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**THE 1995 WESTERN AUSTRALIAN  
BIRTH COHORT**

**PERINATAL AND INFANT MORTALITY  
IDENTIFIED BY MATERNAL RACE**

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Health Statistics  
Health Information Centre

**OCTOBER 1998**

**Statistical Series 54  
Health Department of  
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## 1. SUMMARY

The Midwives' Notification System of Western Australia identified 25369 births of  $\geq 500$  grams birthweight to 25020 women during 1995. Of these babies, 128 (0.5%) were stillborn and a further 104 (0.4%) liveborn babies died within the first twelve months.

This Report assesses mortality amongst infants born during 1995 in Western Australia with reference to maternal race, place of residence, age and parity plus baby characteristics including birthweight, plurality, sex, age and cause of death.

Overall, the stillbirth rate was 5.0/1000 total births. Among babies born to Caucasian women the stillbirth rate was 4.8/1000, for babies of Aboriginal women 8.9/1000 and for babies of women of other races the rate was 4.6/1000 total births. The stillbirth rate of 4.8/1000 among singleton births was lower than (14.9/1000) for multiple births. Of babies born to teenage women, 9 (5.9/1000) were stillborn. Consideration of maternal parity showed a higher stillbirth rate for primiparous women (5.4/1000) than among babies of multiparous women (2.8/1000).

The causes of stillbirths were unexplained for 56 (43.8%) babies and the deaths of 24 (18.8%) babies were attributed to complications arising from extremely low birth weight ( $< 1000$  grams). Lethal congenital abnormalities were the cause of death for 16 (12.5%) stillbirths.

There were 59 neonatal deaths, giving a neonatal mortality proportion of 2.3/1000 livebirths. For babies of Caucasian women the proportion was 1.8/1000, for babies of Aboriginal mothers 8.3/1000 and for babies of women of other races 3.6/1000.

Post neonatal deaths numbered 45 (1.8/1000 livebirths) babies. Nineteen (42.2%) of these were attributed to Sudden Infant Death Syndrome and 5 (11.1%) to lethal congenital malformations.

The perinatal mortality rate was 7.4/1000 total births. For babies of Caucasian women the rate was 6.6/1000, for babies of Aboriginal women 17.1/1000 and babies of women of other races 8.2/1000. Perinatal deaths amongst babies born to Aboriginal teenage mothers (2.8/1000) was lower than the rate for babies born to Caucasian women in the same age group (8.1/1000). The rate of perinatal mortality among babies of single women and of babies of separated, divorced or widowed women (16.0/1000) was noticeably higher than the rate (6.9/1000) for babies of women reported to be socially supported by a partner.

Infant deaths numbered 104 and included 59 neonatal deaths and 45 post neonatal deaths. These numbers provide an overall infant death rate of 4.1/1000 livebirths.

Among babies of Aboriginal women the infant mortality rate (21.4/1000) was more than five times the overall rate (4.1/1000). The fraction of infant deaths attributed to Sudden Infant Death Syndrome among babies of Aboriginal women (22.6%) was greater than the overall fraction of 21.2%.

The major causes of infant death remain lethal congenital malformation (26.0%), Sudden Infant Death Syndrome (21.2%) and disorders related to low birthweight (30.8%). The overall rate of infant death was higher where mothers were socially unsupported by a partner.

Perinatal and infant mortality rates were higher among babies born to Aboriginal mothers than among babies of non-Aboriginal women. Although the infant mortality rate among babies of Aboriginal women has substantially decreased over the past sixteen years from 31.1/1000 in 1980 to 21.4/1000 in 1995, it still remains more than five times that of the overall infant mortality rate of 4.1/1000 livebirths in 1995.

## **2. INTRODUCTION**

This report is the twelfth in a continuing series examining perinatal and infant mortality in Western Australia. The aim of compiling the data in this report is to measure relationships of mortality among infants with consideration of variables such as maternal race, maternal age, parity, conjugal state and infant plurality, gestation and birthweight.

This report relates to the cohort of babies that was born in Western Australia in 1995 and includes information on their outcomes up to the age of twelve months. Prior to 1984, mortality data were calculated according to year of death rather than year of birth.

Epidemiological studies in the area of infant mortality are naturally long term and this report compiles basic factual data which will assist research aimed to limit human loss in future years.

### **3. DATA COLLECTION**

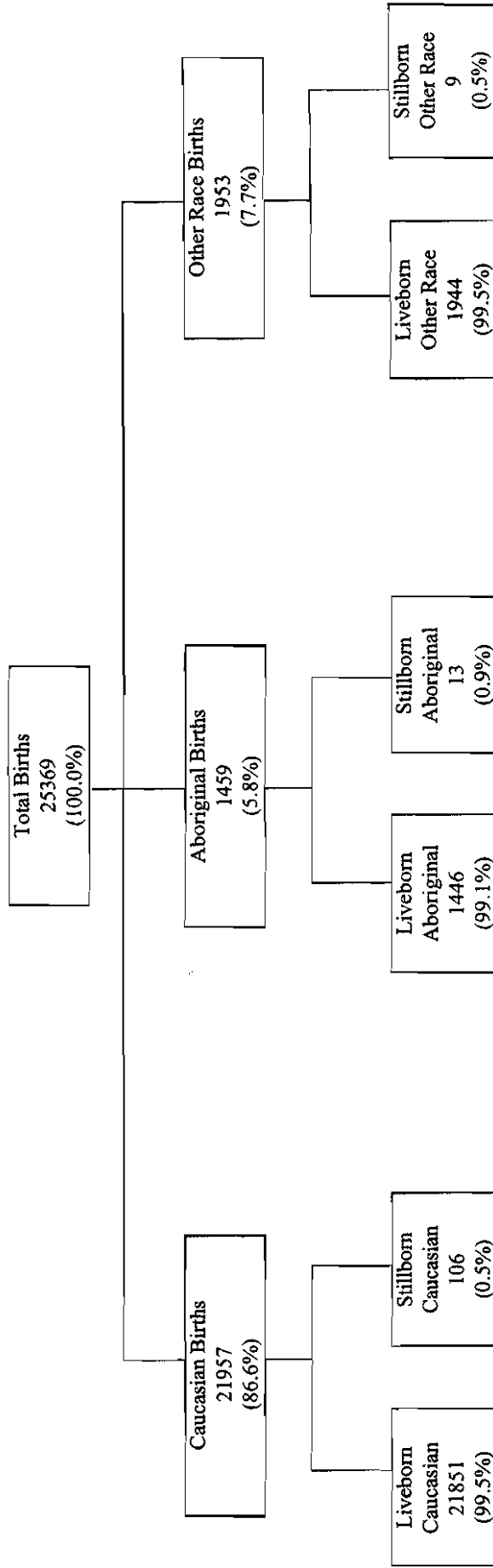
The Western Australian Midwives' Notification System forms the basis of this eleventh annual report of perinatal and infant mortality.

Although this System collects data for babies  $\geq 20$  weeks gestation or  $\geq 400$  grams birthweight, this report includes only those babies whose birthweight was  $\geq 500$  grams. Information related to deaths of liveborn babies was obtained from the Registrar General's Office, the Hospital Morbidity Data System, and the Australian Bureau of Statistics (Western Australian Branch). As far as can be determined from the above-mentioned sources, the data relating to number of deaths in this report are complete.

Information on infants born in Western Australia who die outside the State is not received by this Department and cannot be included in this Report.

A computer file of deaths was created and linked to the Midwives' Notification System. This provided a comprehensive data base from which this report was written. After all follow up procedures were complete, linkage was 100% successful for babies  $\geq 500$  grams. Intercensal estimates of total population of Western Australia and Statistical Divisions, and female populations by age were supplied by the Australian Bureau of Statistics (Western Australian Branch).

**TABLE 1: MATERNAL RACE AND CONDITION OF BIRTHS IN WESTERN AUSTRALIA IN 1995**



Excludes births less than 500 grams birthweight.

## **4. BIRTHS IN WESTERN AUSTRALIA IN 1995**

### **4.1 Births Incidence**

Midwives' forms received by this department indicate that 25369 babies were born to 25020 women during 1995. This report includes statistics only on those babies whose birthweight was equal to or greater than 500 grams.

Examination of births showed that 21957 (86.6%) were born to Caucasian women, 1459 (5.8%) to Aboriginal women and 1953 (7.7%) to women of other racial groups.

### **4.2 Place of Birth**

The majority of births, 25189 (99.3%), occurred in hospital. Of these, births in metropolitan hospitals numbered 18926 (75.1%) and non-metropolitan hospital births were 6252 (24.8%).

There were 180 (0.8%) non hospital births including 84 (0.4%) born before arrival at hospital and 96 (0.4%) planned supervised homebirths.

### **4.3 Maternal Place of Residence**

Assessment of location of women bearing children throughout the State shows that the majority of births 17357 (69.4%) were to women whose usual place of residence was within one of the Perth Metropolitan Health Zones (Table 2).

### **4.4 Crude Birth Rate**

An overall crude birth rate of 14.6/1000 total population was identified for Western Australia during 1995. The area with the lowest crude birth rate (12.2/1000 total population) was the North Metropolitan Health Zone (Figure 1) (Table 39).

### **4.5 Condition of Births**

Analysis of the condition at birth showed 25241 (99.5%) babies were liveborn and 128 (0.5%) babies were stillborn. Livebirths to Caucasian women numbered 21853 (99.5%) and stillbirths 106 (0.5%). Among Aboriginal women there were 1444 (99.1%) liveborn and 13 (0.9%) stillborn babies. For women of other races there were 1944 (99.5%) livebirths and 9 (0.6%) stillbirths (Table 1).

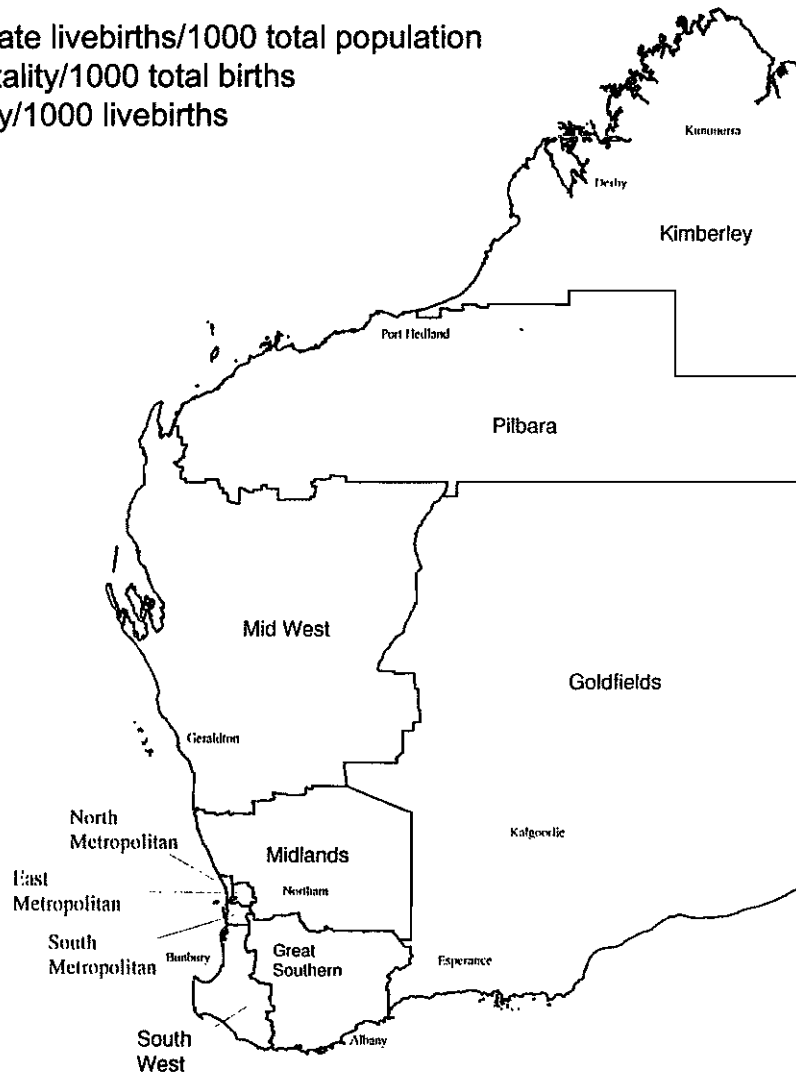
### **4.6 Maternal Age**

Consideration of maternal age shows that the highest percentage of women confined (32.5%), were in the 25 to 29 year age category. Women in their teenage years accounted for 6.1% of total confinements. Almost a quarter (24.7%) of Aboriginal women confined were teenagers. This contrasts with Caucasian women of whom 5.1% were teenagers and women of other races with 3.2% teenage confinements. Women aged 40 years or more represented 1.7% of all women confined.

**FIGURE I**

**CRUDE BIRTH RATE, PERINATAL AND INFANT MORTALITY  
BY HEALTH ZONE OF MATERNAL RESIDENCE  
FOR BIRTHS IN WESTERN AUSTRALIA IN 1995**

Crude Birth Rate livebirths/1000 total population  
Perinatal Mortality/1000 total births  
Infant Mortality/1000 livebirths



Authority	Crude Birth Rate	Perinatal Mortality	Infant Mortality
Kimberley	24.8	12.8	11.3
Pilbara	18.7	14.7	7.5
Midwest	15.8	9.4	4.2
Midlands	14.2	3.9	2.6
Goldfields	19.9	7.2	9.9
South West	14.5	7.6	3.8
Great Southern	15.5	9.3	4.7
North Metropolitan	12.2	5.6	4.4
East Metropolitan	15.2	7.6	2.8
South Metropolitan	14.5	7.0	3.2
Total WA	14.6	7.9	5.2

**TABLE 2: LIVEBIRTHS AND TOTAL BIRTHS BY HEALTH ZONE OF MATERNAL RESIDENCE AND MATERNAL RACE IN WESTERN AUSTRALIA 1995**

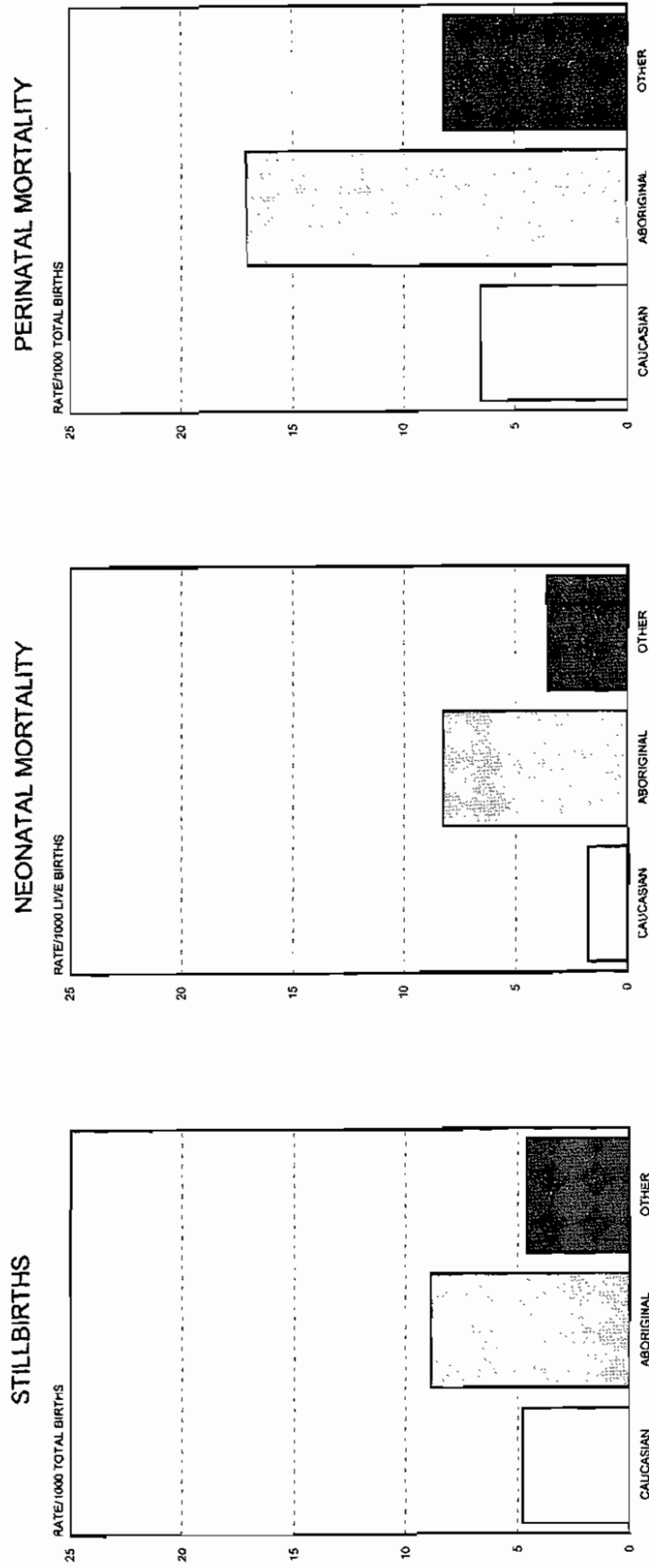
Health Zone	Maternal Race															
	Caucasian				Aboriginal				Other				Total			
	Live Births No.	%	Total Births No.	%	Live Births No.	%	Total Births No.	%	Live Births No.	%	Total Births No.	%	Live Births No.	%	Total Births No.	%
<u>Metropolitan</u>																
North	4895	22.4	4915	22.4	111	7.6	111	7.6	508	26.1	508	26.1	5514	21.9	5534	21.8
East	4854	22.2	4882	22.2	202	13.9	203	13.9	678	34.9	683	35.0	5734	22.7	5768	22.7
South	5639	25.8	5665	25.8	156	10.8	158	10.8	481	24.7	484	24.8	6276	24.9	6307	24.9
<u>Non-Metropolitan</u>																
Kimberley	221	1.0	222	1.0	376	26.0	378	25.9	22	1.1	23	1.2	619	2.5	623	2.5
Pilbara	581	2.7	586	2.7	151	10.4	155	10.6	73	3.8	73	3.7	805	3.2	814	3.2
Midwest	767	3.5	772	3.5	154	10.7	156	10.7	28	1.4	28	1.4	949	3.8	956	3.8
Midlands	727	3.3	730	3.3	24	1.7	24	1.6	11	0.6	11	0.6	762	3.0	765	3.0
Goldfields	930	4.3	931	4.2	130	9.0	132	9.1	53	2.7	53	2.7	1113	4.4	1116	4.4
South West	2246	10.3	2257	10.3	73	5.1	73	5.0	41	2.1	41	2.1	2360	9.4	2371	9.4
Great Southern	979	4.5	985	4.5	65	4.5	65	4.5	31	1.6	31	1.6	1075	4.3	1081	4.3
Outside WA	12	-	12	-	4	-	4	-	18	0.9	18	0.9	34	0.1	34	0.1
<b>TOTAL</b>	<b>21851</b>	<b>100.0</b>	<b>21957</b>	<b>100.0</b>	<b>1446</b>	<b>100.0</b>	<b>1459</b>	<b>100.0</b>	<b>1944</b>	<b>100.0</b>	<b>1953</b>	<b>100.0</b>	<b>25241</b>	<b>100.0</b>	<b>25369</b>	<b>100.0</b>

Excludes births <500 grams birthweight.



FIGURE II

# STILLBIRTHS, NEONATAL AND PERINATAL MORTALITY, ABORIGINAL AND NON-ABORIGINAL, WESTERN AUSTRALIA, 1995



Excludes births less than 500 grams birthweight

SOURCE: MIDWIVES' NOTIFICATION SYSTEM  
REGISTRAR GENERAL'S OFFICE



## 5. STILLBIRTHS, NEONATAL AND POST-NEONATAL MORTALITY IN WESTERN AUSTRALIA IN THE 1995 BIRTH COHORT

### 5.1 Stillbirths

There were 128 stillbirths in Western Australia during the 1995 year which were equal to or greater than 500 grams birthweight. The stillbirth rate for the State was 5.0/1000 total births (Table 4).

The stillbirth rate for babies of Aboriginal women (8.9/1000) was high compared to that for babies of Caucasian women (4.8/1000) and for babies of women of other racial groups (4.6/1000).

Stillbirth proportions relating to Health Zone of maternal residence are shown on Table 3. It should be noted, however, that due to small numbers of births in each country division the rates do vary from year to year and may be considered unrepresentative on an annual basis (Table 3, Figure I).

#### 5.1.1 Maternal Race and Maternal Age

Among babies of all teenage mothers, the rate was 5.9/1000 total births. There were no stillbirths to Aboriginal teenage mothers. Among women aged 25-29 years, the group with the highest number of births overall, the stillbirth rate was 5.0/1000 total births. Among babies of women aged 35 years and over, 16 (4.9/1000) stillbirths occurred. (Table 4).

TABLE 4: STILLBIRTHS BY MATERNAL RACE AND MATERNAL AGE IN WESTERN AUSTRALIA IN 1995

Maternal Age	Maternal Race									Total		
	Caucasian			Aboriginal			Other					
	No.	Total	Rate	No.	Total	Rate	No.	Total	Rate	No.	Total	Rate
≤15	-	19	-	-	43	-	-	2	-	-	64	-
16	1	99	10.1	-	53	-	-	6	-	1	158	6.3
17	1	202	5.0	-	74	-	-	13	-	1	289	3.5
18	2	320	6.3	-	92	-	-	15	-	2	427	4.7
19	5	466	10.7	-	96	-	-	25	-	5	587	8.5
≤19	9	1106	8.1	-	358	-	-	61	-	9	1525	5.9
20-24	20	4122	4.9	4	512	7.8	-	307	-	24	4941	4.9
25-29	33	7302	4.5	5	375	13.3	3	572	5.2	41	8249	5.0
30-34	32	6627	4.8	3	152	19.7	3	631	4.8	38	7410	5.1
35-39	7	2433	2.9	1	60	16.7	2	326	6.1	10	2819	3.5
40-44	5	352	14.2	-	2	-	1	54	18.5	6	408	14.7
≤45	-	15	-	-	-	-	-	2	-	-	17	-
<b>TOTAL</b>	<b>106</b>	<b>21957</b>	<b>4.8</b>	<b>13</b>	<b>1459</b>	<b>8.9</b>	<b>9</b>	<b>1953</b>	<b>4.6</b>	<b>128</b>	<b>25369</b>	<b>5.0</b>

Excludes births <500 grams birthweight.

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

### 5.1.2 Maternal Race and Parity

Fifty six (5.4/1000) stillborn babies were to primiparous women compared with 56 (5.5/1000) in the 1994 birth cohort. For babies of women whose parity was three or more, the stillbirth rate was 11 (4.3/1000) in 1995. (Table 5).

**TABLE 5: STILLBIRTHS BY MATERNAL RACE AND PARITY IN WESTERN AUSTRALIA IN 1995**

Parity	Caucasian			Aboriginal			Other			Total		
	No.	Total Births	Rate	No.	Total Births	Rate	No.	Total Births	Rate	No.	Total Births	Rate
0	52	9082	5.7	1	388	2.6	3	835	3.6	56	10305	5.4
1-2	48	10942	4.4	7	626	11.2	6	919	6.5	61	12487	4.9
3-4	5	1698	2.9	5	304	16.4	-	175	-	10	2177	4.6
≥5	1	235	4.3	-	141	-	-	24	-	1	400	2.5
<b>TOTAL</b>	<b>106</b>	<b>21957</b>	<b>4.8</b>	<b>13</b>	<b>1459</b>	<b>8.9</b>	<b>9</b>	<b>1953</b>	<b>4.6</b>	<b>128</b>	<b>25369</b>	<b>5.0</b>

Excludes births < 500 grams birthweight.

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

### 5.1.3 Maternal Race, Condition and Plurality

The stillbirth proportion for all multiple births (14.9/1000) compares unfavourably with 4.8/1000 stillbirth rate for all singleton births. For singleton births the rate of stillbirths among babies of Aboriginal women (9.0/1000) is higher than for total births (5.0/1000) (Table 6).

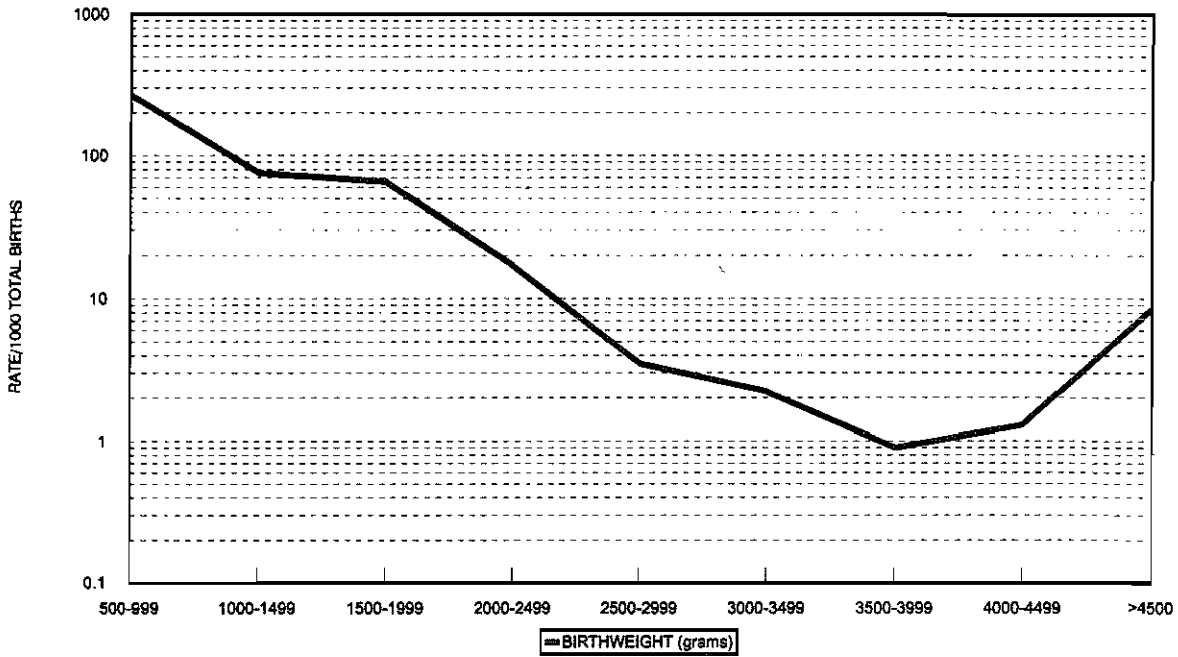
**TABLE 6: CONDITION, PLURALITY AND MATERNAL RACE OF BIRTHS IN WESTERN AUSTRALIA 1995**

Plurality				
Maternal Race		Singleton	Multiple	Total
Caucasian	Total Births	21319	638	21957
	Live Births	21223	628	21851
	Stillbirths	96	10	106
	<b>Rate</b>	<b>4.5</b>	<b>15.7</b>	<b>4.8</b>
Aboriginal	Total Births	1440	19	1459
	Live Births	1427	19	1446
	Stillbirths	13	-	13
	<b>Rate</b>	<b>9.0</b>	<b>-</b>	<b>8.9</b>
Other	Total Births	1917	36	1953
	Live Births	1908	36	1944
	Stillbirths	9	-	9
	<b>Rate</b>	<b>4.7</b>	<b>-</b>	<b>4.6</b>
Total	Total Births	24676	669	25369
	Live Births	24558	659	25241
	Stillbirths	118	10	128
	<b>Rate</b>	<b>4.8</b>	<b>14.9</b>	<b>5.0</b>

Excludes births <500 grams birthweight.

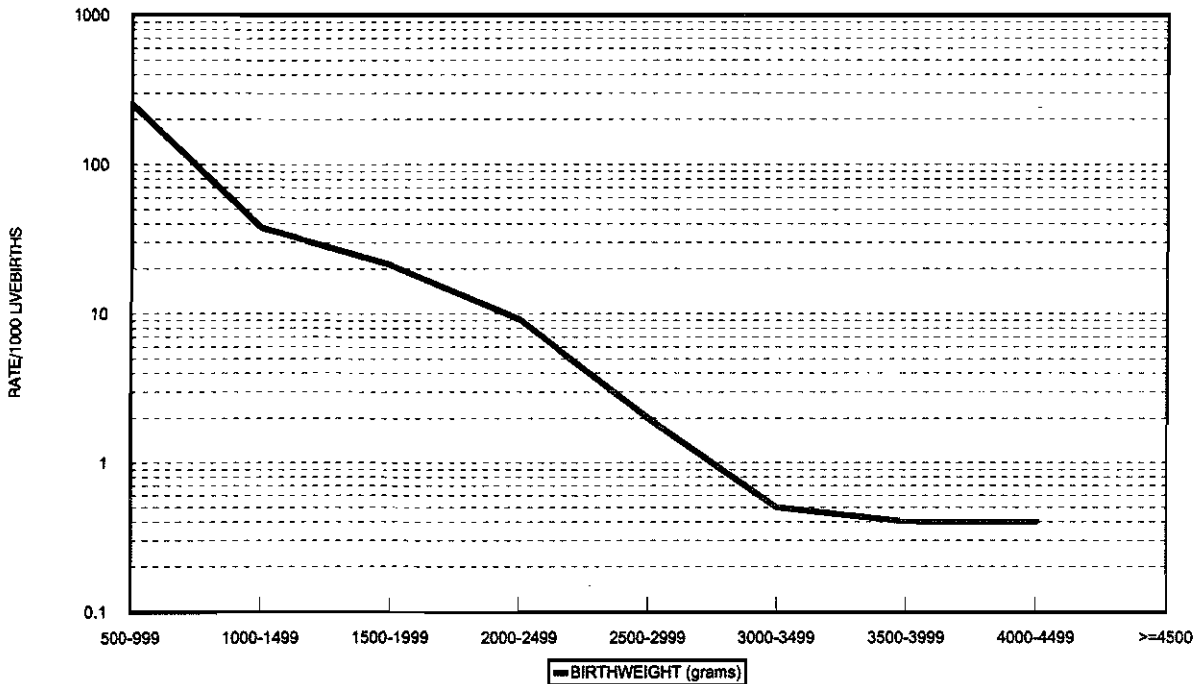
<sup>1</sup> Rate/1000 total births.

**FIGURE III  
BIRTHWEIGHT DISTRIBUTION OF STILLBIRTHS  
IN WESTERN AUSTRALIA IN 1995**



Excludes births less than 500 grams birthweight  
SOURCE: MIDWIVES' NOTIFICATION SYSTEM

**FIGURE IV  
BIRTHWEIGHT DISTRIBUTION OF NEONATAL DEATHS  
IN WESTERN AUSTRALIA IN 1995**



Excludes births less than 500 grams birthweight  
SOURCE: MIDWIVES' NOTIFICATION SYSTEM

#### 5.1.4 Maternal Race and Birthweight

The stillbirths rate for low birthweight babies was 50.2/1000. The lowest stillbirth rate (0.9/1000) was for babies with birthweight 3500-3999 grams. (Table 7 and Figure III).

**TABLE 7 : STILLBIRTH PROPORTION BY MATERNAL RACE AND BIRTHWEIGHT DISTRIBUTION IN WESTERN AUSTRALIA IN 1995**

Birthweight (grams)	Maternal Race									Total		
	Caucasian			Aboriginal			Other					
	No.	Births	Rate	No.	Births	Rate	No.	Births	Rate	No.	Births	Rate
500-999	24	86	271.9	4	18	(222.2)	2	8	(250.0)	30	112	267.9
1000-1499	11	148	74.3	2	16	(125.0)	-	8	-	13	172	75.6
1500-1999	14	251	55.8	3	29	(103.4)	3	26	(115.4)	20	306	65.4
2000-2499	15	807	18.6	-	107	-	2	90	(22.2)	17	1004	16.9
<2500	64	1292	49.5	9	170	52.9	7	132	53.0	80	1594	50.2
2500-2999	11	3264	3.4	2	350	(5.7)	1	429	(2.3)	14	4043	3.5
3000-3499	21	8086	2.6	-	532	-	-	848	-	21	9466	2.2
3500-3999	6	6825	0.9	1	303	(3.3)	-	429	-	7	7557	0.9
4000-4499	2	2161	(0.9)	1	95	(10.5)	-	100	-	3	2356	(1.3)
≥4500	2	329	(6.1)	-	9	-	1	15	(66.7)	3	353	(8.5)
<b>TOTAL</b>	<b>106</b>	<b>21957</b>	<b>4.8</b>	<b>13</b>	<b>1459</b>	<b>8.9</b>	<b>9</b>	<b>1953</b>	<b>4.6</b>	<b>128</b>	<b>25369</b>	<b>5.0</b>

Excludes births <500 grams birthweight.

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

( ) Where n<5 rate has been bracketed and should be treated with caution.

#### 5.1.5 Causes of Stillbirth

There were 56 (43.8%) stillborn babies with cause unknown and 24 (18.8%) stillbirths with extremely low birthweight. Lethal congenital malformations resulted in 16 (12.5%) stillbirths and a further 20 (15.6%) stillbirths resulted from complications of the placenta and/or cord (Table 8).

Understanding of the cause of stillbirth is improved by autopsy. Of the 128 stillborn babies, it is known that 71 (55.5%) had autopsies and 50 (39.1%) did not. It is not known whether the remaining 7 (5.5%) stillborn babies underwent autopsy.

Ninety five (74.2%) stillbirths were recorded as antepartum deaths, 23 (18.0%) were recorded as intrapartum deaths and for 10 (7.8%), the time of death was unknown.

**TABLE 8 : CAUSE OF STILLBIRTH BY MATERNAL RACE IN WESTERN AUSTRALIA IN 1995**

Cause of Death	Maternal Race						Total	
	Caucasian		Aboriginal		Other		1995	
	No.	%	No.	%	No.	%	No.	%
Lethal Congenital Malformation	15	14.2	1	7.7	-	-	16	12.5
Extremely Low Birth Weight (<1000g)*	18	17.0	4	30.8	2	22.2	24	18.8
Unknown	47	44.3	4	30.8	5	55.6	56	43.8
Maternal: Obstetric	2	1.9	-	-	-	-	2	1.6
Maternal: Medical	-	-	1	7.7	-	-	1	0.8
Maternal: Hypertension	4	3.8	1	7.7	1	11.1	6	4.7
Placenta and Cord	18	17.0	1	7.7	1	11.1	20	15.6
Other	2	1.9	1	7.7	-	-	3	2.3
<b>TOTAL</b>	<b>106</b>	<b>100.0</b>	<b>13</b>	<b>100.0</b>	<b>9</b>	<b>100.0</b>	<b>128</b>	<b>100.0</b>

Excludes births < 500 grams birthweight.

\* Any non-malformed stillbirth of birthweight 500-999 grams was included in the extremely low birthweight category.

## 5.2 Neonatal Deaths

There were 59 neonatal deaths among the 25241 livebirths in 1995<sup>1</sup>. The overall neonatal mortality proportion was 2.3/1000 livebirths. For babies of Aboriginal women neonatal mortality was 8.3/1000 livebirths which is higher than for babies of Caucasian women (1.8/1000) and the rate for babies of women of other races (3.6/1000) (Table 3).

The figures for neonatal mortality by Health Zone of maternal residence are provided in Table 3. However, it should be noted that due to small numbers of births in some Zones, the rates may not be representative on an annual basis.<sup>3</sup>

### 5.2.1 Maternal Race and Maternal Age

Of the 59 liveborn babies who died within the first 28 days of life, 2 (1.3/1000) were born to teenage mothers. In the age group where the highest number of births occurred (25-29 years) the neonatal mortality rate was 3.2/1000. The rate of neonatal deaths among babies of Aboriginal mothers (8.3/1000) was four times that for babies of Caucasian women (1.8/1000) (Table 9).

**TABLE 9 : NEONATAL DEATHS BY MATERNAL RACE AND MATERNAL AGE IN WESTERN AUSTRALIA IN 1995**

Maternal Age	Maternal Race									Total		
	Caucasian			Aboriginal			Other					
	No.	Live Births	Rate	No.	Live Births	Rate	No.	Live Births	Rate	No.	Live Births	Rate
≤15	-	19	-	-	43	-	-	2	-	-	64	-
16	-	98	-	-	53	-	-	6	-	-	157	-
17	-	201	-	-	74	-	-	13	-	-	288	-
18	-	318	-	-	92	-	-	15	-	-	425	-
19	1	461	2.2	1	96	10.4	-	25	-	2	582	3.4
≤19	1	1097	0.9	1	358	10.4	1	61	-	2	1516	1.3
20-24	5	4102	1.2	5	508	9.8	1	307	3.3	11	4917	2.2
25-29	17	7269	2.3	6	370	16.2	3	569	5.3	26	8208	3.2
30-34	13	6595	2.0	-	149	-	1	628	1.6	14	7372	1.9
35-39	4	2426	1.6	-	59	-	1	324	3.1	5	2809	1.8
40-44	-	347	-	-	2	-	1	53	18.9	1	402	2.5
≥45	-	15	-	-	-	-	-	2	-	-	17	-
<b>TOTAL</b>	<b>40</b>	<b>21851</b>	<b>1.8</b>	<b>12</b>	<b>1446</b>	<b>8.3</b>	<b>7</b>	<b>1944</b>	<b>3.6</b>	<b>59</b>	<b>25241</b>	<b>2.3</b>

Excludes births <500 grams birthweight.

<sup>1</sup> Rate/1000 livebirths.

### 5.2.2 Maternal Race and Parity

Twenty eight (2.3/1000) neonatal deaths were to women with a previous parity of one or two. A higher rate was recorded for babies of women with parity of three or more (3.9/1000) (Table 10).

**TABLE 10 : NEONATAL DEATHS BY MATERNAL RACE AND PARITY IN WESTERN AUSTRALIA IN 1995**

Parity	Maternal Race									Total		
	Caucasian			Aboriginal			Other					
	No.	Live Births	Rate	No.	Live Births	Rate	No.	Live Births	Rate	No.	Live Births	Rate
0	14	9030	1.6	5	387	12.9	2	832	2.4	21	10249	2.0
1-2	21	10894	1.9	3	619	4.8	4	913	4.4	28	12426	2.3
3-4	4	1693	2.4	3	299	10.0	1	175	5.7	8	2167	3.7
≥5	1	234	4.3	1	141	7.1	-	24	-	2	399	5.0
<b>TOTAL</b>	<b>40</b>	<b>21851</b>	<b>1.8</b>	<b>12</b>	<b>1446</b>	<b>8.3</b>	<b>7</b>	<b>1944</b>	<b>3.6</b>	<b>59</b>	<b>25241</b>	<b>2.3</b>

Excludes births < 500 grams birthweight.

<sup>1</sup> Rate/1000 livebirths.



### 5.2.3 Maternal Race and Plurality

These data show an overall neonatal death rate of 2.2/1000 livebirths for singleton births and 7.6/1000 livebirths for twin births. There was 1 neonatal death among triplet births and no triplet births to either Aboriginal women or women of other races (Table 11).

**TABLE 11: NEONATAL DEATHS BY MATERNAL RACE AND PLURALITY IN WESTERN AUSTRALIA IN 1995**

Plurality	Maternal Race									Total		
	Caucasian			Aboriginal			Other					
	No.	Births	Rate	No.	Births	Rate	No.	Births	Rate	No.	Births	Rate
Singleton	36	21223	1.7	10	1427	7.0	7	1908	3.7	53	24558	2.2
Twins	3	604	5.0	2	19	105.3	-	36	-	5	659	7.6
Triplets	1	24	41.7	-	-	-	-	-	-	1	24	41.7
<b>TOTAL</b>	<b>40</b>	<b>21851</b>	<b>1.8</b>	<b>12</b>	<b>1446</b>	<b>8.3</b>	<b>7</b>	<b>1944</b>	<b>3.6</b>	<b>59</b>	<b>25241</b>	<b>2.3</b>

Excludes births < 500 grams birthweight.

<sup>1</sup> Rate/1000 livebirths.

### 5.2.4 Maternal Race and Birthweight

In broad terms and as reported for stillbirths, neonatal mortality proportions for all races fell as birthweight rose. The rate of low birthweight neonatal deaths among babies born to Aboriginal mothers (49.7/1000) is higher than for low birthweight neonatal deaths of babies born to Caucasian women (24.4/1000) (Table 12, Figure IV).

**TABLE 12: NEONATAL MORTALITY BY MATERNAL RACE AND BIRTHWEIGHT DISTRIBUTION IN WESTERN AUSTRALIA IN 1995**

Birthweight (grams)	Maternal Race									Total		
	Caucasian			Aboriginal			Other					
	No.	Births	Rate	No.	Births	Rate	No.	Births	Rate	No.	Births	Rate
500-999	14	62	225.8	5	14	357.1	2	6	(333.3)	21	82	256.1
1000-1499	5	137	36.5	1	14	(71.4)	-	8	-	6	159	37.7
1500-1999	3	237	(12.7)	2	26	(76.9)	1	23	(43.5)	6	286	21.0
2000-2499	8	792	10.1	-	107	-	1	88	(11.4)	9	987	9.1
<2500	30	1228	24.4	8	161	49.7	4	125	(32.0)	42	1514	27.7
2500-2999	5	3253	1.5	2	348	(5.7)	1	428	(2.3)	8	4029	2.0
3000-3499	4	8065	(0.5)	1	532	(1.9)	-	848	-	5	9445	0.5
3500-3999	1	6819	(0.1)	1	302	(3.3)	1	429	(2.3)	3	7550	(0.4)
4000-4499	-	2159	-	-	94	-	1	100	(10.0)	1	2353	(0.4)
≥4500	-	327	-	-	9	-	-	14	-	-	350	-
<b>TOTAL</b>	<b>40</b>	<b>21851</b>	<b>1.8</b>	<b>12</b>	<b>1446</b>	<b>8.3</b>	<b>7</b>	<b>1944</b>	<b>3.6</b>	<b>59</b>	<b>25241</b>	<b>2.3</b>

Excludes births <500 grams birthweight.

<sup>1</sup> Rate/1000 livebirths.

( ) Where n<5 rate has been bracketed and should be treated with caution.

### 5.2.5 Maternal Race and Age at Neonatal Death

The majority (78.0%) of neonatal deaths occurred in the first week of life, 61.0% occurring within the first 48 hours of life. Among babies of Aboriginal women 75.0% of neonatal deaths occurred in the first seven days of life compared with 80.0% of babies born to Caucasian women (Table 13).

**TABLE 13 : AGE AT NEONATAL DEATHY BY MATERNAL RACE IN WESTERN AUSTRALIA IN 1995**

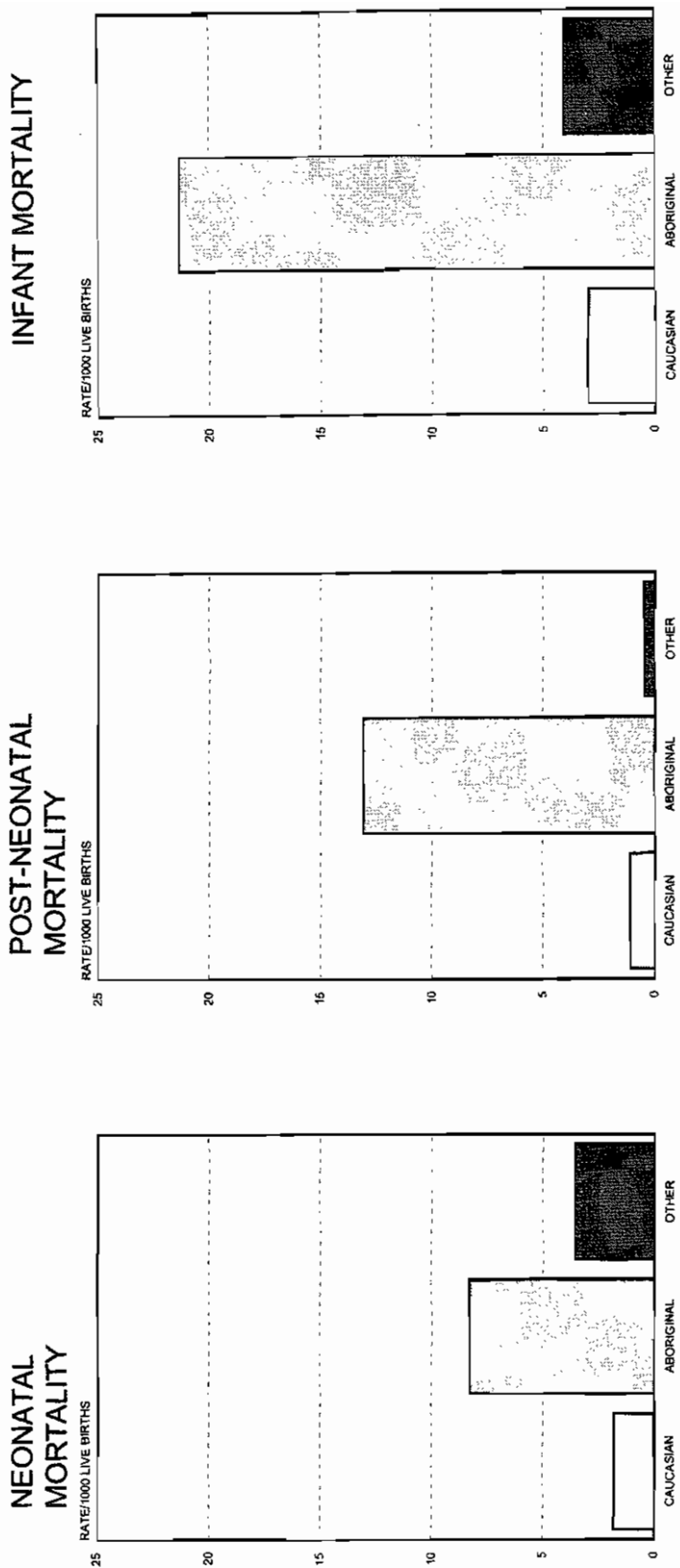
Age at Death	Maternal Race						Total	
	Caucasian		Aboriginal		Other			
	No.	%	No.	%	No.	%	No.	%
< day 1	17	42.5	5	41.7	3	42.9	25	42.4
day 1	8	20.0	1	8.3	2	28.6	11	18.6
day 2	3	7.5	1	8.3	-	-	4	6.8
day 3	2	5.0	2	16.7	-	-	4	6.8
day 4	1	2.5	-	-	-	-	1	1.7
day 5	-	-	-	-	-	-	-	-
day 6	1	2.5	-	-	-	-	1	1.7
day 7	-	-	-	-	-	-	-	-
day ≤ 7	32	80.0	9	75.0	5	71.4	46	78.0
day 8 - 14	4	10.0	1	8.3	1	14.3	6	10.2
day 15 - 21	2	5.0	1	8.3	1	14.3	4	6.8
day 22 - 28	2	5.0	1	8.3	-	-	3	5.1
<b>TOTAL</b>	<b>40</b>	<b>100.0</b>	<b>12</b>	<b>100.0</b>	<b>7</b>	<b>100.0</b>	<b>59</b>	<b>100.0</b>

Excludes births <500 grams birthweight

### 5.2.6 Causes of Neonatal Deaths

Lethal congenital malformation in 22 babies (37.3%) and low birthweight for 27 babies (45.8%) were the main causes of neonatal death in the 1995 birth cohort (Table 14).

**FIGURE V**  
**NEONATAL, POST-NEONATAL AND INFANT MORTALITY,**  
**ABORIGINAL AND NON-ABORIGINAL,**  
**WESTERN AUSTRALIA, 1995**



Excludes births less than 500 grams birthweight

SOURCE: MIDWIVES' NOTIFICATION SYSTEM  
 REGISTRAR GENERAL'S OFFICE

**TABLE 14 : CAUSE OF NEONATAL DEATH BY MATERNAL RACE IN WESTERN AUSTRALIA IN 1995**

Cause of Death	Maternal Race						Total	
	Caucasian		Aboriginal		Other			
	No.	%	No.	%	No.	%	No.	%
Lethal Congenital Malformation	15	37.5	2	16.7	5	71.4	22	37.3
Low Birth Weight (<2500g)	20	50.0	6	50.0	1	14.3	27	45.8
Asphyxia	1	2.5	-	-	-	-	1	1.7
Pregnancy conditions	-	-	2	16.7	-	-	2	3.4
Infections	-	-	-	-	-	-	-	-
Hydrops fetalis	-	-	-	-	-	-	-	-
Other	1	2.5	1	8.3	-	-	2	3.4
Sudden Infant Deaths	1	2.5	1	8.3	1	14.3	3	5.1
Unknown	2	5.0	-	-	-	-	2	3.4
<b>TOTAL</b>	<b>40</b>	<b>100.0</b>	<b>12</b>	<b>100.0</b>	<b>7</b>	<b>100.0</b>	<b>59</b>	<b>100.0</b>

Excludes births < 500 grams birthweight.

### **5.3 Post Neonatal Deaths**

There were 45 post-neonatal deaths identified among the 1995 livebirths, providing a rate of 1.8/1000 livebirths (Table 15 and Table 37).

Post-neonatal mortality for babies of Aboriginal women was 13.1/1000 livebirths, twelve times the rate of 1.1/1000 for babies of Caucasian women. For babies born to women of other races the rate was 0.5/1000 (Table 15, Table 30 and Figure IV).

Post-neonatal deaths in relation to Health Zone of maternal residence are shown in Table 15. It should be noted however, that due to small numbers of births in some Zones the rates do vary from year to year and may be considered unrepresentative on an annual basis (Table 15).

TABLE 15 :  
POST-NEONATAL AND INFANT MORTALITY BY HEALTH ZONE OF MATERNAL RESIDENCE AND MATERNAL RACE IN WESTERN AUSTRALIA IN 1995

Health Zone Maternal Residence	Maternal Race											
	Caucasian			Aboriginal			Other			Total		
	Post-Neonatal No.	Infant No.	Rate	Post-Neonatal No.	Infant No.	Rate	Post-Neonatal No.	Infant No.	Rate	Post-Neonatal No.	Infant No.	Rate
<u>Metropolitan</u>												
North	12	21	4.3	1	1	(9.0)	-	2	(3.9)	13	24	2.4
East	4	12	(0.8)	2	2	(9.9)	-	2	(2.9)	6	16	1.0
South	3	13	(0.5)	4	5	(25.6)	-	2	(4.2)	7	20	1.1
<u>Non-Metropolitan</u>												
Kimberley	-	1	-	3	6	(8.0)	-	-	-	3	7	(4.8)
Pilbara	-	-	-	3	6	(19.9)	-	-	-	3	6	(3.7)
Midwest	-	1	-	1	2	(6.5)	1	1	(35.7)	2	4	(2.1)
Midlands	2	2	(2.8)	-	-	-	-	-	-	2	2	(2.6)
Goldfields	2	3	(2.2)	4	8	(30.8)	-	-	-	6	11	5.4
South West	2	8	(0.9)	-	-	-	-	1	(24.4)	2	9	(0.8)
Great Southern	-	4	-	1	1	(15.4)	-	-	-	1	5	(0.9)
Outside WA	-	-	-	-	-	-	-	-	-	-	-	-
<b>TOTAL</b>	<b>25</b>	<b>65</b>	<b>1.1</b>	<b>19</b>	<b>31</b>	<b>13.1</b>	<b>1</b>	<b>8</b>	<b>(0.5)</b>	<b>45</b>	<b>104</b>	<b>1.8</b>
												<b>4.1</b>

Excludes births <500 grams birthweight.

<sup>1</sup> Post-neonatal death rate/1000 livebirths.

<sup>2</sup> Infant death rate/1000 livebirths.

( ) Where n<5 rate has been bracketed and should be treated with caution.

SOURCE : MIDWIVES' NOTIFICATION SYSTEM  
REGISTRAR GENERAL'S OFFICE

### 5.3.1 Maternal Race and Maternal Age

The rate of post-neonatal deaths among babies of teenage women was 4.6/1000 livebirths. Among babies born to Aboriginal women 6 (16.8/1000) post-neonatal deaths were to teenage mothers (Table 16).

**TABLE 16 : POST-NEONATAL DEATHS BY MATERNAL RACE AND MATERNAL AGE IN WESTERN AUSTRALIA IN 1995**

Maternal Age	Maternal Race									Total		
	Caucasian			Aboriginal			Other					
	No.	Births	Rate	No.	Births	Rate	No.	Births	Rate	No.	Births	Rate
≤15	-	19	-	-	43	-	-	2	-	-	64	-
16	-	98	-	2	53	37.7	-	6	-	2	157	12.7
17	-	201	-	2	74	27.0	-	13	-	2	288	6.9
18	1	318	3.1	1	92	10.9	-	15	-	2	425	4.7
19	-	461	-	1	96	10.4	-	25	-	1	582	1.7
≤19	1	1097	0.9	6	358	16.8	-	61	-	7	1516	4.6
20-24	8	4102	2.0	7	508	13.8	-	307	-	15	4917	3.1
25-29	6	7269	0.8	4	370	10.8	1	569	1.8	11	8208	1.3
30-34	5	6595	0.8	1	149	6.7	-	628	-	6	7372	0.8
35-39	4	2426	1.6	1	59	16.9	-	324	-	5	2809	1.8
40-44	1	347	2.9	-	2	-	-	53	-	1	402	2.5
≥45	-	15	-	-	-	-	-	2	-	-	17	-
<b>TOTAL</b>	<b>25</b>	<b>21851</b>	<b>1.1</b>	<b>19</b>	<b>1446</b>	<b>13.1</b>	<b>1</b>	<b>1944</b>	<b>0.5</b>	<b>45</b>	<b>25241</b>	<b>1.8</b>

Excludes births <500 grams birthweight.

<sup>1</sup> Rate/1000 livebirths.

### 5.3.2 Maternal Race and Conjugal State

Higher rates of post-neonatal mortality were recorded for babies of single women (4.5/1000) than for women socially supported by a partner in a married or defacto relationship (1.4/1000) (Table 17).

**TABLE 17: POST-NEONATAL DEATHS BY MATERNAL RACE AND CONJUGAL STATE IN WESTERN AUSTRALIA IN 1995**

Conjugal State	Maternal Race									Total		
	Caucasian			Aboriginal			Other					
	No.	Births	Rate	No.	Births	Rate	No.	Births	Rate	No.	Births	Rate
Single	4	1855	2.2	7	497	14.1	-	100	-	11	2452	4.5
Married/defacto	20	19799	1.0	11	930	11.8	1	1833	0.5	32	22562	1.4
Other	1	197	5.0	1	19	52.6	-	11	-	2	227	8.8
<b>TOTAL</b>	<b>25</b>	<b>21851</b>	<b>1.1</b>	<b>19</b>	<b>1446</b>	<b>13.1</b>	<b>1</b>	<b>1944</b>	<b>0.5</b>	<b>45</b>	<b>25241</b>	<b>1.8</b>

Excludes births < 500 grams birthweight.

<sup>1</sup> Rate/1000 livebirths.

<sup>2</sup> Other includes separated, divorced and widowed.

### 5.3.3 Maternal Race and Parity

Less than one quarter (22.2%) of babies who died in the post-neonatal period were born to primiparous mothers, and a further 55.6% were to women with a parity of 1-2. The rates for these groups were 1.0/1000 for primiparous women, 2.0/1000 for women with parity 1-2, 3.2/1000 for women with parity 3-4 and 7.5/1000 for women with parity of 5 or more. (Table 18).

**TABLE 18 :** POST-NEONATAL DEATHS BY MATERNAL RACE AND PARITY IN WESTERN AUSTRALIA IN 1995

Parity	Maternal Race									Total		
	Caucasian			Aboriginal			Other					
	No.	Births	Rate	No.	Births	Rate	No.	Births	Rate	No.	Births	Rate
0	7	9030	0.8	3	387	7.8	-	832	-	10	10249	1.0
1-2	13	10894	1.2	11	619	17.8	1	913	1.1	25	12426	2.0
3-4	4	1693	2.4	3	299	10.0	-	175	-	7	2167	3.2
≥5	1	234	4.3	2	141	14.2	-	24	-	3	399	7.5
<b>TOTAL</b>	<b>25</b>	<b>21851</b>	<b>1.1</b>	<b>19</b>	<b>1446</b>	<b>13.1</b>	<b>1</b>	<b>1944</b>	<b>0.5</b>	<b>45</b>	<b>25241</b>	<b>1.8</b>

Excludes births < 500 grams birthweight.

<sup>1</sup> Rate/1000 livebirths.

### 5.3.4 Maternal Race and Plurality

Examination of the 45 post-neonatal deaths in 1995 by plurality revealed that for singleton births the rate was 1.8/1000 and for multiple births the rate was 2.9/1000 livebirths. Among twin babies the post-neonatal death rate was 3.0/1000 (Table 19).

**TABLE 19:** POST-NEONATAL DEATHS BY MATERNAL RACE AND PLURALITY IN WESTERN AUSTRALIA IN 1995

Plurality	Maternal Race									Total		
	Caucasian			Aboriginal			Other					
	No.	Births	Rate	No.	Births	Rate	No.	Births	Rate	No.	Births	Rate
Singleton	23	21223	1.1	19	1427	13.3	1	1908	0.5	43	24558	1.8
Twins	2	604	3.3	-	19	-	-	36	-	2	659	3.0
Triplets	-	24	-	-	-	-	-	-	-	-	24	-
<b>TOTAL</b>	<b>25</b>	<b>21851</b>		<b>19</b>	<b>1446</b>	<b>13.1</b>	<b>1</b>	<b>1944</b>	<b>0.5</b>	<b>45</b>	<b>25241</b>	<b>1.8</b>

Excludes births < 500 grams birthweight.

<sup>1</sup> Rate/1000 livebirths.

### 5.3.5 Maternal Race and Birthweight

Overall the trend was for post-neonatal mortality proportions to increase as birthweight fell. The post-neonatal rate for low birthweight babies of Aboriginal mothers (37.3/1000) was higher than the rate for low birthweight babies of Caucasian women (6.5/1000) (Table 20).

**TABLE 20: POST-NEONATAL MORTALITY BY MATERNAL RACE AND BIRTHWEIGHT DISTRIBUTION IN WESTERN AUSTRALIA IN 1995**

Birthweight (grams)	Maternal Race									Total		
	Caucasian			Aboriginal			Other					
	No.	Births	Rate	No.	Births	Rate	No.	Births	Rate	No.	Births	Rate
500-999	4	62	(64.5)	-	14	-	-	6	-	4	82	(48.8)
1000-1499	2	137	(14.6)	1	14	(71.4)	-	8	-	3	159	(18.9)
1500-1999	1	237	(4.2)	2	26	(76.9)	-	23	-	3	286	(10.5)
2000-2499	1	792	(1.3)	3	107	(28.0)	-	88	-	4	987	(4.1)
<2500	8	1228	6.5	6	161	37.3	-	125	-	14	1514	9.2
2500-2999	7	3253	2.2	5	348	14.4	1	428	(2.3)	13	4029	3.2
3000-3499	5	8065	0.6	3	532	(5.6)	-	848	-	8	9445	0.8
3500-3999	4	6819	(0.6)	5	302	16.6	-	429	-	9	7550	1.2
4000-4499	1	2159	(0.5)	-	94	-	-	100	-	1	2553	(0.4)
≥4500	-	329	-	-	9	-	-	14	-	-	350	-
<b>TOTAL</b>	<b>25</b>	<b>21851</b>	<b>1.1</b>	<b>19</b>	<b>1466</b>	<b>13.1</b>	<b>1</b>	<b>1944</b>	<b>(0.5)</b>	<b>45</b>	<b>25241</b>	<b>1.8</b>

Excludes births <500 grams birthweight.

<sup>1</sup> Rate/1000 livebirths.

( ) Where n<5 rate has been bracketed and should be treated with caution.

### 5.3.6 Causes of Post Neonatal Death

The major cause of post-neonatal deaths in Western Australia continued to be Sudden Infant Death Syndrome (42.2%) (Table 21). Sudden Infant Death Syndrome was largely responsible for an increase in the rate of post neonatal deaths of babies of Aboriginal mothers from 13.6/1000 in 1987 to 16.8/1000 in 1988. These rates reduced to 14.7/1000 in 1989 and 10.4/1000 in 1990, rose to 14.4/1000 in 1991 and reduced to 12.1/1000 in 1992 and 9.1/1000 in 1993 before rising to 14.7/1000 in 1994 and 13.1/1000 in 1995 (Table 41).

Lethal congenital malformation remained a significant known cause, to which 5 (11.1%) post-neonatal deaths were attributed. The percentage of post-neonatal deaths due to infection fell from 13.5% in 1988 and 13.0% in 1989 to 9.2% in 1990, then rose to 15.6% in 1991, 33.3% in 1992, 15.4% in 1993 and 23.0% in 1994 and 24.4% in 1995 (Table 21).



**TABLE 21 : CAUSE OF POST-NEONATAL DEATH BY MATERNAL RACE IN WESTERN AUSTRALIA IN 1995**

Cause of Death	Maternal Race						Total	
	Caucasian		Aboriginal		Other		No.	%
	No.	%	No.	%	No.	%		
Sudden Infant Death	12	48.0	6	31.6	1	100.0	19	42.2
Lethal Congenital Malformation	4	16.0	1	5.3	-	-	5	11.1
Extremely Low Birthweight (<1000g)	4	16.0	1	5.3	-	-	5	11.1
Infection - Respiratory	2	8.0	9	47.4	-	-	11	24.4
Infection - Meningitis	-	-	-	-	-	-	-	-
Infection - Other	-	-	-	-	-	-	-	-
Other	3	12.0	2	10.5	-	-	5	11.1
Unknown	1	-	-	-	-	-	-	-
<b>TOTAL</b>	<b>25</b>	<b>100.0</b>	<b>19</b>	<b>100.0</b>	<b>1</b>	<b>100.0</b>	<b>45</b>	<b>100.0</b>

Excludes births <500 grams birthweight.

### 5.3.7 Seasonal Incidence of Post-Neonatal Deaths

The highest percentages of post-neonatal deaths from Sudden Infant Death Syndrome were during the April - June and the October-December seasonal quarters of the year (Table 22).

**TABLE 22 CAUSE OF POST-NEONATAL DEATH BY SEASONAL INCIDENCE IN WESTERN AUSTRALIA IN 1995**

Cause of Death	Jan-Mar		Apr - Jun		Jul-Sep		Oct-Dec		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Sudden Infant Death	1	10.0	4	57.1	4	33.3	10	62.5	19	42.2
Lethal Congenital Malformation	2	20.0	1	14.3	1	8.3	1	6.3	5	11.1
Infection	2	20.0	1	14.3	5	41.7	3	18.8	11	24.4
Other/Unknown	5	50.0	1	14.3	2	16.7	2	12.5	10	22.2
<b>TOTAL</b>	<b>10</b>	<b>100.0</b>	<b>7</b>	<b>100.0</b>	<b>12</b>	<b>100.0</b>	<b>16</b>	<b>100.0</b>	<b>45</b>	<b>100.0</b>

Excludes births <500 grams birthweight.

SOURCE: MIDWIVES' NOTIFICATION SYSTEM  
REGISTRAR GENERAL'S OFFICE

## 6. PERINATAL MORTALITY IN WESTERN AUSTRALIA IN THE 1995 BIRTH COHORT

### 6.1 Perinatal Mortality

There were 187 perinatal deaths identified in the 1995 birth cohort which gave a perinatal mortality rate of 7.4/1000 total births (Table 3 and Table 23). This compares with rates of 10.2/1000 in 1989, 7.9/1000 in 1990, 8.1/1000 in 1991, 8.4/1000 in 1992, 7.3/1000 in 1993 and 7.9/1000 in 1994. Among babies born to Aboriginal women the rate (17.1/1000) was higher than for perinatal deaths of babies of Caucasian women (6.6/1000) and for perinatal deaths of babies born to women of other races (8.2/1000) (Table 23).

**TABLE 23 :** STILLBIRTHS, NEONATAL AND PERINATAL MORTALITY BY MATERNAL RACE IN WESTERN AUSTRALIA IN 1995

Type of Death	Maternal Race						Total	
	Caucasian		Aboriginal		Other			
	No.	Rate	No.	Rate	No.	Rate	No.	Rate
Stillbirths	106	4.8	13	8.9	9	4.6	128	5.0
Neonatal Mortality	40	1.8	12	8.3	7	3.6	59	2.3
Perinatal Mortality	146	6.6	25	17.1	16	8.2	187	7.4

Excludes births <500 grams birthweight.

<sup>1</sup> Stillbirth & Perinatal Death rate/1000 total births.

<sup>2</sup> Neonatal Death rate/1000 livebirths.

Perinatal deaths in relation to Health Zone of maternal residence are shown in Table 3. It should be noted however, that due to small numbers of births in each country division, the rates do vary on an annual basis (Table 3).

### 6.2 Maternal Race and Maternal Age

Perinatal mortality in 1995 was higher for babies of women aged 25 - 29 years, (8.1/1000) than for women of other age categories with the exception of the rate recorded (17.2/1000) among women aged 40 years or more. In accord with previous years, data shows that in general risk increases toward the extremes of the fertile age group.

Eleven (7.2/1000) perinatal deaths were among babies of women in their teenage years. Another 22 (6.8/1000) perinatal deaths were among babies of women aged 35 years or more (Table 24).

**TABLE 24 : PERINATAL DEATHS BY MATERNAL RACE AND MATERNAL AGE IN WESTERN AUSTRALIA IN 1995**

Maternal Age	Maternal Race									Total		
	Caucasian			Aboriginal			Other					
	No.	Births	Rate	No.	Births	Rate	No.	Births	Rate	No.	Births	Rate
≤15	-	19	-	-	43	-	-	2	-	-	64	-
16	1	99	10.1	-	53	-	-	6	-	1	158	6.3
17	1	202	5.0	-	74	-	-	13	-	1	289	3.5
18	2	320	6.3	-	92	-	-	15	-	2	427	4.7
19	6	466	12.9	1	96	10.4	-	25	-	7	587	11.9
≤19	9	1106	8.1	1	358	2.8	-	61	-	11	1525	7.2
20-24	25	4122	6.1	9	512	17.6	1	307	3.3	35	4941	7.1
25-29	50	7302	6.8	11	375	29.3	6	572	10.5	67	8249	8.1
30-34	45	6627	6.8	3	152	19.7	4	631	6.3	52	7410	7.0
35-39	11	2433	4.5	1	60	16.7	3	326	9.2	15	2819	5.3
40-44	5	352	14.2	-	2	-	2	54	37.0	7	408	17.2
≥45	-	15	-	-	-	-	-	2	-	-	17	-
<b>TOTAL</b>	<b>146</b>	<b>21957</b>	<b>6.6</b>	<b>25</b>	<b>1459</b>	<b>17.1</b>	<b>16</b>	<b>1953</b>	<b>8.2</b>	<b>187</b>	<b>25369</b>	<b>7.4</b>

Excludes births <500 grams birthweight.

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

### 6.3 Maternal Race and Parity

The perinatal mortality rates for babies born to primiparous women 7.5/1000 and babies born to women with a parity of 1-2 (7.1/1000) were lower than the rate of perinatal death (8.3/1000) recorded among babies of women with a parity of 3 or more (Table 25).

**TABLE 25 : PERINATAL DEATHS BY MATERNAL RACE AND PARITY IN WESTERN AUSTRALIA IN 1995**

Parity	Caucasian			Aboriginal			Other			Total		
	Total			Total			Total			Total		
	No.	Births	Rate	No.	Births	Rate	No.	Births	Rate	No.	Births	Rate
0	66	9082	7.3	6	388	15.5	5	835	6.0	77	10305	7.5
1-2	69	10942	6.3	10	626	16.0	10	919	10.9	89	12487	7.1
3-4	9	1698	5.3	8	304	26.3	1	175	5.7	18	2177	8.3
≥5	2	235	8.5	1	141	7.1	-	24	-	3	400	7.5
<b>TOTAL</b>	<b>146</b>	<b>21957</b>	<b>6.6</b>	<b>25</b>	<b>1459</b>	<b>17.1</b>	<b>16</b>	<b>1953</b>	<b>8.2</b>	<b>187</b>	<b>25369</b>	<b>7.4</b>

Excludes births < 500 grams birthweight.

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

#### 6.4 Maternal Race and Birthweight

More than three quarters (76.5%) of all perinatal deaths were babies of low birthweight (<2500 grams).

In general terms the perinatal mortality in all racial groups increased as birthweight fell, the exception being for babies in  $\geq 4000$  gram categories. Rates in races other than for babies of Caucasian women are based on small numbers and therefore statistically unreliable. (Table 26).

**TABLE 26: PERINATAL DEATHS BY MATERNAL RACE AND BIRTHWEIGHT DISTRIBUTION IN WESTERN AUSTRALIA IN 1995**

Birthweight (grams)	Maternal Race									Total		
	Caucasian			Aboriginal			Other					
	No.	Total Births	Rate	No.	Total Births	Rate	No.	Total Births	Rate	No.	Total Births	Rate
500-999	38	86	441.9	9	18	500.0	4	8	(500.0)	51	112	455.4
1000-1499	16	148	108.1	3	16	(187.5)	-	8	-	19	172	110.5
1500-1999	17	251	67.7	5	29	172.4	4	26	(153.8)	26	306	85.0
2000-2499	23	807	28.5	-	107	-	3	90	(33.3)	26	1004	25.9
<2500	94	1292	72.8	17	170	100.0	11	132	83.3	122	1594	76.5
2500-2999	16	3264	4.9	4	350	(16.0)	2	429	(4.7)	22	4043	5.4
3000-3499	25	8086	3.1	1	532	(1.9)	-	848	-	26	9466	2.7
3500-3999	7	6825	1.0	2	303	(6.6)	1	429	(2.3)	10	7557	1.3
4000-4499	2	2161	(0.9)	1	95	(10.5)	1	100	(10.0)	4	2356	(1.7)
$\geq 4500$	2	329	(6.1)	-	9	-	1	15	(66.7)	3	353	(8.5)
<b>TOTAL</b>	<b>146</b>	<b>21957</b>	<b>6.6</b>	<b>25</b>	<b>1459</b>	<b>17.1</b>	<b>16</b>	<b>1953</b>	<b>8.2</b>	<b>187</b>	<b>25369</b>	<b>7.4</b>

Excludes births <500 grams birthweight.

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

( ) Where  $n < 5$  rate has been bracketed.

#### 6.5 Maternal Race and Babies' Sex

There were 105 (8.0/1000) male and 82 (6.7/1000) female perinatal deaths among those babies born in 1995.

Among babies born to Caucasian women the perinatal death rate for males (7.0/1000) was higher than the perinatal death rate for females (6.2/1000). The rate of perinatal deaths among male babies of Aboriginal woman (19.8/1000) was higher than the perinatal death rate for females (14.2/1000) and among babies of women of other races the rates were 10.0/1000 male and 6.3/1000 female (Table 27).

**TABLE 27 : PERINATAL DEATHS BY MATERNAL RACE AND SEX IN WESTERN AUSTRALIA IN 1995**

Sex	Maternal Race									Total		
	Caucasian			Aboriginal			Other					
	No.	Births	Rate	No.	Births	Rate	No.	Births	Rate	No.	Births	Rate
Male	80	11350	7.0	15	757	19.8	10	997	10.0	105	13104	8.0
Female	66	10607	6.2	10	702	14.2	6	956	6.3	82	12265	6.7
<b>TOTAL</b>	<b>146</b>	<b>21957</b>	<b>6.6</b>	<b>25</b>	<b>1459</b>	<b>17.1</b>	<b>16</b>	<b>1953</b>	<b>8.2</b>	<b>187</b>	<b>25369</b>	<b>7.4</b>

Excludes births <500 grams birthweight.

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

### 6.6 Maternal Race and Conjugal State

One sixth (16.0/1000) of perinatal deaths were among babies of women reported as socially unsupported by a partner. This represents an increase since the 1994 cohort report (12.0/1000). The increasing social acceptance of defacto relationships may influence reporting (Table 28).

**TABLE 28 : PERINATAL DEATHS BY MATERNAL RACE AND CONJUGAL STATE IN WESTERN AUSTRALIA IN 1995**

Conjugal State	Maternal Race									Total		
	Caucasian			Aboriginal			Other					
	No.	Births	Rate	No.	Births	Rate	No.	Births	Rate	No.	Births	Rate
Single	16	1868	8.6	9	503	17.9	2	101	19.8	27	2472	10.9
Married/defacto	127	19890	6.4	16	937	17.1	14	1841	7.6	157	22668	6.9
<sup>2</sup> Other	3	199	15.1	-	19	-	-	11	-	3	229	13.1
<b>TOTAL</b>	<b>146</b>	<b>21957</b>	<b>6.6</b>	<b>25</b>	<b>1459</b>	<b>17.1</b>	<b>16</b>	<b>1953</b>	<b>8.2</b>	<b>187</b>	<b>25369</b>	<b>7.4</b>

Excludes births <500 grams birthweight.

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

<sup>2</sup> Other includes separated, divorced and widowed.

## 7. INFANT MORTALITY IN WESTERN AUSTRALIA IN THE 1995 BIRTH COHORT

### 7.1 Infant Deaths

There were 104 infant deaths identified amongst the 25241 livebirths in 1995. Of these, 59 were neonatal deaths and 45 were post-neonatal deaths. The infant mortality rate for Western Australia in 1995 was 4.1/1000 livebirths, a decrease from the rate of 5.2/1000 in 1994 (Tables 15 and 29).

Infant mortality among babies born to Aboriginal women (21.4/1000) was more than six times that for babies born to non-Aboriginal women (Table 41, Figure V). The difference between these groups reduced from 18.9/1000 in 1985, 12.5/1000 in 1986, 11.7/1000 in 1987, 22.5/1000 in 1988, 15.5/1000 in 1989, 10.2/1000 in 1990, then rose to 14.2/1000 in 1991, 16.7/1000 in 1992 and decreased to 10/1000 in 1993 before increasing again to 15.3/1000 in 1994 and 18.3/1000 in 1995 (Table 41).

### 7.2 Maternal Race and Maternal Age

The infant mortality rate is greatest for babies of teenage women (5.9/1000). The infant mortality rate for babies of Aboriginal teenage mothers (19.6/1000) was higher than that for babies of Caucasian teenage mothers (1.8/1000) (Table 29).

TABLE 29 : INFANT DEATHS BY MATERNAL RACE AND MATERNAL AGE IN WESTERN AUSTRALIA IN 1995

Maternal Age	Maternal Race									Total		
	Caucasian			Aboriginal			Other					
	No.	Live Births	Rate	No.	Live Births	Rate	No.	Live Births	Rate	No.	Live Births	Rate
≤15	-	19	-	-	43	-	-	2	-	-	64	-
16	-	98	-	2	53	37.7	-	6	-	2	157	12.7
17	-	201	-	2	74	27.0	-	13	-	2	288	6.9
18	1	318	3.1	1	92	10.9	-	15	-	2	425	4.7
19	1	461	2.2	2	96	20.8	-	25	-	3	582	5.2
≤19	2	1097	1.8	7	358	19.6	-	61	-	9	1516	5.9
20-24	13	4102	3.2	12	508	23.6	1	307	3.3	26	4917	5.3
25-29	23	7269	3.2	10	370	27.0	4	569	7.0	37	8208	4.5
30-34	18	6595	2.7	1	149	6.7	1	628	1.6	20	7372	2.7
35-39	8	2426	3.3	1	59	16.9	1	324	3.1	10	2809	3.6
40-44	1	347	2.9	-	2	-	1	53	18.9	2	402	5.0
≥45	-	15	-	-	-	-	-	2	-	-	17	-
<b>TOTAL</b>	<b>65</b>	<b>21851</b>	<b>3.0</b>	<b>31</b>	<b>1446</b>	<b>21.4</b>	<b>8</b>	<b>1944</b>	<b>4.1</b>	<b>104</b>	<b>25241</b>	<b>4.1</b>

Excludes births <500 grams birthweight.

<sup>1</sup> Rate/1000 livebirths.

### 7.3 Maternal Race and Conjugal State

The infant mortality rate (9.2/1000) among babies born to single, separated, divorced or widowed women is greater than the rate for babies of women reported to be in a married or defacto relationship (3.7/1000) (Table 30).

**TABLE 30** INFANT DEATHS BY MATERNAL RACE AND CONJUGAL STATE IN WESTERN AUSTRALIA IN 1995

Congugal State	Maternal Race									Total		
	Caucasian			Aboriginal			Other					
	No.	Live Births	Rate	No.	Live Births	Rate	No.	Live Births	Rate	No.	Live Births	Rate
Single	7	1855	3.8	10	497	20.1	1	100	10.0	18	2452	7.3
Married/defacto	56	19799	2.8	20	930	21.5	7	1833	3.8	83	22562	3.7
Other	2	197	10.2	1	19	52.6	-	11	-	3	227	13.2
<b>TOTAL</b>	<b>65</b>	<b>21851</b>	<b>3.0</b>	<b>31</b>	<b>1446</b>	<b>21.4</b>	<b>8</b>	<b>1944</b>	<b>4.1</b>	<b>104</b>	<b>25241</b>	<b>4.1</b>

Excludes births <500 grams birthweight.

<sup>1</sup> Rate/1000 livebirths.

<sup>2</sup> Other includes separated, divorced and widowed.

### 7.4 Maternal Race and Parity

Overall, the highest rate of infant death was recorded among babies of women whose parity was 3 or more (7.8/1000).

**TABLE 31 :** INFANT DEATHS BY MATERNAL RACE AND PARITY IN WESTERN AUSTRALIA IN 1995

Parity	Maternal Race									Total		
	Caucasian			Aboriginal			Other					
	No.	Live Births	Rate	No.	Live Births	Rate	No.	Live Births	Rate	No.	Live Births	Rate
0	21	9030	2.3	8	387	20.7	2	832	2.4	31	10249	3.0
1-2	34	10894	3.1	14	619	22.6	5	913	5.5	53	12426	4.3
3-4	8	1693	4.7	6	299	20.1	1	175	5.7	15	2167	6.9
≥5	2	234	8.5	3	141	21.3	-	24	-	5	399	12.5
<b>TOTAL</b>	<b>65</b>	<b>21851</b>	<b>3.0</b>	<b>31</b>	<b>1446</b>	<b>21.4</b>	<b>8</b>	<b>1944</b>	<b>4.1</b>	<b>104</b>	<b>25241</b>	<b>4.1</b>

Excludes births < 500 grams birthweight.

<sup>1</sup> Rate/1000 livebirths.

### 7.5 Maternal Race and Plurality

Infant mortality for twins (10.6/1000) was more than double the rate for singleton births (3.9/1000). The infant death rate (8.3/1000) for twin babies born to Caucasian women in 1995 was lower than the rate (18.3/1000) in 1994 (Table 32).

**TABLE 32: INFANT DEATHS BY MATERNAL RACE AND PLURALITY IN WESTERN AUSTRALIA IN 1995**

Plurality	Maternal Race									Total		
	Caucasian			Aboriginal			Other					
	No.	Live Births	Rate	No.	Live Births	Rate	No.	Live Births	Rate	No.	Live Births	Rate
Singleton	59	21223	2.8	29	1427	20.3	8	1908	4.2	96	24558	3.9
Twins	5	604	8.3	2	19	105.3	-	36	-	7	659	10.6
Triplets	1	24	41.7	-	-	-	-	-	-	1	24	41.7
<b>TOTAL</b>	<b>62</b>	<b>21851</b>	<b>3.0</b>	<b>31</b>	<b>1446</b>	<b>21.4</b>	<b>8</b>	<b>1944</b>	<b>4.1</b>	<b>104</b>	<b>25241</b>	<b>4.1</b>

Excludes births < 500 grams birthweight.

<sup>1</sup> Rate/1000 livebirths.

### 7.6 Maternal Race and Babies' Sex

The infant death rates were 5.0/1000 male and 3.2/1000 female. Among babies born to Caucasian women the infant death rate for males (3.6/1000) was higher than the infant death rate for females (2.3/1000). For babies of Aboriginal mothers the infant death rate for males (25.4/1000) was higher than the infant death rate for females (17.2/1000) and for infants of women of other races the infant death rate for males (5.0/1000) was higher than the infant death rate for females (3.2/1000) (Table 33).

**TABLE 33 : INFANT DEATHS BY MATERNAL RACE AND SEX IN WESTERN AUSTRALIA IN 1995**

Sex	Maternal Race									Total		
	Caucasian			Aboriginal			Other					
	No.	Live Births	Rate	No.	Live Births	Rate	No.	Live Births	Rate	No.	Live Births	Rate
Male	41	11299	3.6	19	749	25.4	5	992	5.0	65	13040	5.0
Female	24	10552	2.3	12	697	17.2	3	952	3.2	39	12201	3.2
<b>TOTAL</b>	<b>65</b>	<b>21851</b>	<b>3.0</b>	<b>31</b>	<b>1446</b>	<b>21.4</b>	<b>8</b>	<b>1944</b>	<b>4.1</b>	<b>104</b>	<b>25241</b>	<b>4.1</b>

Excludes births <500 grams birthweight.

<sup>1</sup> Rate/1000 livebirths.

### 7.7 Maternal Race and Birthweight

Low birthweight (less than 2500 grams) babies comprised more than half (53.8%) of all infant deaths. A rate of 37.0/1000 livebirths was recorded for low birthweight babies. Babies with birthweight between 3000-3499 grams had the highest chance of survival with an infant mortality rate of 1.4/1000. An infant mortality rate (87.0/1000) for low birthweight babies of Aboriginal women was higher than the rate (30.9/1000) for low birthweight babies of Caucasian women (Table 34).



**TABLE 34: INFANT MORTALITY BY MATERNAL RACE AND BIRTHWEIGHT DISTRIBUTION IN WESTERN AUSTRALIA IN 1995**

Birth weight (grams)	Maternal Race									Total		
	Caucasian			Aboriginal			Other					
	No.	Live Births	Rate	No.	Live Births	Rate	No.	Live Births	Rate	No.	Live Births	Rate
500-999	18	62	290.3	5	14	357.1	2	6	(333.3)	25	82	304.9
1000-1499	7	137	51.1	2	14	(142.9)	-	8	-	9	159	56.6
1500-1999	4	237	(16.9)	4	26	(153.8)	1	23	(43.5)	9	286	31.5
2000-2499	9	792	11.4	3	107	(28.0)	1	88	(11.4)	13	987	13.2
<2500	38	1228	30.9	14	161	87.0	4	125	(32.0)	56	1514	37.0
2500-2999	12	3253	3.7	7	348	20.1	2	428	(4.7)	21	4029	5.2
3000-3499	9	8065	1.1	4	532	(7.5)	-	848	-	13	9445	1.4
3500-3999	5	6819	0.7	6	302	19.9	1	429	(2.3)	12	7550	1.6
4000-4499	1	2159	(0.5)	-	94	-	1	100	(10.0)	2	2353	(0.9)
≥4500	-	327	-	-	9	-	-	14	-	-	350	-
<b>TOTAL</b>	<b>65</b>	<b>21851</b>	<b>3.0</b>	<b>31</b>	<b>1446</b>	<b>21.4</b>	<b>8</b>	<b>1944</b>	<b>4.1</b>	<b>104</b>	<b>25241</b>	<b>4.1</b>

Excludes births <500 grams birthweight.

<sup>1</sup> Rate/1000 livebirths.

( ) Where n<5 rate has been bracketed.

## 7.8 Maternal Race and Age at Infant Death

More than half (58.7%) of the infant deaths occurred in the first four weeks, with most (85.6%) deaths occurring within 24 weeks of birth (Table 35).

**TABLE 35 : INFANT DEATHS BY MATERNAL RACE AND AGE AT DEATH IN WESTERN AUSTRALIA IN 1995**

Age at Death in Weeks	Maternal Race						Total	
	Caucasian		Aboriginal		Other			
	No.	%	No.	%	No.	%	No.	%
1-4	41	63.1	13	41.9	7	87.5	61	58.7
5-8	7	10.8	4	12.9	-	-	11	10.6
9-12	2	3.1	-	-	-	-	2	1.9
13-16	3	4.6	5	16.1	-	-	8	7.7
17-20	3	4.6	1	3.2	1	12.5	5	4.8
21-24	1	1.5	1	3.2	-	-	2	1.9
25-52	8	12.3	7	22.6	8	-	15	14.4
<b>TOTAL</b>	<b>65</b>	<b>100.0</b>	<b>31</b>	<b>100.0</b>	<b>8</b>	<b>100.0</b>	<b>104</b>	<b>100.0</b>

Excludes births <500 grams birthweight.

## 7.9 Causes of Infant Death

The major causes of infant deaths remain lethal congenital malformations for 27 (26.0%) babies, Sudden Infant Death Syndrome for 22 (21.2%) and low birthweight (<2500 grams) for 32 (30.8%) babies. Infection remained a significant cause of infant mortality (Table 36).

**TABLE 36 : CAUSE OF INFANT DEATHS AND MATERNAL RACE IN WESTERN AUSTRALIA IN 1995**

Cause of Death	Maternal Race						Total	
	Caucasian		Aboriginal		Other			
	No.	%	No.	%	No.	%	No.	%
Lethal Congenital Malformation	19	29.2	3	9.7	5	62.5	27	26.0
Low Birth Weight (<2500g)	24	36.9	7	22.6	1	12.5	32	30.8
Asphyxia	1	1.5	-	-	-	-	1	1.0
Pregnancy conditions	-	-	2	6.5	-	-	2	1.9
Infections	2	3.1	9	29.0	-	-	11	10.6
Hydrops fetalis	-	-	-	-	-	-	-	-
Other	4	6.2	3	9.7	-	-	7	6.7
Sudden Infant Deaths	13	20.0	7	22.6	2	25.0	22	21.2
Unknown	2	3.1	-	-	-	-	2	1.9
<b>TOTAL</b>	<b>65</b>	<b>100.0</b>	<b>31</b>	<b>100.0</b>	<b>8</b>	<b>100.0</b>	<b>104</b>	<b>100.0</b>

Excludes births <500 grams birthweight.

**TABLE 37 : NEONATAL, POST-NEONATAL AND INFANT MORTALITY BY MATERNAL RACE IN WESTERN AUSTRALIA IN 1995**

Type of Death	Maternal Race						Total	
	Caucasian		Aboriginal		Other			
	No.	Rate	No.	Rate	No.	Rate	No.	Rate
Neonatal Mortality	40	1.8	12	8.3	7	3.6	59	2.3
Post-Neonatal Mortality	25	1.1	19	13.1	1	0.5	45	1.8
Infant Mortality	65	3.0	31	21.4	8	4.1	104	4.1

Excludes births <500 grams birthweight.

Neonatal, post-neonatal and infant mortality rates/1000 livebirths.

TABLE 38 : PERINATAL AND INFANT MORTALITY BY MATERNAL AGE, PLURALITY AND SEX IN WESTERN AUSTRALIA IN 1995

Conjugal	Perinatal Mortality						Infant Mortality										
	Aboriginal		Non-Aboriginal		Total		Aboriginal		Non-Aboriginal		Total						
	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate					
<u>Maternal</u>																	
Age																	
≤15	-	43	-	42	-	64	-	43	-	21	-	64	-	-	-	-	-
16-19	1	315	(3.2)	10	1146	8.7	11	315	22.2	2	1137	1.8	2	1137	1.8	9	1452
20-29	20	887	22.5	82	12303	6.7	102	878	25.1	41	12247	3.3	63	12247	3.3	63	13125
30-39	4	212	(18.9)	63	10017	6.3	67	208	(9.6)	28	9973	2.8	30	9973	2.8	30	10181
≥40	-	2	-	7	423	16.5	7	2	-	2	417	(4.8)	2	417	(4.8)	2	419
Total	25	1459	17.1	162	23910	6.8	187	1446	21.4	31	23795	3.1	104	23795	3.1	104	25241
<u>Plurality</u>																	
Singleton	23	1440	16.0	148	23236	6.4	171	1427	20.3	29	23131	2.9	67	23131	2.9	96	24558
Multiple	2	19	(105.3)	14	674	20.8	16	19	(105.3)	2	664	9.0	6	664	9.0	8	683
Total	25	1459	17.1	162	23910	6.8	187	1446	21.4	31	23795	3.1	73	23795	3.1	104	25241
<u>Sex</u>																	
Male	15	757	19.8	90	12347	7.3	105	749	25.4	19	12291	3.7	46	12291	3.7	65	13040
Female	10	702	14.2	72	11563	6.2	82	697	17.2	12	11504	2.3	27	11504	2.3	39	12201
Total	25	1459	17.1	162	23910	6.8	187	1446	21.4	31	23795	3.1	73	23795	3.1	104	25241

Excludes births <500 grams birthweight.

<sup>1</sup> Perinatal death rate/1000 total births.

<sup>2</sup> Infant death rate/1000 livebirths.

( ) Where n<5 rate has been bracketed.

## 8. TRENDS IN BIRTHS, PERINATAL AND INFANT MORTALITY IN WESTERN AUSTRALIA 1980 - 1995

### 8.1 Crude Birth Rates and Total Births 1980 - 1995

Over the past decade, the crude birth rate for Western Australia has gradually reduced from 16.3/1000 in 1985 to 14.6/1000 in 1995 (Table 39).

Among Aboriginal women, the crude birth rate remained relatively stable ranging between 29.7/1000 and 35.5/1000. These rates remain approximately twice the rates for non-Aboriginal women (Table 39, Figure VI).

**TABLE 39 : CRUDE BIRTH RATES FOR ABORIGINAL AND NON-ABORIGINAL WESTERN AUSTRALIAN BIRTHS 1980-1995**

Year	Aboriginal			Non-Aboriginal			Total		
	Live Births	Popn	Crude Birth Rate	Live Births	Popn	Crude Birth Rate	Live Births	Popn	Crude Birth Rate
*1980	1029	32598	31.6	19595	1236470	15.8	20624	1269068	16.2
1981	1093	31351	34.9	20948	1268705	16.5	22041	1300056	17.0
1982	1113	32874	33.9	21071	1306025	16.1	22184	1338899	16.6
1983	1135	34395	33.0	21737	1334655	16.3	22872	1369050	16.7
1984	1176	35919	32.7	21607	1355318	15.9	22783	1391237	16.4
1985	1235	37440	33.0	21903	1381124	15.9	23138	1418564	16.3
1986	1230	38964	31.6	22463	1420055	15.8	23693	1455923	16.3
1987	1328	39948	33.2	22676	1456300	15.6	24004	1493041	16.1
1988	1428	41028	34.8	23534	1494139	15.8	24962	1531841	16.3
1989	1430	42093	34.0	23913	1536341	15.6	25343	1574986	16.1
1990	1537	43251	35.5	24289	1569798	15.5	25826	1609528	16.0
1991	1462	44325	33.0	23339	1591742	14.7	24801	1636067	15.2
1992	1409	45385	31.0	23734	1611965	14.7	25143	1657350	15.2
1993	1432	46492	30.8	23711	1629928	14.5	25143	1676420	15.0
1994	1427	47352	30.1	23783	1653712	14.4	25210	1701064	14.8
1995	1446	48721	29.7	23795	1682442	14.1	25241	1731163	14.6

SOURCE : Livebirths - MIDWIVES' NOTIFICATION SYSTEM  
 Population data - ESTIMATED RESIDENT POPULATION BY AGE, SEX AND ABORIGINALITY  
 1981-1995, Health Statistics, Health Information Centre, HDWA 1994  
 \*1980 population data - Australian Bureau Of Statistics - Cat. No. 3201.0.

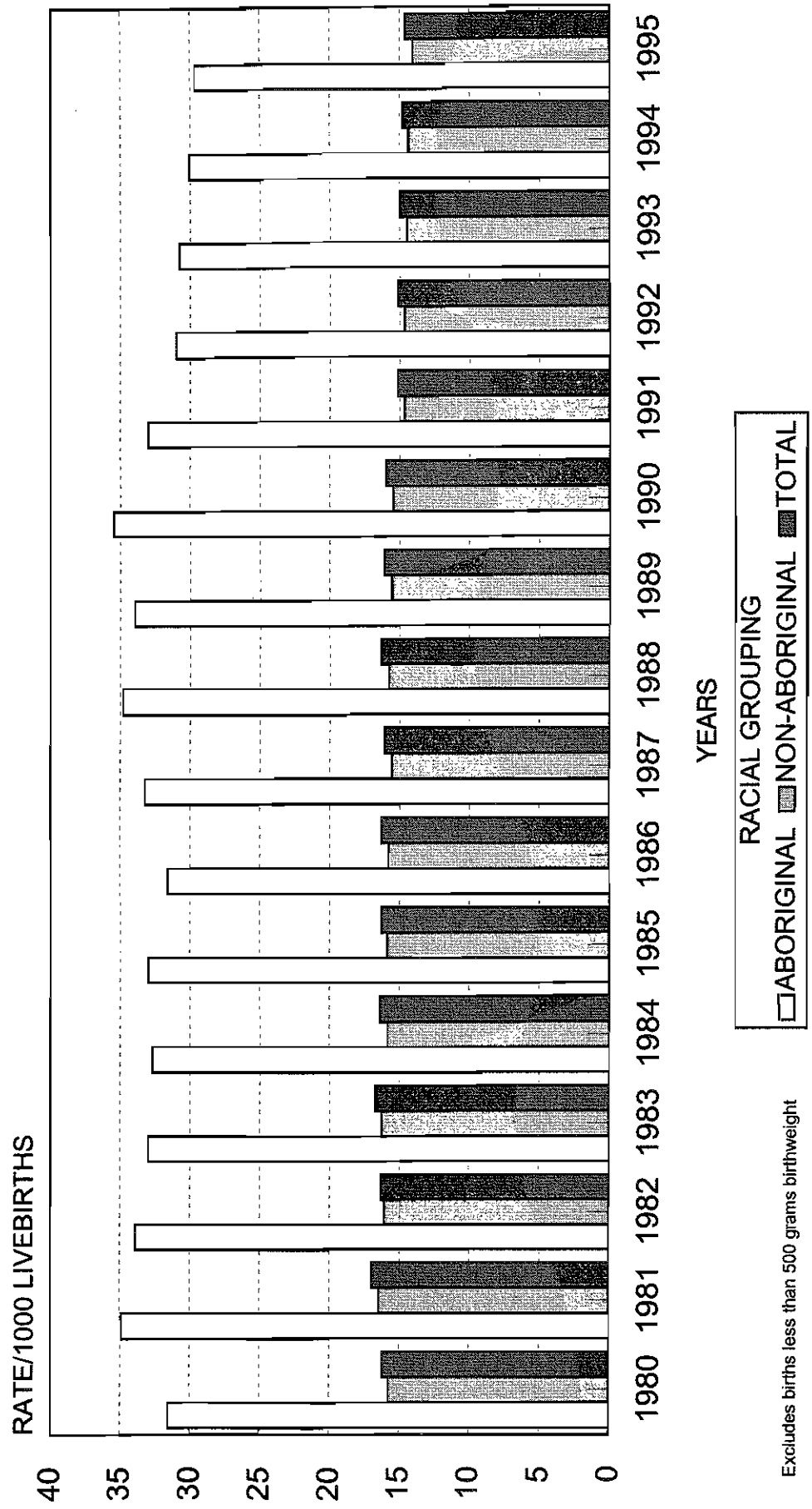
#### 8.2.1 Stillbirths, Neonatal and Perinatal Mortality 1980 - 1995

Western Australian stillbirth rates showed a general downward trend from 7.5/1000 total births in 1980 to 5.0/1000 in 1995 (Table 40).

Consideration of stillbirth rates and racial groups showed stillbirths among babies of non-Aboriginal women followed this trend while the rates decreased from 7.2/1000 in 1980 to 4.8/1000 in 1995. Among babies of Aboriginal women, stillbirth rates were less consistent in their decline and remained approximately double the rate for stillbirths among babies of non-Aboriginal women (Table 40).

FIGURE VI

**CRUDE BIRTH RATES AND RACIAL GROUPING  
FOR WESTERN AUSTRALIAN BIRTHS, 1980-1995**



Excludes births less than 500 grams birthweight

FIGURE VII

**STILLBIRTH PROPORTIONS AND RACIAL GROUPING OF BIRTHS IN W.A. 1980-1995**

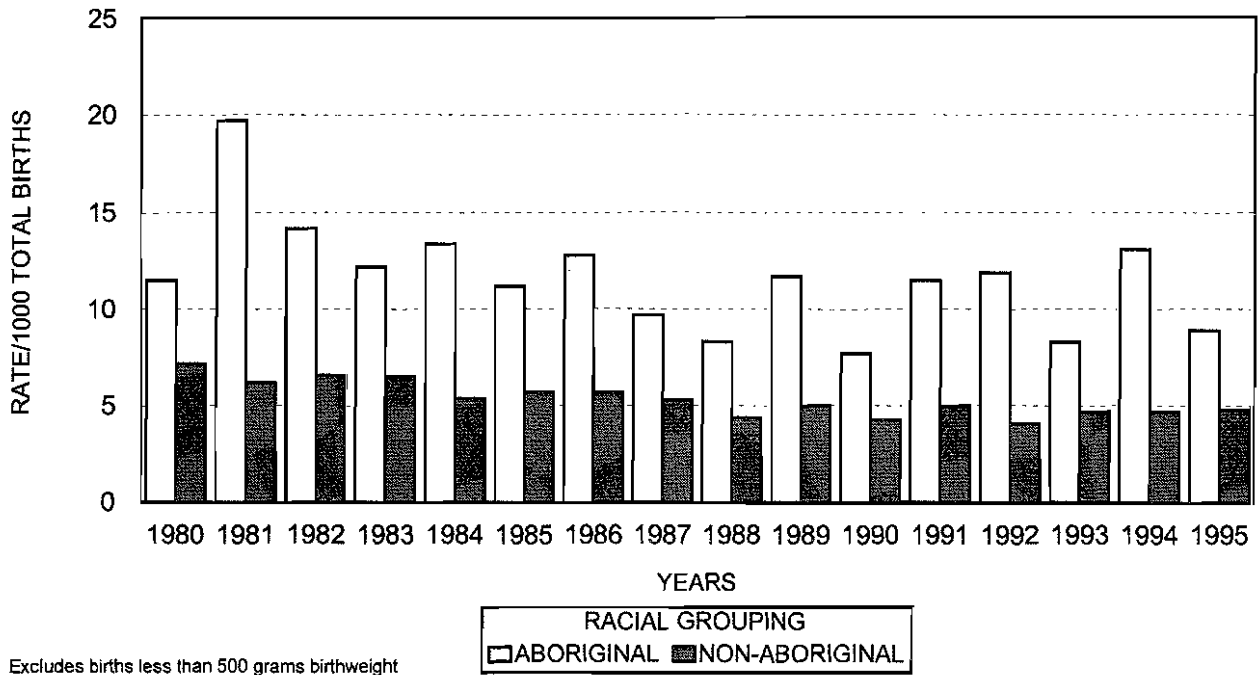


FIGURE VIII

**PERINATAL MORTALITY AND RACIAL GROUPING FOR WESTERN AUSTRALIAN BIRTHS, 1980-1995**

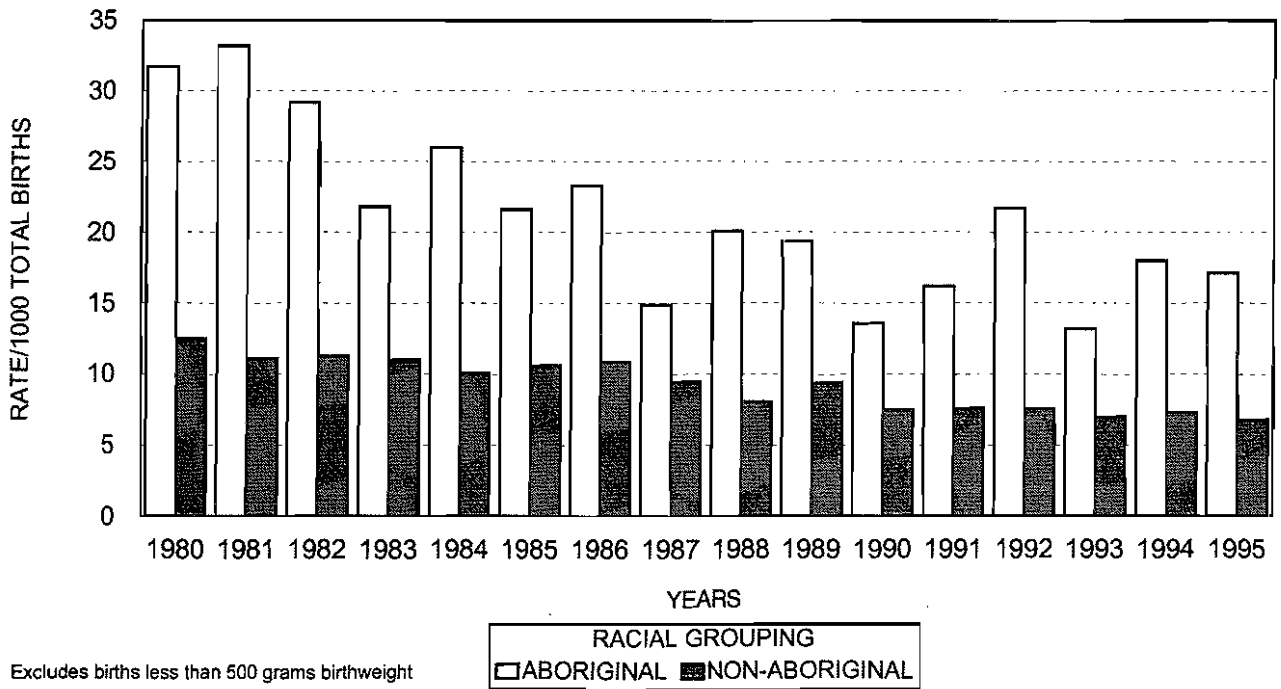


TABLE 40: STILLBIRTHS, NEONATAL AND PERINATAL MORTALITY FOR ABORIGINAL AND NON-ABORIGINAL BIRTHS IN WESTERN AUSTRALIA 1980-1995

Year	Stillbirths			Neonatal Mortality			Perinatal Mortality		
	Aboriginal	Non-Aboriginal	Total	Aboriginal	Non-Aboriginal	Total	Aboriginal	Non-Aboriginal	Total
	No. (1)	No. (1)	No. (1)	No. (2)	No. (2)	No. (2)	No. (3)	No. (3)	No. (3)
1980	12	143	155	21	104	125	33	247	280
1981	22	131	153	15	103	118	37	234	271
1982	16	139	155	17	101	118	33	240	273
1983	14	143	157	11	97	108	25	240	265
1984	16	118	134	15	101	116	31	219	250
1985	14	136	150	13	96	109	27	232	259
1986	16	130	146	13	116	129	29	246	275
1987	13	121	134	7	96	103	20	217	237
1988	12	105	117	17	87	104	29	192	221
1989	17	121	138	11	110	121	28	231	259
1990	12	106	118	9	78	87	21	184	205
1991	17	117	134	7	61	68	24	178	202
1992	17	98	115	14	83	97	31	181	212
1993	12	111	123	7	55	62	19	166	185
1994	19	112	131	7	62	69	26	174	200
1995	13	115	128	12	47	59	25	162	187

Excludes births <500 grams birthweight.

1980 - 1983 based on year of death.

1984 - 1995 based on year of birth.

(1) Stillbirth Rates/1000 total births.

(2) Neonatal Mortality Rate/1000 livebirths.

(3) Perinatal Mortality Rate/1000 total births.

SOURCE: MIDWIVES' NOTIFICATION SYSTEM  
REGISTRAR GENERAL'S OFFICE

### 8.2.2 Neonatal Mortality

The neonatal mortality rate for babies born to Aboriginal women remained higher than the neonatal mortality rate for babies born to non-Aboriginal women.

The rate of neonatal mortality among babies of Aboriginal women has reduced during the fifteen year period from 1980-1995. The rate of 20.4/1000 livebirths in 1980 reduced to 8.3/1000 livebirths in 1995. For babies of non-Aboriginal women, neonatal mortality rates reduced from 5.3/1000 in 1980 to 2.0/1000 in 1995 (Table 40, Figure IX).

### 8.2.3 Perinatal Mortality

Comparison of perinatal mortality for 1985-95, the eleven years where the birth cohort method was employed, showed that overall the rate has decreased from 11.1/1000 total births in 1985 to 7.4/1000 in 1995. Overall a reduction of 6.1/1000 (13.5/1000 in 1980 to 7.4/1000 in 1995) occurred over sixteen years. It was apparent that the reduction in the perinatal mortality among babies of Aboriginal women from 31.7/1000 in 1980 to 17.1/1000 in 1995, was greater than among babies born to non-Aboriginal women over the same period (Table 40).

## 8.3 Neonatal, Post-neonatal and Infant Mortality 1980 - 1994

Over the sixteen year period from 1980 to 1995 neonatal and infant mortality rates reduced in Western Australia. Post-neonatal mortality rates showed minimal change over the same period. The neonatal mortality rate reduced from 6.1/1000 in 1980 to 2.3/1000 in 1995. Rates for post-neonatal deaths decreased slightly from 3.2/1000 in 1980 to 1.8/1000 in 1995 and infant mortality rates reduced from 9.3/1000 in 1980 to 4.1/1000 in 1995 (Table 41, Figure X, Figure XI).

Among babies of Aboriginal women a reduction in infant mortality from 31.1/1000 in 1980 to 18.8/1000 in 1987 was shown. The rate increased again to 28.7/1000 in 1988 and 22.4/1000 in 1989 but then decreased to 16.3/1000 in 1990, 19.2/1000 in 1991, 22.0/1000 in 1992, 14.0/1000 in 1993, 19.6/1000 in 1994 and rose again to 21.4/1000 in 1995 (Table 41, Figure XI).

Infant mortality rates among babies of Aboriginal women are more than six times the rate for babies of non-Aboriginal women, the differences in age at death (Table 35) and the cause of death (Table 36) should be noted. The rate of deaths of babies born to Aboriginal women during the post-neonatal period (13.1/1000) was eleven times the rate of deaths among babies of non-Aboriginal women (1.1/1000)(Table 41).



TABLE 41 : NEONATAL, POST-NEONATAL AND INFANT MORTALITY FOR ABORIGINAL AND NON-ABORIGINAL BIRTHS IN WESTERN AUSTRALIA 1980-1995

Year	Neonatal Mortality			Post-Neonatal Mortality			Infant Mortality		
	Aboriginal	Non-Aboriginal	Total	Aboriginal	Non-Aboriginal	Total	Aboriginal	Non-Aboriginal	Total
	No. (1)	No. (1)	No. (1)	No. (1)	No. (1)	No. (1)	No. (1)	No. (1)	No. (1)
1980	21	104	125	11	55	66	32	159	191
1981	15	103	118	6	63	69	21	166	187
1982	17	101	118	11	69	80	28	170	198
1983	11	97	108	17	59	76	28	156	184
1984	15	101	116	14	75	89	29	176	205
1985	13	96	109	19	58	77	32	154	186
1986	13	116	129	12	59	71	25	175	200
1987	7	96	103	18	64	82	25	160	185
1988	17	87	104	24	58	82	41	145	186
1989	11	110	121	21	56	77	32	166	198
1990	9	78	87	16	71	87	25	149	174
1991	7	61	68	21	56	77	28	117	145
1992	14	83	97	17	43	60	31	126	157
1993	7	55	62	13	39	52	20	94	114
1994	7	62	69	21	40	61	28	102	130
1995	12	47	59	19	26	45	31	73	104

Excludes births <500 grams birthweight.

1980 - 1983 based on year of death.

1984 - 1995 based on year of birth.

(1) Neonatal, Post-Neonatal and Infant Mortality Rate/1000 livebirths.

SOURCE : MIDWIVES' NOTIFICATION SYSTEM  
REGISTRAR GENERAL'S OFFICE

FIGURE IX

**NEONATAL MORTALITY AND RACIAL GROUPING  
FOR WESTERN AUSTRALIAN BIRTHS, 1980-1995**

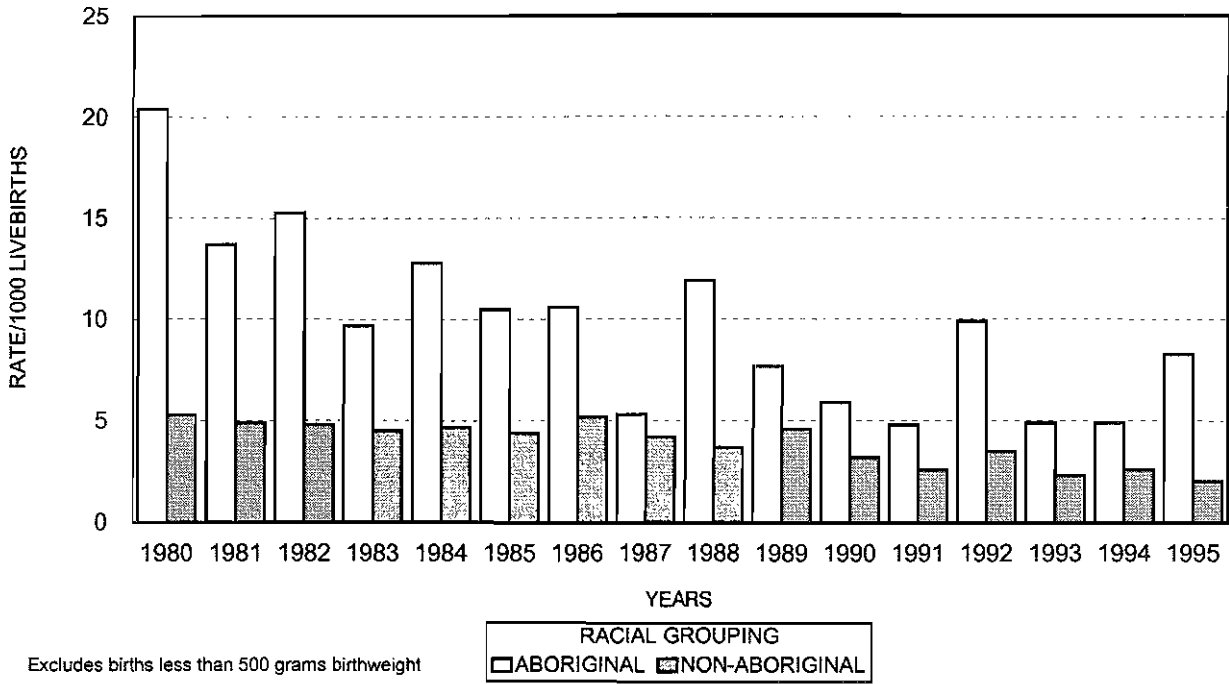


FIGURE X

**POSTNEONATAL MORTALITY, RACIAL GROUPING  
FOR WESTERN AUSTRALIAN BIRTHS, 1980-1995**

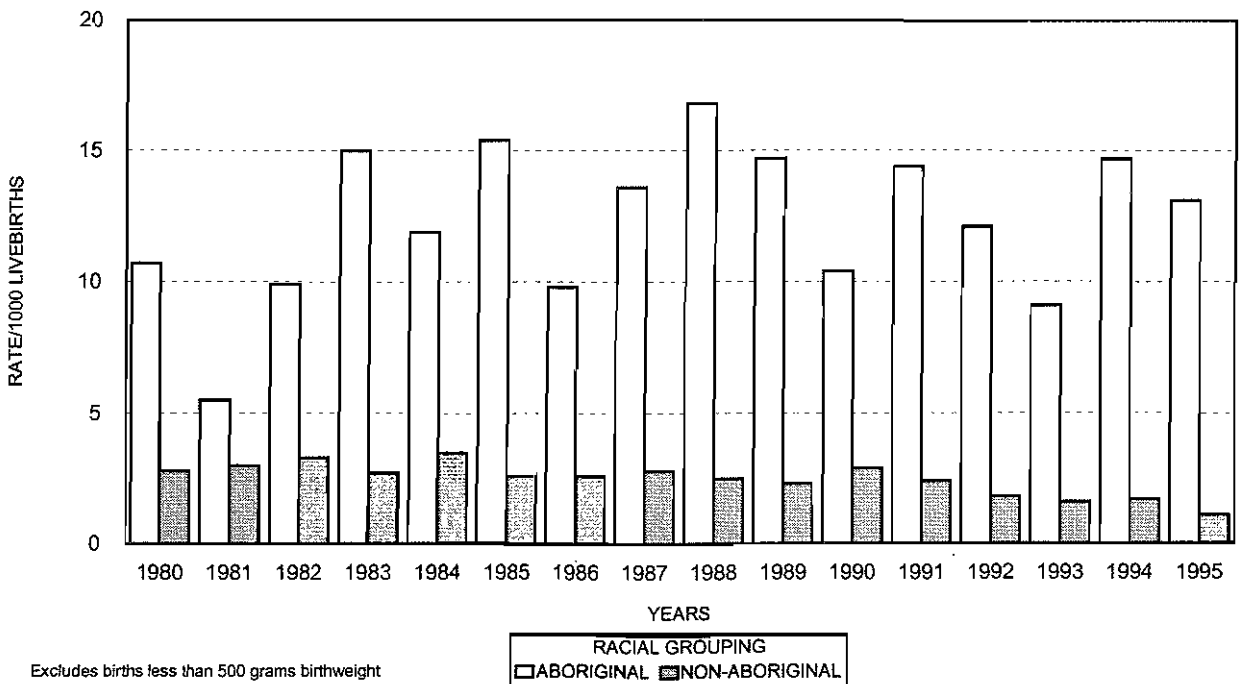
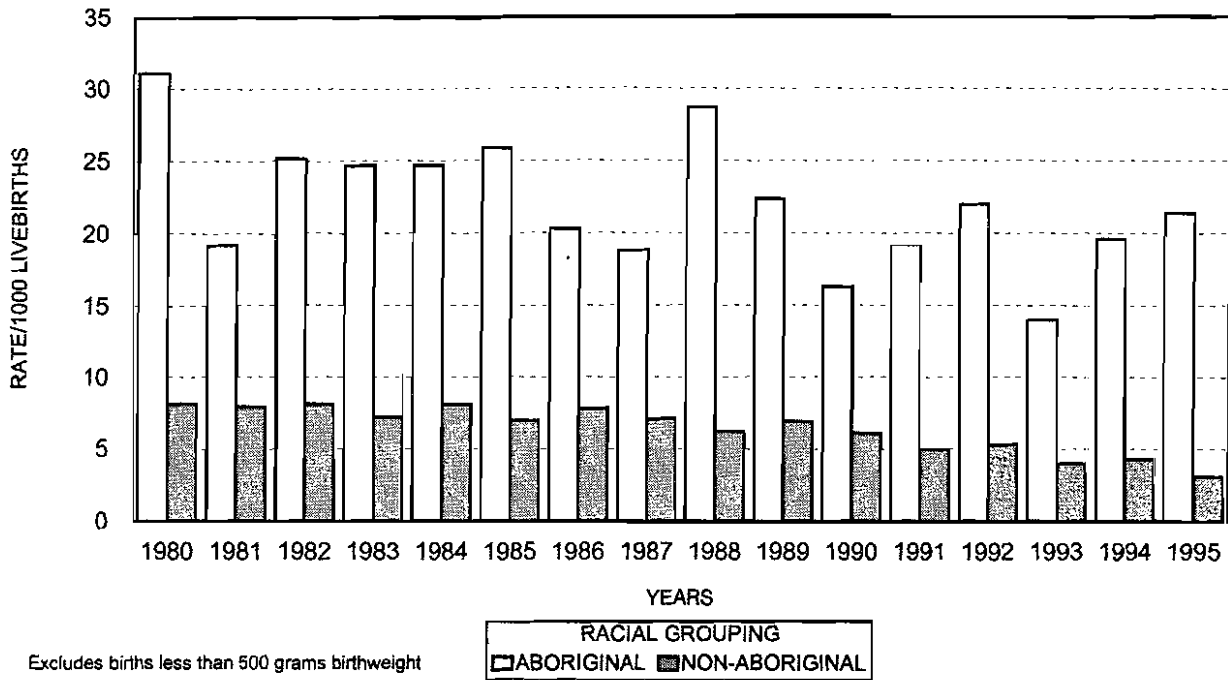


FIGURE XI

**INFANT MORTALITY AND RACIAL GROUPING FOR  
WESTERN AUSTRALIAN BIRTHS, 1980-1995**



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2. Gee, V. Perinatal and Infant Mortality Identified by Maternal Race. The 1994 Western Australian Birth Cohort, Health Department of Western Australia, Perth. October 1996.
3. Holman, C.D.J. and Quadros, C.F. Health and Disease in the Aboriginal Population of the Kimberley Region of Western Australia 1980-1985. Health Department of Western Australia, Perth. 1986.

## APPENDIX: A

### DEFINITIONS

#### BIRTHWEIGHT :

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

Low Birthweight                      A birthweight of less than 2500 grams

Very Low Birthweight              A birthweight of less than 1500 grams

Extremely Low Birthweight        A birthweight of less than 1000 grams

#### CONGENITAL MALFORMATION :

Any defect present at birth, probably of developmental origin.

#### CRUDE BIRTH RATE :

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

#### FERTILITY RATE :

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

#### INFANT DEATH :

The death of a liveborn infant within the first year of life.

#### LIVEBIRTH :

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

#### MORTALITY PROPORTIONS :

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

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

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

Post-neonatal Mortality            Is the number of post-neonatal deaths per 1000 livebirths in a year.

Infant Mortality                    Is the number of neonatal and post neonatal deaths per 1000 livebirths in a year.

**NEONATAL DEATH :**

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

**PARITY :**

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

**PERINATAL DEATH :**

Is a stillbirth or neonatal death.

**POST-NEONATAL DEATH :**

Is the death of a liveborn infant occurring after the first month and within the first year of life.

**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, not that of the baby or of the father of the baby.

Caucasian Includes all people of caucasoid (European) heritage.

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

Other Includes Asian, Indian, African, Polynesian, etc.

**RESIDENCE :**

The mothers usual residential address.

**STILLBIRTH :**

Is the complete expulsion or extraction from its mother, of a product of conception of at least 20 weeks gestation or 400 grams birthweight, which after separation did not show any sign of life.

# APPENDIX: B

MR 15

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

PARTICULARS RELATING TO MOTHER

PRINT  
IN  
BLOCK  
LETTERS

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

Hospital .....

**Current Conjugal State:**

1. single

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

**Race:**

1. Caucasian

2. Aboriginal (full or part)

3. Other (please specify)

**Height (cms)**

**PREGNANCY**

**PREVIOUS PREGNANCIES** (excluding this pregnancy)

Total Number of:

Previous Pregnancies

Previous children now living

born alive, now dead

stillborn

**THIS PREGNANCY**

Date of LMP

This date: 1. certain  2. not certain

Expected due date

**Complications of Pregnancy:**

threatened abortion (under 20 weeks)  A

urinary tract infection  B

pregnancy induced hypertension  C

APH -placenta praevia  D

-abruptio  E

-other  F

prem. rupture of membranes  G

other  H

**Medical Conditions:**

**Procedures/Treatments:**

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

cervical suture  B

CVS/placental biopsy  C

amniocentesis  D

ultrasound  E

CTG - antepartum/intrapartum  F

**LABOUR AND DELIVERY**

**Onset of Labour:**

A. spontaneous  B. induced

D. no labour

**Augmentation of Labour:**

1. no  2. yes

**Presentation:**

1. vertex  2. breech

3. other (please specify)

**Type of Delivery:**

normal  A

vacuum -successful  B

          -failed  C

forceps -successful  D

          -failed  E

breech manoeuvre  F

\*caesarean -elective  G

                  -emergency  H

**Anaesthesia/Analgesia:**

none  Z

general  A

epidural/spinal  B

other (please specify)  C

**Hours of established labour:**

**Complications of Labour, Delivery:**

\*Include reason for caesarean

precipitate delivery  A

total distress  B

prolapsed cord  C

cord tight around neck  D

cephalopelvic disproportion  E

PPH (>500mls)  G

other (please specify)  F

**Repair Perineum and/or Vagina:**

1. none  2. episiotomy

3. 1° or 2° tear  4. 3° or 4° tear

5. other (please specify)

**BABY**

**Separate Form for each Baby**

Adoption Yes ( ) No ( )

**Birth Date:**

Time (24 hour clock)

**Plurality:**

1. single birth  2. first twin

3. second twin  4. multiple birth (specify baby number \_\_\_ of \_\_\_)

**Sex:**

1. male  2. female

**Condition:**

1. liveborn  2. stillborn

**Birthweight (grams)**

**Length (cms)**

**Head circumference (cms)**

**Time to establish unassisted regular breathing (mins)**

**Resuscitation:**

0. none  3. intubation

5. bag & mask  8. oxygen only

other (please specify)

**Apgar Score** 1 min

5 min

**Estimated Gestation (weeks)**

**Vitamin K - first dose given**

1. oral  2. IM/IV/IAI  3. nil

**Birth Defects**

**Birth Trauma (eg cephalhaematoma)**

**BABY'S SEPARATION DETAILS**

Date of Discharge Transfer or Death

**Type of Separation:**

1. discharged home  2. died

3. transferred to

**Special Care (wholedays only)**

**COMPLETE SECTION ON SEPARATION**  
Attach to Mother and Baby's Inpatient Summaries (HA22). Forward to Epidemiology and Health Statistics Section, Health Dept of Western Australia P.O. Box 8172, Stirling Street, PERTH 6840 after discharge of mother and/or baby whichever is later. Guidelines for completion of this form available from above address.

**MIDWIFE**

Name

Signature

Reg. No.  Date

**HEALTH DEPARTMENT COPY**

APPENDIX: C

R.G. 364

MEDICAL CERTIFICATE OF CAUSE OF PERINATAL DEATH

To be completed in respect of—  
 (i) a child not born alive, of at least 20 weeks gestation or 400 grammes weight  
 (ii) a live born child dying within twenty-eight days after birth

Note: Please ✓ in relevant boxes thus   
 PARTICULARS RELATING TO MOTHER

1. Full Name \_\_\_\_\_ 2. Age \_\_\_\_\_ years

3. Address of usual residence \_\_\_\_\_

4. Parity \_\_\_\_\_

PARTICULARS RELATING TO CHILD ABORIGINAL: YES  NO

5. Name, if given \_\_\_\_\_

6. Sex: Male  Female

7. Place of death \_\_\_\_\_

8. Time and date of birth \_\_\_\_\_ 19\_\_\_\_  
 a.m.  p.m.

9. This birth was: Single  Twin  Triplet

10. Weight at birth \_\_\_\_\_ grammes

11. Period of gestation \_\_\_\_\_ completed weeks from first day of last menstrual period to date of delivery

12. HEART BEAT CEASED:
- (a) Before labour commenced
  - (b) During labour but before delivery
  - (c) Before delivery but not known whether before or during labour
  - (d) After delivery
  - (e) Not known whether before or after delivery

If heart beat ceased before labour commenced, please estimate how long before—  
 \_\_\_\_\_ hours or \_\_\_\_\_ days

If heart beat ceased after delivery, please state time—  
 \_\_\_\_\_ a.m. \_\_\_\_\_ p.m. and date \_\_\_\_\_

13. BREATHING:  
 Did the child breathe after complete expulsion or extraction from the mother?  
 Yes  No

CAUSE OF DEATH

14. Post mortem: carried out  : to be carried out Yes  No

Is cause of death shown below based on post mortem Yes  No

PART I  
 A. CAUSES IN CHILD OR FOETUS

Disease or condition directly leading to death \_\_\_\_\_

due to f \_\_\_\_\_

due to f \_\_\_\_\_

B. MATERNAL OR OTHER CONDITIONS OR CAUSES GIVING RISE TO THE UNDERLYING CAUSE ABOVE

due to \_\_\_\_\_

\* Maternal conditions, if any, giving rise to the above cause, stating the underlying condition first.

PART II  
 OTHER SIGNIFICANT CONDITIONS in child, foetus or mother contributing to the death, but not related to the disease or condition causing it \_\_\_\_\_

For Office Use Only

Registration Number \_\_\_\_\_

1 \_\_\_\_\_

2 \_\_\_\_\_

3 \_\_\_\_\_

4 \_\_\_\_\_

5 \_\_\_\_\_

6 \_\_\_\_\_

7 \_\_\_\_\_

8 \_\_\_\_\_

9 \_\_\_\_\_

10 \_\_\_\_\_

11 \_\_\_\_\_

12 \_\_\_\_\_

13 \_\_\_\_\_

14 \_\_\_\_\_

15 \_\_\_\_\_

Approximate Interval Between Onset and Death \_\_\_\_\_

I hereby certify that the particulars shown above are true to the best of my knowledge.

Signature \_\_\_\_\_

Date \_\_\_\_\_

Name \_\_\_\_\_

Address \_\_\_\_\_

(Block Letters)

APPENDIX: D

R.G. 356

WESTERN AUSTRALIA

REGISTRATION OF BIRTHS, DEATHS, AND MARRIAGES ACT, 1961

Registrar to enter  
No. of death entry.

MEDICAL CERTIFICATE OF CAUSE OF DEATH

(For use only by a legally qualified medical practitioner who has been in attendance during deceased's last illness.  
If Deceased less than 29 days old use Form R.G. 364)

Aboriginal: Yes  No

Name of Deceased \_\_\_\_\_

Sex \_\_\_\_\_ Date of Death \_\_\_\_\_ 19\_\_

Age as stated to me \_\_\_\_\_ Date last seen alive by me \_\_\_\_\_ 19\_\_

Place of Death \_\_\_\_\_

\*Post Mortem Carried Out  ; To be Carried Out  ; Not to be Carried Out

Approximate Interval  
between onset and  
death

CAUSE OF DEATH  
(IN BLOCK LETTERS)

DIRECT CAUSE—  
Disease or condition directly  
leading to death† — (a) \_\_\_\_\_

due to—

ANTECEDENT  
CAUSES—  
Morbid conditions, if  
any, giving rise to the  
above cause stating  
the underlying con-  
dition last — (b) \_\_\_\_\_

due to—

(c) \_\_\_\_\_

OTHER SIGNIFICANT CONDITIONS CONTRIBUTING TO DEATH BUT NOT RELATED TO THE DISEASE OR CONDITION  
CAUSING IT

\* See Fly Leaf—This means the disease, injury or complication which caused death—NOT the mode of dying, as e.g., heart failure, asphyxia, etc.

If operation performed on Deceased within 3 months of Death specify condition for which performed \_\_\_\_\_  
and Date of Operation \_\_\_\_\_

If this case has been reported to the Coroner, enter "Yes" here \_\_\_\_\_

I hereby certify that I was in medical attendance during the abovenamed Deceased's last illness and that the particulars and cause of death above written are true to the best of my knowledge and belief.

Name \_\_\_\_\_  
(block letters)

Signature

Address \_\_\_\_\_

Professional Title

Date \_\_\_\_\_

NOTE—SECTION 41 of the abovementioned Act provides that in case of the death of any person who has been attended in his last illness by a duly qualified medical practitioner, such practitioner shall forthwith after the death complete and sign a certificate of the cause of death in the form approved by the Registrar General and give it to the person required by the Act to furnish information concerning such death.

\* Please tick appropriate box.

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