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**THE 1994 WESTERN AUSTRALIAN
BIRTH COHORT**

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

VIVIEN GEE
BAppSc.(Nursing Admin.),RN,RM,CHN
Health Statistics
Health Information Centre

OCTOBER 1996

Statistical Series / 47
Health Department of
Western Australia
Perth

The logo for the Health Department of Western Australia, featuring the words "Western Australia" in a stylized, cursive font above a series of horizontal lines.

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SUMMARY

The Midwives' Notification System of Western Australia identified 25341 births of ≥ 500 grams birthweight to 25000 women during 1994. Of these babies, 131 were stillborn and a further 130 liveborn babies died within the first twelve months (Tables 23 and 29).

Overall, the stillbirth rate was 5.2/1000 total births. Among babies born to Caucasian women the stillbirth rate was 4.6/1000, for babies of Aboriginal women 13.1/1000 and for babies of women of other races the rate was 6.1/1000 total births. The stillbirth rate of 4.4/1000 among singleton births was lower than (11.3/1000) for multiple births (Table 6).

Of babies born to teenage women, 15 (9.4/1000) were stillborn (Table 4). Consideration of maternal parity showed a higher stillbirth rate for primiparous women (5.5/1000) than among babies of multiparous women (4.9/1000) (Table 5).

The causes of stillbirths were unexplained for 50 (38.2%) babies and the deaths of 36 (27.5%) babies were attributed to complications arising from extremely low birth weight (<1000 grams). Lethal congenital abnormalities were the cause of death for 19 (14.5%) stillbirths (Table 8).

There were 69 neonatal deaths, giving a neonatal mortality proportion of 2.7/1000 livebirths; for babies of Caucasian women the proportion was 2.5/1000, for babies of Aboriginal mothers 4.9/1000 and for babies of women of other races 3.3/1000 (Tables 3 and 10).

Post neonatal deaths numbered 61 (2.4/1000 livebirths) babies (Table 16). Twenty three (37.7%) of these were attributed to Sudden Infant Death Syndrome and 10 (16.4%) to lethal congenital malformations (Table 21).

The perinatal mortality rate was 7.9/1000 total births. For babies of Caucasian women the rate was 7.1/1000, for babies of Aboriginal women 18.0/1000 and babies of women of other races 9.4/1000. Perinatal deaths amongst babies born to Aboriginal teenage mothers (22.0/1000) was higher than the rate for babies born to Caucasian women in the same age group (8.0/1000) (Table 24). The rate of perinatal mortality among babies of single women and of babies of separated, divorced or widowed women (12.0/1000) was noticeably higher than the rate (7.4/1000) for babies of women reported to be socially supported by a partner (Table 28).

Infant deaths numbered 130 and included 69 neonatal deaths and 61 post neonatal deaths. These numbers provide an overall infant death rate of 5.2/1000 livebirths (Table 37).

Among babies of Aboriginal women the infant mortality rate (19.6/1000) was more than three times the overall rate (5.2/1000). The fraction of infant deaths attributed to Sudden Infant Death Syndrome among babies of Aboriginal women (25.0%) was greater than the overall fraction of 22.3% (Table 36).

The major causes of infant death remain lethal congenital malformation (25.4%), Sudden Infant Death Syndrome (22.3%) and disorders related to low birthweight (25.4%) (Table 36).

In accord with perinatal deaths, the overall rate of infant death was higher where mothers were socially unsupported by a partner (Table 30).

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 fifteen years from 31.1/1000 in 1980 to 19.6/1000 in 1994, it still remains more than three times that of the overall infant mortality rate (5.2/1000) of livebirths in 1994 (Table 41).

ACKNOWLEDGEMENTS

The author acknowledges the contribution of many people for input essential to this document.

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1. INTRODUCTION

This report is the eleventh in a continuing series examining perinatal and infant mortality. 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 1994 and includes information on their outcomes up to the age of twelve months. Prior to 1984, mortality data was 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.

2. 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 ≥ 20 weeks gestation or ≥ 400 grams birthweight, this report includes only those babies whose birthweight was ≥ 500 grams. Information related to deaths of liveborn babies was obtained from the Registrar General's Office, the Hospital Morbidity 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 ≥ 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).

3. DEFINITIONS

BIRTHWEIGHT :

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

<u>Low Birthweight</u>	A birthweight of less than 2500 grams
<u>Verv Low Birthweight</u>	A birthweight of less than 1500 grams
<u>Extremelv Low Birthweight</u>	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 :

<u>Stillbirth</u>	Is the number of stillbirths per 1000 total births in a year.
<u>Neonatal Mortality</u>	Is the number of neonatal deaths per 1000 livebirths in a year.
<u>Perinatal Mortality</u>	Is the number of stillbirths and neonatal deaths per 1000 total births in a year.
<u>Post-neonatal Mortality</u>	Is the number of post-neonatal deaths per 1000 livebirths in a year.
<u>Infant Mortality</u>	Is the number of infant 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.

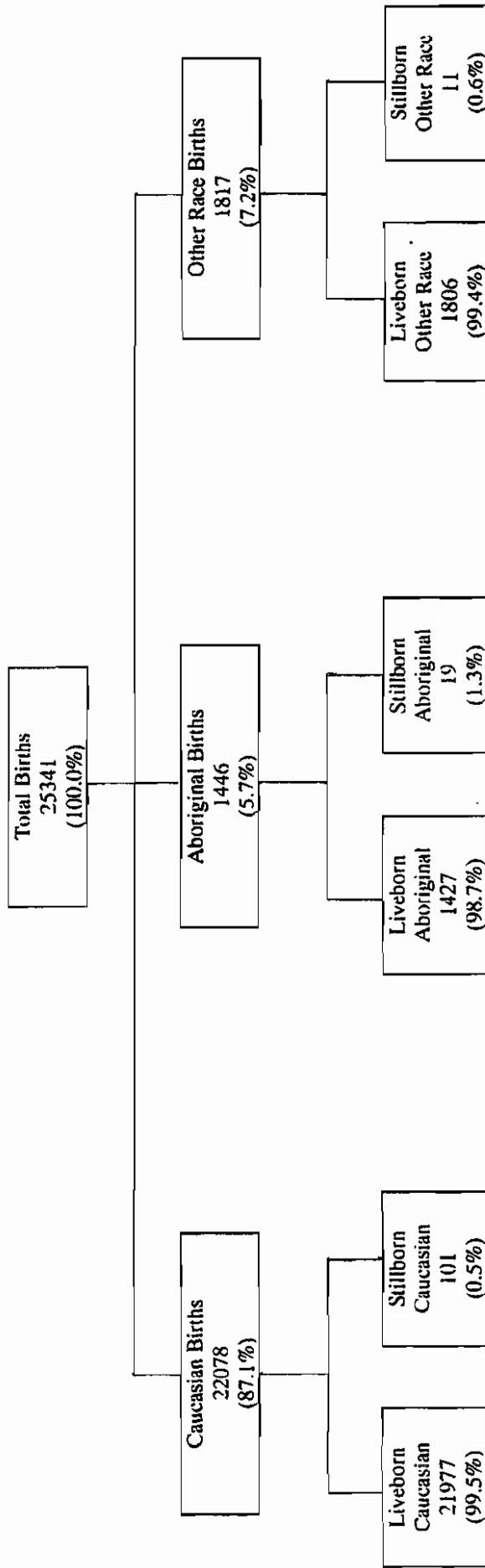
Aboriginal Includes persons of Australian-Aboriginal heritage (Australoid) or of mixed Aboriginal-caucasian heritage.

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

STILLBIRTH :

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

TABLE 1: MATERNAL RACE AND CONDITION OF BIRTHS IN WESTERN AUSTRALIA IN 1994



Excludes births less than 500 grams birthweight.

4. BIRTHS IN WESTERN AUSTRALIA IN 1994

4.1 Births Incidence

Midwives' forms received by this department indicate that 25341 babies were born to 25000 women during 1994. This report includes statistics only on those babies whose birthweight was equal to or greater than 500 grams.

Examination of births showed that 22078 (87.1%) were born to Caucasian women, 1446 (5.7%) to Aboriginal women and 1817 (7.2%) to women of other racial groups.

4.2 Place of Birth

The majority of births, 25139 (99.1%), occurred in hospital. Of these, births in metropolitan hospitals numbered 18907 (75.2%) and non-metropolitan hospital births were 6232 (24.8%).

There were 202 (0.8%) non hospital births including 93 (0.4%) born before arrival at hospital and 109 (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 17618 (69.5%) 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 14.8/1000 total population was identified for Western Australia during 1994. The area with the lowest crude birth rate (12.7/1000 total population) was the North Metropolitan Health Zone (Figure 1) (Table 39).

4.5 Condition of Births

Analysis of the condition at birth showed 25210 (99.5%) babies were liveborn and 131 (0.5%) babies were stillborn. Livebirths to Caucasian women numbered 21977 (99.5%) and stillbirths 101 (0.5%). Among Aboriginal women there were 1427 (98.9%) liveborn and 19 (1.1%) stillborn babies. For women of other races there were 1806 (99.4%) livebirths and 11 (0.6%) stillbirths (Table 1).

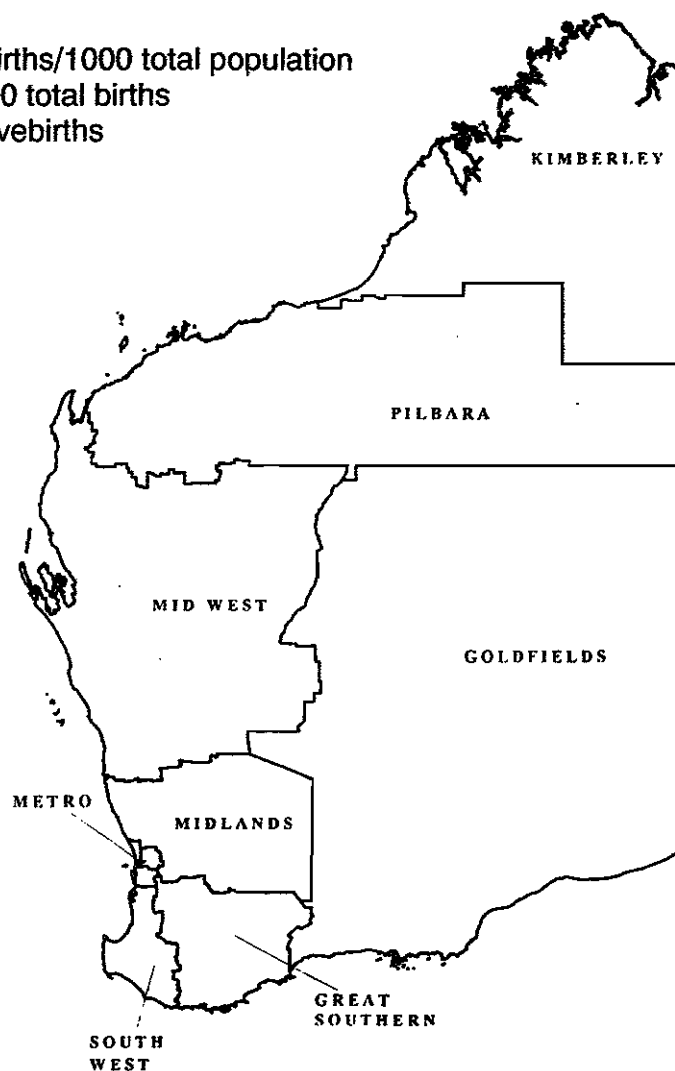
4.6 Maternal Age

Consideration of maternal age shows that the highest percentage of women confined (33.2%), were in the 25 to 29 year age category. Women in their teenage years accounted for 6.3% of total confinements. More than a quarter (28.3%) of Aboriginal women confined were teenagers. This contrasts with Caucasian women of whom 5.2% were teenagers and women of other races with 3.2% teenage confinements. Women aged 40 years or more represented 1.6% 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 1994**

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	25.0	19.6	13.2
Pilbara	18.5	20.8	13.7
Midwest	16.6	12.0	6.1
Midlands	15.5	8.4	6.0
Goldfields	20.7	7.0	6.2
South West	14.2	10.2	4.9
Great Southern	15.2	10.4	6.6
North Metropolitan	12.7	7.2	4.5
East Metropolitan	15.1	5.8	4.2
South Metropolitan	14.8	5.9	4.1
Total WA	14.8	7.9	5.2

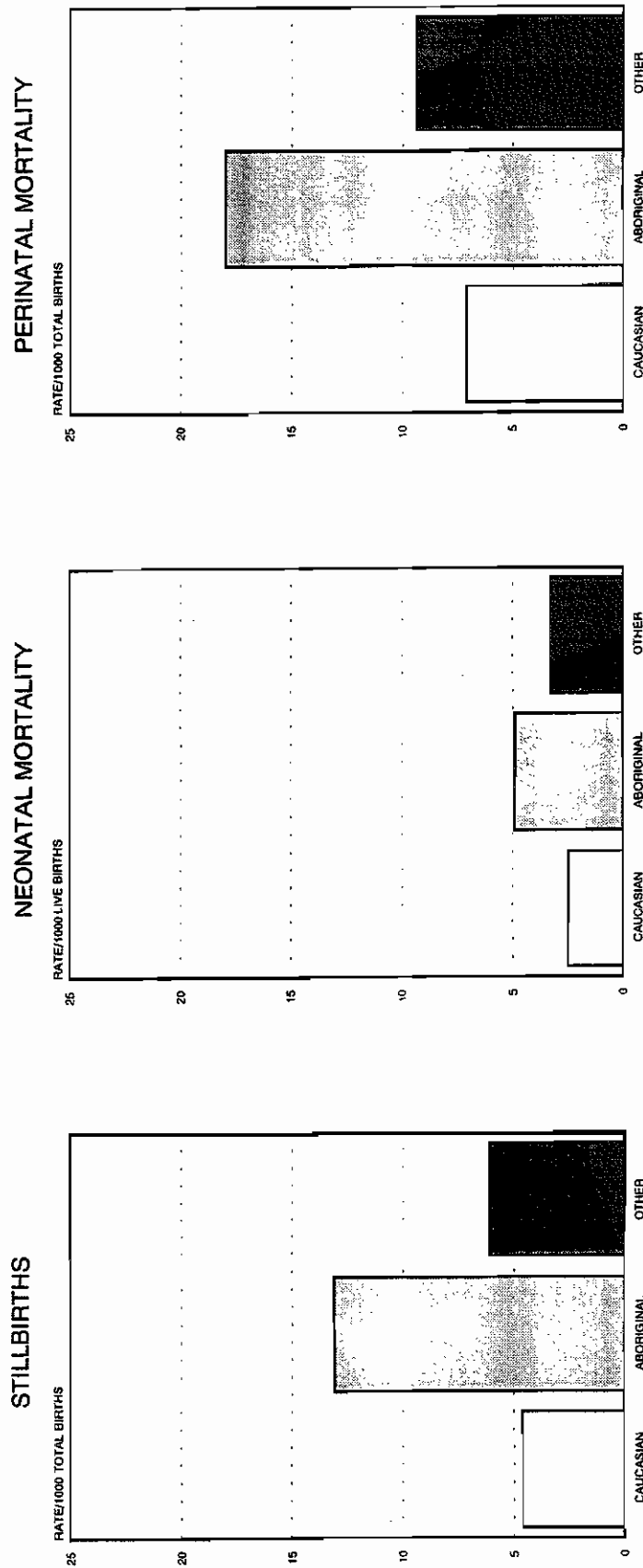
TABLE 2: LIVEBIRTHS AND TOTAL BIRTHS BY HEALTH ZONE OF MATERNAL RESIDENCE AND MATERNAL RACE IN WESTERN AUSTRALIA 1994

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	4931	22.4	4951	22.4	133	9.3	135	9.3	487	27.0	490	27.0	5551	22.0	5576	22.0
East	4887	22.2	4904	22.2	192	13.5	195	13.5	615	34.1	620	34.1	5694	22.6	5719	22.6
South	5677	25.8	5699	25.8	186	13.0	186	2.9	437	24.2	438	6.9	6300	25.0	6323	25.0
<u>Non-Metropolitan</u>																
Kimberley	229	1.0	232	1.1	364	25.5	369	25.5	12	0.7	12	0.7	605	2.4	613	2.4
Pilbara	603	2.7	608	2.8	132	9.3	137	9.5	69	3.8	71	3.9	804	3.2	816	3.2
Midwest	803	3.7	810	3.7	145	10.2	146	10.1	40	2.2	40	2.2	988	3.9	996	3.9
Midlands	774	3.5	778	3.5	41	2.9	41	2.8	15	0.8	15	0.8	830	3.3	834	3.3
Goldfields	979	4.5	984	4.5	104	7.3	106	7.3	50	2.8	50	2.8	1133	4.5	1140	4.5
South West	2133	9.7	2145	9.7	59	4.1	59	4.1	41	2.3	41	2.3	2233	8.9	2245	8.9
Great Southern	951	4.3	957	4.3	70	4.9	71	4.9	33	1.8	33	1.8	1054	4.2	1061	4.2
Outside WA	10	-	10	-	1	-	1	-	7	0.4	7	0.4	18	0.1	18	0.1
TOTAL	21977	100.0	22078	100.0	1427	100.0	1446	100.0	1806	100.0	1817	100.0	25210	100.0	25341	100.0

Excludes births <500 grams birthweight.

FIGURE II

**STILLBIRTHS, NEONATAL AND PERINATAL MORTALITY,
ABORIGINAL AND NON-ABORIGINAL,
WESTERN AUSTRALIA, 1994**



Excludes births less than 500 grams birthweight

SOURCE: MIDWIVES' NOTIFICATION SYSTEM
REGISTRAR GENERAL'S OFFICE

TABLE 3: STILLBIRTHS, NEONATAL AND PERINATAL DEATHS BY HEALTH ZONE OF MATERNAL RESIDENCE AND MATERNAL RACE IN WESTERN AUSTRALIA IN 1994

Health Zone of Maternal Residence	Maternal Race												Total									
	Caucasian				Aboriginal				Other				Stillbirths		Neonatal		Perinatal					
	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate				
Metropolitan	20	4.0	14	2.8	34	6.9	2	(14.8)	-	-	3	(6.1)	1	(2.1)	4	(8.2)	25	4.5	15	2.7	40	7.2
North	17	3.5	7	1.4	24	4.9	1	(5.2)	4	(20.5)	5	(8.1)	-	-	5	(8.1)	25	4.4	8	1.4	33	5.8
East	22	3.9	13	2.3	35	6.1	-	-	-	-	1	(2.3)	1	(2.3)	2	(4.6)	23	3.6	14	2.2	37	5.9
South																						
Non Metropolitan	3	(12.9)	2	(8.7)	5	21.6	2	(5.5)	7	19.0	-	-	-	-	-	-	8	13.1	4	(6.6)	12	19.6
Kimberley	5	8.2	3	(5.0)	8	13.2	2	(15.2)	7	51.1	2	(28.2)	-	-	2	(28.2)	12	14.7	5	6.2	17	20.8
Pilbara	7	8.6	2	(2.5)	9	11.1	1	(7.0)	2	(13.7)	-	-	1	(25.0)	1	(25.0)	8	8.0	4	4.0	12	12.0
Midwest	4	(5.1)	3	(3.9)	7	9.0	-	-	-	-	-	-	-	-	-	-	4	(4.8)	3	(3.6)	7	8.4
Midlands	5	5.1	1	(1.0)	6	6.1	2	(18.9)	2	(19.0)	-	-	-	-	-	-	7	6.1	1	(0.9)	8	7.0
Goldfields	12	5.6	8	3.8	20	9.3	-	-	-	-	-	-	3	(73.2)	3	(73.2)	12	5.3	11	4.9	23	10.2
South West	6	6.3	3	(3.2)	9	9.4	1	(14.3)	2	(28.2)	-	-	-	-	-	-	7	6.6	4	(3.8)	11	10.4
Gt Southern																						
Outside WA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL	101	4.6	56	2.5	157	7.1	19	13.1	26	18.0	11	6.1	6	3.3	17	9.4	131	5.2	69	2.7	200	7.9

Excludes births <500 grams birthweight.

¹ Stillbirth and Perinatal Death rate/1000 total births.

² Neonatal Death rate/1000 livebirths.

() Where n<5 rate has been bracketed.

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

5. STILLBIRTHS, NEONATAL AND POST-NEONATAL MORTALITY IN WESTERN AUSTRALIA IN THE 1994 BIRTH COHORT

5.1 Stillbirths

There were 131 stillbirths in Western Australia during the 1994 year which were equal to or greater than 500 grams birthweight. The stillbirth rate for the State was 5.2/1000 total births (Table 4).

The stillbirth rate for babies of Aboriginal women (13.1/1000) was high compared to that for babies of Caucasian women (4.6/1000) and for babies of women of other racial groups (6.1/1000).

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 9.4/1000 and for babies of Aboriginal teenage mothers the rate was 19.6/1000 total births. Among women aged 25-29 years, the group with the highest number of births overall, the stillbirth rate was 5.1/1000 total births. Among babies of women aged 35 years and over, 12 (4.0/1000) stillbirths occurred. (Table 4).

TABLE 4: STILLBIRTHS BY MATERNAL RACE AND MATERNAL AGE IN WESTERN AUSTRALIA IN 1994

Maternal Age	Maternal Race									Total		
	Caucasian			Aboriginal			Other					
	No.	Total	Rate	No.	Total	Rate	No.	Total	Rate	No.	Total	Rate
≤15	1	38	26.3	1	57	17.5	-	2	-	2	97	20.6
16	-	91	-	1	49	20.4	-	8	-	1	148	6.8
17	-	202	-	1	80	12.5	-	7	-	1	289	3.5
18	3	316	9.5	3	106	28.3	-	12	-	6	434	13.8
19	2	485	4.1	2	117	17.1	1	28	35.7	5	630	7.9
≤19	6	1132	5.3	8	409	19.6	1	57	17.5	15	1598	9.4
20-24	16	4208	3.8	4	520	7.7	1	290	3.4	21	5018	4.2
25-29	35	7546	4.6	4	320	12.5	4	558	7.2	43	8424	5.1
30-34	34	6568	5.2	3	150	20.0	3	581	5.2	40	7299	5.5
35-39	10	2271	4.4	-	42	-	2	274	7.3	12	2587	4.6
40-44	-	339	-	-	5	-	-	53	-	-	397	-
≤45	-	14	-	-	-	-	-	4	-	-	18	-
TOTAL	101	22078	4.6	19	1446	13.1	11	1817	6.1	131	25341	5.2

Excludes births <500 grams birthweight.

¹ Rate/1000 total births.

5.1.2 Maternal Race and Parity

Fifty six (5.5/100) stillborn babies were to primiparous women compared with 59 (6.0/1000) in the 1993 birth cohort. For babies of women whose parity was three or more, the stillbirth rate was 19 (7.3/1000) in 1994. (Table 5).

TABLE 5: STILLBIRTHS BY MATERNAL RACE AND PARITY IN WESTERN AUSTRALIA IN 1994

Parity	Caucasian			Aboriginal			Other			Total		
	No.	Total Births	Rate	No.	Total Births	Rate	No.	Total Births	Rate	No.	Total Births	Rate
0	44	8954	4.9	5	425	11.8	7	767	9.1	56	10146	5.5
1-2	46	11085	4.1	7	626	11.2	3	881	3.4	56	12592	4.4
3-4	10	1785	5.6	4	297	13.5	1	137	7.3	15	2219	6.8
≥5	1	254	3.9	3	98	30.6	-	32	-	4	384	10.4
TOTAL	101	22078	4.6	19	1446	13.1	11	1817	6.1	131	25341	5.2

Excludes births < 500 grams birthweight.

¹ Rate/1000 total births.

5.1.3 Maternal Race, Condition and Plurality

The stillbirth proportion for all multiple births (13.2/1000) compares unfavourably with 4.9/1000 stillbirth rate for all singleton births. For singleton births the rate of stillbirths among babies of Aboriginal women (12.7/1000) is higher than for total births (5.2/1000) (Table 6).

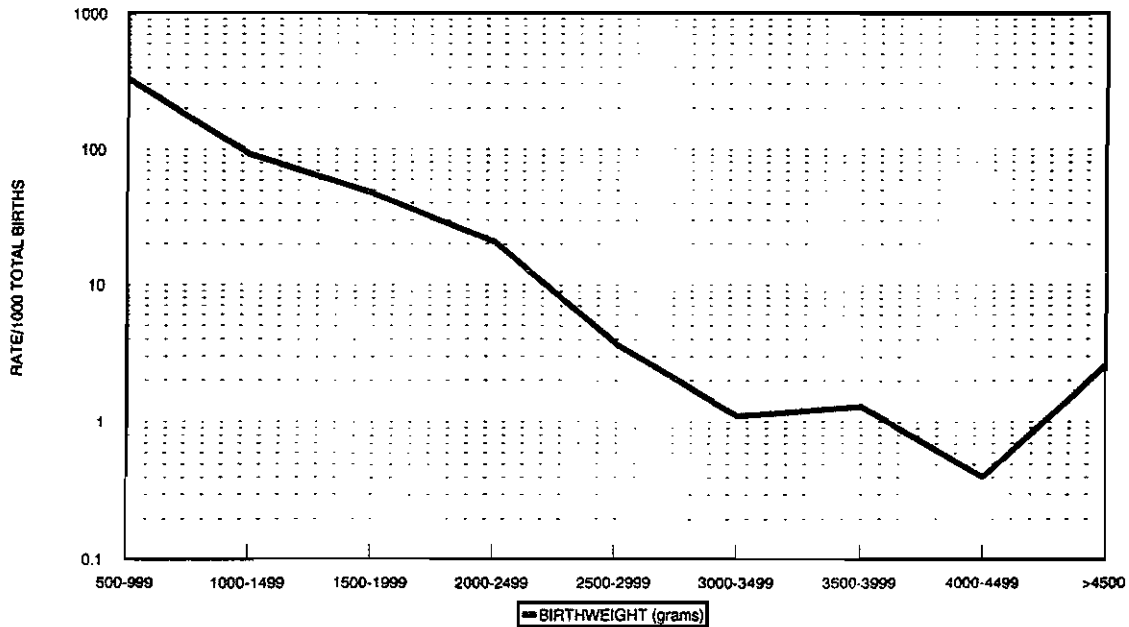
TABLE 6: CONDITION, PLURALITY AND MATERNAL RACE OF BIRTHS IN WESTERN AUSTRALIA 1994

Plurality				
Maternal Race		Singleton	Multiple	Total
Caucasian	Total Births	21460	618	22078
	Live Births	21366	611	21977
	Stillbirths	94	7	101
	Rate	4.4	11.3	4.6
Aboriginal	Total Births	1414	32	1446
	Live Births	1396	31	1427
	Stillbirths	18	1	19
	Rate	12.7	31.2	13.1
Other	Total Births	1787	30	1817
	Live Births	1777	29	1806
	Stillbirths	10	1	11
	Rate	5.6	33.3	6.0
Total	Total Births	24661	680	25341
	Live Births	24539	671	25210
	Stillbirths	122	9	131
	Rate	4.9	13.2	5.2

Excludes births <500 grams birthweight.

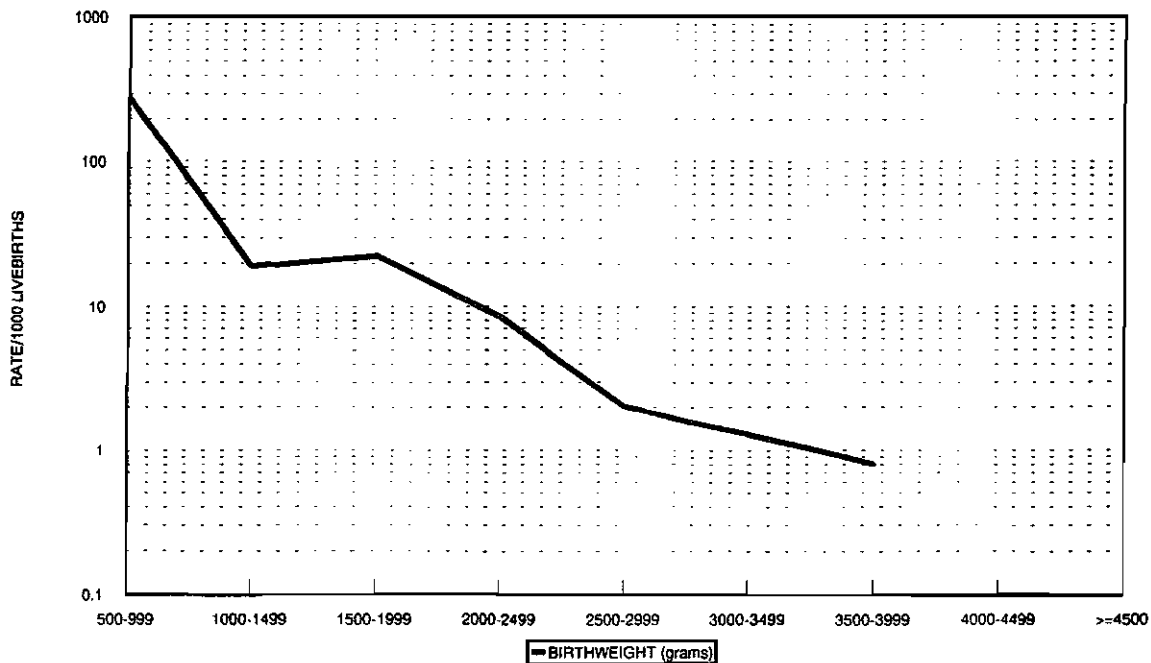
¹ Rate/1000 total births.

**FIGURE III
BIRTHWEIGHT DISTRIBUTION OF STILLBIRTHS
IN WESTERN AUSTRALIA IN 1994**



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

**FIGURE IV
BIRTHWEIGHT DISTRIBUTION OF NEONATAL DEATHS
IN WESTERN AUSTRALIA IN 1994**



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 60.1/1000. The lowest stillbirth rate (1.1/1000) was for babies with birthweight 3000-3499 grams. (Table 7 and Figure III).

TABLE 7 : STILLBIRTH PROPORTION BY MATERNAL RACE AND BIRTHWEIGHT DISTRIBUTION IN WESTERN AUSTRALIA IN 1994

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	114	333.3	5	14	357.1	2	9	(222.2)	45	137	328.5
1000-1499	9	135	66.7	5	24	208.3	2	15	(133.3)	16	174	92.0
1500-1999	9	227	39.6	4	32	(125.0)	-	18	-	13	277	46.9
2000-2499	13	772	16.8	2	127	(15.7)	5	76	65.8	20	975	20.5
<2500	69	1248	55.3	11	197	81.2	9	118	76.3	94	1563	60.1
2500-2999	13	3320	3.9	1	361	(2.8)	1	399	(2.5)	15	4080	3.7
3000-3499	8	8132	1.0	2	502	(4.0)	-	730	-	10	9364	1.1
3500-3999	10	6813	1.5	-	292	-	-	447	-	10	7552	1.3
4000-4499	-	2203	-	-	81	-	1	115	(8.7)	1	2399	0.4
≥4500	1	362	(2.8)	-	13	-	-	8	-	1	383	2.6
TOTAL	101	22078	4.6	19	1446	13.1	11	1817	6.1	131	25341	5.2

Excludes births <500 grams birthweight.

¹ Rate/1000 total births.

() Where n<5 rate has been bracketed.

5.1.5 Causes of Stillbirth

There were 50 (38.2%) stillborn babies with cause unknown and 36 (27.5%) stillbirths with extremely low birthweight. Lethal congenital malformations resulted in 19 (14.5%) stillbirths and a further 17 (13.0%) stillbirths resulted from complications of the placenta and/or cord (Table 8).

Understanding of the cause of stillbirth is improved by autopsy. Of the 131 stillborn babies, it is known that 79 (60.3%) had autopsies and 42 (32.1%) did not. It is not known whether the remaining 10 (7.6%) stillborn babies underwent autopsy.

Eighty four (64.1%) stillbirths were recorded as antepartum deaths, 32 (24.4%) were recorded as intrapartum deaths and for 15 (11.5%), the time of death was unknown.

TABLE 8 : CAUSE OF STILLBIRTH BY MATERNAL RACE IN WESTERN AUSTRALIA IN 1994

Cause of Death	Maternal Race						Total	
	Caucasian		Aboriginal		Other		No.	%
	No.	%	No.	%	No.	%		
Lethal Congenital Malformation	16	15.8	2	10.5	1	9.1	19	14.5
Extremely Low Birth Weight (<1000g)*	30	29.7	4	21.5	2	18.2	36	27.5
Unknown	35	34.7	9	47.4	6	54.6	50	38.2
Maternal: Obstetric	3	3.0	-	-	-	-	3	2.3
Maternal: Medical	-	-	-	-	-	-	-	-
Maternal: Hypertension	2	2.0	-	-	-	-	2	1.5
Placenta and Cord	14	13.9	1	5.3	2	18.2	17	13.0
Other	1	1.0	3	15.8	-	-	4	3.1
TOTAL	101	100.0	19	100.0	11	100.0	131	100.0

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 69 neonatal deaths among the 25210 livebirths in 1994¹. The overall neonatal mortality proportion was 2.7/1000 livebirths. For babies of Aboriginal women neonatal mortality was 4.9/1000 livebirths which is higher than for babies of Caucasian women (2.5/1000) and the rate for babies of women of other races (3.3/1000) (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.³

5.2.1 Maternal Race and Maternal Age

Of the 69 liveborn babies who died within the first 28 days of life, 4 (2.5/1000) were born to teenage mothers. In the age group where the highest number of births occurred (25-29 years) the neonatal mortality rate was 1.9/1000. The rate of neonatal deaths among babies of Aboriginal mothers (4.9/1000) was higher than that for babies of Caucasian women (2.5/1000) (Table 9).

TABLE 9 : NEONATAL DEATHS BY MATERNAL RACE AND MATERNAL AGE IN WESTERN AUSTRALIA IN 1994

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	-	37	-	-	56	-	-	2	-	-	95	-
16	1	91	11.0	-	48	-	-	8	-	1	147	6.8
17	-	202	-	-	79	-	-	7	-	-	288	-
18	1	313	3.2	-	103	-	-	12	-	1	428	2.3
19	1	483	2.1	1	115	8.7	-	27	-	2	625	3.2
≤19	3	1126	2.7	1	401	2.5	-	56	-	4	1583	2.5
20-24	13	4192	3.1	1	516	1.9	-	289	-	4	4997	0.8
25-29	22	7511	2.9	1	316	3.2	2	554	3.6	16	8381	1.9
30-34	10	6534	1.5	3	147	20.4	1	578	1.7	26	7259	3.6
35-39	7	2261	3.1	2	42	47.6	3	272	11.0	15	2575	5.8
40-44	1	339	2.9	-	5	-	-	53	-	7	397	17.6
≥45	-	14	-	-	-	-	-	4	-	1	18	55.6
TOTAL	56	21977	2.5	7	1427	4.9	6	1806	3.3	69	25210	2.7

Excludes births <500 grams birthweight.

¹ Rate/1000 livebirths.

5.2.2 Maternal Race and Parity

Thirty (2.4/1000) 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 1994

Parity	Maternal Race									Total		
	Caucasian			Aboriginal			Other					
	No.	Live Births	Rate	No.	Live Births	Rate	No.	Live Births	Rate	No.	Live Births	Rate
0	27	8910	3.0	1	420	2.4	1	760	1.3	29	10090	2.9
1-2	21	11039	1.9	4	619	6.5	5	878	5.7	30	12536	2.4
3-4	3	1775	1.7	1	293	3.4	-	136	-	4	2204	1.8
≥5	5	253	19.8	1	95	10.5	-	32	-	6	380	15.8
TOTAL	56	21977	2.5	7	1427	4.9	6	1806	3.3	69	25210	2.7

Excludes births < 500 grams birthweight.

¹ Rate/1000 livebirths.

5.2.3 Maternal Race and Plurality

These data show an overall neonatal death rate of 2.4/1000 livebirths for singleton births and 15.1/1000 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 1994

Plurality	Maternal Race									Total		
	Caucasian			Aboriginal			Other					
	No.	Live Births	Rate	No.	Live Births	Rate	No.	Live Births	Rate	No.	Live Births	Rate
Singleton	46	21366	2.2	7	1396	5.0	5	1777	2.8	58	24539	2.4
Twins	9	601	14.9	-	31	-	1	29	34.5	10	661	15.1
Triplets	1	10	100.0	-	-	-	-	-	-	1	10	100.0
TOTAL	56	21977	2.5	7	1427	4.9	6	1806	3.3	69	25210	2.7

Excludes births < 500 grams birthweight.

¹ 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 (27.6/1000) is lower than for low birthweight neonatal deaths of babies born to Caucasian women (28.8/1000) (Table 12, Figure IV).

TABLE 12: NEONATAL MORTALITY BY MATERNAL RACE AND BIRTHWEIGHT DISTRIBUTION IN WESTERN AUSTRALIA IN 1994

Birthweight (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	21	76	276.3	4	9	(444.4)	1	7	(142.9)	26	92	282.6
1000-1499	2	126	(15.9)	-	19	-	1	13	(76.9)	3	158	(19.0)
1500-1999	5	218	22.9	-	28	-	1	18	(55.6)	6	264	22.7
2000-2499	6	759	7.9	1	125	(8.0)	1	71	(14.1)	8	955	8.4
<2500	34	1179	28.8	5	181	27.6	4	109	(36.7)	43	1469	29.3
2500-2999	7	3307	2.1	1	360	(2.8)	-	398	-	8	4065	2.0
3000-3499	11	8124	1.4	-	500	-	1	730	(1.4)	12	9354	1.3
3500-3999	4	6803	(0.6)	1	292	(3.4)	1	447	(2.2)	6	7542	0.8
4000-4499	-	2203	-	-	81	-	-	114	-	-	2398	-
≥4500	-	361	-	-	13	-	-	8	-	-	382	-
TOTAL	56	21977	2.5	7	1427	4.9	6	1806	3.3	69	25210	2.7

Excludes births <500 grams birthweight.

¹ Rate/1000 livebirths.

() Where n<5 rate has been bracketed.

5.2.5 Maternal Race and Age at Neonatal Death

The majority (76.8%) of neonatal deaths occurred in the first week of life, 53.6% occurring within the first 48 hours of life. Among babies of Aboriginal women 85.7% of neonatal deaths occurred in the first seven days of life compared with 78.6% of babies born to Caucasian women (Table 13).

TABLE 13 : AGE AT NEONATAL DEATHY BY MATERNAL RACE IN WESTERN AUSTRALIA IN 1994

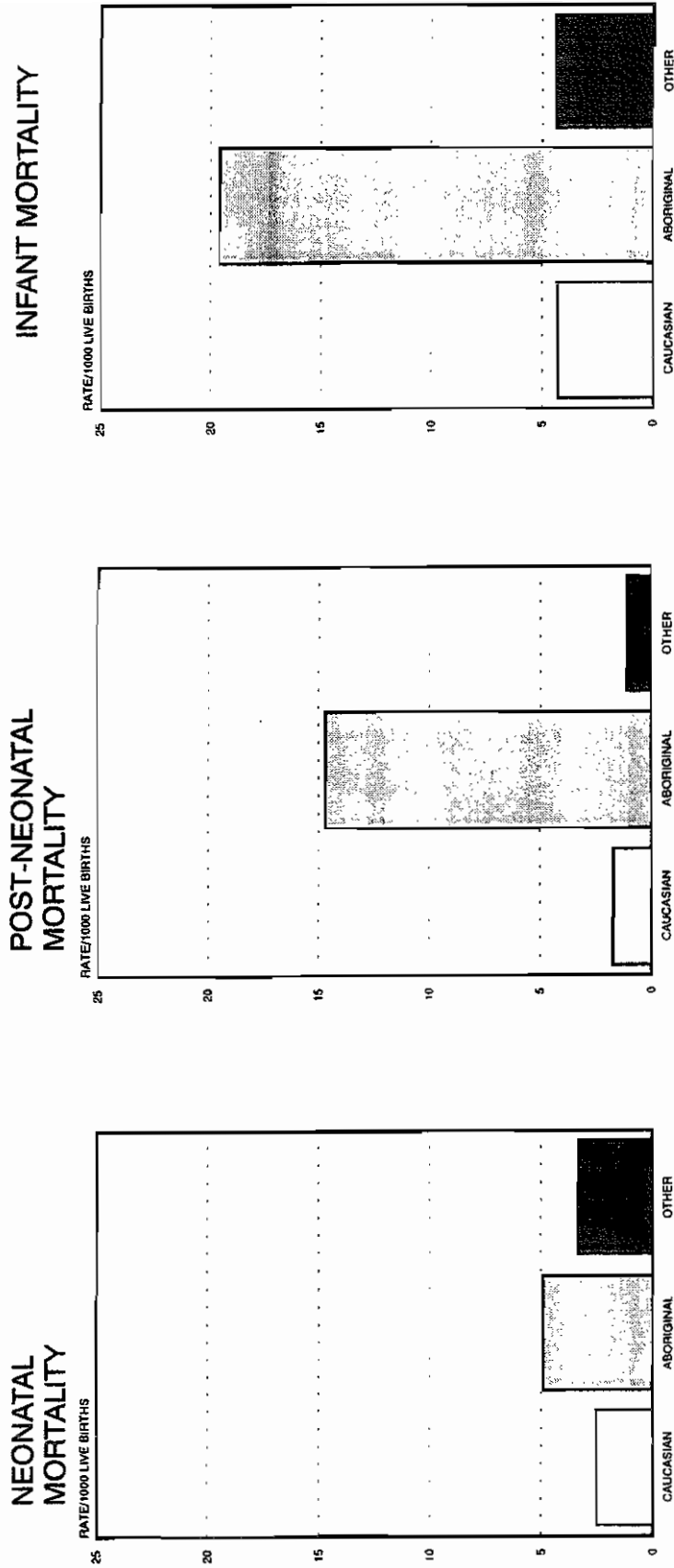
Age at Death	Maternal Race						Total	
	Caucasian		Aboriginal		Other			
	No.	%	No.	%	No.	%	No.	%
< day 1	18	32.1	4	57.1	3	50.0	25	36.2
day 1	11	19.6	1	14.3	-	-	12	17.4
day 2	7	12.5	-	-	-	-	7	10.1
day 3	3	5.4	-	-	-	-	3	4.4
day 4	1	1.8	-	-	-	-	1	1.5
day 5	2	3.6	-	-	-	-	2	2.9
day 6	-	-	1	14.3	-	-	1	1.5
day 7	2	3.6	-	-	-	-	2	2.9
day ≤ 7	44	78.6	6	85.7	3	50.0	53	76.8
day 8 - 14	6	10.7	-	-	1	16.7	7	10.1
day 15 - 21	6	10.7	-	-	1	16.7	7	10.1
day 22 - 28	-	-	1	14.3	1	16.7	2	2.9
TOTAL	56	100.0	7	100.0	6	100.0	69	100.0

Excludes births <500 grams birthweight

5.2.6 Causes of Neonatal Deaths

Lethal congenital malformation in 23 babies (33.3%) and low birthweight for 30 babies (43.5%) were the main causes of neonatal death in the 1994 birth cohort (Table 14).

FIGURE V
NEONATAL, POST-NEONATAL AND INFANT MORTALITY,
ABORIGINAL AND NON-ABORIGINAL,
WESTERN AUSTRALIA, 1994



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 1994

Cause of Death	Maternal Race						Total	
	Caucasian		Aboriginal		Other			
	No.	%	No.	%	No.	%	No.	%
Lethal Congenital Malformation	17	30.4	2	28.6	4	66.7	23	33.3
Low Birth Weight (<2500g)	25	44.6	3	42.9	2	33.3	30	43.5
Asphyxia	5	8.9	1	14.3	-	-	6	8.7
Pregnancy conditions	-	-	-	-	-	-	-	-
Infections	1	1.8	-	-	-	-	1	1.5
Hydrops fetalis	-	-	-	-	-	-	-	-
Other	2	3.6	-	-	-	-	2	2.9
Sudden Infant Deaths	5	8.9	1	14.3	-	-	6	8.7
Unknown	1	1.8	-	-	-	-	1	1.5
TOTAL	56	100.0	7	100.0	6	100.0	69	100.0

Excludes births < 500 grams birthweight.

5.3 Post Neonatal Deaths

There were 61 post-neonatal deaths identified among the 1994 livebirths, providing a rate of 2.4/1000 livebirths (Table 15 and Table 37).

Post-neonatal mortality for babies of Aboriginal women was 14.7/1000 livebirths, nine times the rate of 1.7/1000 for babies of Caucasian women. For babies born to women of other races the rate was 1.1/1000 (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 1994

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	6	20	1.2	3	3	(22.6)	1	2	(4.1)	10	25	1.8
East	12	19	2.5	4	4	(15.6)	1	1	(1.6)	16	24	2.8
South	9	23	1.6	2	2	(16.1)	-	1	(2.3)	12	26	1.9
<u>Non-Metropolitan</u>												
Kimberley	-	2	-	4	6	(11.0)	-	-	-	4	8	(6.6)
Pilbara	3	6	(5.0)	3	5	(22.7)	-	-	-	6	11	7.5
Midwest	1	4	(1.2)	1	1	(6.9)	-	1	(25.0)	2	6	(2.0)
Midlands	1	4	(1.3)	1	1	(24.4)	-	-	-	2	5	(2.4)
Goldfields	4	5	(4.1)	2	2	(115.4)	-	-	-	6	7	5.3
South West	-	8	-	-	-	-	-	3	(73.2)	-	11	-
Great Southern	2	5	(2.1)	1	2	(28.6)	-	-	-	3	7	(2.8)
Outside WA	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL	38	96	1.7	21	26	14.7	2	8	4.4	61	130	2.4

Excludes births <500 grams birthweight.

¹ Post-neonatal death rate/1000 livebirths.

² Infant death rate/1000 livebirths.

() Where n<5 rate has been bracketed.

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 5.1/1000 livebirths. Among babies born to Aboriginal women 6 (15.0/1000) post-neonatal deaths were to teenage mothers (Table 16).

TABLE 16 : POST-NEONATAL DEATHS BY MATERNAL RACE AND MATERNAL AGE IN WESTERN AUSTRALIA IN 1994

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	-	37	-	1	56	17.9	-	2	-	1	95	10.5
16	-	91	-	-	48	-	-	8	-	-	147	-
17	2	202	9.9	1	79	12.7	-	7	-	3	288	10.4
18	-	313	-	2	103	19.4	-	12	-	2	428	4.7
19	-	483	-	2	115	17.4	-	27	-	2	625	3.2
≤19	2	1126	1.8	6	401	15.0	-	56	-	8	1583	5.1
20-24	12	4192	2.9	7	516	9.7	-	289	-	8	4997	1.6
25-29	12	7511	1.6	6	316	19.0	1	554	1.8	19	8381	2.3
30-34	9	6534	1.4	1	147	40.8	1	578	1.7	19	7259	2.6
35-39	2	2261	0.9	1	42	23.8	-	272	-	11	2575	4.3
40-44	1	339	2.9	-	5	-	-	53	-	3	397	7.6
•45	-	14	-	-	-	-	-	4	-	1	18	55.6
TOTAL	38	21977	1.7	21	1427	14.7	2	1806	1.1	61	25210	2.4

Excludes births <500 grams birthweight.

¹ Rate/1000 livebirths.

5.3.2 Maternal Race and Conjugal State

Higher rates of post-neonatal mortality were recorded for babies of single women (4.6/1000) than for women socially supported by a partner in a married or defacto relationship (2.1/1000) (Table 17).

TABLE 17: POST-NEONATAL DEATHS BY MATERNAL RACE AND CONJUGAL STATE IN WESTERN AUSTRALIA IN 1994

Conjugal State	Maternal Race									Total		
	Caucasian			Aboriginal			Other					
	No.	Live Births	Rate	No.	Live Births	Rate	No.	Live Births	Rate	No.	Live Births	Rate
Single	5	1992	2.5	7	530	13.2	-	105	-	12	2427	4.6
Married/defacto	32	19765	1.6	13	876	14.8	2	1686	7.1	47	22327	2.1
Other	1	5	200.0	1	1	-	-	2	-	2	8	250.0
TOTAL	38	21977	1.7	19	1427	14.7	2	1806	1.1	61	25210	2.4

Excludes births < 500 grams birthweight.

¹ Rate/1000 livebirths.

² Other includes separated, divorced and widowed.

5.3.3 Maternal Race and Parity

Less than one quarter (18.0%) of babies who died in the post-neonatal period were born to primiparous mothers, and a further 57.4% were to women with a parity of 1-2. The rates for these groups were 1.1/1000 for primiparous women, 2.8/1000 for women with parity 1-2, 5.4/1000 for women with parity 3-4 and 7.9/1000 for women with parity of 5 or more. (Table 18).

TABLE 18 : POST-NEONATAL DEATHS BY MATERNAL RACE AND PARITY IN WESTERN AUSTRALIA IN 1994

Parity	Maternal Race									Total		
	Caucasian			Aboriginal			Other					
	No.	Live Births	Rate	No.	Live Births	Rate	No.	Live Births	Rate	No.	Live Births	Rate
0	8	8910	0.9	2	420	4.8	1	760	1.3	11	10090	1.1
1-2	22	11039	2.0	12	619	19.4	1	878	1.1	35	12536	2.8
3-4	7	1775	3.9	5	293	17.1	-	136	-	12	2204	5.4
≥5	1	253	4.0	2	95	21.1	-	32	-	3	380	7.9
TOTAL	38	21977	1.7	21	1427	14.7	2	1806	1.1	61	25210	2.4

Excludes births < 500 grams birthweight.

¹ Rate/1000 livebirths.

5.3.4 Maternal Race and Plurality

Examination of the 61 post-neonatal deaths in 1994 by plurality revealed that for singleton births the rate was 1.6/1000 and for multiple births the rate was 31.3/1000 livebirths. Among twin babies the post-neonatal death rate was 28.7/1000 (Table 19).

TABLE 19: POST-NEONATAL DEATHS BY MATERNAL RACE AND PLURALITY IN WESTERN AUSTRALIA IN 1994

Plurality	Maternal Race									Total		
	Caucasian			Aboriginal			Other					
	No.	Live Births	Rate	No.	Live Births	Rate	No.	Live Births	Rate	No.	Live Births	Rate
Singleton	36	21366	1.8	21	1396	15.0	2	177	1.1	40	24539	1.6
Twins	2	601	3.3	-	31	-	-	29	-	19	661	28.7
Triplets	-	10	-	-	-	-	-	-	-	2	10	200.0
TOTAL	38	21977	1.7	21	1427	14.7	2	1806	1.1	61	25210	2.4

Excludes births < 500 grams birthweight.

¹ 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 (33.1/1000) was higher than the rate for low birthweight babies of Caucasian women (8.5/1000) (Table 20).

TABLE 20: POST-NEONATAL MORTALITY BY MATERNAL RACE AND BIRTHWEIGHT DISTRIBUTION IN WESTERN AUSTRALIA IN 1994

Birthweight (grams)	Maternal Race									Total		
	Caucasian			Aboriginal			Other					
	No.	Births	Rate	No.	Births	Rate	No.	Births	Rate	No.	Births	Rate
500-999	2	76	(26.3)	1	9	(111.1)	-	7	-	3	92	(32.6)
1000-1499	3	126	(23.8)	-	19	-	-	13	-	3	158	(19.0)
1500-1999	-	218	-	2	28	(71.4)	-	18	-	2	264	(7.6)
2000-2499	5	759	6.6	3	125	(24.0)	2	71	(28.2)	10	955	10.5
<2500	10	1179	8.5	6	181	33.1	2	109	(18.3)	18	1469	12.3
2500-2999	11	3307	3.3	4	360	(11.1)	-	398	-	15	4065	3.7
3000-3499	16	8124	2.0	10	500	20.0	-	730	-	26	9354	2.8
3500-3999	1	6803	(0.1)	1	292	(3.4)	-	447	-	2	7542	(0.3)
4000-4499	-	2203	-	-	81	-	-	114	-	-	2398	-
≥4500	-	361	-	-	13	-	-	8	-	-	382	-
TOTAL	38	21977	1.7	21	1427	14.7	2	1806	(1.1)	61	25210	2.4

Excludes births <500 grams birthweight.

¹ Rate/1000 livebirths.

() Where n<5 rate has been bracketed.

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 (37.7%) (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 (Table 41).

Lethal congenital malformation remained the second highest known cause, to which 10 (16.4%) 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 (Table 21).

TABLE 21 : CAUSE OF POST-NEONATAL DEATH BY MATERNAL RACE IN WESTERN AUSTRALIA IN 1994

Cause of Death	Maternal Race						Total	
	Caucasian		Aboriginal		Other		No.	%
	No.	%	No.	%	No.	%		
Sudden Infant Death	16	42.1	6	28.6	1	50.0	23	37.7
Lethal Congenital Malformation	8	21.1	1	4.8	1	50.0	10	16.4
Extremely Low Birthweight (<1000g)	2	5.3	1	4.8	-	-	3	4.9
Infection - Respiratory	4	10.5	4	19.0	-	-	8	13.1
Infection - Meningitis	2	5.3	-	-	-	-	2	3.3
Infection - Other	2	5.3	2	9.5	-	-	4	6.6
Other	1	2.6	1	4.8	-	-	2	3.3
Unknown	3	7.9	6	28.6	-	-	9	14.8
TOTAL	38	100.0	21	100.0	2	100.0	61	100.0

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 July - September seasonal quarters of the year (Table 22).

TABLE 22 CAUSE OF POST-NEONATAL DEATH BY SEASONAL INCIDENCE IN WESTERN AUSTRALIA IN 1994

Cause of Death	Jan-Mar		Apr - Jun		Jul-Sep		Oct-Dec		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Sudden Infant Death	4	40.0	6	30.0	7	36.8	6	50.0	23	37.7
Lethal Congenital Malformation	3	30.0	4	20.0	3	15.8	-	-	10	16.4
Infection	1	10.0	4	20.0	5	26.3	3	25.0	13	21.3
Other/Unknown	2	20.0	6	30.0	4	21.1	3	25.0	15	24.6
TOTAL	10	100.0	20	100.0	19	100.0	12	100.0	61	100.0

Excludes births <500 grams birthweight.

SOURCE: MIDWIVES' NOTIFICATION SYSTEM
REGISTRAR GENERAL'S OFFICE

6. PERINATAL MORTALITY IN WESTERN AUSTRALIA IN THE 1994 BIRTH COHORT

6.1 Perinatal Mortality

There were 200 perinatal deaths identified in the 1994 birth cohort which gave a perinatal mortality rate of 7.9/1000 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 and 7.3/1000 in 1993. Among babies born to Aboriginal women the rate (18.0/1000) was higher than for perinatal deaths of babies of Caucasian women (7.1/1000) and for perinatal deaths of babies born to women of other races (9.4/1000) (Table 23).

TABLE 23 : STILLBIRTHS, NEONATAL AND PERINATAL MORTALITY BY MATERNAL RACE IN WESTERN AUSTRALIA IN 1994

Type of Death	Maternal Race						Total	
	Caucasian		Aboriginal		Other			
	No.	Rate	No.	Rate	No.	Rate	No.	Rate
Stillbirths	101	4.6	19	13.1	11	6.1	131	5.2
Neonatal Mortality	56	2.5	7	4.9	6	3.3	69	2.7
Perinatal Mortality	157	7.1	26	18.0	17	9.4	200	7.9

Excludes births <500 grams birthweight.

¹ Stillbirth & Perinatal Death rate/1000 total births.

² 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 was highest for babies of women aged 20 - 24 years, (8.2/1000) during 1994. In accord with previous years, data shows that in general risk increases toward the extremes of the fertile age group.

Nineteen (11.9/1000) perinatal deaths were among babies of women in their teenage years. Another 20 (6.7/1000) 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 1994

Maternal Age	Maternal Race									Total		
	Caucasian			Aboriginal			Other					
	No.	Births	Rate	No.	Births	Rate	No.	Births	Rate	No.	Births	Rate
≤15	1	38	26.3	1	57	17.5	-	2	-	2	97	20.6
16	1	91	11.0	1	49	20.4	-	8	-	2	148	13.5
17	-	202	-	1	80	12.5	-	7	-	1	289	3.5
18	4	316	12.7	3	106	28.3	-	12	-	7	434	16.1
19	3	485	6.2	3	117	25.6	1	28	35.7	7	630	11.1
≤19	9	1132	8.0	9	409	22.0	1	57	17.5	19	1598	11.9
20-24	29	4208	6.9	5	520	9.6	3	290	10.3	37	5018	7.4
25-29	57	7546	7.6	7	320	21.8	5	558	9.0	69	8424	8.2
30-34	44	6568	6.7	5	150	33.3	6	581	10.3	55	7299	7.5
35-39	17	2271	7.5	-	42	-	2	274	7.3	19	2587	7.3
40-44	1	339	2.9	-	5	-	-	53	-	1	397	2.5
•45	-	14	-	-	-	-	-	4	-	-	18	-
TOTAL	157	22078	7.1	26	1446	18.0	17	1817	9.4	200	25341	7.9

Excludes births <500 grams birthweight.

¹ Rate/1000 total births.

6.3 Maternal Race and Parity

The perinatal mortality rates for babies born to primiparous women 8.4/1000 and babies born to women with a parity of 1-2 (6.8/1000) were lower than the rate of perinatal death (8.6/1000) 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 1994

Parity	Caucasian			Aboriginal			Other			Total		
	No.	Births	Rate	No.	Births	Rate	No.	Births	Rate	No.	Births	Rate
0	71	8954	7.9	6	425	14.1	8	767	10.4	85	10146	8.4
1-2	67	11085	6.0	11	626	17.6	8	881	9.1	86	12592	6.8
3-4	13	1785	7.3	5	297	16.8	1	137	7.3	19	2219	8.6
≥5	6	254	23.6	4	98	40.8	-	32	-	10	384	26.0
TOTAL	157	22078	7.1	26	1446	18.0	17	1817	9.4	200	25341	7.9

Excludes births < 500 grams birthweight.

¹ Rate/1000 total births.

6.4 Maternal Race and Birthweight

More than half (68.5%) of all perinatal deaths (137, 87.7/1000) 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 ≥ 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 1994

Birthweight (grams)	Maternal Race									Total		
	Caucasian			Aboriginal			Other					
	No.	Births	Rate	No.	Births	Rate	No.	Births	Rate	No.	Births	Rate
500-999	59	114	517.5	9	14	642.9	3	9	(333.3)	71	137	518.2
1000-1499	11	135	81.5	5	24	208.3	3	15	(200.0)	19	174	109.2
1500-1999	14	227	61.7	4	32	(125.0)	1	18	(55.6)	19	277	68.6
2000-2499	19	772	24.6	3	127	(23.6)	6	76	78.9	28	975	28.7
<2500	103	1248	82.5	21	197	106.6	13	118	110.2	137	1563	87.7
2500-2999	20	3320	6.0	2	361	(5.5)	1	399	(2.5)	23	4080	5.6
3000-3499	19	8132	2.3	2	502	(4.0)	1	730	(1.4)	22	9364	2.3
3500-3999	14	6813	2.1	1	292	(3.4)	1	447	(2.2)	16	7552	2.1
4000-4499	-	2203	-	-	81	-	1	115	(8.7)	1	2399	(0.4)
≥ 4500	1	362	(2.8)	-	13	-	-	8	-	1	383	(2.6)
TOTAL	157	22078	7.1	26	1446	18.0	17	1817	9.4	200	25341	7.9

Excludes births <500 grams birthweight.

¹ Rate/1000 total births.

() Where n<5 rate has been bracketed.

6.5 Maternal Race and Babies' Sex

There were 103 (7.9/1000) male and 97 (7.8/1000) female perinatal deaths among those babies born in 1994.

Among babies born to Caucasian women the perinatal death rate for males (7.5/1000) was higher than the perinatal death rate for females (6.7/1000). The rate of perinatal deaths among male babies of Aboriginal woman (15.9/1000) was lower than the perinatal death rate for females (20.3/1000) and among babies of women of other races the rates were 6.3/1000 male and 12.8/1000 female (Table 27).

TABLE 27 : PERINATAL DEATHS BY MATERNAL RACE AND SEX IN WESTERN AUSTRALIA IN 1994

Sex	Maternal Race									Total		
	Caucasian			Aboriginal			Other					
	No.	Total Births	Rate	No.	Total Births	Rate	No.	Total Births	Rate	No.	Total Births	Rate
Male	85	11261	7.5	12	755	15.9	6	955	6.3	103	12971	7.9
Female	72	10817	6.7	14	691	20.3	11	862	12.8	97	12370	7.8
TOTAL	157	22078	7.1	26	1446	18.0	17	1817	9.4	200	25341	7.9

Excludes births <500 grams birthweight.

¹ Rate/1000 total births.

6.6 Maternal Race and Conjugal State

One sixth (12.0/1000) of perinatal deaths were among babies of women reported as socially unsupported by a partner. This represents an increase since the 1993 cohort report (9.9/1000). 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 1994

Conjugal State	Maternal Race									Total		
	Caucasian			Aboriginal			Other					
	No.	Total Births	Rate	No.	Total Births	Rate	No.	Total Births	Rate	No.	Total Births	Rate
Single	16	2003	8.0	15	542	27.7	3	107	28.0	34	2652	12.8
Married/defacto	140	19855	7.1	11	883	12.5	14	1695	8.3	165	22433	7.4
² Other	1	107	9.3	-	21	-	-	15	-	1	256	3.9
TOTAL	157	22078	7.1	26	1446	18.0	17	1817	9.4	200	25341	7.9

Excludes births <500 grams birthweight.

¹ Rate/1000 total births.

² Other includes separated, divorced and widowed.

7. INFANT MORTALITY IN WESTERN AUSTRALIA IN THE 1994 BIRTH COHORT

7.1 Infant Deaths

There were 130 infant deaths identified amongst the 25210 livebirths in 1994. Of these, 69 were neonatal deaths and 61 were post-neonatal deaths. The infant mortality rate for Western Australia in 1994 was 5.2/1000 livebirths, an increase from the rate of 4.5/1000 in 1993 (Tables 15 and 29).

Infant mortality among babies born to Aboriginal women (19.6/1000) was more than three 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 and 15.3/1000 in 1994 (Table 41).

7.2 Maternal Race and Maternal Age

The infant mortality rate is greatest for babies of teenage women (7.6/1000). The infant mortality rate for babies of Aboriginal teenage mothers (17.5/1000) was higher than that for babies of Caucasian teenage mothers (4.4/1000) (Table 29).

TABLE 29 : INFANT DEATHS BY MATERNAL RACE AND MATERNAL AGE IN WESTERN AUSTRALIA IN 1994

Maternal Age	Maternal Race									Total		
	Caucasian			Aboriginal			Other					
	No.	Births	Rate	No.	Births	Rate	No.	Births	Rate	No.	Births	Rate
≤15	-	37	-	1	56	17.9	-	2	-	1	95	10.5
16	1	91	11.0	-	48	-	-	8	-	1	147	6.8
17	2	202	9.9	1	79	12.7	-	7	-	3	288	10.4
18	1	313	3.2	2	103	19.4	-	12	-	3	428	7.0
19	1	483	2.1	3	115	26.1	-	27	-	4	625	6.4
≤19	5	1126	4.4	7	401	17.5	-	56	-	12	1583	7.6
20-24	25	4192	6.0	8	516	15.5	2	289	6.9	35	4997	7.0
25-29	34	7511	4.5	9	316	28.5	2	554	3.6	45	8381	5.4
30-34	19	6534	2.9	3	147	20.4	4	578	6.9	26	7259	3.6
35-39	9	2261	4.0	1	42	23.8	-	272	-	10	2575	3.9
40-44	1	339	2.9	-	5	-	-	53	-	1	397	2.5
≥45	1	14	71.4	-	-	-	-	4	-	1	18	55.6
TOTAL	94	21977	4.3	28	1427	19.6	8	1806	4.4	130	25210	5.2

Excludes births <500 grams birthweight.

¹ Rate/1000 livebirths.

7.3 Maternal Race and Conjugal State

The infant mortality rate (9.1/1000) 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 (4.7/1000) (Table 30).

TABLE 30 INFANT DEATHS BY MATERNAL RACE AND CONJUGAL STATE IN WESTERN AUSTRALIA IN 1994

Conjugal State	Maternal Race									Total		
	Caucasian			Aboriginal			Other					
	No.	Live Births	Rate	No.	Live Births	Rate	No.	Live Births	Rate	No.	Live Births	Rate
Single	10	1992	5.0	10	530	18.9	1	105	9.5	21	2627	8.0
Married/defacto	82	19765	4.1	17	876	19.4	7	1686	4.2	106	22327	4.7
Other	2	5	400.0	1	1	-	-	2	-	3	8	375.0
TOTAL	94	21977	4.3	28	1427	19.6	8	1806	4.4	130	25210	5.2

Excludes births <500 grams birthweight.

¹ Rate/1000 livebirths.

² 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 (10.1/1000).

TABLE 31 : INFANT DEATHS BY MATERNAL RACE AND PARITY IN WESTERN AUSTRALIA IN 1994

Parity	Maternal Race									Total		
	Caucasian			Aboriginal			Other					
	No.	Live Births	Rate	No.	Live Births	Rate	No.	Live Births	Rate	No.	Live Births	Rate
0	35	8910	3.9	3	420	7.1	2	760	2.6	40	10090	4.0
1-2	43	11039	3.9	16	619	25.8	6	878	6.8	65	12536	5.2
3-4	10	1775	5.6	6	293	20.5	-	136	-	16	2204	7.3
≥5	6	253	23.7	3	95	31.6	-	32	-	9	380	23.7
TOTAL	94	21977	4.3	28	1427	19.6	8	1806	4.4	130	25210	5.2

Excludes births < 500 grams birthweight.

¹ Rate/1000 livebirths.

7.5 Maternal Race and Plurality

Infant mortality for twins (18.2/1000) was almost four times the rate for singleton births (4.8/1000). The infant death rate (18.3/1000) for twin babies born to Caucasian women in 1994 was higher than the rate (17.0/1000) in 1993 (Table 32).

TABLE 32: INFANT DEATHS BY MATERNAL RACE AND PLURALITY IN WESTERN AUSTRALIA IN 1994

Plurality	Maternal Race									Total		
	Caucasian			Aboriginal			Other					
	No.	Live Births	Rate	No.	Live Births	Rate	No.	Live Births	Rate	No.	Live Births	Rate
Singleton	82	21366	3.8	28	1396	20.1	7	1777	3.9	117	24539	4.8
Twins	11	601	18.3	-	31	-	1	29	34.5	12	661	18.2
Triplets	1	10	100.0	-	-	-	-	-	-	1	10	100.0
TOTAL	94	21977	4.3	28	1427	19.6	8	1806	4.4	130	25210	5.2

Excludes births < 500 grams birthweight.

¹ Rate/1000 livebirths.

7.6 Maternal Race and Babies' Sex

The infant death rates were 4.7/1000 male and 5.6/1000 female. Among babies born to Caucasian women the infant death rate for males (4.4/1000) was higher than the infant death rate for females (4.2/1000). For babies of Aboriginal mothers the infant death rate for males (12.1/1000) was lower than the infant death rate for females (27.9/1000) and for infants of women of other races the infant death rate for males (3.2/1000) was lower than the infant death rate for females (5.8/1000) (Table 33).

TABLE 33 : INFANT DEATHS BY MATERNAL RACE AND SEX IN WESTERN AUSTRALIA IN 1994

Sex	Maternal Race									Total		
	Caucasian			Aboriginal			Other					
	No.	Live Births	Rate	No.	Live Births	Rate	No.	Live Births	Rate	No.	Live Births	Rate
Male	49	11205	4.4	9	745	12.1	3	951	3.2	61	12901	4.7
Female	45	10772	4.2	19	682	27.9	5	855	5.8	69	12309	5.6
TOTAL	94	21977	4.3	28	1427	19.6	8	1806	4.4	130	25210	5.2

Excludes births <500 grams birthweight.

¹ Rate/1000 livebirths.

7.7 Maternal Race and Birthweight

Low birthweight (less than 2500 grams) babies comprised less than half (46.9%) of all infant deaths. A rate of 41.5/1000 livebirths was recorded for low birthweight babies. Babies with birthweight of 3500 grams or more had the highest chance of survival with an infant mortality rate of 1.1/1000. An infant mortality rate (60.8/1000) for low birthweight babies of Aboriginal women was higher than the rate (37.3/1000) for low birthweight babies of Caucasian women (Table 34).

TABLE 34: INFANT MORTALITY BY MATERNAL RACE AND BIRTHWEIGHT DISTRIBUTION IN WESTERN AUSTRALIA IN 1994

Birth weight (grams)	Maternal Race									Total		
	Caucasian			Aboriginal			Other					
	No.	Births	Rate	No.	Births	Rate	No.	Births	Rate	No.	Births	Rate
500-999	23	76	302.6	5	9	555.6	1	7	(142.9)	29	92	315.2
1000-1499	5	126	39.7	-	19	-	1	13	(76.9)	6	158	38.0
1500-1999	5	218	22.9	2	28	(71.4)	1	18	(55.6)	8	264	30.3
2000-2499	11	759	14.5	4	125	(32.0)	3	71	(42.3)	18	955	18.8
<2500	44	1179	37.3	11	181	60.8	6	109	55.0	61	1469	41.5
2500-2999	18	3307	5.4	5	360	13.9	-	398	-	23	4065	5.7
3000-3499	27	8124	3.3	10	500	20.0	1	730	(1.4)	38	9354	4.1
3500-3999	5	6803	0.7	2	292	(6.8)	1	447	(2.2)	8	7542	1.1
4000-4499	-	2203	-	-	81	-	-	114	-	-	2398	-
≥4500	-	361	-	-	13	-	-	8	-	-	382	-
TOTAL	94	21977	4.3	28	1427	19.6	8	1806	4.4	130	25210	5.2

Excludes births <500 grams birthweight.

¹ Rate/1000 livebirths.

() Where n<5 rate has been bracketed.

7.8 Maternal Race and Age at Infant Death

More than half (55.4%) of the infant deaths occurred in the neonatal period, with most (85.4%) deaths occurring within 24 weeks of birth (Table 35).

TABLE 35 : INFANT DEATHS BY MATERNAL RACE AND AGE AT DEATH IN WESTERN AUSTRALIA IN 1994

Age at Death in Weeks	Maternal Race						Total	
	Caucasian		Aboriginal		Other			
	No.	%	No.	%	No.	%	No.	%
1-4	56	59.6	9	32.1	7	87.5	72	55.4
5-8	5	5.3	2	7.1	-	-	7	5.4
9-12	5	5.3	5	17.9	1	12.5	11	8.5
13-16	2	2.1	3	10.7	-	-	5	3.9
17-20	8	8.5	1	3.6	-	-	9	6.9
21-24	6	6.4	1	3.6	-	-	7	5.4
25-52	12	12.8	7	25.0	-	-	19	14.6
TOTAL	94	100.0	28	100.0	8	100.0	130	100.0

Excludes births <500 grams birthweight.

7.9 Causes of Infant Death

The major causes of infant deaths remain lethal congenital malformations for 33 (25.4%) babies, Sudden Infant Death Syndrome for 29 (22.3%) and low birthweight (<2500 grams) for 33 (25.4%) babies. Infection remained a significant cause of infant mortality (Table 36).

TABLE 36 : CAUSE OF INFANT DEATHS AND MATERNAL RACE IN WESTERN AUSTRALIA IN 1994

Cause of Death	Maternal Race						Total	
	Caucasian		Aboriginal		Other			
	No.	%	No.	%	No.	%	No.	%
Lethal Congenital Malformation	25	26.6	3	10.7	5	62.5	33	25.4
Low Birth Weight (<2500g)	27	28.7	4	14.3	2	25.0	33	25.4
Asphyxia	5	5.3	1	3.6	-	-	6	4.6
Pregnancy conditions	-	-	-	-	-	-	-	-
Infections	8	8.5	6	21.4	-	-	14	10.8
Hydrops fetalis	-	-	-	-	-	-	-	-
Other	4	4.3	1	3.6	-	-	5	3.8
Sudden Infant Deaths	21	22.3	7	25.0	1	12.5	29	22.3
Unknown	4	4.3	6	21.4	-	-	10	7.7
TOTAL	94	100.0	28	100.0	8	100.0	130	100.0

Excludes births <500 grams birthweight.

TABLE 37 : NEONATAL, POST-NEONATAL AND INFANT MORTALITY BY MATERNAL RACE IN WESTERN AUSTRALIA IN 1994

Type of Death	Maternal Race						Total	
	Caucasian		Aboriginal		Other			
	No.	Rate	No.	Rate	No.	Rate	No.	Rate
Neonatal Mortality	56	2.5	7	4.9	6	3.3	69	2.7
Post-Neonatal Mortality	38	1.7	21	14.7	2	1.1	61	2.4
Infant Mortality	94	4.3	28	19.6	8	4.4	130	5.2

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 1994

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	1	57 (17.5)	1	40 (25.0)	2	97 (20.6)	1	56 (17.9)	-	39	-	1	95 (10.5)	
16-19	8	352 22.7	9	1149 7.8	17	1501 11.3	6	345 17.4	5	1143 4.4	11	1488 7.4		
20-29	12	840 14.3	94	12602 7.5	106	13442 7.9	17	832 20.4	63	12546 5.0	80	13378 6.0		
30-39	5	192 26.0	69	9694 7.1	74	9886 7.5	4	189 (21.2)	32	9645 3.3	36	9834 3.7		
≥40	-	5 -	1	410 (2.4)	1	415 (2.4)	-	5 -	2	410 (4.9)	2	415 (4.8)		
Total	26	1446 18.0	174	23895 7.3	200	25341 7.9	28	1427 19.6	102	23783 4.3	130	25210 5.2		
<u>Plurality</u>														
Singleton	25	1414 17.7	155	23247 6.7	180	24661 7.3	28	1396 20.1	89	23143 3.8	117	24539 4.8		
Multiple	1	32 (31.3)	19	648 29.3	20	650 30.8	-	31 -	13	640 20.3	13	671 19.3		
Total	26	1446 18.0	174	23895 7.3	200	25341 7.9	28	1427 19.6	102	23783 4.3	130	25210 5.1		
<u>Sex</u>														
Male	12	755 15.9	91	12216 7.4	103	12971 7.9	9	745 12.1	52	12156 4.3	61	12901 4.7		
Female	14	691 20.3	83	11679 7.1	97	12370 7.8	19	682 27.9	50	11627 4.3	69	12309 5.6		
Total	26	1446 18.0	174	23895 7.3	200	25341 7.9	28	1427 19.6	102	23783 4.3	130	25210 5.2		

Excludes births <500 grams birthweight.

¹ Perinatal death rate/1000 total births.

² Infant death rate/1000 livebirths.

() Where n<5 rate has been bracketed.

8. TRENDS IN BIRTHS, PERINATAL AND INFANT MORTALITY IN WESTERN AUSTRALIA 1980 - 1994

8.1 Crude Birth Rates and Total Births 1980 - 1994

Over the past decade, the crude birth rate for Western Australia has gradually reduced from 16.3/1000 in 1985 to 14.8/1000 in 1994.

Among Aboriginal women, the crude birth rate remained relatively stable ranging between 30.1/1000 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 1980-1994

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

SOURCE : Livebirths - MIDWIVES' NOTIFICATION SYSTEM
 Population data - ESTIMATED RESIDENT POPULATION BY AGE, SEX AND ABORIGINALITY
 1981-1994, 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 - 1994

Western Australian stillbirth rates showed a general downward trend from 7.5/1000 total births in 1980 to 5.2/1000 in 1994 (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 4.7/1000 in 1994. 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, 1980-1994

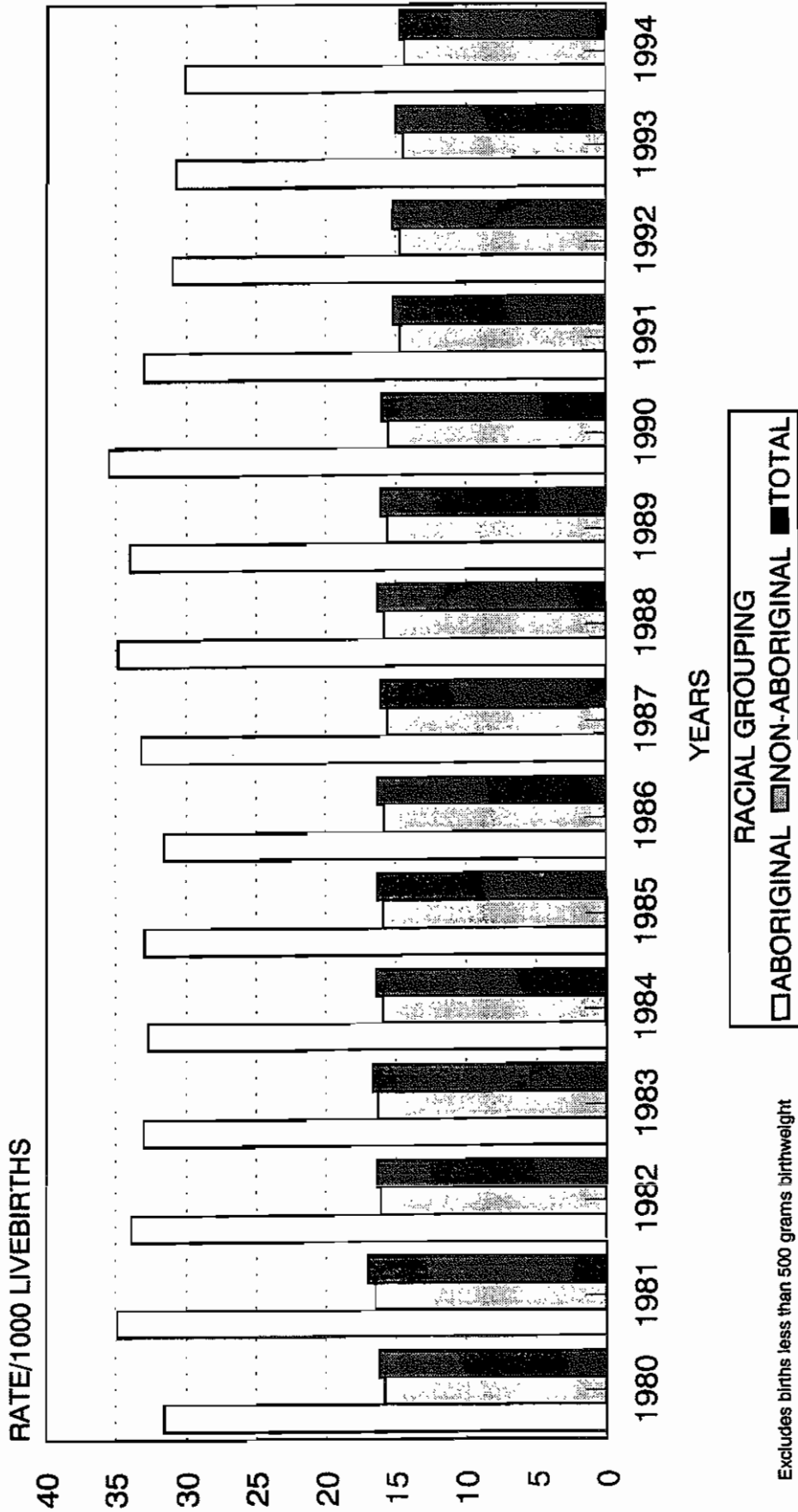


FIGURE VII

STILLBIRTH PROPORTIONS AND RACIAL GROUPING OF BIRTHS IN W.A. 1980-1994

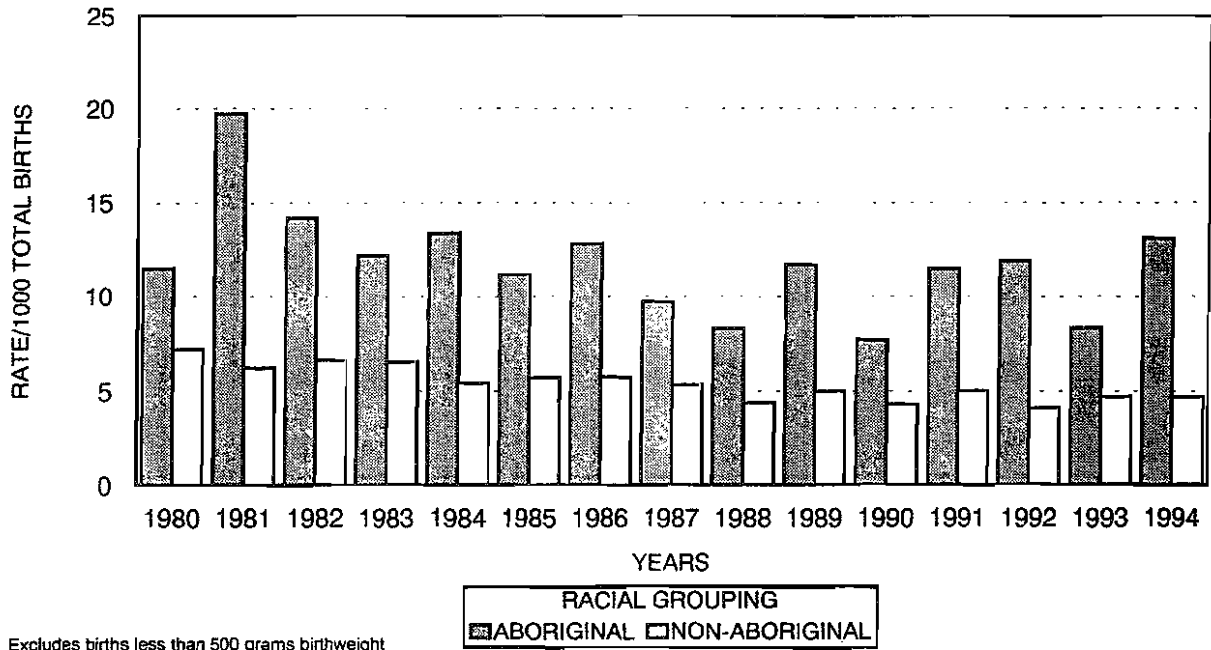


FIGURE VIII

PERINATAL MORTALITY AND RACIAL GROUPING FOR WESTERN AUSTRALIAN BIRTHS, 1980-1994

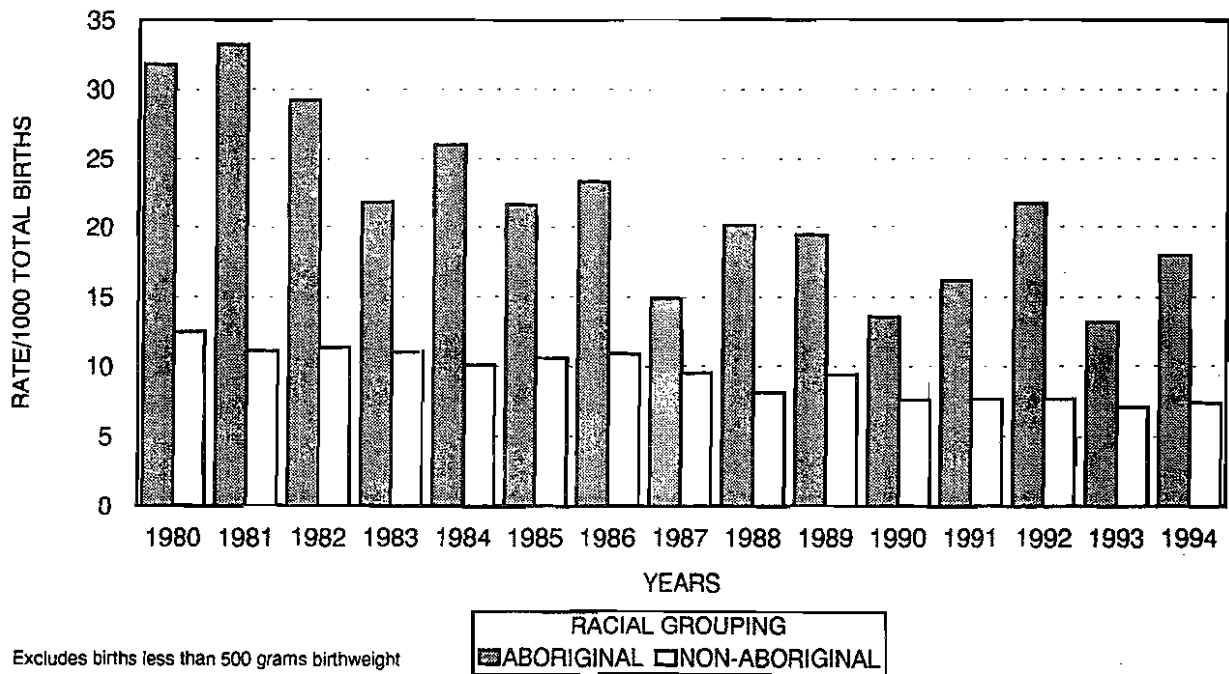


TABLE 40 : STILLBIRTHS, NEONATAL AND PERINATAL MORTALITY FOR ABORIGINAL AND NON-ABORIGINAL BIRTHS IN WESTERN AUSTRALIA 1980-1994

Year	Stillbirths				Neonatal Mortality				Perinatal Mortality							
	Aboriginal		Non-Aboriginal		Aboriginal		Non-Aboriginal		Aboriginal		Non-Aboriginal					
	No.	(1)	No.	(1)	No.	(2)	No.	(2)	No.	(3)	No.	(3)				
1980	12	11.5	143	7.2	155	7.5	21	20.4	104	5.3	33	31.7	247	12.5	280	13.5
1981	22	19.7	131	6.2	153	6.9	15	13.7	103	4.9	37	33.2	234	11.1	271	12.2
1982	16	14.2	139	6.6	155	6.9	17	15.3	101	4.8	33	29.2	240	11.3	273	12.2
1983	14	12.2	143	6.5	157	6.8	11	9.7	97	4.5	25	21.8	240	11.0	265	11.5
1984	16	13.4	118	5.4	134	5.8	15	12.8	101	4.7	31	26.0	219	10.1	250	10.9
1985	14	11.2	136	5.7	150	6.4	13	10.5	96	4.4	27	21.6	232	10.6	259	11.1
1986	16	12.8	130	5.7	146	6.1	13	10.6	116	5.2	29	23.3	246	10.9	275	11.5
1987	13	9.7	121	5.3	134	5.5	7	5.3	96	4.2	20	14.9	217	9.5	237	9.8
1988	12	8.3	105	4.4	117	4.7	17	11.9	87	3.7	29	20.1	192	8.1	221	8.8
1989	17	11.7	121	5.0	138	5.4	11	7.7	110	4.6	28	19.4	231	9.4	259	10.2
1990	12	7.7	106	4.3	118	4.5	9	5.9	78	3.2	21	13.6	184	7.5	205	7.9
1991	17	11.5	117	5.0	134	5.4	7	4.8	61	2.6	24	16.2	178	7.6	202	8.1
1992	17	11.9	98	4.1	115	4.6	14	9.9	83	3.5	31	21.7	181	7.6	212	8.4
1993	12	8.3	111	4.7	123	4.9	7	4.9	55	2.3	19	13.2	166	7.0	185	7.3
1994	19	13.1	112	4.7	131	5.2	7	4.9	62	2.6	26	18.0	174	7.3	200	7.9

Excludes births <500 grams birthweight.

1980 - 1983 based on year of death.

1984 - 1994 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 fourteen year period from 1980-1994. The rate of 20.4/1000 livebirths in 1980 reduced to 4.9/1000 livebirths in 1994. For babies of non-Aboriginal women, neonatal mortality rates reduced from 5.3/1000 in 1980 to 2.6/1000 in 1994 (Table 40, Figure IX).

8.2.3 Perinatal Mortality

Comparison of perinatal mortality for 1985-94, the ten years where the birth cohort method was employed, showed that overall the rate has decreased from 11.1/1000 total births in 1985 to 7.9/1000 in 1994. Overall a reduction of 5.6/1000 (13.5/1000 in 1980 to 7.9/1000 in 1994) occurred over fifteen years. It was apparent that the reduction in the perinatal mortality among babies of Aboriginal women from 31.7/1000 in 1980 to 18.0/1000 in 1994, 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 fifteen year period from 1980 to 1994 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 2.7/1000 in 1994. Rates for post-neonatal deaths decreased slightly from 3.2/1000 in 1980 to 2.4/1000 in 1994 and infant mortality rates reduced from 9.3/1000 in 1980 to 5.2/1000 in 1994 (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 and 19.6/1000 in 1994.

Infant mortality rates among babies of Aboriginal women at more than three times the rate for babies of non-Aboriginal women, should be noted for the differences in age at death (Table 35) and the cause of death (Table 36). The rate of deaths of babies born to Aboriginal women during the post-neonatal period (14.7/1000) was eight times the rate of deaths among babies of non-Aboriginal women (1.7/1000)(Table 41).

TABLE 41 : NEONATAL, POST-NEONATAL AND INFANT MORTALITY FOR ABORIGINAL AND NON-ABORIGINAL BIRTHS IN WESTERN AUSTRALIA 1980-1994

Year	Neonatal Mortality				Post-Neonatal Mortality				Infant Mortality									
	Aboriginal		Non-Aboriginal		Aboriginal		Non-Aboriginal		Aboriginal		Non-Aboriginal		Total					
	No.	(1)	No.	(1)	No.	(1)	No.	(1)	No.	(1)	No.	(1)	No.	(1)				
1980	21	20.4	104	5.3	125	6.1	11	10.7	55	2.8	66	3.2	32	31.1	159	8.1	191	9.3
1981	15	13.7	103	4.9	118	5.4	6	5.5	63	3.0	69	3.1	21	19.2	166	7.9	187	8.5
1982	17	15.3	101	4.8	118	5.3	11	9.9	69	3.3	80	3.6	28	25.2	170	8.1	198	8.9
1983	11	9.7	97	4.5	108	4.7	17	15.0	59	2.7	76	3.3	28	24.7	156	7.2	184	8.0
1984	15	12.8	101	4.7	116	5.1	14	11.9	75	3.5	89	3.9	29	24.7	176	8.1	205	9.0
1985	13	10.5	96	4.4	109	4.7	19	15.4	58	2.6	77	3.3	32	25.9	154	7.0	186	8.0
1986	13	10.6	116	5.2	129	5.4	12	9.8	59	2.6	71	3.0	25	20.3	175	7.8	200	8.4
1987	7	5.3	96	4.2	103	4.3	18	13.6	64	2.8	82	3.4	25	18.8	160	7.1	185	7.7
1988	17	11.9	87	3.7	104	4.2	24	16.8	58	2.5	82	3.3	41	28.7	145	6.2	186	7.5
1989	11	7.7	110	4.6	121	4.8	21	14.7	56	2.3	77	3.0	32	22.4	166	6.9	198	7.8
1990	9	5.9	78	3.2	87	3.4	16	10.4	71	2.9	87	3.4	25	16.3	149	6.1	174	6.7
1991	7	4.8	61	2.6	68	2.7	21	14.4	56	2.4	77	3.1	28	19.2	117	5.0	145	5.8
1992	14	9.9	83	3.5	97	3.9	17	12.1	43	1.8	60	2.4	31	22.0	126	5.3	157	6.2
1993	7	4.9	55	2.3	62	2.5	13	9.1	39	1.6	52	2.1	20	14.0	94	4.0	114	4.5
1994	7	4.9	62	2.6	69	2.7	21	14.7	40	1.7	61	2.4	28	19.6	102	4.3	130	5.2

Excludes births <500 grams birthweight.

1980 - 1983 based on year of death.

1984 - 1994 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, 1980-1994

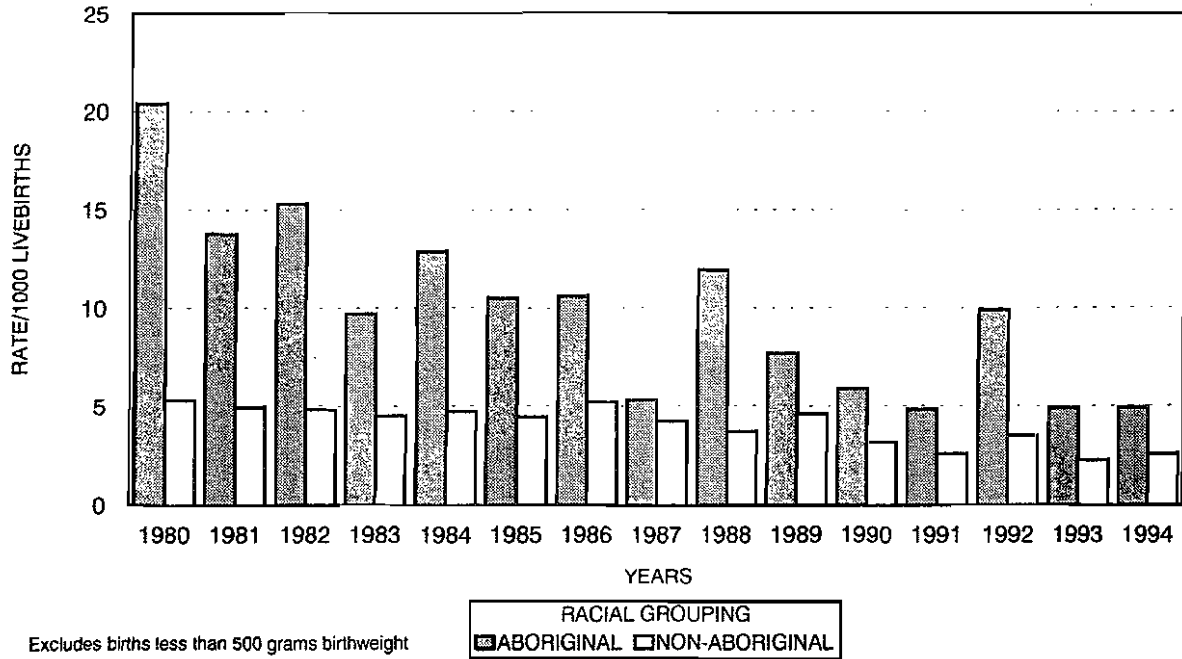


FIGURE X
POSTNEONATAL MORTALITY, RACIAL GROUPING
FOR WESTERN AUSTRALIAN BIRTHS, 1980-1994

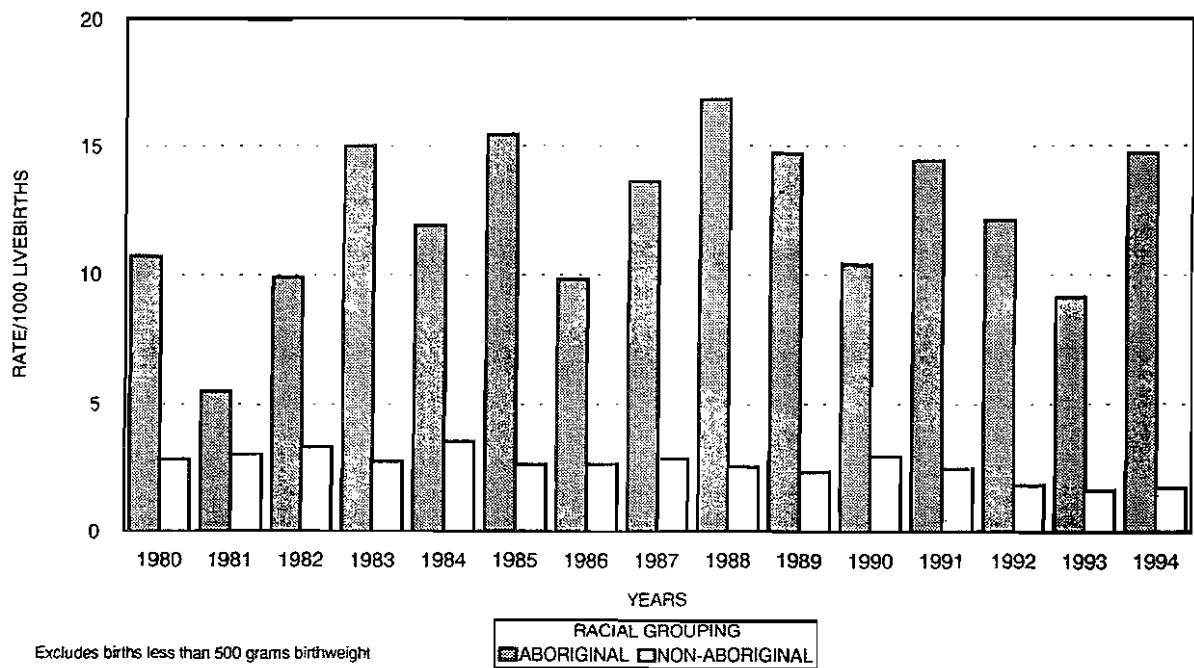
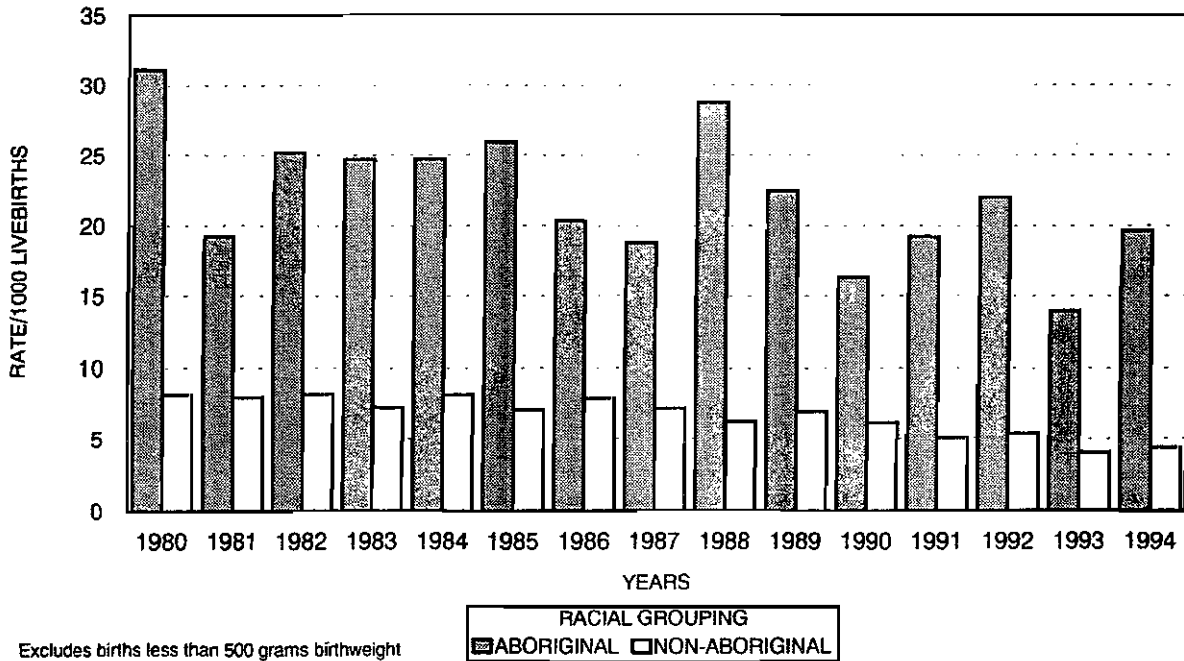


FIGURE XI

**INFANT MORTALITY AND RACIAL GROUPING FOR
WESTERN AUSTRALIAN BIRTHS, 1980-1994**



REFERENCES

1. Gee, V. Perinatal Statistics in Western Australia. Twelfth Annual Report of the Midwives' Notification System for 1994. Health Department of Western Australia, Perth. December 1995.
2. Gee, V. Perinatal and Infant Mortality Identified by Maternal Race. The 1993 Western Australian Birth Cohort, Health Department of Western Australia, Perth. December 1995.
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.

Health Act (Midwifery Nurses) Regulations Form 2
NOTIFICATION OF CASE ATTENDED
 PARTICULARS RELATING TO MOTHER

Hospital _____

PRINT
 IN
 BLOCK
 LETTERS.

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

Current Conjugal State:

single () 1
 married (incl. de facto) () 2
 other _____

Race: (please specify) _____

Caucasian () 1
 Aboriginal (full or part) () 2
 Other () 3

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 - certain () 1
 - not certain () 2

Expected due date _____

Complications of Pregnancy:

Threatened abortion (under 20 weeks) () A
 urinary tract infection () B
 pre eclampsia () C
 APH - placenta praevia () D
 - abruptio () E
 - other () F
 prem. rupture of membranes () G
 other _____ H

Medical Conditions:

LABOUR AND DELIVERY

Onset of Labour:

spontaneous () A
 induced () B
 no labour () D

Augmentation of Labour no () 1
 yes () 2

Presentation:

vertex () 1
 breech () 2
 other () 3

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 () C

Hours of established labour: _____

Complications of Labour, Delivery: (include reason for Caesarean)

precipitate delivery () A
 fetal distress () B
 prolapsed cord () C
 cord tight around neck () D
 cephalopelvic disproportion () E
 other _____ F

BABY

Separate Form for each Baby.

Adoption Yes () No ()

Birth Date: _____

Time (24 hr. clock) _____

Plurality:

single birth () 1
 first twin () 2
 second twin () 3
 other multiple birth: () 4
 (specify baby number ___ of ___)

Sex: male () 1
 female () 2

Condition: liveborn () 1
 stillborn () 2

Birthweight (grams) _____

Length (cms) _____

Head circumference (cms) _____

Time to establish unassisted regular breathing (mins) _____

Resuscitation:

none () 0
 intubation () 3
 oxygen only () 8
 other _____

Apgar Score:

1 min _____

5 mins _____

Estimated Gestation (weeks) _____

Birth Defects _____

Birth Trauma (Eg. cephalhaematoma) _____

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

MIDWIFE

Name _____

Signature _____

Reg. No. _____ Date _____/_____/_____

BABY'S SEPARATION DETAILS

Date of Discharge/Transfer or Death _____

Type of Separation:

Discharged home () 1
 Died () 2
 Transferred to () 3

Special Care (whole days only) _____

Separate HA22 for baby: yes, attached () 1 2

HEALTH DEPARTMENT COPY

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 _____ 3.m. p.m. _____ 19____

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—
 _____ 3.m. _____ and date _____ p.m.

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 | _____

due to | _____

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 conditions last.

PART II

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

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

Signature _____ Date _____

Name _____ Address _____

(Block Letters)

APPENDIX B

For Office Use Only

Registration Number

1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	

Approximate Interval Between Onset and Death

1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	

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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