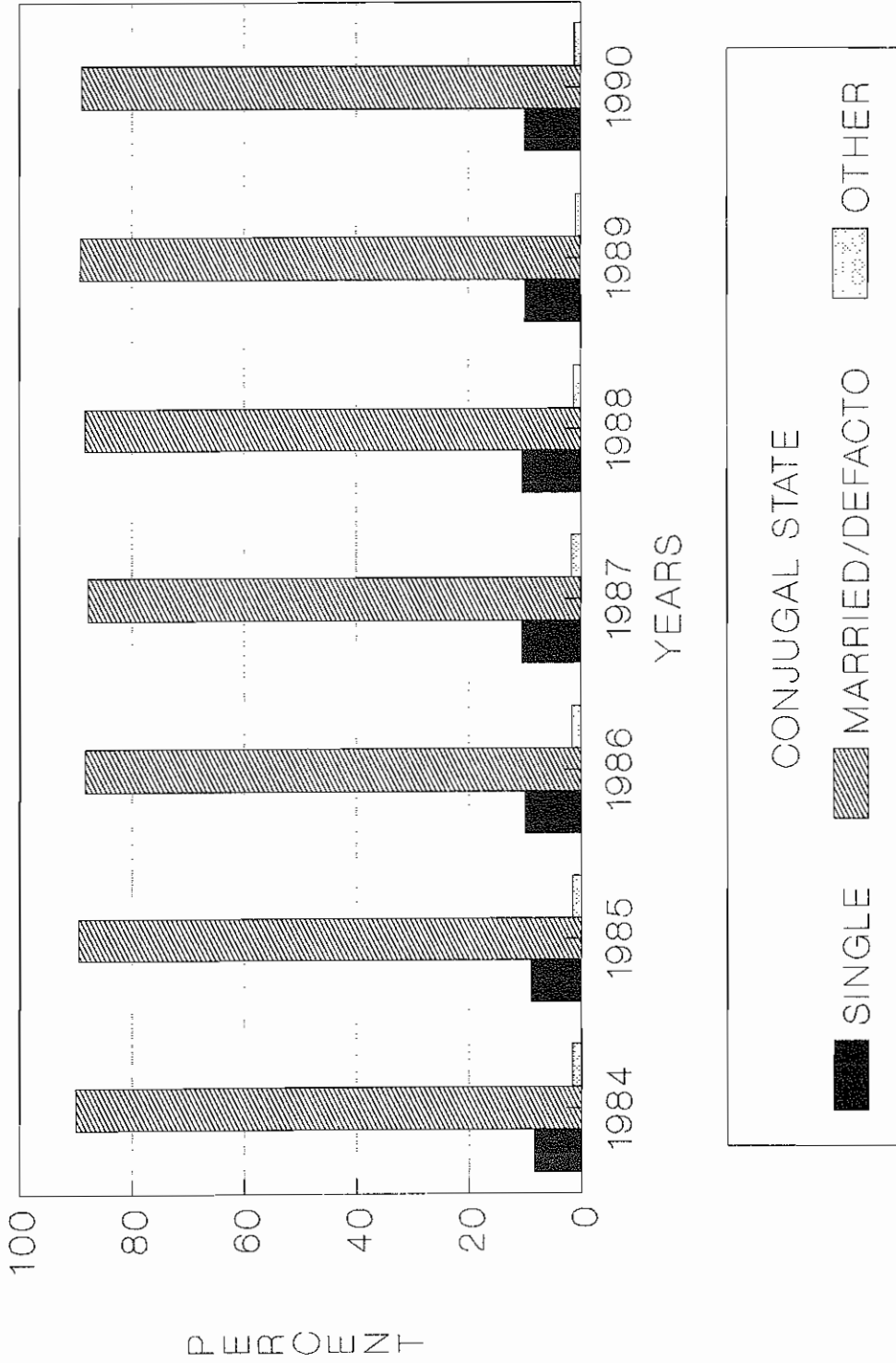
4.2 Race

Ethnic grouping of women identified the majority (87.1%) of women confined as caucasian. The remaining twelve percent was comprised of Aboriginal women (6.0%) and women of "other" races (6.9%).

There were 1758 women confined whose race was identified as 'other' than Caucasian or Aboriginal. Examination of a 10% sample of women in this group showed 76.7% to be of Asian racial origin and 4.5% of negroid origin.

FIGURE I

CONJUGAL STATE OF WOMEN CONFINED IN WESTERN AUSTRALIA, 1984-1990



Excludes births less than 500 grams birthweight.

Source: Midwives' Notification System.

TABLE 2: RACE AND PLURALITY OF WOMEN CONFINED IN WESTERN AUSTRALIA, 1990

Maternal	Plurality				Total	
	Singleton		Multiple		No.	%
	No.	%	No.	%		
Caucasian	22054	87.1	286	93.1	22340	87.1
Aboriginal	1529	6.0	10	3.3	1539	6.0
Other	1747	6.9	11	3.6	1758	6.9
TOTAL	25330	100.0	307	100.0	25637	100.0

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

4.3 Conjugal State

Eleven percent of all women confined in Western Australia during 1990 were reported to be socially unsupported, being either single, widowed or separated. Single women represented the largest unsupported group (10.0%). For women with multiple pregnancy 7.9% were unsupported (Table 3, Figure I).

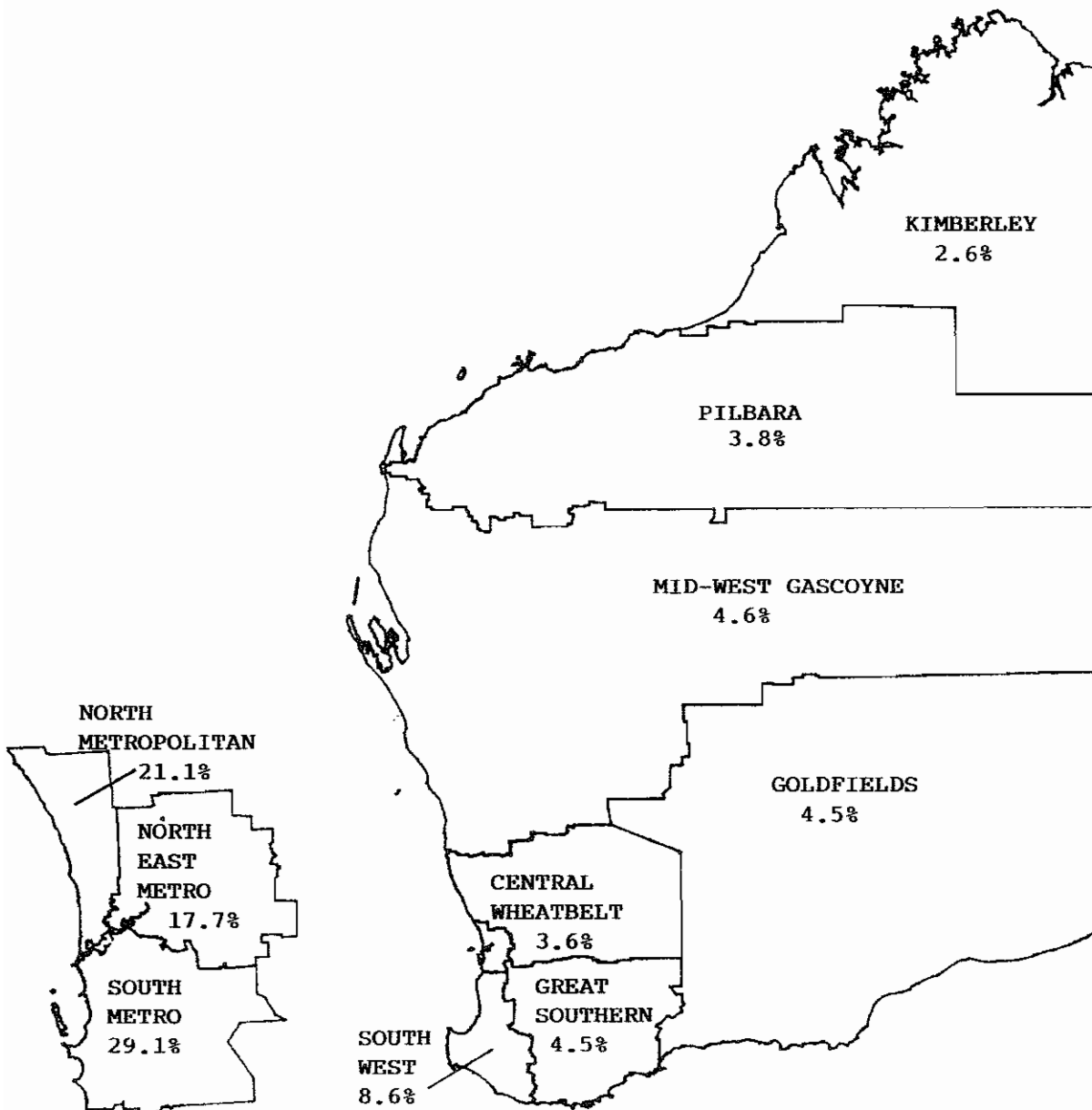
TABLE 3: CONJUGAL STATE AND PLURALITY OF WOMEN CONFINED IN WESTERN AUSTRALIA, 1990

Conjugal State	Plurality				Total	
	Singleton		Multiple		No.	%
	No.	%	No.	%		
Single	2557	10.1	18	5.9	2575	10.0
Married/Defacto	22501	88.8	283	92.1	22784	88.9
Other ¹	272	1.1	6	2.0	278	1.1
TOTAL	25330	100.0	307	100.0	25637	100.0

Excludes births less than 500 grams birthweight.

¹ Other includes separated, divorced and widowed.

HEALTH SERVICES MANAGEMENT REGION OF RESIDENCE OF WOMEN CONFINED
IN WESTERN AUSTRALIA, 1990



Excludes births less than 500 grams birthweight and those 15 (0.1%) mothers resident outside Western Australia.

SOURCE: Midwives' Notification System

4.4 Health Service Management Regions

More than two thirds (67.9%) of women confined in 1990 gave their residential address as being within the three Metropolitan Health Service Management Regions. There were 32.0% of women confined whose usual place of residence was within the seven Country Health Service Management Regions and 15 women (0.1%) who were not residents of Western Australia.

Of the women with a multiple pregnancy 66.4% were Metropolitan residents and 33.6% were resident in country regions (Table 4, Figure II).

Information on Western Australian women confined in other States and outside Australia during 1990 is not included in this report.

TABLE 4: HEALTH SERVICE MANAGEMENT REGION OF RESIDENCE AND PLURALITY OF WOMEN CONFINED IN WESTERN AUSTRALIA, 1990

Health Service Management Region	Plurality				Total	
	Singleton		Multiple		No.	%
	No.	%	No.	%	No.	%
<u>Metropolitan</u>						
North	5342	21.1	65	21.2	5407	21.1
North East	4483	17.7	54	17.6	4537	17.7
South	7370	29.1	85	27.7	7455	29.1
<u>Country</u>						
South West	2177	8.6	29	9.4	2206	8.6
Great Southern	1153	4.6	9	2.9	1162	4.5
Central Wheatbelt	888	3.5	23	7.5	911	3.6
Goldfields	1135	4.5	8	2.6	1143	4.5
Mid-West Gascoyne	1151	4.5	16	5.2	1167	4.6
Pilbara	969	3.8	11	3.6	980	3.8
Kimberley	647	2.6	7	2.3	654	2.6
Outside WA	15	0.1	-	-	15	0.1
TOTAL	25330	100.0	307	100.0	25637	100.0

Excludes births less than 500 grams birthweight.

Metropolitan Regions

Of the 25,637 women confined in Western Australia in 1990, 73.2% were confined in hospitals within the metropolitan area (Table 7).

Consideration of the maternal usual place of residence within Health Service Management 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 94.7% were confined at hospitals within the region. Of these 21.4% were confined at a metropolitan teaching hospital and 73.3% at other hospitals in the region.

In the North East Metropolitan Region, almost half (48.9%) of women were confined in the region, 23.3% in a metropolitan teaching hospital and a further 21.1% in the North Metropolitan Region.

For women residing in the South Metropolitan Region 66.8% were confined in hospitals within the region with a further 23.4% confined in a metropolitan teaching hospital (Table 5, Figure III).

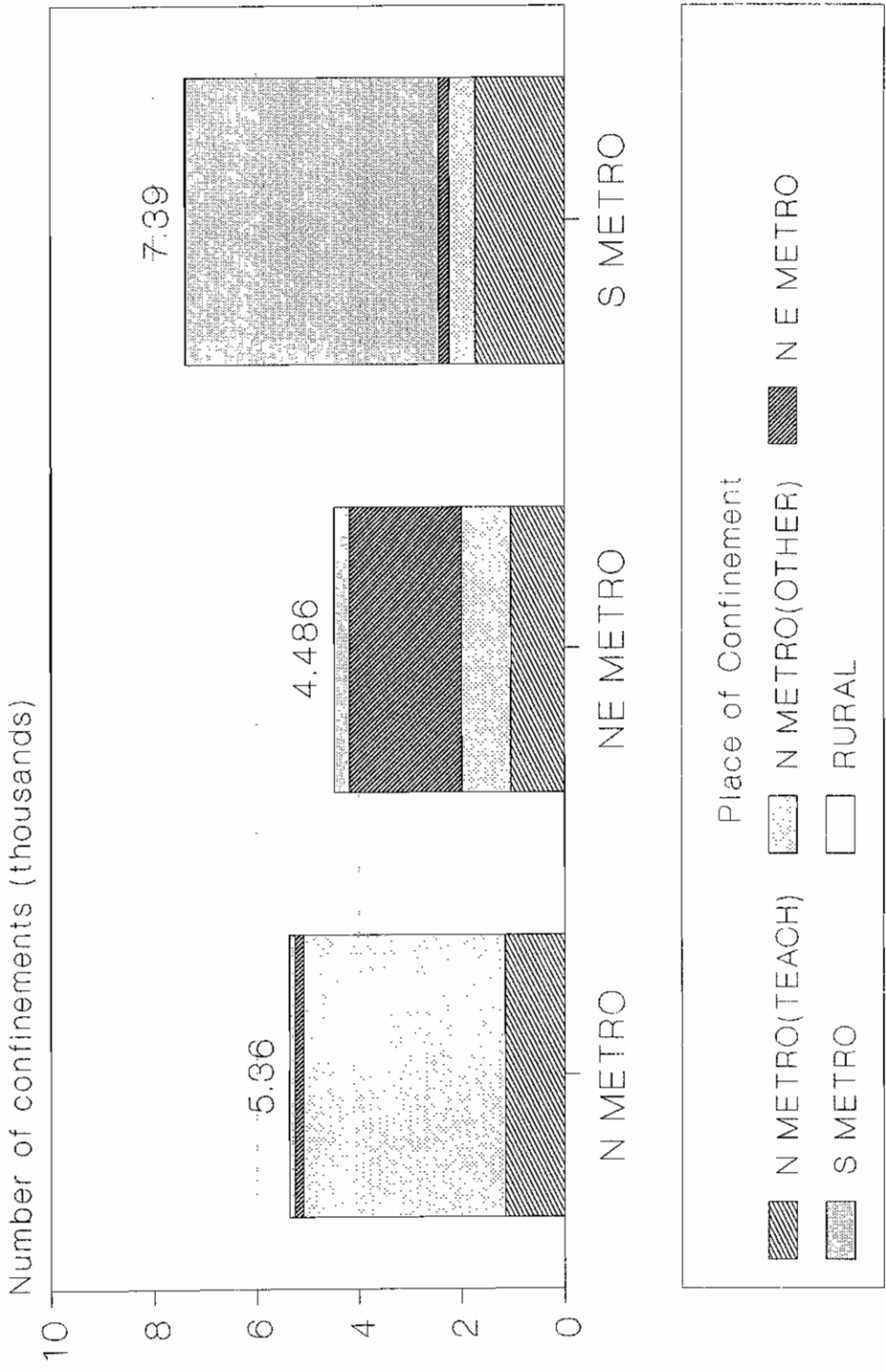
TABLE 5: MATERNAL RESIDENCE AND BIRTH HOSPITAL IN MANAGEMENT REGIONS FOR WOMEN CONFINED IN METROPOLITAN AREAS OF WESTERN AUSTRALIA - 1990

MATERNAL RESIDENCE MANAGEMENT REGIONS	BIRTH HOSPITALS IN MANAGEMENT REGIONS										TOTAL		
	NORTH METRO					NE METRO		SOUTH METRO		RURAL		No.	%
	Teaching		Other			No.	%	No.	%	No.	%		
	No.	%	No.	%	%								
North Metro	1149	21.4	3928	73.3	173	3.2	103	1.9	7	0.1	5360	100.0	
North East Metro	1043	23.3	947	21.1	2193	48.9	298	6.6	5	0.1	4486	100.0	
South Metro	1732	23.4	503	6.8	202	2.7	4933	66.8	20	0.3	7390	100.0	

Excludes births less than 500 grams birthweight and 163 non hospital births.

FIGURE III

HOSPITAL BIRTHS AND MATERNAL RESIDENCE IN METROPOLITAN REGIONS OF W.A. 1990



All women confined in hospital WA 1990

Excludes births less than 500 grams birthweight and 163 non hospital births.

Source: Midwives' Notification System.

Country Regions

One quarter, (25.8%) of women confined in Western Australia during 1990 were confined in country hospitals (Table 7).

With the exception of the Central Health Service Management Region more than 73.5% of women were confined at a hospital within the management Region of their residence.

For the 2182 women residing in the South West Region, 85.1% were confined in the Region and 14.3% in the metropolitan area.

In the Great Southern Region, of the 1149 women 81.3% were confined locally and 16.6% were confined in the metropolitan area.

Almost half (48.5%) of the 905 women residents confined in the Central Region were confined in a hospital in that Region while 49.2% were confined in the metropolitan area and 2.3% in other Regions.

Among the 1135 women residents confined in the Goldfields, 84.7% were attended in the Region and 14.4% in the metropolitan area.

Of the 1158 women confined in the Mid-West Gascoyne Region 73.5% were confined in the Region and 24.9% in the metropolitan area.

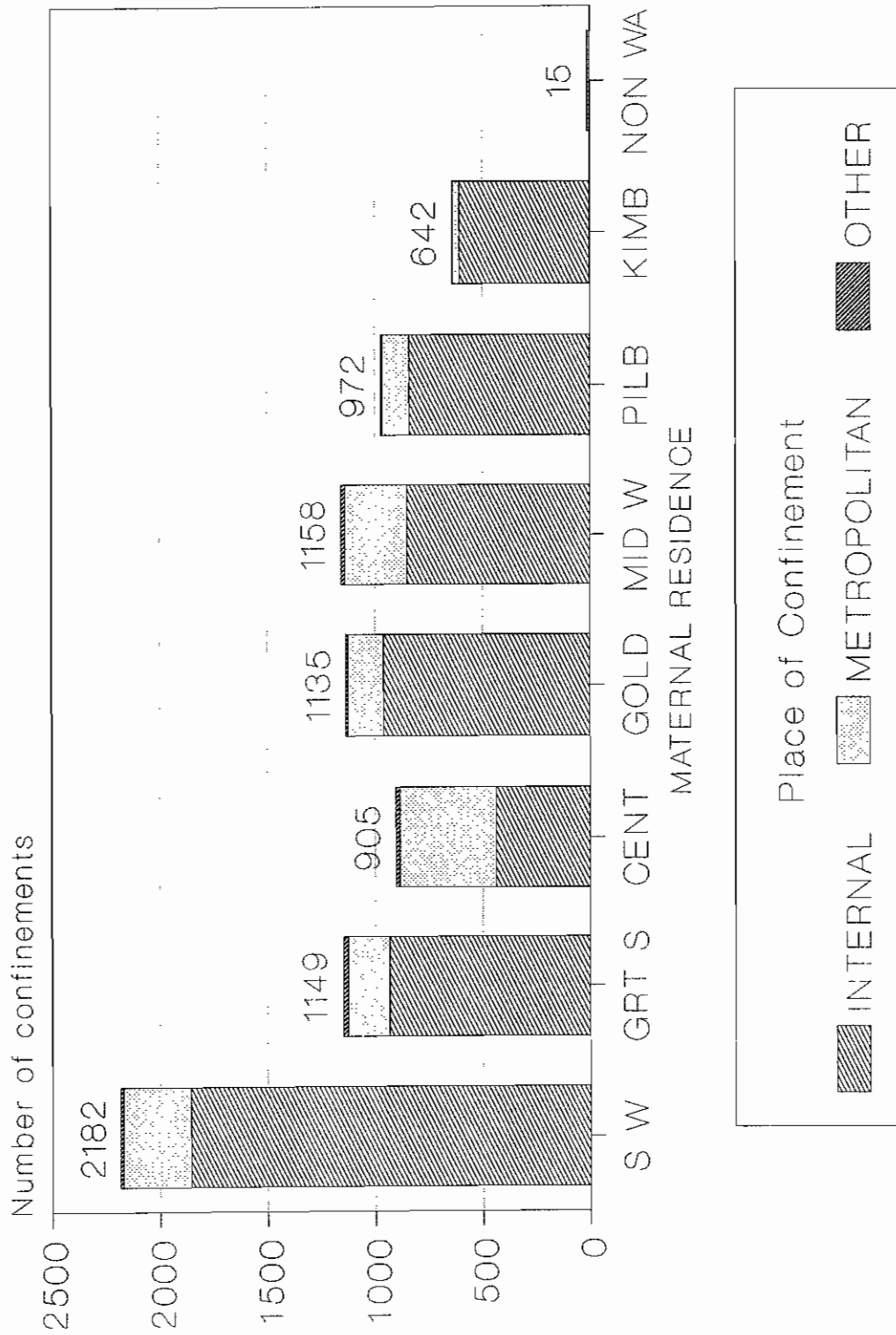
For the 972 women for confinement resident in the Pilbara Region, 86.3% were confined at hospitals within the Region and 13.0% travelled to the metropolitan Regions for confinement.

Among those 642 women confined whose residence was in the Kimberley Region, 94.4% were confined in hospitals within the Region and only 5.1% were confined in the metropolitan area (Table 6, Figure IV).

The movement of women to the metropolitan area for confinement reflects the geographical location of Health Service Management Regions and the levels of expertise and resources available to women during confinement in those Regions.

FIGURE IV

HOSPITAL BIRTHS AND MATERNAL RESIDENCE IN COUNTRY HEALTH REGIONS OF W.A. 1990



All women confined in hospital in 1990

Excludes births less than 500 grams birthweight and 80 non hospital births.
Source: Midwives' Notification System.

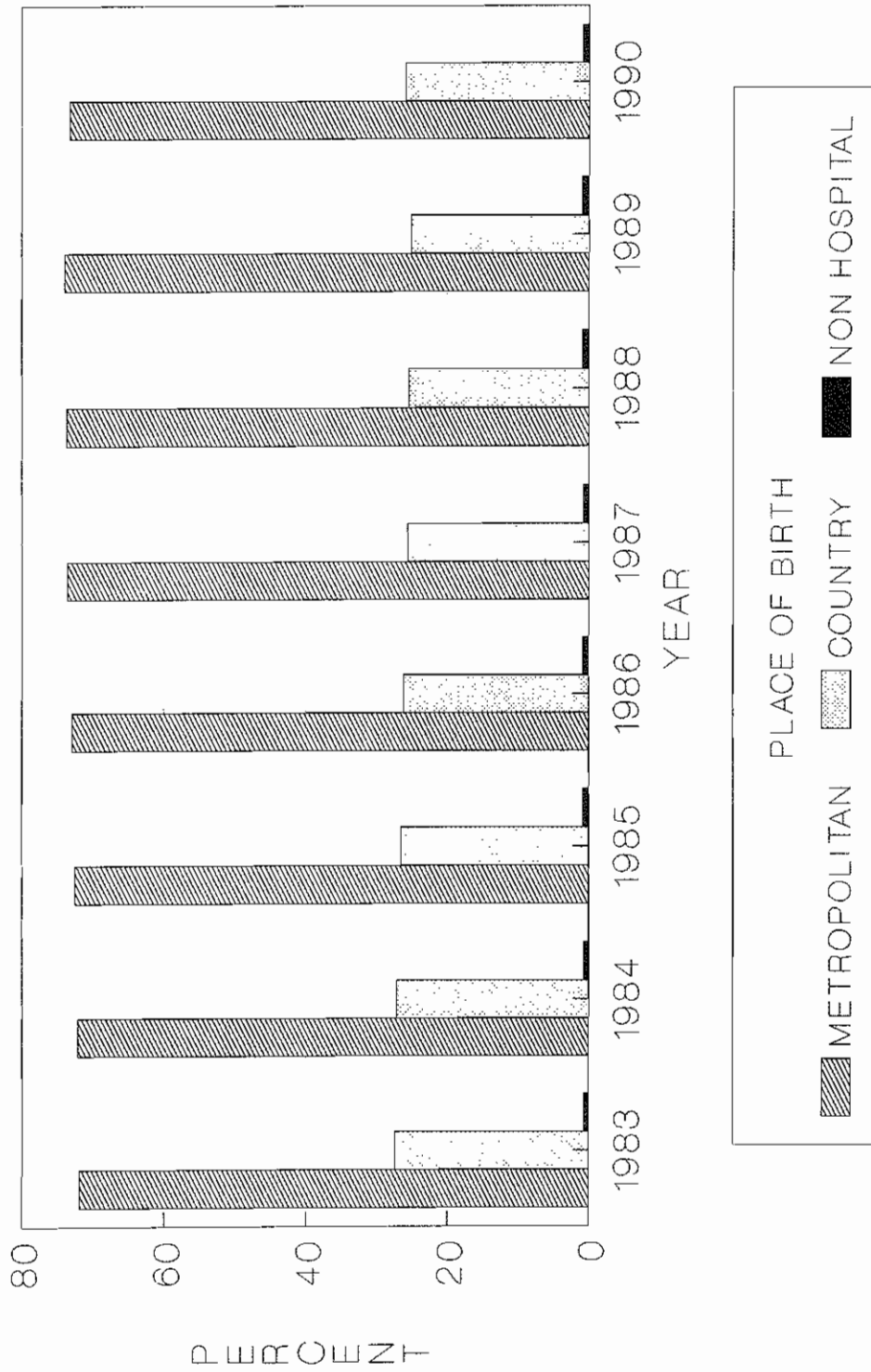
TABLE 6: MATERNAL RESIDENCE AND BIRTH HOSPITAL IN MANAGEMENT REGIONS FOR WOMEN CONFINED IN COUNTRY AREAS OF WESTERN AUSTRALIA - 1990

MATERNAL RESIDENCE MANAGEMENT REGION	BIRTH HOSPITALS IN MANAGEMENT REGIONS						TOTAL	
	INTERNAL		METROPOLITAN		OTHER			
	No.	%	No.	%	No.	%	No.	%
<u>Country</u>								
South West	1856	85.1	313	14.3	13	0.6	2182	100.0
Grt Southern	934	81.3	191	16.6	24	2.1	1149	100.0
Central	439	48.5	445	49.2	21	2.3	905	100.0
Goldfields	961	84.7	163	14.4	11	1.0	1135	100.0
Mid-West	851	73.5	288	24.9	19	1.6	1158	100.0
Pilbara	839	86.3	126	13.0	7	0.7	972	100.0
Kimberley	606	94.4	33	5.1	3	0.5	642	100.0
Non W.A.	-	-	10	66.7	5	33.3	15	100.0

Excludes births less than 500 grams birthweight and 80 non hospital births.

FIGURE V

PLACE OF CONFINEMENT FOR WOMEN CONFINED IN WESTERN AUSTRALIA, 1983-1990



Excludes births less than 500 grams birthweight.

Source: Midwives' Notification System.

4.5 Place of Confinement

During 1990 there were 25637 women confined in Western Australia. Of these, 99.0% gave birth in metropolitan or country hospitals. Non-hospital births included 92 babies born before arrival at hospital (BBA) and 151 babies born at home as planned.

Almost 74% of total births were in metropolitan hospitals. These included 18.0% occurring in a metropolitan teaching hospital, 28.4% in metropolitan departmental (Government) hospitals and 26.8% in private metropolitan hospitals. The majority (89.6%) of the multiple births in 1990 occurred in metropolitan hospitals, with 46.3% being delivered in a teaching hospital (Table 7, Figure V).

TABLE 7: PLACE OF CONFINEMENT AND PLURALITY OF WOMEN CONFINED IN WESTERN AUSTRALIA, 1990

Place of Birth	Plurality				Total	
	Singleton		Multiple		No.	%
	No.	%	No.	%	No.	%
<u>Metropolitan</u>						
¹ Teaching	4484	17.7	142	46.3	4626	18.0
Department	7237	28.6	48	15.6	7285	28.4
Private	6780	26.8	85	27.7	6865	26.8
<u>Country</u>				5.5		
² Regional	3178	12.5	17	2.3	3195	12.5
Private	562	2.2	7	2.6	569	2.2
³ Other	2846	11.2	8		2854	11.1
<u>Non-Hospital</u>						
Homebirths	151	0.6	-	-	151	0.6
⁴ BBA	92	0.4	-	-	92	0.4
TOTAL	25330	100.0	307	100.0	25637	100.0

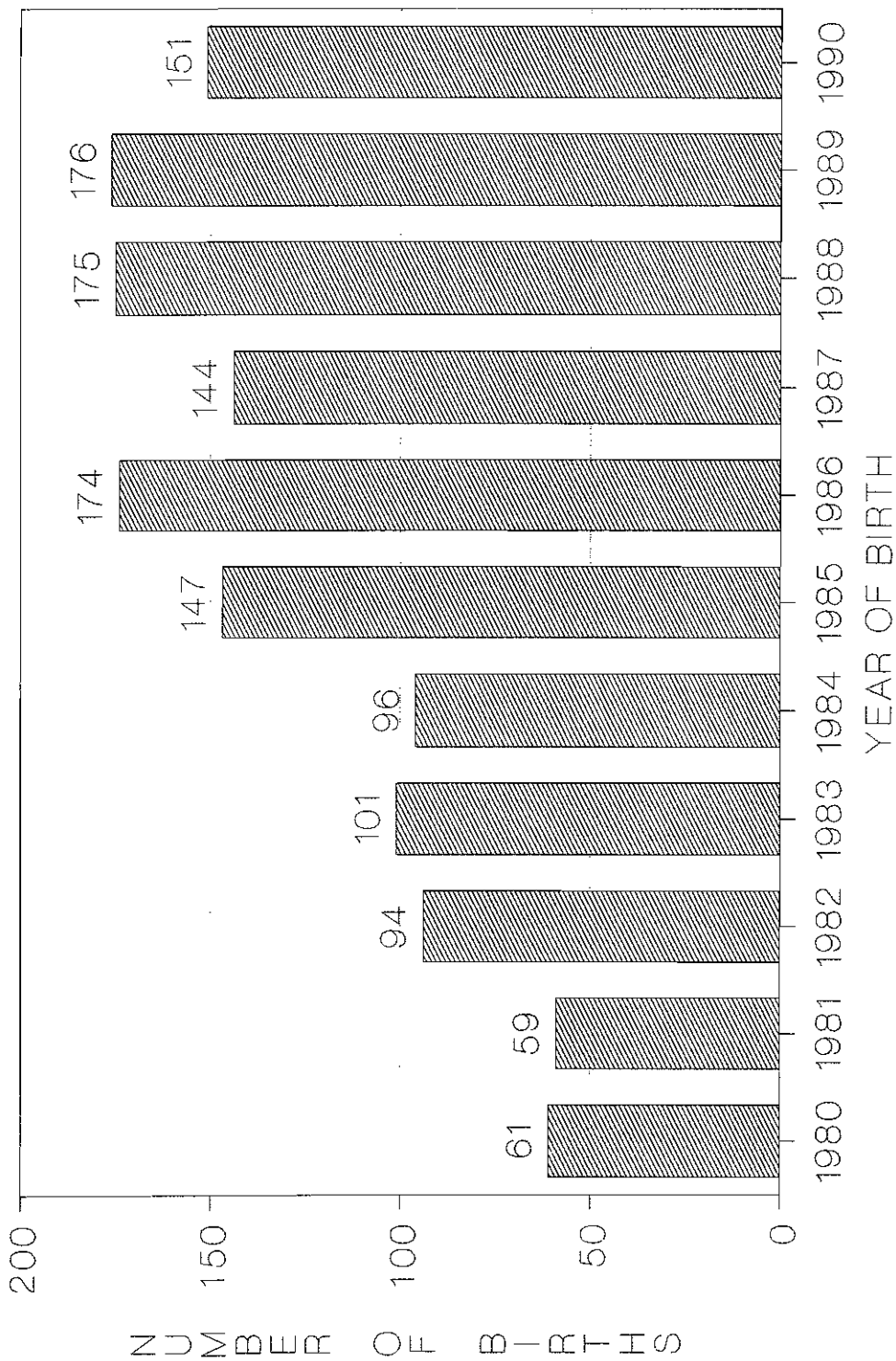
Excludes births less than 500 grams birthweight

- 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 slightly reduced from 176 (0.7%) in 1989 to 151 (0.6%) in 1990 (Table 8, Figure VI).

FIGURE VI

HOME BIRTHS IN WESTERN AUSTRALIA 1980-1990



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

TABLE 8: HOME BIRTHS IN WESTERN AUSTRALIA, 1980-1990

Year	No. ¹	% 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
1987	144	0.6
1988	175	0.7
1989	176	0.7
1990	151	0.6

¹ Excludes planned homebirths transferred either antepartum or intrapartum to hospital.

In 1990 there were 41 women who had planned a homebirth but because of complications were either referred or transferred during pregnancy (36.6%) or during labour (63.4%). These women and their babies are included in hospital birth statistics (Table 9).

TABLE 9: REFERRAL/TRANSFER OF WOMEN WHO PLANNED A HOME BIRTH IN WESTERN AUSTRALIA IN 1990

Time of Referral/Transfer	No.	%
Antepartum	15	36.6
Intrapartum	26	63.4
TOTAL	41	100.0

One other woman received medical attention in hospital following postpartum haemorrhage. The babies of five other women were admitted to hospital following homebirth for observation and treatment.

5. PREGNANCY PROFILE

5.1 Previous Pregnancies

More than a third of the total women confined were confined for the first time. The range of previous confinements extended to thirteen with a mean parity of 1.06. Of those women with a multiple pregnancy 41.0% were identified as nulliparous. Only 10.5% of women confined had a parity of three or more (Table 10).

The highest number of recorded previous pregnancies was eighteen. Mean = 1.5 previous pregnancies. Standard Deviation = 1.5.

TABLE 10: PARITY AND PLURALITY OF WOMEN CONFINED IN WESTERNAUSTRALIA, 1990

Parity	Plurality				Total	
	Singleton		Multiple		No.	%
	No.	%	No.	%		
0	9870	39.0	126	41.0	9996	39.0
1-2	12811	50.6	150	48.9	12961	50.6
3-4	2320	9.2	30	9.8	2350	9.2
≥5	329	1.3	1	0.3	330	1.3
TOTAL	25330	100.0	307	100.0	25637	100.0

Excludes births less than 500 grams birthweight.

Of the 9996 nulliparous women, 1337 (13.4%) were identified as teenagers (19 years or less), 82.0% were aged 20 to 34 years. Amongst the 314 women aged forty or more, 53 were having their first baby.

Teenage mothers were 80.7% nulliparous and 19.3% had a parity of 1-4. There were 4 teenagers who had a parity of three or more. Among the 314 women confined aged 40 years or more 53 (16.9%) were nulliparous, 138 (43.9%) had a parity of 1-2, 95 (30.3%) a parity of 3-4 and 28 (8.9%) a parity of 5 or more (Table 11).

TABLE 11: PARITY AND AGE OF WOMEN CONFINED IN WESTERN AUSTRALIA, 1990

Maternal Age	Parity								Total	
	0		1-2		3-4		5			
	No.	%	No.	%	No.	%	No.	%	No.	%
<15	20	0.2	-	-	-	-	-	-	20	0.1
15-19	1317	13.2	315	2.4	4	0.2	-	-	1636	6.4
20-24	2836	28.4	2402	18.5	211	9.0	6	1.8	5455	21.3
25-29	3670	36.7	4878	37.6	717	30.5	65	19.7	9330	36.4
30-34	1686	16.9	4072	31.4	885	37.7	138	41.8	6781	26.5
35-39	414	4.1	1156	8.9	438	18.6	93	28.2	2101	8.2
40-44	51	0.5	135	1.0	92	3.9	25	7.6	303	1.2
≥45	2	-	3	-	3	0.1	3	0.9	11	-
TOTAL	9996	100.0	12961	100.0	2350	100.0	330	100.0	25637	100.0

Excludes births less than 500 grams birthweight.

Trends in births by socio-economic status can be assessed for mothers living in the metropolitan area.

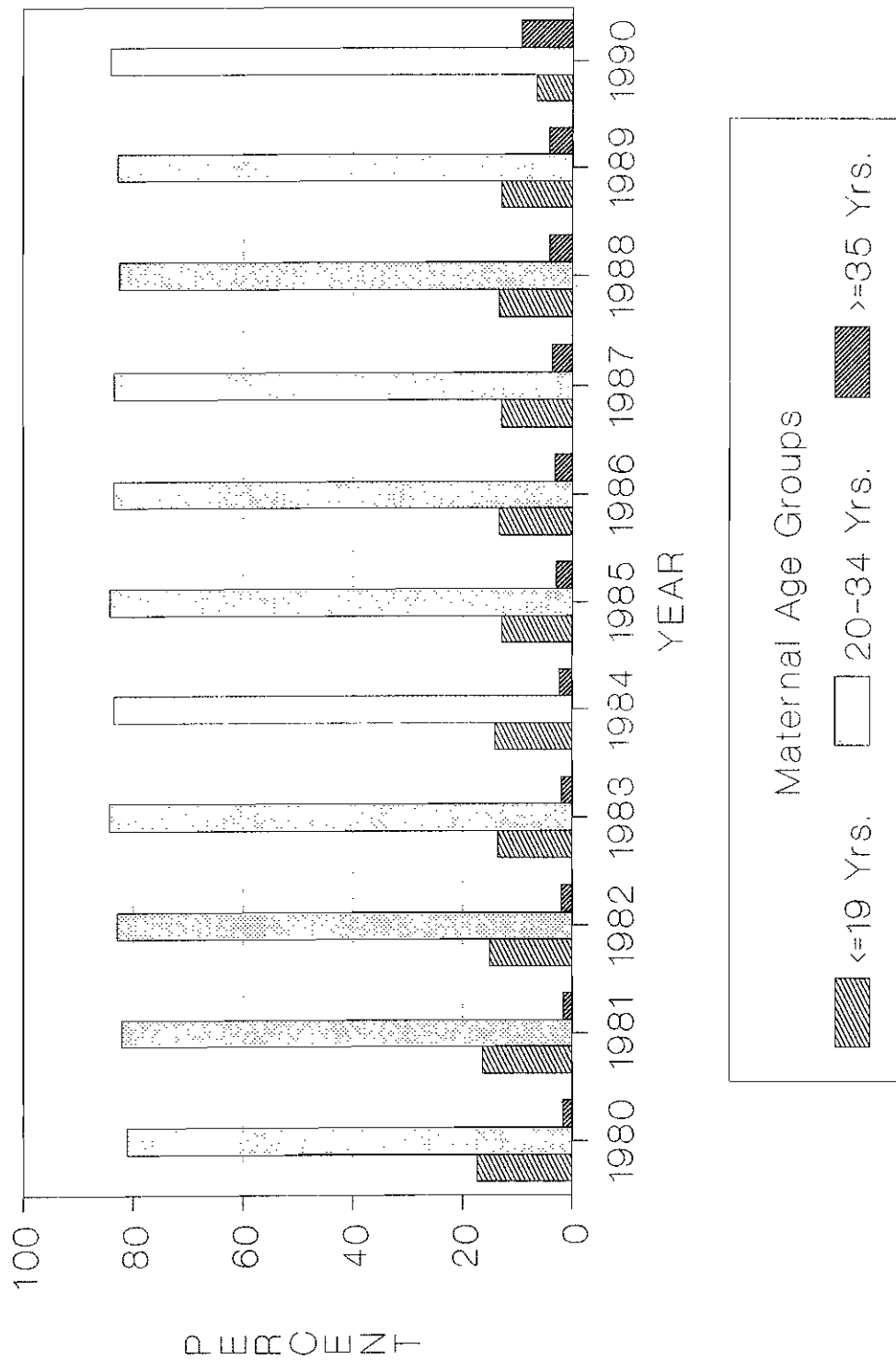
A socio-economic status scale for Perth has been constructed using Census data to allocate postcodes to four socio-economic status levels. This is a fairly crude scale, but nevertheless demonstrates differences. Postcodes in the country regions cannot be allocated to the socio-economic status scale because of the greater heterogeneity of the population within country postcodes.

Trends in maternal age and parity were investigated. Table 12 shows the proportions of women living in Perth 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 (0.6%) was three times that for women of the same age in the highest socio-economic group (0.2%). This trend was reversed for older women, 35 years and above, where the percentage of women in the highest socio-economic group (3.4%) was more than twice that for women in the lowest socio-economic group (1.6%).

To investigate the trend in grand multiparity by socio-economic status, the proportion of women of parity ≥5 was calculated. In the highest social group, 0.1% of the mothers were found to be grand multiparas whereas in the lowest social group this percentage was 0.3% (Table 12).

FIGURE VII

MATERNAL AGE OF PRIMIPAROUS WOMEN CONFINED IN WESTERN AUSTRALIA 1980-1990



Excludes births less than 500 grams birthweight.

Source: Midwives' Notification System.

TABLE 12: SOCIO-ECONOMIC STATUS AND MATERNAL AGE AND PARITY, PERTH METROPOLITAN AREA OF WESTERN AUSTRALIA, 1990

Socio-Economic Status	Women Confined		Maternal Age						Parity	
			≤ 17 years		18-34 years		≥ 35 years		≥ 5 babies	
	n	%	n	%	n	%	n	%	n	%
I (HIGHEST)	3931	23.1	37	0.2	3320	19.5	574	3.4	16	0.1
II	4804	28.2	49	0.3	4223	24.8	532	3.1	33	0.2
III	4417	25.9	86	0.5	3901	22.9	430	2.5	57	0.3
IV (LOWEST)	3870	22.7	110	0.6	3480	20.4	280	1.6	58	0.3
Total	17022	100.0	282	1.7	14924	87.7	1816	10.7	164	1.0

Excludes births less than 500 grams birthweight.

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

When maternal age was examined for primiparous women confined during 1980-1990, an obvious change in the age of women having their first pregnancies was discernible. Among teenage primiparous women the percentage of confinements decreased from 17.2% in 1980 to 13.4% in 1990. For primiparous women aged 30 years or more there was a marked increase from 10.3% in 1980 to 21.5% in 1990. The average age at confinement of primiparous women was 25.6 years (Table 13, Figure VII).

TABLE 13: AGE OF PRIMIPAROUS WOMEN AT CONFINEMENT IN WESTERN AUSTRALIA 1980-1990

Maternal Age	1980		1981		1982		1983		1984		1985		1986		1987		1988		1989		1990	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
<15	17	0.2	24	0.3	20	0.2	22	0.2	14	0.1	24	0.3	21	0.2	19	0.2	23	0.2	21	0.2	20	0.2
15	49	0.7	50	0.6	47	0.5	51	0.6	42	0.5	48	0.6	57	0.6	58	0.6	47	0.5	46	0.5	45	0.5
16	148	2.0	161	1.9	140	1.6	136	1.5	151	1.7	142	1.6	151	1.7	125	1.4	149	1.6	156	1.6	146	1.5
17	248	3.4	292	3.4	275	3.2	271	3.0	272	3.1	233	2.7	260	2.8	225	2.4	274	2.9	269	2.7	249	2.5
18	356	4.9	381	4.5	361	4.1	308	3.4	338	3.9	289	3.3	320	3.5	343	3.7	341	3.6	389	3.9	414	4.1
19	444	6.1	492	5.8	468	5.4	435	4.9	422	4.8	398	4.5	419	4.6	420	4.5	447	4.7	396	4.0	463	4.6
20-24	3035	41.4	3551	41.6	3470	39.7	3547	39.6	3323	37.9	3155	36.0	3081	33.6	3002	32.4	2888	30.3	2893	29.2	2836	28.4
25-29	2286	31.2	2684	31.4	2906	33.2	3081	34.4	3059	34.7	3124	35.6	3395	37.0	3444	37.2	3536	37.1	3698	37.3	3670	36.7
30-34	634	8.6	773	9.1	876	10.0	925	10.3	958	10.9	1104	12.6	1169	12.8	1286	13.9	1444	15.1	1614	16.3	1686	16.9
35-39	101	1.4	123	1.4	167	1.9	167	1.9	191	2.2	235	2.7	276	3.0	303	3.3	351	3.7	387	3.9	414	4.1
40-44	18	0.3	11	0.1	13	0.2	17	0.2	16	0.2	20	0.2	17	0.2	35	0.4	39	0.4	40	0.4	51	0.5
≥45	3	-	-	-	-	-	2	-	3	-	-	-	1	-	-	-	-	-	1	-	2	-
TOTAL	7339	100.0	8542	100.0	8743	100.0	8962	100.0	8779	100.0	8772	100.0	9167	100.0	9260	100.0	9539	100.0	9910	100.0	9996	100.0

Excludes births less than 500 grams birthweight.
1990 Mean = 25.6 years. Standard Deviation = 5.07.

Aboriginal women had a much higher parity than non-Aboriginal women (Table 14). Approximately 40% of caucasian women and those of "other" races were experiencing their first confinement compared with less than 30% of Aboriginal women.

TABLE 14: PARITY AND RACE OF WOMEN CONFINED IN WESTERN AUSTRALIA, 1990

Parity	Race						Total	
	Caucasian		Aboriginal		Other			
	No.	%	No.	%	No.	%	No.	%
0	8871	39.7	441	28.7	684	38.9	9996	39.0
1-2	11400	51.0	671	43.6	890	50.6	12961	50.6
3-4	1873	8.4	316	20.5	161	9.2	2350	9.2
≥5	196	0.9	111	7.2	23	1.3	330	1.3
Total	22340	100.0	1539	100.0	1758	100.0	25637	100.0

Excludes births less than 500 grams birthweight.

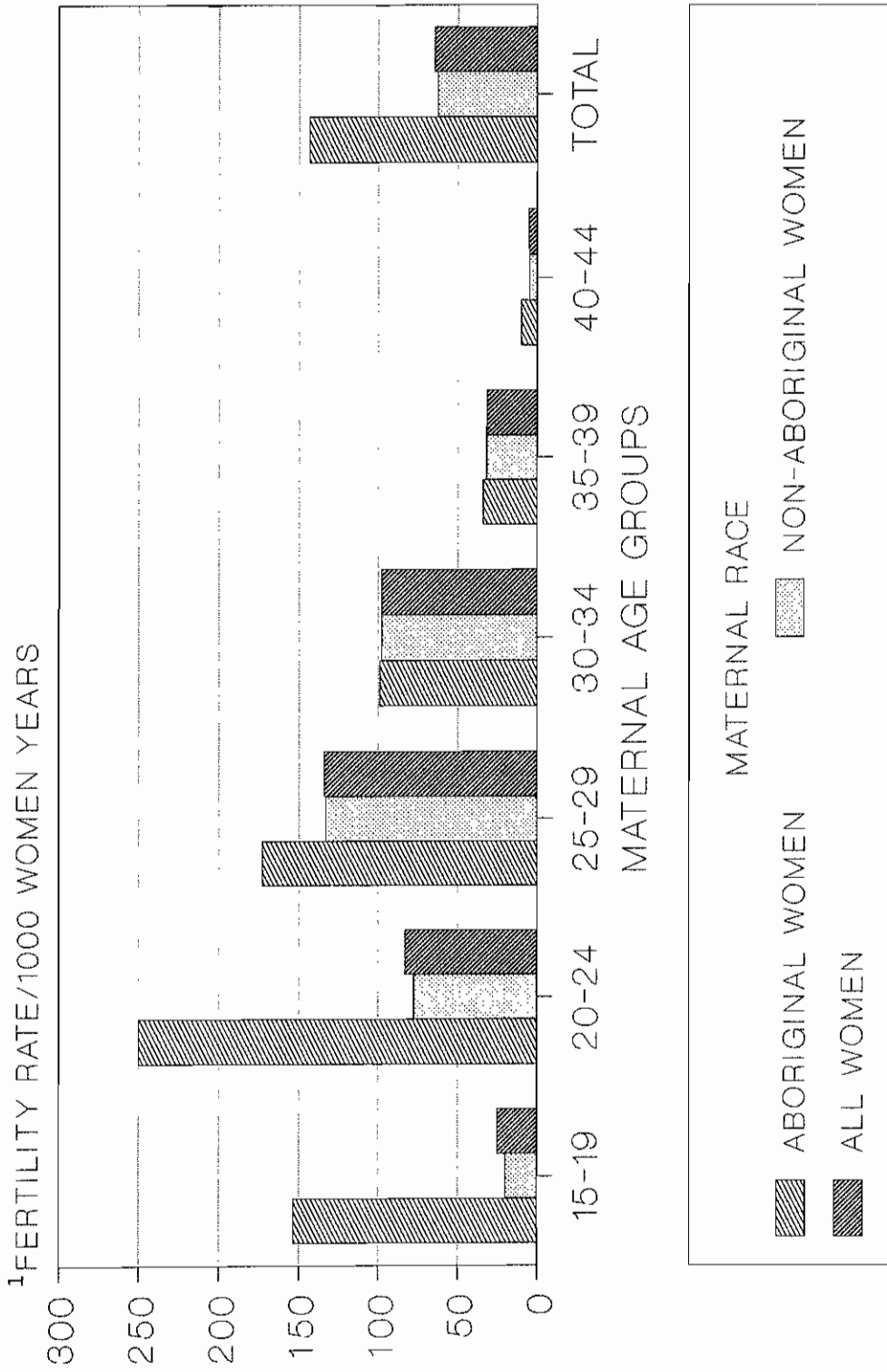
5.2 Fertility Rates

Age-specific fertility rates in the Aboriginal and non-Aboriginal sub-populations and the total population are shown in Table 15. The population estimates used were projections from the 1986 census data. 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.³

Overall, the fertility rate among Aboriginal women (143.4/1000) was more than double that of non-Aboriginal women (62.6/1000). Among the 15 to 19 year age group the fertility rate of Aboriginal women (153.6/1000) was more than seven times greater than for non-Aboriginal women (19.8/1000). For those women in the 20 to 34 year age group the rate for Aboriginal women (182.7/1000) was almost double that for non-Aboriginal women (103.2/1000). The rates for Aboriginal women (23.8/1000) and non-Aboriginal women (19.1/1000) in the 35 to 44 year age group were similar (Table 15, Figure VIII).

FIGURE VIII

FERTILITY RATES OF ABORIGINAL AND NON-ABORIGINAL WOMEN IN W.A. 1990.



Excludes births less than 500 grams birthweight.

¹Fertility Rates: Total Births/1000 Women Years.

Source: Midwives' Notification System, Australian Bureau of Statistics.

TABLE 15: FERTILITY RATES¹ OF ABORIGINAL, NON-ABORIGINAL AND TOTAL WOMEN CONFINED IN WESTERN AUSTRALIA, 1990

Maternal Age	Aboriginal			Non-Aboriginal			Total		
	Births	Population	Fertility Rate ¹	Births	Population	Fertility Rate ¹	Births	Population	Fertility Rate ¹
15-19	402	2618	153.6	1234	62397	19.8	1636	65015	25.2
20-24	579	2313	250.3	4876	63321	77.0	5455	65634	83.1
25-29	334	1936	172.5	8996	67636	133.0	9330	69572	134.1
30-34	161	1630	98.8	6620	67551	98.0	6781	69181	98.0
35-39	42	1235	34.0	2059	64715	31.8	2101	65950	31.9
40-44	9	904	10.0	294	58770	5.0	303	59674	5.1
TOTAL	1525	10636	143.4	24079	384390	62.6	25606	395026	64.8

Excludes births less than 500 grams birthweight.

¹ Fertility Rate: Total births/1000 women-years

SOURCE: AUSTRALIAN BUREAU OF STATISTICS - Cat. No. 3201.0 (preliminary data)
COMMUNITY AND CHILD HEALTH SERVICES.

5.3 Complications of Pregnancy

Almost two thirds (65.2%) of all women confined during 1990 were recorded as having no complications of pregnancy.

Pre-eclampsia was reported in 1582 (6.2%) of women. Of the 45 (14.7%) women with multiple pregnancy, the percentage for pre-eclampsia was more than twice that for women with singleton pregnancies (6.1%) (Table 16). Also, there were 908 (3.5%) women recorded as having unspecified hypertension, 308 (1.2%) with anaemia of pregnancy, 578 (2.3%) women had a viral or bacterial genito-urinary tract infection, 282 (1.1%) had retarded fetal growth and 289 (1.1%) showed symptoms of gestational diabetes.

TABLE 16: SELECTED COMPLICATIONS OF PREGNANCY AND PLURALITY OF WOMEN CONFINED IN WESTERN AUSTRALIA, 1990

	Plurality				Total	
	Singleton		Multiple		No.	% ³
	No.	% ¹	No.	% ²		
No complications	16633	65.7	85	27.7	16718	65.2
<u>Complication</u>						
Threatened Abortion	1261	5.0	17	5.5	1278	5.0
Urinary Tract Infection	1108	4.4	12	3.9	1120	4.4
Pre-eclampsia	1537	6.1	45	14.7	1582	6.2
A.P.H. - placenta praevia	160	0.6	5	1.6	165	0.6
- abruptio	159	0.6	3	1.0	162	0.6
- other	675	2.7	10	3.3	685	2.7
Premature Rupture of Membranes	869	3.4	28	9.1	897	3.5
Other	4462	17.6	170	55.4	4632	18.1

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 women confined

Although it was thought that complications of pregnancy may be under reported by midwives, the validation study undertaken in 1987⁴ 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.

5.4 Medical Conditions

Among the 25,637 women confined during 1990, there were 4762 reported instances of pre-existing medical complications. Of these 1095 (4.3%) of women confined were reported as asthmatic, 130 (0.5%) as epileptic, 53 (0.2%) as having pre-existing diabetes and 125 (0.5%) with known thyroid disorders.

6. LABOUR AND DELIVERY

6.1 Onset of Labour

Almost two thirds (64.8%) of total women confined during 1990 established labour spontaneously. Among women with multiple pregnancy 39.4% had a spontaneous onset of labour.

Induction of labour occurred for 24.0% of total women confined. Ninety-four (30.6%) women with multiple pregnancy underwent induction of labour (Table 17).

TABLE 17: ONSET OF LABOUR AND PLURALITY OF WOMEN CONFINED IN WESTERN AUSTRALIA, 1990

Onset of Labour	Plurality				Total	
	Singleton		Multiple		No.	%
	No.	%	No.	%		
Spontaneous	16485	65.1	121	39.4	16606	64.8
Induced	6055	23.9	94	30.6	6149	24.0
No labour	2790	11.0	92	30.0	2882	11.2
Total	25330	100.0	307	100.0	25637	100.0

Excludes births less than 500 grams birthweight.

There were 52 women reported as having had a failed induction of labour during 1990.

From 1981 to 1989 the number of women in Western Australia having an induction of labour remained between 25-27% of total confinements⁵ and reduced to 24% in 1990.

6.2 Augmentation of Labour

There were 6141 (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 4083 (15.9%) women was followed by a spontaneous vaginal delivery, 1511 (5.9%) women required an assisted vaginal delivery and 547 (2.1%) women an emergency caesarean section.

Of the 16606 women for whom onset of labour was spontaneous 6141 (37.0%) had labour augmented and 10,465 (63.0%) did not.

It is of interest to note that almost one third (8340, 32.5%) of women established labour following spontaneous onset, received no augmentation of labour and achieved a spontaneous vaginal delivery (Table 18).

TABLE 18: ONSET AND AUGMENTATION OF LABOUR AND TYPE OF DELIVERY FOR WOMEN CONFINED IN WESTERN AUSTRALIA, 1990

Labour (women confined)	Type of delivery								Total	
	Spontaneous Vaginal		Assisted Vaginal		Emergency Caesarean		Elective Caesarean			
Spont. onset No augmentation	8340	32.5	1394	5.4	731	2.9	-	-	10465	40.8
Spont. onset and Augmentation	4083	15.9	1511	5.9	547	2.1	-	-	6141	24.0
Induced onset	3973	15.5	1508	5.9	668	2.6	-	-	6149	24.0
No labour	-	-	-	-	389	1.5	2493	9.7	2882	11.2
Total	16396	64.0	4413	17.2	2335	9.1	2493	9.7	25637	100.0

Excludes births less than 500 grams birthweight.

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

6.3 Presentation

The presentation for the 25,330 singleton confinements was identified as 24,204 (95.6%) vertex, 955 (3.8%) breech, and 171 (0.7%) "other" presentations (Table 19).

Vertex presentations of singleton births were delivered vaginally in 84.2% of cases during 1990.

More than three quarters (79.6%) of total singleton births presenting by the breech were delivered by caesarean section (51.2% elective and 28.4% emergency caesarean section) (Table 19).

TABLE 19: PRESENTATION AND TYPE OF DELIVERY FOR SINGLETON BIRTHS IN WESTERN AUSTRALIA, 1990

Type of Delivery	Presentation						Total	
	Vertex		Breech		Other		No.	%
	No.	%	No.	%	No.	%		
Normal	16266	67.2	7	0.7	36	21.1	16309	64.4
Vacuum	1967	8.1	-	-	8	4.7	1975	7.8
Forceps	2147	8.9	-	-	10	5.8	2157	8.5
Breech Manoeuvre	-	-	189	19.8	-	-	189	0.7
Elective Caesaren	1891	7.8	488	51.2	44	25.7	2423	9.6
Emergency Caesarean	1933	8.0	271	28.4	73	42.7	2277	9.0
TOTAL	24204	100.0	955	100.0	171	100.0	25330	100.0

Excludes births less than 500 grams birthweight.

6.4 Type of Delivery

Less than two thirds (64.0%) of the total women confined in 1990 had a spontaneous vaginal delivery. Vaginal deliveries were assisted for approximately one in six total confinements with 7.8% of women having a vacuum extraction and 8.6% a forcep delivery.

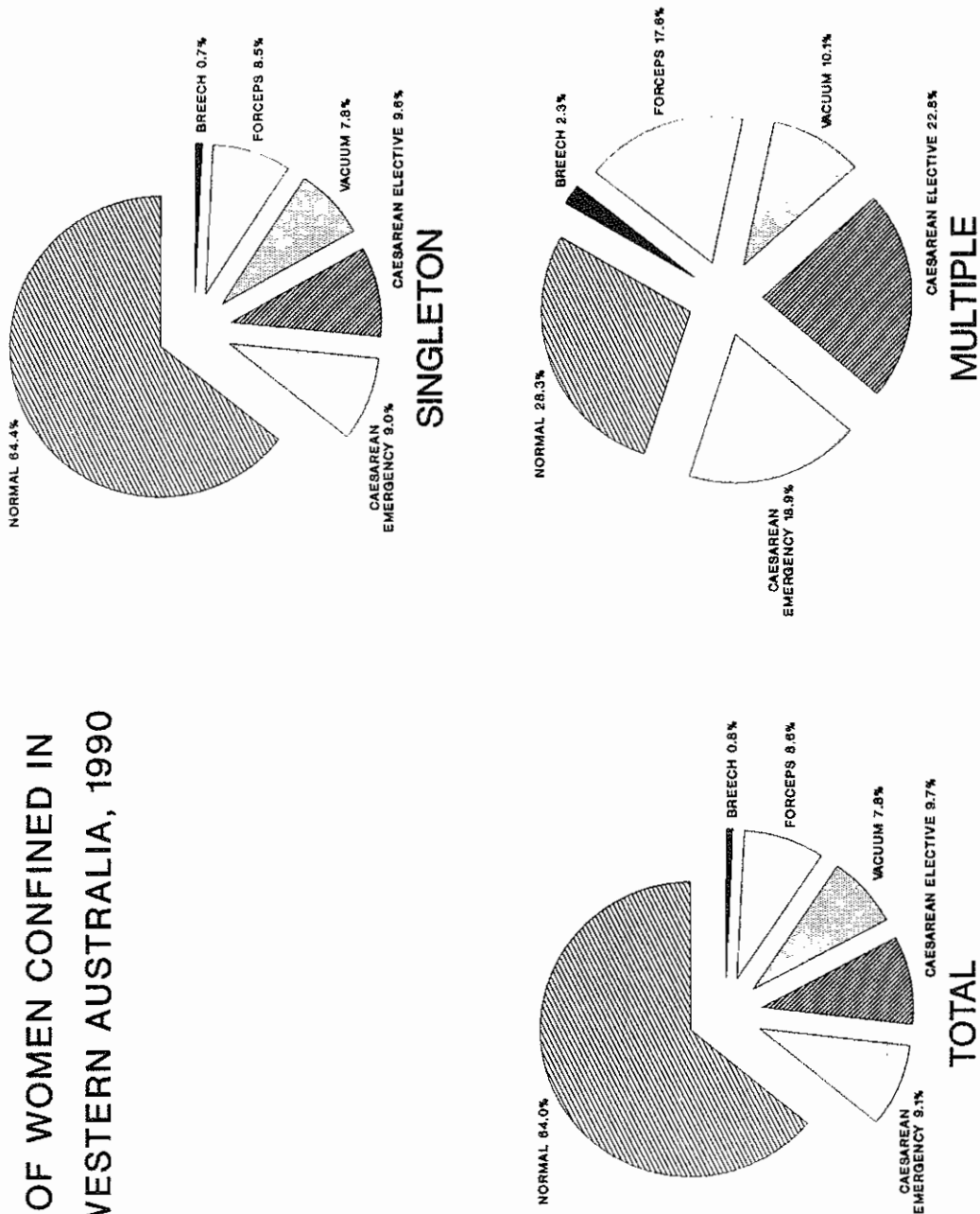
The type of delivery for each woman with multiple pregnancy was classified according to features of labour and delivery for the first twin/triplet. While all four women with triplet pregnancies were delivered by elective caesarean section there were seven women for whom the first twin was delivered vaginally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

Among women with a multiple pregnancy, 128 (41.7%) were delivered by caesarean section. Spontaneous vaginal deliveries occurred for 87 (28.3%) multiple pregnancies (Table 20, Figure IX).

Of the women who were delivered by caesarean section during 1990, one third (32.2%) had had a previous caesarean section delivery or other uterine surgery.

FIGURE IX

TYPE OF DELIVERY AND PLURALITY
OF WOMEN CONFINED IN
WESTERN AUSTRALIA, 1990



Excludes births less than 500 grams birthweight.
Multiple births relate to first multiple.
Source: Midwives' Notification System.

TABLE 20: TYPE OF DELIVERY AND PLURALITY OF WOMEN CONFINED IN WESTERN AUSTRALIA, 1990

Type of Delivery	Plurality				Total	
	Singleton		Multiple		No.	%
	No.	%	No.	%		
Normal	16309	64.4	87	28.3	16396	64.0
Vacuum	1975	7.8	31	10.1	2006	7.8
Forceps	2157	8.5	54	17.6	2211	8.6
Breech Manoeuvre	189	0.7	7	2.3	196	0.8
Elective Caesarean	2423	9.6	70	22.8	2493	9.7
Emergency Caesarean	2277	9.0	58	18.9	2335	9.1
TOTAL	25330	100.0	307	100.0	25637	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 Australia has gradually increased over the past decade. In 1990, 18.8% of women were delivered by this method (Table 21, Figure X). This increase reflects both national and international trends. Data from South Australia in 1989 reported caesarean section proportions of 21.1%⁶, Victoria in 1988, 15.9%⁷, NSW in 1987 15.9%⁸, and Tasmania 14.7% in 1988⁹.

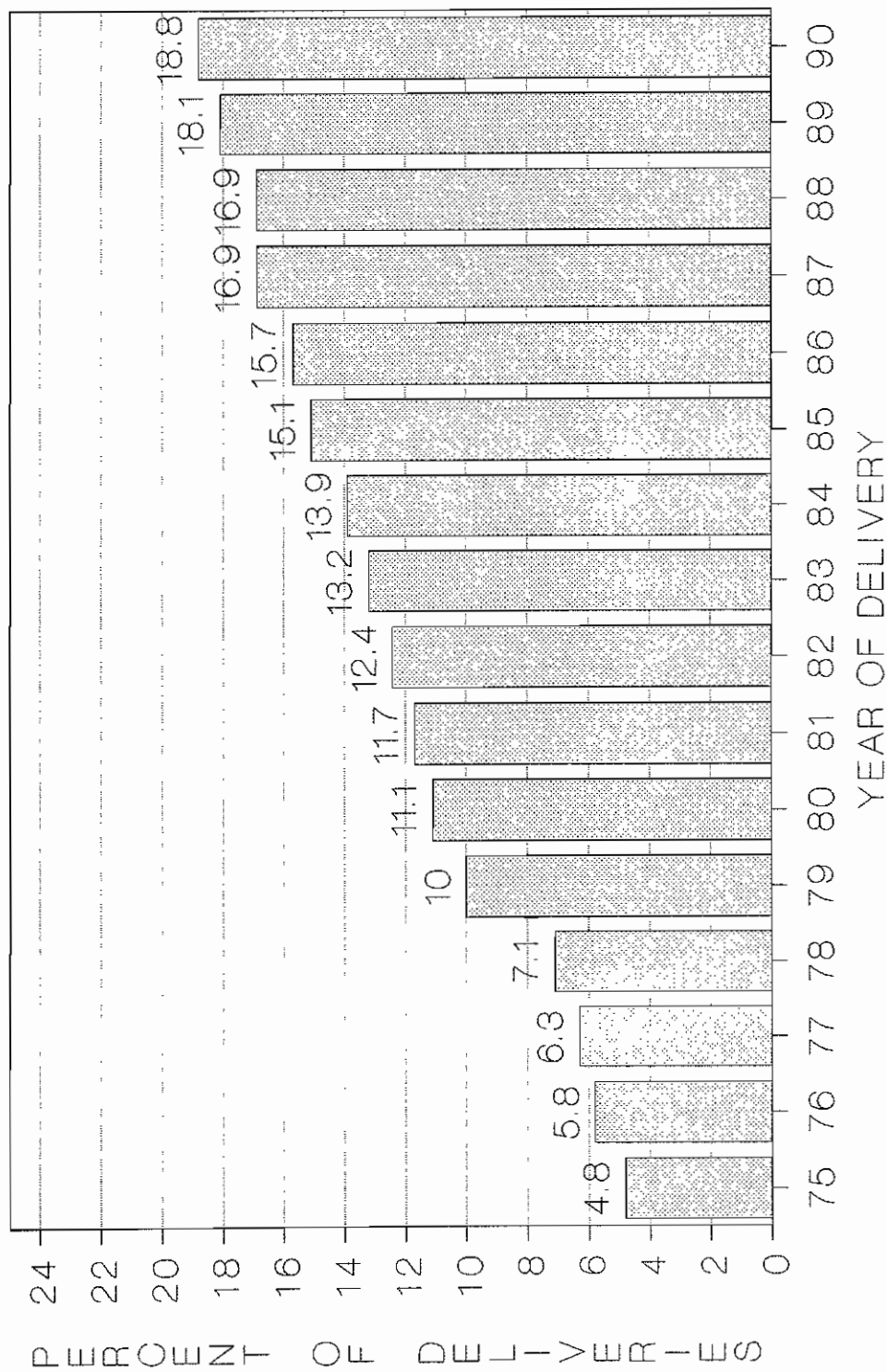
TABLE 21: CAESAREAN SECTION IN WOMEN CONFINED IN WESTERN AUSTRALIA, 1975-1990

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
1987	16.9
1988	16.9
1989	18.1
1990	18.8

Excludes births less than 500 grams birthweight.

FIGURE X

CAESAREAN SECTIONS IN WESTERN AUSTRALIA 1975-1990



Excludes births less than 500 grams birthweight.

Source: Midwives' Notification System.

The indications for caesarean section were assessed by examination of complications of labour and delivery.

For the 4828 women confined by caesarean section 7101 complications of labour and delivery were recorded. The distribution of complications is shown in Table 22. All women had at least one complication recorded and 39.6% had more than one complication recorded (Table 22).

TABLE 22: CAESAREAN SECTION CONFINEMENTS, FREQUENCY OF COMPLICATIONS OF LABOUR AND DELIVERY FOR WOMEN CONFINED IN WESTERN AUSTRALIA, 1990

Number of complications of labour and delivery	Women confined by caesarean section	
	n	%
1	2914	60.4
2	1467	30.4
3	373	7.7
4	65	1.3
5	9	0.2
TOTAL	4828	100.0

Assessment of complications of labour and delivery for women confined by caesarean section showed previous caesarean section or other uterine surgery (20.5%) and cephalopelvic disproportion (17.8%) as the principal indications for caesarean section confinement (Table 23).

TABLE 23: CAESAREAN SECTION CONFINEMENTS, COMPLICATIONS OF LABOUR AND DELIVERY FOR WOMEN CONFINED IN WESTERN AUSTRALIA, 1990

Complications of Labour and Delivery	Caesarean Section				Total	
	Emergency		Elective		n	%
	n	%	n	%		
Umbilical Cord Complications	137	3.5	63	2.0	258	3.6
Cephalopelvic Disproportion	638	16.4	686	21.4	1266	17.8
Breech and other Malpresentations	357	9.2	546	17.0	903	12.7
Previous Caesarean Section or other uterine surgery	258	6.6	1197	37.3	1455	20.5
Fetal Distress	870	22.4	40	1.2	910	12.8
Pregnancy Induced Disorders	361	9.3	219	6.8	580	8.2
Abnormal Forces of Labour	545	14.0	18	0.6	563	7.9
Post Partum Haemorrhage	155	4.0	88	2.7	243	3.4
Other	569	14.6	354	11.0	923	13.0
Total	3890	100.0	3211	100.0	7101	100.0

Of those women confined by caesarean section in Western Australia during 1990, the highest proportion were at metropolitan obstetric teaching and private hospitals. Overall, elective caesarean sections comprised 9.8% and emergency caesarean section 9.2% of women confined in hospital (Table 25).

TABLE 24: CAESAREAN SECTION CONFINEMENTS, MATERNAL AGE AND PLACE OF CONFINEMENT IN WESTERN AUSTRALIA, 1990

Maternal Age	Metropolitan						Country						Total							
	Teaching		Departmental		Private		Regional		Private		Other		No.	Women	%					
	No.	Women %	No.	Women %	No.	Women %	No.	Women %	No.	Women %	No.	Women %								
≤ 19	62	472	13.1	74	538	13.8	3	30	10.0	-	10	19	205	9.3	219	1644	13.3			
20-34	850	3538	24.0	1010	6208	16.3	1297	6007	21.6	118	512	209	2493	8.4	3974	21371	18.6			
≥ 35	213	616	34.6	108	539	20.0	235	828	28.4	11	47	15	156	9.6	635	2379	26.7			
Total	1125	4626	24.3	1192	7285	16.4	1535	6865	22.4	604	3195	129	569	22.7	243	2854	8.5	4828	25394	19.0

Excludes births less than 500 grams birthweight.
Excludes 151 homebirths and 92 BBA's.

TABLE 25: PLACE OF CONFINEMENT AND CAESAREAN SECTION FOR WOMEN CONFINED IN WESTERN AUSTRALIA, 1990

Place of Birth	Caesarean Section						Total		
	Elective			Emergency			No.	women confined	%
	No.	women confined	%	No.	women confined	%			
Metropolitan									
Teaching	482	4626	10.4	643	4626	13.9	1125	4626	24.3
Departmental	590	7285	8.1	602	7285	8.3	1192	7285	16.4
Private	876	6865	12.8	659	6865	9.6	1535	6865	22.4
Country									
Regional	320	3195	10.0	284	3195	8.9	604	3195	18.9
Private	87	569	15.3	42	569	7.4	129	569	22.7
Other	138	2854	4.8	105	2854	3.7	243	2854	8.5
Total	2493	25394	9.8	2335	25394	9.2	4828	25394	19.0

Excludes births less than 500 grams birthweight.

Excludes 151 homebirths and 92 BBA's.

Caesarean section confinements increased proportionally with maternal age. This trend was found in nearly all categories of hospitals (Table 24).

6.5 Anaesthesia/analgesia

There were 6580 (25.7%) of women confined who did not receive pharmacological anaesthesia/analgesia during labour and delivery. Of these 94.6% had a spontaneous vaginal delivery.

An epidural was administered to 7503 (29.3%) women during labour. Almost one half (44.7%) of these women were then delivered by caesarean section, 32.8% by assisted vaginal delivery and 22.4% had a spontaneous vaginal delivery.

Investigation of the 4828 (18.5%) women delivered by caesarean section, showed that 69.5% received an epidural, 27.3% general anaesthesia and 3.1% a combination of both during labour and delivery.

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

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 26).

TABLE 26: ANAESTHESIA/ANALGESIA AND TYPE OF DELIVERY FOR WOMEN CONFINED IN WESTERN AUSTRALIA, 1990

Type of Anaesthesia/ Analgesia	Type of Delivery								Total	
	Emergency Caesarean		Elective Caesarean		Assisted Vaginal		Spontaneous Vaginal			
	No.	%	No.	%	No.	%	No.	%	No.	%
None	-	-	-	-	357	1.4	6223	24.3	6580	25.7
Epidural	1434	5.6	1923	7.5	2462	9.6	1684	6.6	7503	29.3
General	799	3.1	521	2.0	31	0.1	70	0.3	1420	5.5
Epidural and General	102	0.4	49	0.2	5	-	-	-	157	0.6
Other	-	-	-	-	1558	6.1	8419	32.8	9977	38.9
Total	2335	9.1	2493	9.7	4413	17.2	16396	64.0	25637	100.0

Excludes births less than 500 grams birthweight.

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

6.6 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 (47.9%) of the women who had an induction of labour experienced between five and twelve hours of labour and more than half (53.6%) of the women with a spontaneous onset had between 5 and 12 hours of labour. There were 73 women or 0.3% of the total whose labour was recorded as more than 24 hours duration (Table 27).

TABLE 28: TYPE OF DELIVERY AND HOURS OF ESTABLISHED LABOUR FOR WOMEN CONFINED IN WESTERN AUSTRALIA, 1990

Type of Delivery	Hours of Established Labour															
	No Labour		<1		1-4		5-12		13-18		19-24		>24		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Normal	-	-	-	-	7622	86.6	8010	67.7	611	43.2	103	36.8	27	37.0	16373	63.9
Vacuum	-	-	-	-	335	3.8	1363	11.5	252	17.8	46	16.4	11	15.1	2007	7.8
Forceps	-	-	-	-	380	4.3	1469	12.4	282	19.9	62	22.1	17	23.3	2210	8.6
Breech Manoeuvre	-	-	-	-	82	0.9	99	0.8	10	0.7	3	1.1	1	1.4	195	0.8
Elective Caesarean	2493	86.5	-	-	-	-	-	-	-	-	-	-	-	-	2493	9.7
Emergency Caesarean	389	13.5	333	100.0	381	4.3	894	7.5	259	18.3	66	23.6	17	23.3	2339	9.1
Total	2882	100.0	333	100.0	8800	100.0	11835	100.0	1414	100.0	280	100.0	73	100.0	25617	100.0

Excludes births less than 500 grams birthweight.
Excludes 20 women for whom the length of labour was unknown.

TABLE 27:**HOURS OF ESTABLISHED LABOUR AND ONSET OF LABOUR OF WOMEN CONFINED IN WESTERN AUSTRALIA, 1990**

Hours of Labour	Onset of Labour			
	Spontaneous		Induction	
	No.	%	No.	%
<1	191	1.2	142	2.3
1-4	5979	36.0	2821	45.9
5-12	8890	53.6	2945	47.9
13-18	1208	7.3	206	3.4
19-24	248	1.5	32	0.5
>24	71	0.4	2	-
Total	16587	100.0	6148	100.0

Excludes births less than 500 grams birthweight, 2882 (11.2%) women who did not experience labour, and 20 women for whom hours of established labour was not known.

Examination of type of delivery and hours of established labour showed that almost half (46.2%) of women confined had a labour lasting between 5 and 12 hours and of these 67.7% resulted in spontaneous delivery. Eleven percent of women did not establish in labour being confined by either elective or emergency caesarean section (Table 28).

6.7 Complications of Labour and Delivery

There were no complications of labour or delivery recorded for almost half (43.2%) of the women confined in 1990. However, for women with multiple pregnancies only 27.7% of women were reported to have had no complications.

Among those women identified as having had a complication, fetal distress was recorded for 16.6% of singleton pregnancies and 13.0% of multiple pregnancies. Cephalopelvic disproportion was identified for 5.3% of all women confined (Table 29).

Other complications included 247 (1.2%) women with hypertension; 121 (0.5%) women with severe pre-eclampsia and two women were recorded as having had an eclamptic fit.

Prolonged first stage of labour was identified in 57 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 545 women (2.4% of women with established labour or 2.1% of total women confined). There were 48 additional women reported to have had prolonged labour with unspecified stage (0.2% of women with established labour or 0.18% of total women).

These data suggest significant morbidity in child bearing women. Furthermore, the validation study of the midwives 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 29: SELECTED COMPLICATIONS OF LABOUR AND DELIVERY AND PLURALITY OF WOMEN CONFINED IN WESTERN AUSTRALIA, 1990

	Plurality				Total	
	Singleton		Multiple		No.	% ³
	No.	% ¹	No.	% ²		
No Complication	10989	43.4	85	27.7	11074	43.2
Precipitate Delivery	1414	5.6	12	3.9	1426	5.6
Fetal Distress	4209	16.6	40	13.0	4249	16.6
Prolapsed Cord	71	0.3	2	0.7	73	0.3
Cord Tightly Around Neck	1856	7.3	7	2.3	1863	7.3
Cephalopelvic Disproportion	1356	5.4	5	1.6	1361	5.3
Other	9161	36.2	195	63.5	9356	36.5

Excludes births less than 500 grams birthweight.

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

¹ Percentage of women with a singleton pregnancy.

² Percentage of women with a multiple pregnancy.

³ Percentage of total women.

Perineal damage was identified as a first degree tear in the case of 512 women confined (2.5% of women with vaginal delivery or 2.0% of total women) and as a second degree tear for 529 women (2.5% of women with vaginal delivery or 2.1% of total women).

There were 112 women (0.5% of women with vaginal delivery or 0.4% of total women confined) who had a third degree tear.

The increased reported incidence of perineal tears correlates with a known decrease in the number of elective episiotomies performed.

Primary postpartum haemorrhage was recorded for 926 (2.9%) women and retained placenta for 334 (1.2%) women.

7. BABY CHARACTERISTICS

7.1 Births

Notification of Case Attended Form 2 (Appendix A) were received for 25,944 births of 500 grams birthweight or more in 1990.

Singleton births numbered 25,330 (97.6%) and multiple births 614 (2.4%). The 614 multiple births comprised 602 twins, (including two twins whose siblings' birthweight was less than 500 grams), and 12 triplets (Tree Diagram 1).

The rates of multiple births have gradually increased this decade but 1990 saw a dramatic decline. For example, the rate of triplet births increased from 0.1/1000 in 1980 to a peak of 2.1/1000 in 1989 and then fell to 0.5/1000 in 1990. Much of the variation in the multiple birth rates has been due to infertility treatments. The decline in the rates in 1990 is probably largely due to a more cautious approach to infertility treatments, including the use of guidelines restricting the number of embryos transplanted during IVF procedures (Table 30).

TABLE 30: PLURALITY OF BIRTHS IN WESTERN AUSTRALIA, 1980-1990

Year of Birth	Plurality					Total
	Singleton	Twin	Triplet	Quadruplet	Quins	
1980	20380	399	2 ¹	-	-	20781
1981	21714	464	9	-	-	22187
1982	21869	458	12	-	-	22339
1983	22546	464 ²	15	-	-	23025
1984	22412	487 ³	18	-	-	22917
1985	22749	515 ⁴	24	-	-	23288
1986	23290	522	23 ¹	4	-	23839
1987	23538	576 ⁵	24	-	-	24138
1988	24405	625 ⁶	48	-	-	25078
1989	24743	671 ⁵	54	8	5	25481
1990	25330	602 ⁵	12	-	-	25944

Excludes births less than 500 grams birthweight

¹ Excludes one triplet less than 500 grams birthweight

² Includes four single twins whose birthweight was 500 grams or more

³ Includes three single twins whose birthweight was 500 grams or more

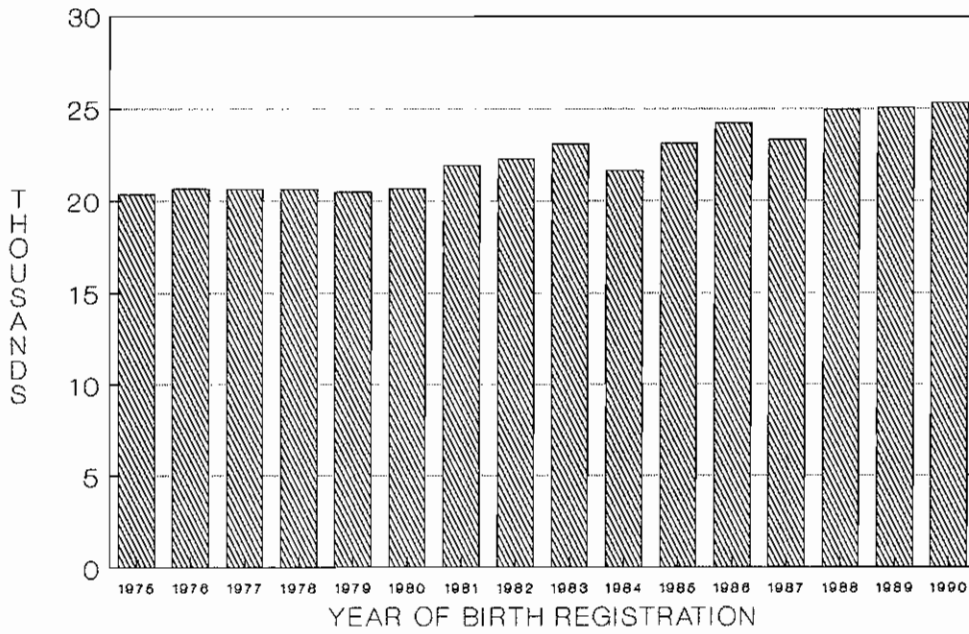
⁴ Includes one single twin whose birthweight was 500 grams or more

⁵ Includes two single twins whose birthweight was 500 grams or more

⁶ Includes five single twins whose birthweight was 500 grams or more

FIGURE XI

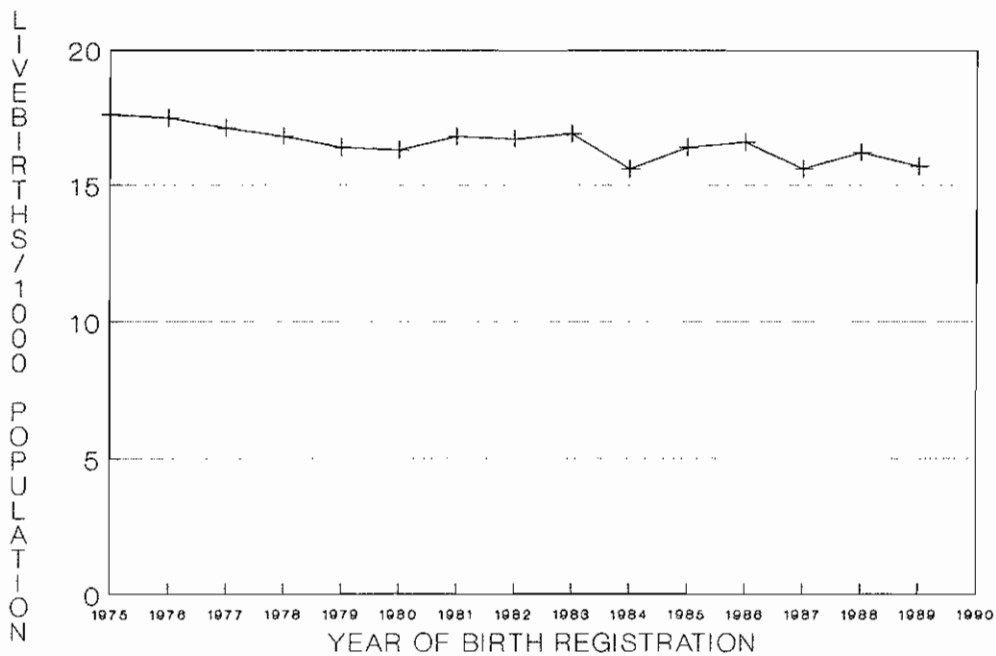
LIVEBIRTHS IN WESTERN AUSTRALIA 1975-1990



1975-1990 Numbers based on State of residence.
Source: Australian Bureau of Statistics.

FIGURE XII

CRUDE BIRTH RATE IN WESTERN AUSTRALIA 1975-1990



Crude Birth Rate: Livebirths per 1000 total population.
Source: Australian Bureau of Statistics.

7.2 Livebirths

The Australian Bureau of Statistics record increasing numbers of livebirths in Western Australia over the past decade (Table 31, Figure XI).

7.3 Crude Birth Rate

The crude birth rate was 15.4/1000 population in 1990. This calculation is based on birth registrations from the Australian Bureau of Statistics and Registrar General's Office (Table 31, Figure XII).

TABLE 31: LIVEBIRTHS AND CRUDE BIRTH RATES IN WESTERN AUSTRALIA, 1975-1990

	Livebirths	Population ¹	Birth Rate ² /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
1987	23332	1500507	15.6
1988	25143	1544806	16.3
1989	25051	1594745	15.7
1990 ³	25337	1649900	15.4

¹ Mean resident population

² Livebirths per 1000 total population

³ Preliminary data

SOURCE: AUSTRALIAN BUREAU OF STATISTICS - Cat. No. 3203.5 population
- Cat. No. 3301.0 livebirths
- Cat. No. 1305.5

7.4 Sex

There were 13,381 (51.6%) male births and 12,563 (48.4%) female births during 1990. The sex ratio was 1.04 male to 1.00 female.

The assessment of condition at birth showed that 56.8% of stillbirths and 51.6% of livebirths were male (Table 32).

TABLE 32: CONDITION AT BIRTH AND SEX OF BIRTHS IN WESTERN AUSTRALIA, 1990

Sex	Condition at Birth				Total	
	Stillbirth		Livebirth			
	No.	%	No.	%	No.	%
Male	67	56.8	13314	51.6	13381	51.6
Female	51	43.2	12512	48.4	12563	48.4
Total	118	100.0	25826	100.0	25944	100.0

Excludes births less than 500 grams birthweight.

7.5 Condition at Birth

Of the total 25,944 births, 25,826 were liveborn. There were 118 stillbirths and 87 livebirths who died within the first 28 days of life (Table 33).

Stillbirth rates were Caucasian 4.5/1000 total Caucasian births, Aboriginal 7.7/1000 total Aboriginal births and for babies of women of 'other' races 2.8/1000 total births (Table 33).

TABLE 33: CONDITION AT BIRTH AND MATERNAL RACE OF BIRTHS IN WESTERN AUSTRALIA, 1990

Race	Condition at Birth				Total Births		Stillbirth Proportion/1000 Total Births
	Stillbirth		Livebirth				
	No.	%	No.	%	No.	%	
Caucasian	101	85.6	22525	87.2	22626	87.2	4.5
Aboriginal	12	10.2	1537	6.0	1549	6.0	7.7
Other	5	4.2	1764	6.8	1769	6.8	2.8
Total	118	100.0	25826	100.0	25944	100.0	4.5

Excludes births less than 500 grams birthweight.

The majority of stillbirths (72.9%) were delivered in hospitals in the metropolitan area, nearly half (44.9%) in a metropolitan obstetric teaching hospital. This reflects the referral of mothers with high risk pregnancies and mothers with fetal death in utero for delivery in a tertiary centre (Table 34).

TABLE 34: PLACE OF BIRTH AND CONDITION AT BIRTH IN WESTERN AUSTRALIA, 1990

Place of Birth	Condition at Birth				Rate/1000 Total Births	Total	
	Livebirth		Stillbirth				
	No.	%	No.	%	No.	%	
Metropolitan							
¹ Teaching Department	4714	18.3	53	44.9	11.1	4767	18.4
Private	7314	28.3	19	16.1	2.7	7333	28.3
	6937	26.9	14	11.9	2.0	6951	26.8
Country							
² Regional	3200	12.4	12	10.2	3.7	3212	12.4
Private	570	2.2	6	5.1	10.4	576	2.2
³ Other	2856	11.1	6	5.1	2.1	2862	11.0
Non-Hospital							
⁴ BBA	86	0.3	6	5.1	65.2	92	0.4
Homebirths	149	0.6	2	1.7	6.6	151	0.6
Total	25826	100.0	118	100.0	4.5	25944	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).

7.6 Apgar Score at One Minute and Five Minutes

More than two thirds of livebirths (73.0%) had a recorded Apgar Score at one minute of 8-10, while 593 (2.3%) livebirths had an Apgar Score of three or less at one minute of life (Table 35 and Figure XIII).

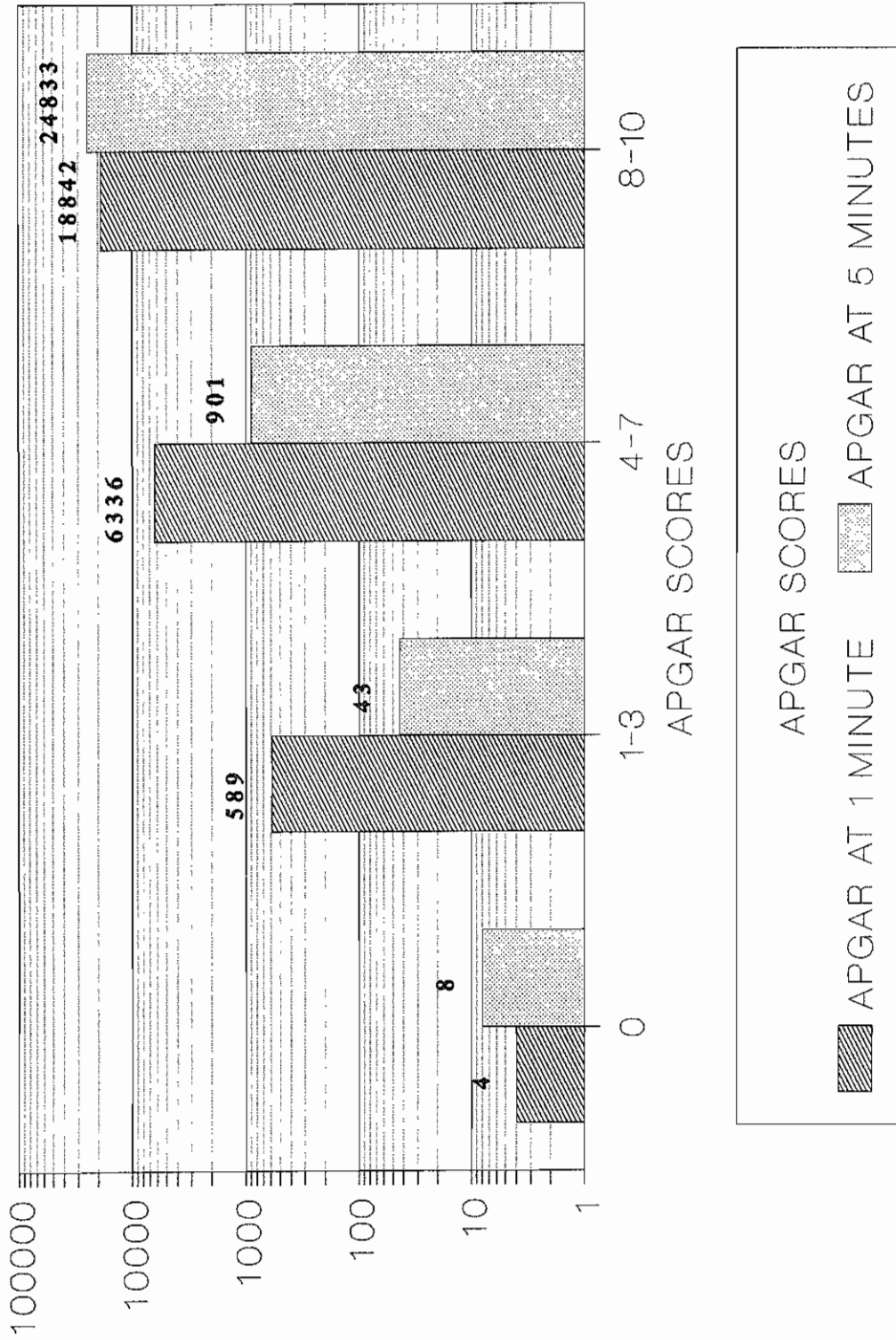
TABLE 35: APGAR SCORE AT ONE MINUTE AND TIME TO SPONTANEOUS RESPIRATION OF LIVEBIRTHS IN WESTERN AUSTRALIA, 1990

Apgar Score at 1 Minute	Time to Spontaneous Respiration					Intubation		Unknown		Total				
	≤1		2-3		4-6		7-10		>10					
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%		
-	-	-	-	-	-	-	-	-	4	0.4	-	-	4	-
1-3	22	0.1	86	3.6	114	24.1	19	37.3	1	20.0	347	37.9	-	-
4-7	3732	17.0	1743	72.5	330	69.8	28	54.9	4	80.0	499	54.5	-	-
8-10	18174	82.8	574	23.9	29	6.1	4	7.9	-	-	61	6.7	-	-
Unknown	24	0.1	1	-	-	-	-	-	-	-	5	0.6	25	100.0
Total	21952	100.0	2404	100.0	473	100.0	51	100.0	5	100.0	916	100.0	25	100.0
													25826	100.0

Excludes births less than 500 grams birthweight.

FIGURE XIII

APGAR SCORES AT ONE MINUTE AND FIVE MINUTES FOR WOMEN CONFINED IN WA 1990.



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

The majority of livebirths, (96.2%) had a recorded Apgar Score at five minutes of 8-10, and 952 (3.7%) livebirths had an Apgar Score of seven or less at five minutes of life (Table 36).

TABLE 36: APGAR SCORE AT FIVE MINUTES AND TIME TO SPONTANEOUS RESPIRATION OF LIVEBIRTHS IN WESTERN AUSTRALIA, 1990

Apgar Score at 5 Minutes	Time to Spontaneous Respiration										Intubation ¹	Unknown	Total			
	<1		2-3		4-6		7-10		>10							
	No.	%	No.	%	No.	%	No.	%	No.	%				No.	%	No.
0	3	-	-	-	-	-	-	-	-	-	5	0.5	-	-	8	-
1-3	3	-	-	-	1	0.2	1	2.0	2	40.0	36	3.9	-	-	43	0.2
4-7	170	0.8	164	6.8	179	37.8	47	92.2	3	60.0	338	36.9	-	-	901	3.5
8-10	21766	99.1	2239	93.1	293	61.9	3	5.9	-	-	532	58.1	-	-	24833	96.2
Unknown	12	0.1	1	-	-	-	-	-	-	-	5	0.5	23	100.0	41	0.2
Total	21954	100.0	2404	100.0	473	100.0	51	100.0	5	100.0	916	100.0	23	100.0	25826	100.0

Excludes births less than 500 grams birthweight.

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

7.7 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 two to six minutes to establish respirations and 56 babies (0.2%) took seven minutes or more. There were 916 (3.6%) livebirths who were intubated immediately following delivery (Table 36).

7.8 Resuscitation

Less than one third (32.7%) of the 25,826 liveborn babies in 1990 received some form of resuscitation at birth. Those babies who received no resuscitation numbered 17381 (67.3%). Resuscitation procedures such as intubation or bag and mask were used for 1924 (7.5%) of births and another 5737 (22.2%) babies received oxygen only.

When resuscitation and Apgar Scores at 5 minutes were examined it was found that 83.7% of the babies with an Apgar Score of 1-3 and 37.5% of those with an Apgar Score of 4-7 were intubated (Table 37).

TABLE 37: RESUSCITATION METHODS AND APGAR SCORE AT FIVE MINUTES OF LIVEBIRTHS IN WESTERN AUSTRALIA, 1990

Resuscitation	Apgar Score at 5 Minutes								Unknown		Total	
	0		1-3		4-7		8-10		No.	%	No.	%
	No.	%	No.	%	No.	%	No.	%				
None	5	45.5	1	2.3	32	3.6	17325	69.8	18	52.9	17381	67.3
Oxygen Only	1	9.1	3	7.0	241	26.7	5492	22.1	-	-	5737	22.2
Intubation	5	45.5	36	83.7	338	37.5	532	2.1	5	14.7	916	3.6
Bag and Mask	-	-	3	7.0	221	24.5	784	3.2	-	-	1008	3.9
Other	-	-	-	-	70	7.8	703	2.8	-	-	773	3.0
Unknown	-	-	-	-	-	-	-	-	11	32.4	11	-
Total	11	100.0	43	100.0	902	100.0	24836	100.0	34	100.0	25826	100.0

Excludes births less than 500 grams birthweight.

7.9 Birthweight

Over two thirds (67.1%) of all babies born weighed between 3000 and 3999 grams at birth and the average birthweight was 3358 grams. The percentage of low birthweight babies (less than 2500 grams) was 6.0% and very low birthweight (less than 1500 grams) was 0.9% of the total births.

Low birthweight among Aboriginal births was 10.8%, nearly double that of Caucasian births of whom only 5.7% were low birthweight (Table 38).

TABLE 38: BIRTHWEIGHT DISTRIBUTION AND MATERNAL RACE OF BIRTHS IN WESTERN AUSTRALIA, 1990

Birthweight (Grams)	Maternal Race						Total	
	Caucasian		Aboriginal		Other		No.	%
	No.	%	No.	%	No.	%		
500 - 999	80	0.4	6	0.4	3	0.2	89	0.3
1000 - 1499	121	0.5	18	1.2	11	0.6	150	0.6
1500 - 1999	277	1.2	32	2.1	29	1.6	338	1.3
2000 - 2499	803	3.5	111	7.2	68	3.8	982	3.8
2500 - 2999	3416	15.1	360	23.2	357	20.2	4133	15.9
3000 - 3499	8289	36.6	555	35.8	710	40.1	9554	36.8
3500 - 3999	7046	31.1	356	23.0	457	25.8	7859	30.3
4000 - 4499	2241	9.9	89	5.7	117	6.6	2447	9.4
≥4500	353	1.6	22	1.4	17	1.0	392	1.5
Total	22626	100.0	1549	100.0	1769	100.0	25944	100.0

Excludes births less than 500 grams birthweight.

Mean = 3358 grams. Standard Deviation = 572 grams.

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

Among the 1559 low birthweight babies (less than 2500 grams birthweight), 1491 (95.6%) were liveborn and 68 (4.4%) were stillborn. This meant that while 57.6% of stillbirths were of low birthweight only 5.8% of livebirths were in the low birthweight category (Table 39).

Singleton births showed similar percentages to total births. Among low birthweight babies there were 1184 (95.0%) livebirths and 62 (5.0%) stillbirths. For stillbirths 55.9% were low birthweight and among livebirths 4.7% were in this category (Table 40).

For multiple births, there were 307 (98.1%) liveborn and 6 (1.9%) stillborn in the low birthweight group. Almost all stillborn multiple births were of low birthweight (Table 41).

When categories of low birthweight were examined from 1980 to 1990 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 1.6% of the total births. Those babies who weighed less than 2500 grams accounted for between 5.8% and 6.6% of the total births. An increase in the low birthweight percentage may be attributed to the increased number of multiple births during 1988 and 1989 (Table 42, Figure XIV).

TABLE 39: BIRTHWEIGHT DISTRIBUTION AND CONDITION AT BIRTH OF TOTAL BIRTHS IN WESTERN AUSTRALIA, 1990

Birthweight (Grams)	Condition at Birth				Total	
	Livebirths		Stillbirths			
	No.	%	No.	%	No.	%
500 - 999	65	0.3	24	20.3	89	0.3
1000 - 1499	132	0.5	18	15.3	150	0.6
1500 - 1999	322	1.2	16	13.6	338	1.3
2000 - 2499	972	3.8	10	8.5	982	3.8
2500 - 2999	4119	15.9	14	11.9	4133	15.9
3000 - 3499	9536	36.9	18	15.3	9554	36.8
3500 - 3999	7850	30.4	9	7.6	7859	30.3
4000 - 4499	2442	9.5	5	4.2	2447	9.4
≥4500	388	1.5	4	3.4	392	1.5
Total	25826	100.0	118	100.0	25944	100.0

Excludes births less than 500 grams birthweight

TABLE 40: SINGLETON BIRTHS IN WESTERN AUSTRALIA, 1990

Birthweight (Grams)	Condition at Birth				Total	
	Livebirths		Stillbirths			
	No.	%	No.	%	No.	%
500 - 999	55	0.2	21	18.9	76	0.3
1000 - 1499	104	0.4	17	15.3	121	0.5
1500 - 1999	238	0.9	15	13.5	253	1.0
2000 - 2499	787	3.1	9	8.1	796	3.1
2500 - 2999	3904	15.5	13	11.7	3917	15.5
3000 - 3499	9466	37.5	18	16.2	9484	37.4
3500 - 3999	7835	31.1	9	8.1	7844	31.0
4000 - 4499	2442	9.7	5	4.5	2447	9.7
≥4500	388	1.5	4	3.6	392	1.5
Total	25219	100.0	111	100.0	25330	100.0

Excludes births less than 500 grams birthweight

TABLE 41: MULTIPLE BIRTHS IN WESTERN AUSTRALIA, 1990

Birthweight (Grams)	Condition at Birth				Total	
	Livebirths		Stillbirths			
	No.	%	No.	%	No.	%
500 - 999	10	1.6	3	42.9	13	2.1
1000 - 1499	28	4.6	1	14.3	29	4.7
1500 - 1999	84	13.8	1	14.3	85	13.8
2000 - 2499	185	30.5	1	14.3	186	30.3
2500 - 2999	215	35.4	1	14.3	216	35.2
3000 - 3499	70	11.5	-	-	70	11.4
3500 - 3999	15	2.5	-	-	15	2.4
4000 - 4499	-	-	-	-	-	-
≥4500	-	-	-	-	-	-
Total	607	100.0	7	100.0	614	100.0

Excludes births less than 500 grams birthweight

TABLE 42: LOW BIRTHWEIGHT CATEGORIES IDENTIFIED AMONGST THE TOTAL BIRTHS IN WESTERN AUSTRALIA, 1980-1990

Year of Birth	Low Birthweight ¹ Categories (grams)						Total
	<1000		<1500		<2500		
	No.	% ²	No.	% ²	No.	% ²	
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
1987	134	0.5	275	1.1	1486	6.2	24138
1988	125	0.5	304	1.2	1537	6.1	25078
1989	168	0.7	334	1.3	1674	6.6	25481
1990	89	0.3	239	0.9	1559	6.0	25944

Excludes births less than 500 grams birthweight.

¹ Low birthweight - births less than 2500 grams birthweight.

² Percentages of the total births.

Low birthweight was identified for babies of Aboriginal and non-Aboriginal women from 1980 to 1990. Although the percentages have been reasonably stable, the Aboriginal low birthweight is on average more than twice that of babies of non-Aboriginal women (Table 43, Figure XV).

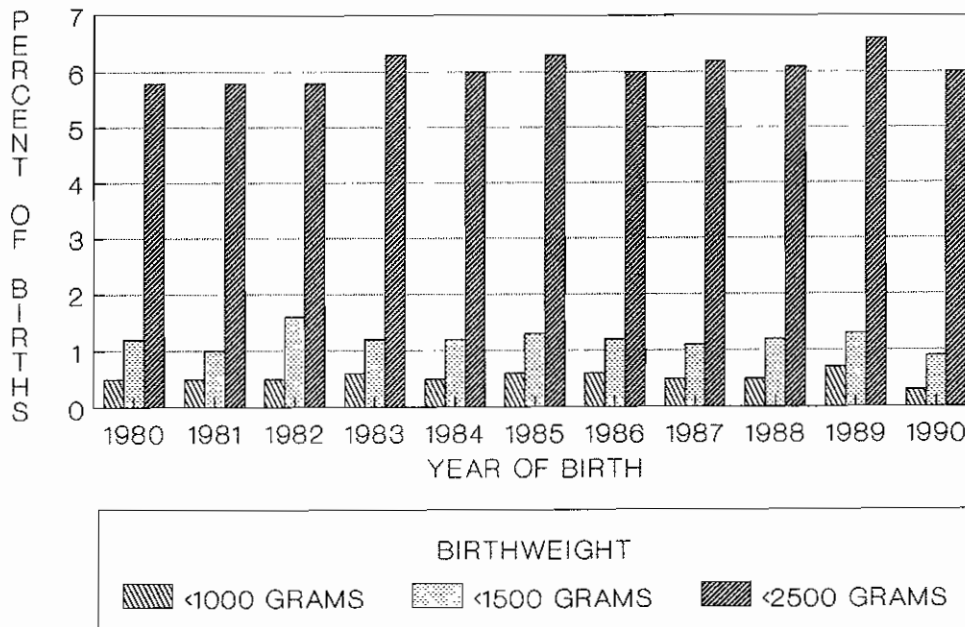
TABLE 43: LOW BIRTHWEIGHT¹ AMONG BABIES OF ABORIGINAL AND NON-ABORIGINAL WOMEN IN WESTERN AUSTRALIA, 1980-1990

Year of Birth	Aboriginal			Non-Aboriginal		
	Total Births	LBW ¹ No.	%	Total Births	LBW ¹ 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	21880	1310	6.0
1984	1192	157	13.2	21725	1225	5.6
1985	1249	170	13.6	22039	1287	5.8
1986	1246	146	11.7	22593	1285	5.7
1987	1341	141	10.5	22797	1344	5.9
1988	1440	188	13.1	23638	1349	5.7
1989	1447	156	10.8	24034	1518	6.3
1990	1549	167	10.8	24395	1392	5.7

Excludes births less than 500 grams birthweight.

¹ Low birthweight - less than 2500 grams birthweight.

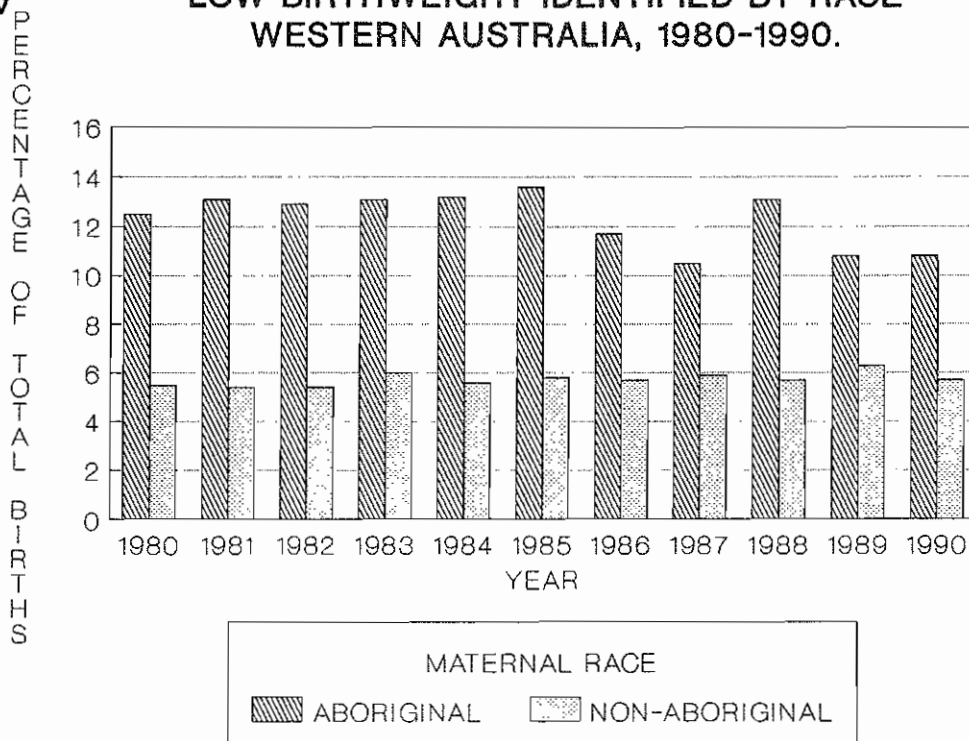
LOW BIRTHWEIGHT IDENTIFIED FOR TOTAL BIRTHS IN WESTERN AUSTRALIA 1980-1990.



Excludes births less than 500 grams birthweight.
 Low birthweight less than 2500 grams birthweight.
Source: Midwives' Notification System

FIGURE XV

LOW BIRTHWEIGHT IDENTIFIED BY RACE WESTERN AUSTRALIA, 1980-1990.



Excludes births less than 500 grams birthweight.
 Low Birthweight - less than 2500 grams birthweight.
Source: Midwives' Notification System.

7.10 Gestation

Preterm birth (less than 37 weeks gestation) occurred for 1,649 (6.4%) of the total births (Table 44). When examined for singleton births only, 1361 (5.4%) babies were preterm (Table 45). Of the 614 multiple births, 288 (46.9%) were preterm (Table 46).

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

7.11 Congenital Malformations

Data on selected birth defects included in this report are made available by the Western Australian Birth Defects Registry¹⁰ (Table 47).

Recording of a congenital malformation on the Notification of Case Attended (Midwives') Form 2, provides an initial data source for the Birth Defects Registry.

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

TABLE 44: GESTATION AND BIRTHWEIGHT OF TOTAL BIRTHS IN WESTERN AUSTRALIA, 1990

Birthweight (Grams)	Gestation Weeks										TOTAL	
	22 - 27		28 - 32		33 - 36		37 - 42		≥ 43		No.	%
	No.	%	No.	%	No.	%	No.	%	No.	%		
500 - 999	60	81.1	25	9.2	4	0.3	-	-	-	-	89	0.3
1000 - 1499	14	18.9	103	37.9	27	2.1	6	-	-	-	150	0.6
1500 - 1999	-	-	123	45.2	175	13.4	40	0.2	-	-	338	1.3
2000 - 2499	-	-	21	7.7	479	36.8	482	2.0	-	-	982	3.8
2500 - 2999	-	-	-	-	462	35.5	3670	15.1	1	3.3	4133	15.9
3000 - 3499	-	-	-	-	128	9.8	9422	38.8	4	13.3	9554	36.8
3500 - 3999	-	-	-	-	21	1.6	7827	32.3	11	36.7	7859	30.3
4000 - 4499	-	-	-	-	4	0.3	2433	10.0	10	33.3	2447	9.4
≥4500	-	-	-	-	3	0.2	385	1.6	4	13.3	392	1.5
Total	74	100.0	272	100.0	1303	100.0	24265	100.0	30	100.0	25944	100.0

Excludes births < 500 grams birthweight.

TABLE 45: GESTATION AND BIRTHWEIGHT OF SINGLETON BIRTHS IN WESTERN AUSTRALIA, 1990

Birthweight (Grams)	Gestation Weeks										TOTAL	
	22 - 27		28 - 32		33 - 36		37 - 42		≥ 43		No.	%
	No.	%	No.	%	No.	%	No.	%	No.	%		
500 - 999	50	82.0	23	10.4	3	0.3	-	-	-	-	76	0.3
1000 - 1499	11	18.0	86	38.9	20	1.9	4	-	-	-	121	0.5
1500 - 1999	-	-	94	42.5	125	11.6	34	0.1	-	-	253	1.0
2000 - 2499	-	-	18	8.1	377	34.9	401	1.7	-	-	796	3.1
2500 - 2999	-	-	-	-	404	37.4	3512	14.7	1	3.3	3917	15.5
3000 - 3499	-	-	-	-	123	11.4	9357	39.1	4	13.3	9484	37.4
3500 - 3999	-	-	-	-	20	1.9	7813	32.6	11	36.7	7844	31.0
4000 - 4499	-	-	-	-	4	0.4	2433	10.2	10	33.3	2447	9.7
≥4500	-	-	-	-	3	0.3	385	1.6	4	13.3	392	1.6
Total	61	100.0	221	100.0	1079	100.0	23939	100.0	30	100.0	25330	100.0

Excludes births < 500 grams birthweight.

TABLE 46: GESTATION AND BIRTHWEIGHT OF MULTIPLE BIRTHS IN WESTERN AUSTRALIA, 1990

Birthweight (Grams)	Gestation Weeks										TOTAL	
	22 - 27		28 - 32		33 - 36		37 - 42		≥ 43		No.	%
	No.	%	No.	%	No.	%	No.	%	No.	%		
500 - 999	10	76.9	2	3.9	1	0.5	-	-	-	-	13	2.1
1000 - 1499	3	23.1	17	33.3	7	3.1	2	0.6	-	-	29	4.7
1500 - 1999	-	-	29	56.9	50	22.3	6	1.9	-	-	85	13.8
2000 - 2499	-	-	3	5.9	102	45.5	81	24.9	-	-	186	30.3
2500 - 2999	-	-	-	-	58	25.9	158	48.5	-	-	216	35.2
3000 - 3499	-	-	-	-	5	2.2	65	19.9	-	-	70	11.4
3500 - 3999	-	-	-	-	1	0.5	14	4.3	-	-	15	2.4
4000 - 4499	-	-	-	-	-	-	-	-	-	-	-	-
≥4500	-	-	-	-	-	-	-	-	-	-	-	-
Total	13	100.0	51	100.0	224	100.0	326	100.0	-	-	614	100.0

Excludes births < 500 grams birthweight.

7.12 Birth Trauma

There were very few reported incidences of major birth trauma. The most common birth trauma identified was injuries to the scalp (7.0% of all livebirths) and this included cephalhaematoma and chignon from vacuum extraction (Table 48).

TABLE 47: BIRTHS IDENTIFIED WITH BIRTH DEFECTS IN WESTERN AUSTRALIA, 1990

Diagnostic Category (and British Paediatric Association Code)	1988		1989		1990	
	No.	¹ Rate	No.	¹ Rate	No.	¹ Rate
NERVOUS SYSTEM DEFECTS (7400-74299)	73	2.9	76	3.0	72	2.8
CARDIOVASCULAR DEFECTS (74500-74799)	198	7.9	212	8.3	250	9.6
RESPIRATORY SYSTEM DEFECTS (74800-74899)	15	0.6	18	0.7	11	-
GASTRO-INTESTINAL DEFECTS (74900-75199)	146	5.8	156	6.1	146	5.6
URO-GENITAL DEFECTS (75200-75399)	249	9.9	223	8.7	180	6.9
MUSCULO-SKELETAL DEFECTS (75400-75699)	310	12.3	304	11.9	293	11.3
CHROMOSOME DEFECTS (75800-75899)	58	2.3	52	2.0	61	2.3

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.

TABLE 48: BIRTH TRAUMA AMONGST LIVEBIRTHS IN WESTERN AUSTRALIA, 1990

Birth Trauma	No.	% of Livebirths
Subdural and Cerebral Haemorrhage	-	-
Injuries to Scalp	1718	6.7
Fracture to Clavicle	9	-
Other Injuries to Skeleton	2	-
Facial Nerve Injury	13	0.1
Injury to Brachial Plexus	15	0.1
Other	65	0.3

Excludes births less than 500 grams birthweight.

7.13 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. 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 relates only to babies in Level 2 or Level 3 Special Care nurseries.

Among the 25,826 livebirths, a total of 1354 (5.2%) babies were reported to have received special care. Of these singleton births numbered 1178 (87.0%) and multiple births 176 (13.0%). The rates for these babies were singleton births 46.7/1000 singleton livebirths and multiple births 290.0/1000 multiple livebirths.

Eleven percent of all babies stayed more than 28 days. Multiple births stayed longer in special care units, with 55.1% staying 8 days or more (Table 49).

TABLE 49: PLURALITY AND LENGTH OF STAY IN SPECIAL CARE OF LIVEBIRTHS IN WESTERN AUSTRALIA, 1990

Length of Stay (Days)	Plurality				Total	
	Singleton		Multiple		No.	%
	No.	%	No.	%		
≤1	583	49.5	32	18.2	615	45.4
2	96	8.2	18	10.2	114	8.4
3	57	4.8	5	2.8	62	4.6
4	34	2.9	5	2.8	39	2.9
5	30	2.6	5	2.8	35	2.6
6	31	2.6	5	2.8	36	2.7
7	21	1.8	9	5.1	30	2.2
8-14	100	8.5	25	14.2	125	9.2
15-20	63	5.4	21	11.9	84	6.2
21-28	43	3.7	14	8.0	57	4.2
>28	120	10.2	37	21.0	157	11.6
Total	1178	100.0	176	100.0	1354	100.0

Excludes births less than 500 grams birthweight.

7.14 Neonatal Transfers

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.

Of the 25,826 livebirths, 1092 (4.2%) babies were transferred to another hospital after birth.

7.15 Length of Stay

The majority of babies (20586, 79.7%) stayed in their hospital of birth from two to seven days and another 4105 (15.9%) stayed eight or more days. Two hundred babies stayed more than 28 days (Table 50).

TABLE 50: LENGTH OF STAY AND BIRTHWEIGHT DISTRIBUTION OF LIVEBIRTHS IN WESTERN AUSTRALIA, 1990

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	17	1.5	8	-	-	2	1.1	-	19.0	38	19.0	65	0.3	
1000 - 1499	16	1.4	6	-	5	2.7	20	20.6	80	40.0	132	0.5		
1500 - 1999	30	2.6	53	0.3	90	31.0	58	41.2	51	25.5	322	1.3		
2000 - 2499	51	4.5	518	2.5	326	27.8	52	17.5	17	3.5	971	3.8		
2500 - 2999	206	18.2	3165	15.4	706	14.4	27	10.3	10	2.5	4119	16.0		
3000 - 3499	428	37.7	7907	38.4	1169	8.6	16	7.2	7	5.0	9537	36.9		
3500 - 3999	283	24.9	6596	32.0	942	26.0	19	2.1	2	4.0	7850	30.4		
4000 - 4499	91	8.0	2020	9.8	324	9.0	6	-	-	1	0.5	2442	9.5	
>4500	13	1.2	313	1.5	59	1.6	2	1.0	1	-	388	1.5		
Total	1135	100.0	20586	100.0	3621	100.0	187	100.0	97	100.0	200	100.0	25826	100.0

Excludes births less than 500 grams birthweight
Includes 151 homebirths in midwives' care

There were 1092 inter-hospital transfers and 53 neonatal deaths in the hospital of birth.
Table 51 shows the length of stay of babies who were neither transferred nor died in the hospital of birth.
The overall length of hospital stay following a baby's transfer from the hospital of birth is not recorded on midwives' data.

TABLE 51: LENGTH OF STAY AND BIRTHWEIGHT DISTRIBUTION OF SURVIVING LIVEBIRTHS IN WESTERN AUSTRALIA, 1990

Birthweight (Grams)	Length of Stay (Days)												Total		
	≤1		2-7		8-14		15-20		21-28		>28				
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%			
500 - 999	-	-	-	-	-	-	-	-	-	-	-	30	20.3	30	0.1
1000 - 1499	-	-	2	-	3	0.1	-	-	-	5	8.5	50	33.8	60	0.2
1500 - 1999	-	-	31	0.2	55	1.6	42	27.1	27	45.8	39	26.4	194	0.8	
2000 - 2499	7	1.0	469	2.3	294	8.3	44	28.4	10	17.0	6	4.1	830	3.4	
2500 - 2999	113	16.1	3064	15.3	697	19.8	26	16.8	8	13.6	4	2.7	3912	15.9	
3000 - 3499	312	44.4	7762	38.6	1158	32.8	16	10.3	7	11.9	10	6.8	9265	37.5	
3500 - 3999	199	28.3	6469	32.2	939	26.6	19	12.3	1	1.7	8	5.4	7635	30.9	
4000 - 4499	65	9.3	1984	9.9	324	9.2	6	3.9	-	-	1	0.7	2380	9.6	
>4500	6	0.9	307	1.5	59	1.7	2	1.3	1	1.7	-	-	375	1.5	
Total	702	100.0	20088	100.0	3529	100.0	155	100.0	59	100.0	148	100.0	24681	100.0	

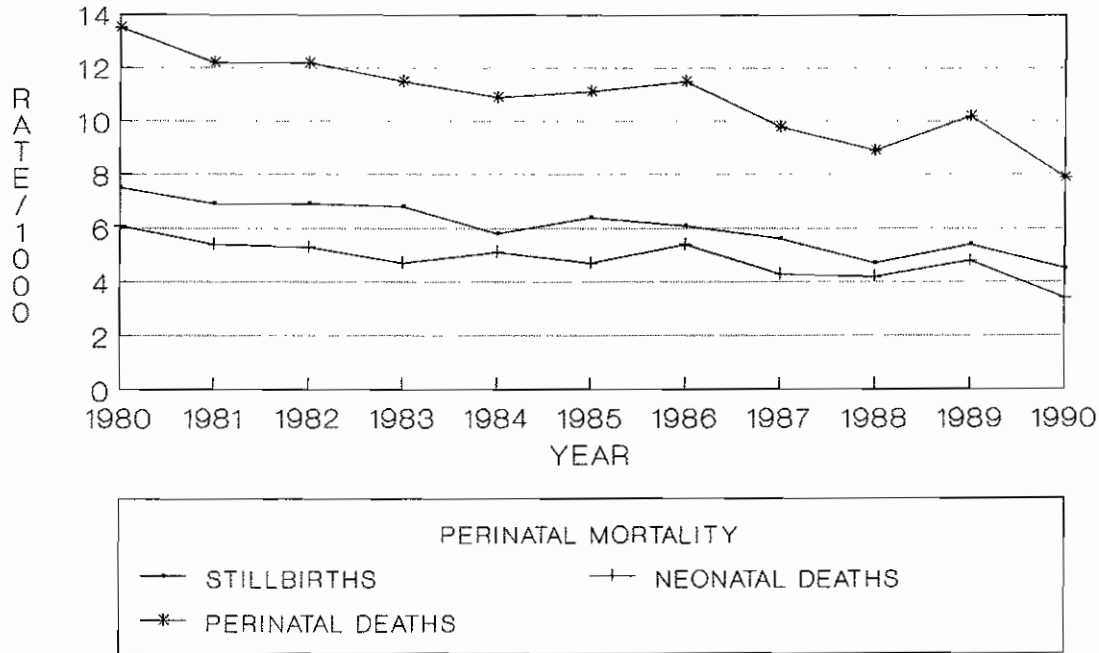
Excludes births less than 500 grams birthweight

Includes 151 homebirths in midwives' care

1 excludes 1092 babies requiring interhospital transfer and 53 neonatal deaths in hospital of birth.

FIGURE XVI

PERINATAL MORTALITY RATES IN WESTERN AUSTRALIA 1980-1990.

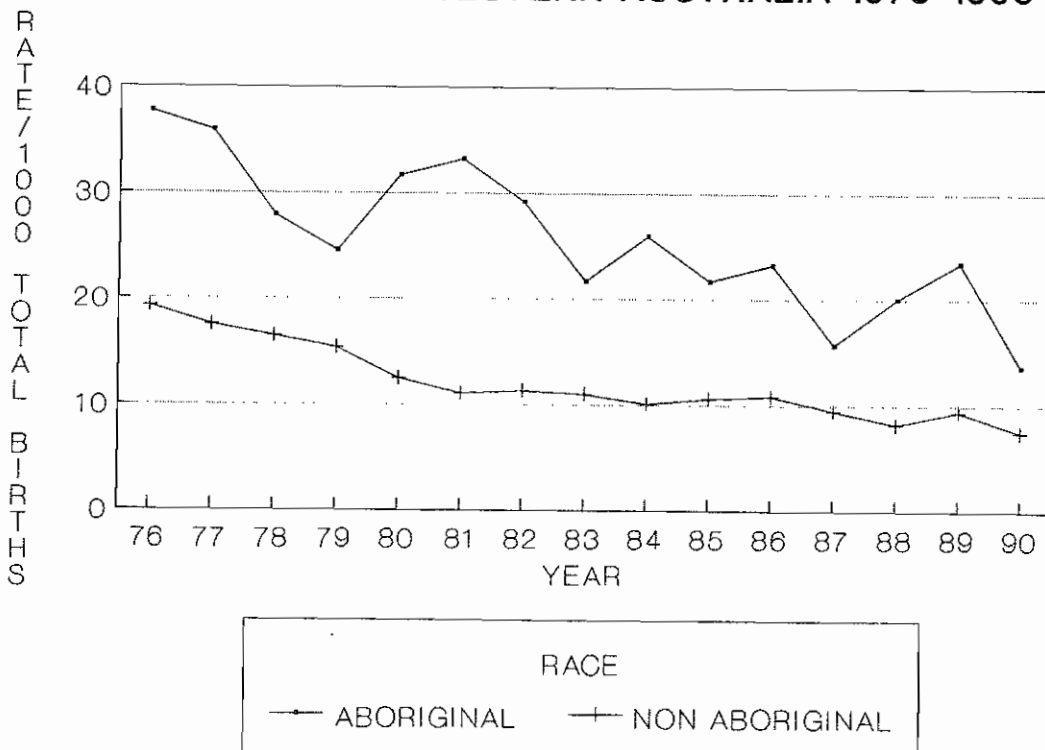


PERINATAL MORTALITY
 — STILLBIRTHS + NEONATAL DEATHS
 * PERINATAL DEATHS

Excludes births less than 500 grams birthweight.
 Stillbirths and Perinatal Deaths/1000 Total Births.
 Neonatal Deaths/1000 Livebirths.
 Note: 1980-1983 data based on year of death.
 1984-1990 data based on year of birth.
 Source: Midwives' Notification System, Registrar General's Office.

FIGURE XVII

PERINATAL MORTALITY AND ETHNIC GROUPING OF BIRTHS IN WESTERN AUSTRALIA 1976-1990



RACE
 — ABORIGINAL + NON ABORIGINAL

Excludes births less than 500 grams birthweight.
 Perinatal Deaths/1000 Total Births.
 Note: 1980-1983 data based on year of death.
 1984-1990 data based on year of birth.
 Source: Midwives' Notification System, Registrar General's Office.

7.16 Perinatal Mortality

There were 118 stillbirths and 87 neonatal deaths of babies born during 1990. The perinatal mortality rate for Western Australia was 7.9/1000 total births.

Perinatal mortality calculations in this report are based on the year of birth whereas prior to 1984 they were based on the year of death (Table 52, Figure XVI).

TABLE 52: STILLBIRTHS, NEONATAL AND PERINATAL MORTALITY RATES IN WESTERN AUSTRALIA, 1980-1990

Perinatal Mortality						
Year	Stillbirths		Neonatal Deaths		Total	
	No.	Rate/1000 Total Births	No.	Rate/1000 Live Births	No.	Rate/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 ¹	134	5.8	116	5.1	250	10.9
1985 ¹	150	6.4	109	4.7	259	11.1
1986 ¹	146	6.1	129	5.4	275	11.5
1987 ¹	134	5.6	103	4.3	237	9.8
1988 ¹	117	4.7	104	4.2	221	8.8
1989 ¹	138	5.4	121	4.8	259	10.2
1990 ¹	118	4.5	87	3.4	205	7.9

Excludes births less than 500 grams birthweight

¹ Data based on year of birth

Tables 53 and 54 give perinatal mortality rates using World Health Organisation definitions.

Aboriginal stillbirth, neonatal and perinatal mortality rates are more than double those for non-Aboriginal births (Table 56, Figure XVII).

TABLE 53: WESTERN AUSTRALIAN PERINATAL MORTALITY USING BIRTHWEIGHT CRITERIA, 1990

Birthweight	Stillbirth Rate/1000 Total Births	Neonatal Death Rate/1000 Livebirths	Perinatal Death Rate/1000 Total Births
≥400 grams	5.5	3.8	9.2
≥500 grams International Definition of World Health Organisation	4.5	3.4	7.9

TABLE 54: WESTERN AUSTRALIAN PERINATAL MORTALITY USING GESTATION CRITERIA, 1990

Gestation	Stillbirth Rate/1000 Total Births	Neonatal Death Rate/1000 Livebirths	Perinatal Death Rate/1000 Total Births
≥20 weeks	6.7	4.1	10.8
≥22 weeks International Definition of World Health Organisation	5.9	3.7	9.6

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

TABLE 55: STILLBIRTHS, NEONATAL AND PERINATAL MORTALITY RATES BY MATERNAL RACE IN WESTERN AUSTRALIA, 1990

Type of Death	Maternal Race			Total
	Caucasian	Aboriginal	Other	
Stillbirth/1000 total births	4.5	7.7	2.8	4.5
Neonatal/1000 livebirths	3.2	5.9	4.0	3.4
Perinatal/1000 total births	7.6	13.6	6.8	7.9

Excludes births less than 500 grams birthweight

Data from 1976 to 1990 on stillbirth, neonatal and perinatal mortality rates in Western Australia shows there has been an overall decline during this decade. Table 53 provides mortality rates by race. Aboriginal rates have declined but remain almost double the non-Aboriginal figures (Table 56).

TABLE 56: STILLBIRTHS, NEONATAL AND PERINATAL MORTALITY RATES BY ABORIGINAL AND NON-ABORIGINAL BIRTHS IN WESTERN AUSTRALIA, 1976-1990

Year	Stillbirth ¹ Rate		Neonatal Mortality ² Rate		Perinatal Mortality ¹ Rate	
	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
1987	9.7	5.3	6.0	4.2	15.7	9.5
1988	8.3	4.4	11.9	3.7	20.1	8.1
1989	11.7	5.0	11.9	4.3	23.5	9.4
1990	7.7	4.3	5.9	3.2	13.6	7.5

Excludes births less than 500 grams birthweight.

¹ Stillbirth and perinatal mortality rates/1000 total births.

² Neonatal mortality rates/1000 livebirths.

Almost one quarter (22.9%) of perinatal deaths had a birthweight of less than 1000 grams. Overall 57.6% of stillbirths and 56.3% of neonatal deaths weighed less than 2500 grams at birth (Table 57).

TABLE 57: BIRTHWEIGHT DISTRIBUTION OF STILLBIRTHS, NEONATAL AND PERINATAL DEATHS IN WESTERN AUSTRALIA, 1990

Birthweight (Grams)	Perinatal Deaths				Total	
	Stillbirths		Neonatal Deaths			
	No.	%	No.	%	No.	%
500 - 999	24	20.3	23	26.4	47	22.9
1000 - 1499	18	15.3	7	8.0	25	12.2
1500 - 1999	16	13.6	6	6.9	22	10.7
2000 - 2499	10	8.5	13	14.9	23	11.2
2500 - 2999	14	11.9	14	16.1	28	13.7
3000 - 3499	18	15.3	16	18.4	34	16.6
3500 - 3999	9	7.6	5	5.7	14	6.8
≥4000	9	7.6	3	3.4	12	5.9
Unknown						
Total	118	100.0	87	100.0	205	100.0

Excludes births less than 500 grams birthweight.

Amongst the 614 multiple births, there were 16 perinatal deaths. Of these, 7 were stillborn and 9 were neonatal deaths (Table 58).

The stillbirth rate for multiple births (11.4/1000) was more than twice that for singleton births (4.4/1000).

The neonatal mortality rate for multiple births (14.8/1000) was almost five times that for singleton births (3.1/1000) (Table 58).

TABLE 58: PLURALITY OF STILLBIRTHS, NEONATAL AND PERINATAL DEATHS AMONGST BIRTHS IN WESTERN AUSTRALIA, 1990

Plurality	Perinatal Mortality				Total	
	Stillbirths		Neonatal Deaths			
	No.	Rate ¹	No.	Rate ²	No.	Rate ¹
Singleton	111	4.4	78	3.1	189	7.5
Multiple	7	11.4	9	14.8	16	26.1
Total	118	4.5	87	3.4	205	7.9

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, 66.1% occurred antepartum, 21.2% were intrapartum and timing of stillbirth was unknown in 12.7% of cases (Table 59).

TABLE 59: TIME OF DEATH OF STILLBIRTHS IN WESTERN AUSTRALIA, 1990

Time of Death	No.	%
Antepartum	78	66.1
Intrapartum	25	21.2
Unknown	15	12.7
Total	118	100.0

Excludes births less than 500 grams birthweight.

More than one half (54.0%) of the neonatal deaths occurred within the first day of life (Table 60).

TABLE 60: AGE AT NEONATAL DEATH AMONGST LIVEBIRTHS IN WESTERN AUSTRALIA, 1990

Age at Neonatal Death	No.	% of Neonatal Deaths
< Day 1	36	41.4
Day 1	11	12.6
Day 2	12	13.8
Day 3	4	4.6
Day 4	4	4.6
Day 5	-	-
Day 6	3	3.4
Day 7	2	2.3
Day 8 - 14	8	9.2
Day 15 - 21	3	3.4
Day 22 - 28	4	4.6
Total	87	100.0

Excludes births less than 500 grams birthweight.

The causes of death of stillborn babies are largely unknown (39.8%). Extremely low birthweight (less than 1000 grams birthweight) contributed in 20.3% of cases and 12.7% resulted from lethal congenital malformations.

The principal causes of death of neonates are reported to be low birthweight 36.8% and lethal congenital malformations 46.0% (Table 61).

TABLE 61: CAUSES OF STILLBIRTHS AND NEONATAL DEATHS IN WESTERN AUSTRALIA, 1990

Causes of Death	¹ Stillbirths		² Neonatal Deaths	
	No.	%	No.	%
Lethal Congenital Malformations	15	12.7	40	46.0
Extremely low birthweight (<1000 grams)	24	20.3	-	-
Low birthweight (<2500 grams)	-	-	32	36.8
Asphyxia	-	-	5	5.7
Maternal	-	-	-	-
Obstetric	2	1.7	1	1.1
Medical	3	2.5	-	-
Hypertension	5	4.2	-	-
Placenta & Cord	15	12.7	-	-
Hydrops fetalis	-	-	-	-
Infection	-	-	3	3.4
S.I.D.S.	-	-	2	2.3
Other	7	5.9	2	2.3
Unknown	47	39.8	2	2.3
Total	118	100.0	87	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.

SOURCE: MIDWIVES' NOTIFICATION SYSTEM

Autopsies were requested for 67.8% of stillbirths and 50.6% of neonatal deaths. In the case of 34 (16.6%) perinatal deaths it is unknown whether an autopsy was requested (Table 62).

TABLE 62: AUTOPSY REQUESTS FOR STILLBIRTHS AND NEONATAL DEATHS IN WESTERN AUSTRALIA, 1990

	Perinatal Deaths				Total	
	Stillbirths		Neonatal Deaths		No.	%
	No.	%	No.	%		
Yes	80	67.8	44	50.6	124	60.5
No	16	13.6	31	35.6	47	22.9
Unknown	22	18.6	12	13.8	34	16.6
Total	118	100.0	87	100.0	205	100.0

Excludes births less than 500 grams birthweight.

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HOME BIRTH TRANSFER FORM

Mrs Vivien Gee
Co-ordinator
Midwives' Notification System
Health Services Statistics and Epidemiology Branch
Health Department of Western Australia
189 Royal Street
EAST PERTH WA 6004

This is to advise that:

SURNAME:.....

FORENAMES:.....

ADDRESS:.....

DATE OF BIRTH:.....

GRAVIDA: PARITY:

had planned to have a home birth but was transferred

- (a) before onset of labour
(b) during labour

to hospital on

REASON FOR TRANSFER:.....

.....
.....
.....

OUTCOME.....

.....

COMMENTS (include problems with transport, referral or reception at hospital)

.....
.....
.....

NAME OF MIDWIFE:.....

(please print)

DATE: