

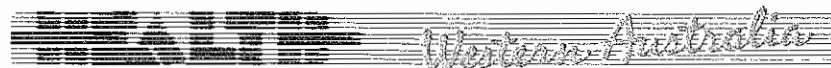
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**THE 1991 WESTERN AUSTRALIAN
BIRTH COHORT**

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

VIVIEN GEE
BAppSc.(Nursing Admin.),RN,RM,CHN
Epidemiology and Health Statistics Section
Health Services Contracts Bureau

April 1994



Health Department of Western Australia

**Statistical Series /34
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SUMMARY

The Midwives' Notification System of Western Australia identified 24935 births of ≥ 500 grams birthweight to 24616 women during 1991. Of these babies, 134 were stillborn and a further 145 liveborn babies died within the first twelve months.

The overall stillborn proportion was 5.4/1000 total births. Among babies born to Caucasian women the proportion was 5.0/1000, for babies of Aboriginal women 11.5/1000 and for babies of women of other races the proportion was 5.4/1000 total births. The stillbirth proportion of 5.0/1000 among singleton births was one third that (18.8/1000) for multiple births (Tables 3 and 6).

Of babies born to teenage women 9 (5.5/1000) were stillborn. Consideration of maternal parity showed a higher stillbirth proportion for primiparous women (5.8/1000) than among babies of multiparous women (5.1/1000) (Table 5).

The causes of stillbirths were unexplained for 60 (44.8%) babies and the deaths of 30 (22.4%) babies were attributed to complications arising from extremely low birth weight (< 1000 grams). Lethal congenital abnormalities were the cause of death for 15 (11.2%) stillbirths (Table 8).

There were 68 neonatal deaths, giving a neonatal mortality proportion of 2.7/1000 livebirths; for babies of Caucasian women the proportion was 2.4/1000, for babies of Aboriginal mothers 4.8/1000 and for babies of women of other races 6.0/1000 (Tables 3 and 10).

Post neonatal deaths numbered 77 (3.1/1000 livebirths) babies. Thirty six (46.8%) of these were attributed to Sudden Infant Death Syndrome and 20 (26.0%) to lethal congenital malformations (Table 21).

The perinatal mortality proportion was 8.1/1000 total births. For babies of Caucasian women the proportion was 7.3/1000, for babies of Aboriginal women 16.2/1000 and babies of women of other races 11.3/1000. Perinatal deaths amongst babies born to Aboriginal teenage mothers (4.4/1000) was less than for babies born to Caucasian women in the same age group (9.6/1000) (Table 24). The rate of perinatal mortality among babies of single women and of babies of separated, divorced or widowed women (11.2/1000) was noticeably higher than the rate (7.7/1000) for babies of women reported to be socially supported by a male partner (Table 28).

Infant deaths numbered 145 being 68 neonatal deaths and 77 post neonatal deaths. These numbers provide an overall proportion of 5.8/1000 livebirths (Table 37).

Among babies of Aboriginal women the infant mortality rate (19.2/1000) was three times the overall rate (5.8/1000). The fraction of infant deaths attributed to Sudden Infant Death Syndrome among babies of Aboriginal women (39.3%) was greater than the overall fraction of 26.9% (Table 36).

The major causes of infant death remain lethal congenital malformation (42.1%), Sudden Infant Death Syndrome (26.9%) and disorders related to low birthweight (11.0%) (Table 36).

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

Perinatal and infant mortality rates are 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 eleven years from 31.1/1000 in 1980 to 19.2/1000 in 1991, it still remains more than three times that of the overall infant mortality rate (5.8/1000) of livebirths in 1991.

Overall, a reduction in perinatal and infant mortality rates occurred over the past eleven years. The infant mortality rate for the 1991 birth cohort is the lowest recorded for a decade. (Table 40 and Table 41).

ACKNOWLEDGEMENTS

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1. INTRODUCTION

This report is the eighth 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 1991 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 eighth 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).

Aboriginal population statistics were supplied by the Community and Child Health Services of the Health Department of Western Australia.

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.

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 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.

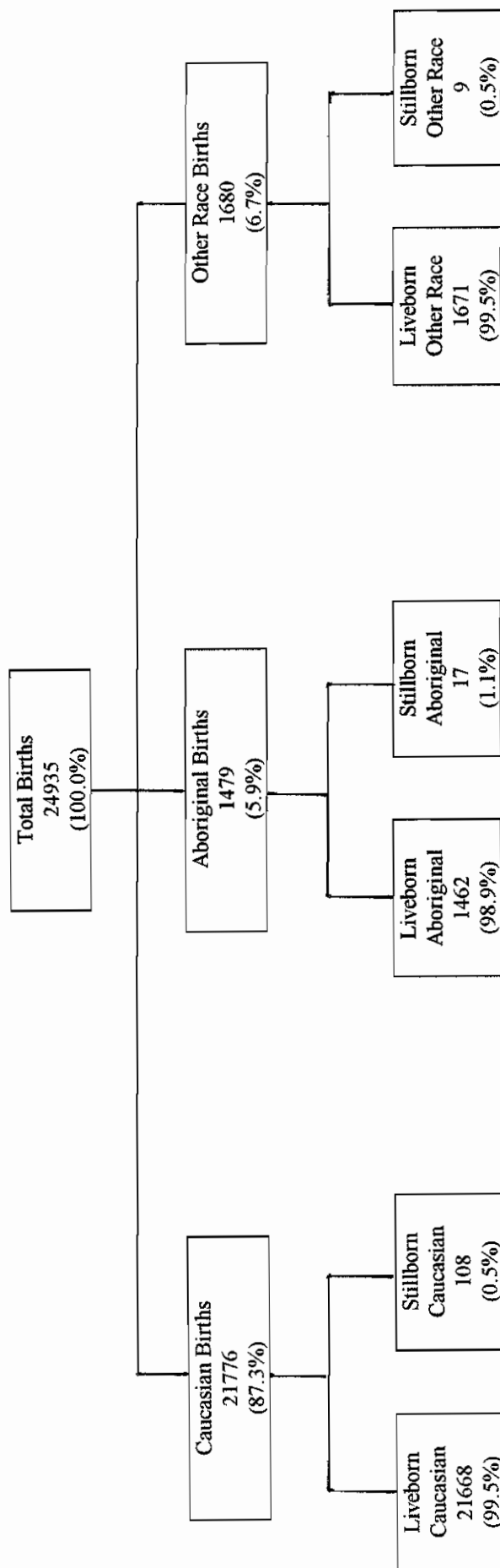
Other Includes Asian, Indian, Negroid, Polynesian, etc.

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 1991



Excludes births less than 500 grams birthweight.

4. BIRTHS IN WESTERN AUSTRALIA IN 1991

4.1 Births Incidence

Midwives' forms received by this department indicate that 24935 babies were born to 24616 women during 1991. This report includes statistics only on those babies whose birthweight was equal to or greater than 500 grams.

Examination of births showed that 21776 (87.3%) were born to Caucasian women, 1479 (5.9%) to Aboriginal women and 1680 (6.7%) to women of other racial groups (Table 1).

4.2 Place of Birth

The majority of births, 24713 (99.1%), occurred in hospital. Of these, births in metropolitan hospitals numbered 18377 (74.4%) and non-metropolitan hospital births were 6336 (25.6%).

There were 222 (0.9%) non hospital births including 77 (0.3%) born before arrival at hospital and 145 (0.6%) 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 16964 (68.0%) were to women whose usual place of residence was in the Perth Metropolitan Health Service Management Regions (Table 2).

4.4 Crude Birth Rate

An overall crude birth rate of 15.2/1000 total population was identified for Western Australia during 1991. The area with the lowest crude birth rate (14.2/1000 total population) was the Perth Metropolitan Region (Figure 1).

4.5 Condition of Births

Analysis of the condition at birth showed 24801 (99.5%) babies were liveborn and 134 (0.5%) babies were stillborn. Livebirths to Caucasian women numbered 21668 (99.5%) and stillbirths 108 (0.5%). Among Aboriginal women there were 1462 (98.9%) liveborn and 17 (1.1%) stillborn babies. For women of other races there were 1671 (99.5%) livebirths and 9 (0.5%) stillbirths (Table 1).

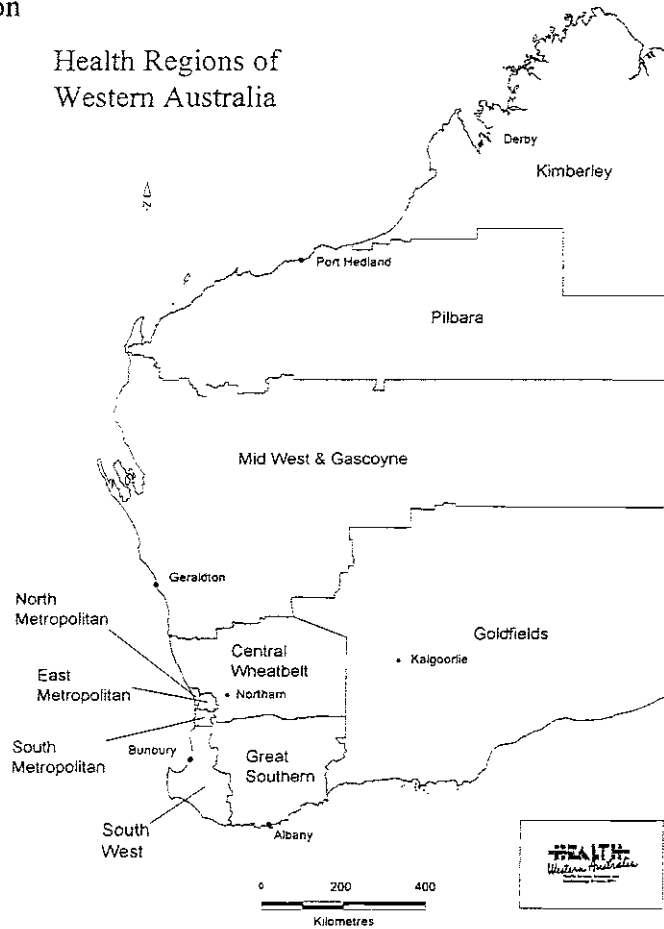
4.6 Maternal Age

Consideration of maternal age shows that the highest percentage of women confined (35.9%), were in the 25 to 29 year age category. Women in their teenage years accounted for 6.6% of total confinements. Almost a third (30.3%) of Aboriginal women confined were teenagers. This contrasts with Caucasian women of whom 5.3% were teenagers and women of other races with 2.8% teenage confinements. Women aged 40 years or more represented 1.3% of all women confined.

FIGURE I

**CRUDE BIRTH RATE, PERINATAL AND INFANT MORTALITY
BY HEALTH SERVICE MANAGEMENT REGION OF MATERNAL RESIDENCE
FOR BIRTHS IN WESTERN AUSTRALIA IN 1991**

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



Region	Crude Birth Rate	Perinatal Mortality	Infant Mortality
Kimberley	25.8	9.9	15.0
Pilbara	21.2	12.2	8.2
Mid West/Gascoyne	18.2	10.0	5.5
Goldfields	20.4	9.2	9.2
Central Wheatbelt	17.2	5.7	5.7
Great Southern	15.8	9.0	7.2
South West	15.1	8.7	8.7
Metropolitan	14.2	7.6	4.7
Total WA	15.2	8.1	5.8

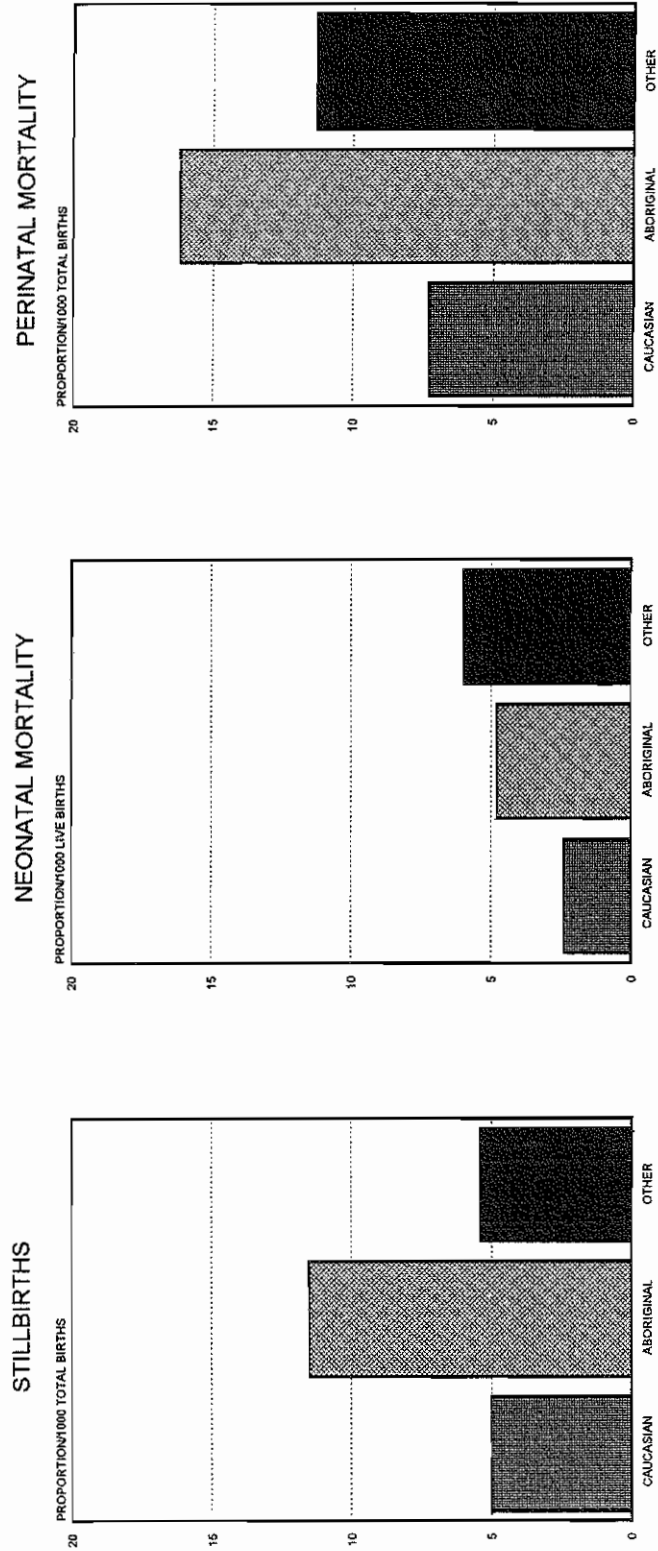
TABLE 2:
LIVEBIRTHS AND TOTAL BIRTHS BY HEALTH SERVICE MANAGEMENT REGION OF MATERNAL RESIDENCE AND MATERNAL RACE IN WESTERN AUSTRALIA 1991

Health Service Management Region of Maternal Residence	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	4765	22.0	4788	22.0	102	7.0	103	7.0	421	25.2	422	25.1	5288	21.3	5313	21.3
East	4917	22.7	4946	22.7	184	12.6	188	12.7	516	30.9	518	30.8	5617	22.7	5642	22.6
South	5353	24.7	5372	24.7	155	10.6	159	10.8	464	27.8	468	27.9	5972	24.1	6009	24.1
<u>Non-Metropolitan</u>																
South West	2081	9.6	2093	9.6	64	4.4	65	4.4	29	1.7	29	1.7	2174	8.8	2187	8.8
Great Southern	1015	4.7	1021	4.7	69	4.7	69	4.7	21	1.3	21	1.3	1105	4.5	1111	4.5
Central Wheatbelt	808	3.7	811	3.7	56	3.8	56	3.8	13	0.8	13	0.8	877	3.5	880	3.5
Goldfields	914	4.2	918	4.2	129	8.8	131	8.9	41	2.5	42	2.5	1084	4.4	1091	4.4
Mid West Gascoyne	865	4.0	872	4.0	178	12.2	178	12.0	45	2.7	46	2.7	1088	4.4	1096	4.4
Pilbara	723	3.3	728	3.3	152	10.4	154	10.4	95	5.7	95	5.7	970	3.9	977	3.9
Kimberley	215	1.0	215	1.0	369	25.2	372	25.2	18	1.1	18	1.1	602	2.4	605	2.4
Outside WA	12	0.1	12	0.1	4	0.3	4	0.3	8	0.5	8	0.5	24	0.1	24	0.1
TOTAL	21668	100.0	21776	100.0	1462	100.0	1479	100.0	1671	100.0	1680	100.0	24801	100.0	24935	100.0

Excludes births <500 grams birthweight.

FIGURE II

STILLBIRTHS, NEONATAL AND PERINATAL MORTALITY,
ABORIGINAL AND NON-ABORIGINAL,
WESTERN AUSTRALIA, 1991



Excludes births less than 500 grams birthweight

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

**TABLE 3:
STILLBIRTHS, NEONATAL AND PERINATAL DEATHS BY HEALTH SERVICE MANAGEMENT REGION OF MATERNAL RESIDENCE AND MATERNAL RACE IN WESTERN AUSTRALIA IN 1991**

Health Service Management Region of Maternal Residence	Maternal Race																								
	Caucasian						Aboriginal						Other						Total						
	Stillbirths No.	Stillbirths Rate	Neonatal No.	Neonatal Rate	Perinatal No.	Perinatal Rate	Stillbirths No.	Stillbirths Rate	Neonatal No.	Neonatal Rate	Perinatal No.	Perinatal Rate	Stillbirths No.	Stillbirths Rate	Neonatal No.	Neonatal Rate	Perinatal No.	Perinatal Rate							
Metropolitan	23	4.8	15	3.1	38	7.9	1	(9.7)	-	-	1	(9.7)	1	(2.4)	1	(2.4)	2	(4.7)	25	4.7	16	3.0	41	7.7	
North	29	5.9	11	2.2	40	8.1	4	(21.3)	-	-	4	(21.3)	2	(3.9)	4	(7.8)	6	11.6	25	4.4	15	2.7	40	7.1	
East	19	3.5	7	1.3	26	4.8	4	31.4	-	(6.5)	5	31.4	4	(8.5)	3	(6.5)	7	15.0	37	6.2	11	1.8	48	8.0	
South																									
Non Metropolitan	12	5.7	6	2.9	18	8.6	1	(15.4)	-	-	1	(15.4)	-	-	-	-	-	-	13	5.9	6	2.8	19	8.7	
South West	6	5.9	4	(3.9)	10	9.8	-	-	-	-	-	-	-	-	-	-	-	-	6	54.1	4	(3.6)	10	9.0	
Great Southern	3	(3.7)	2	(2.5)	5	6.2	-	-	-	-	-	-	-	-	-	-	-	-	3	(3.4)	2	(2.3)	5	5.7	
Central Wheatbelt	4	(4.4)	1	(1.1)	5	5.4	2	(15.3)	-	-	2	(15.3)	1	(23.8)	2	(48.8)	3	(71.4)	7	6.4	3	(2.8)	10	9.2	
Goldfields	7	8.0	2	(2.3)	9	10.3	1	(5.6)	-	-	1	(5.6)	1	(21.7)	-	-	1	(21.7)	8	7.3	3	(2.8)	11	10.0	
Mid West Gascoyne	5	6.9	2	(2.8)	7	9.6	3	32.5	-	(19.7)	5	32.5	-	-	-	-	-	-	7	7.2	5	5.2	12	12.2	
Pilbara	-	-	1	(4.7)	1	(4.7)	3	13.4	-	(5.4)	5	13.4	-	-	-	-	-	-	3	(5.0)	3	(5.0)	6	9.9	
Kimberley	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Outside WA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
TOTAL	108	5.0	51	2.4	159	7.3	17	11.5	7	4.8	24	16.2	9	5.4	10	6.0	19	11.3	134	5.4	68	2.7	202	8.1	

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 1991 BIRTH COHORT

5.1 Stillbirths

There were 134 stillbirths in Western Australia during the 1991 year which were equal to or greater than 500 grams birthweight. The stillbirth proportion for the State was 5.4/1000 total births (Table 4).

The stillbirth proportion for babies of Aboriginal women (11.5/1000) was high compared to that for babies of Caucasian women (5.0/1000) and for babies of women of other racial groups (5.4/1000).

Stillbirth proportions relating to Health Service Management Regions 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 5.5/1000 and for babies of Aboriginal teenage mothers the rate was 2.2/1000 total births. Among women aged 25-29 years, the group with the highest number of births overall, the stillbirth rate was 4.7/1000 total births. Among babies of women aged 35 years and over 19 (7.7/1000) stillbirths occurred. (Table 4).

TABLE 4:
STILLBIRTHS BY MATERNAL RACE AND MATERNAL AGE IN WESTERN AUSTRALIA IN 1991

Maternal Age	Maternal Race									Total		
	Caucasian			Aboriginal			Other					
	No.	Total	Rate	No.	Total	Rate	No.	Total	Rate	No.	Total	Rate
≤15	-	26	-	-	51	-	-	2	-	-	79	-
16	-	90	-	-	61	-	-	1	-	-	152	-
17	3	202	14.9	-	90	-	-	3	-	3	295	10.2
18	3	316	9.5	-	123	-	-	17	-	3	456	6.6
19	2	510	3.9	1	130	7.7	-	24	-	3	664	4.5
≤19	8	1144	7.0	1	455	2.2	-	47	-	9	1646	5.5
20-24	19	4410	4.3	8	554	14.4	2	248	8.1	29	5212	5.6
25-29	34	8099	4.2	5	298	16.8	3	556	5.4	42	8953	4.7
30-34	32	5997	5.3	-	124	-	3	532	5.6	35	6653	5.3
35-39	14	1861	7.5	2	41	48.8	1	248	4.0	17	2150	7.9
40-44	1	261	3.8	1	7	142.9	-	49	-	2	317	6.3
≥45	-	4	-	-	-	-	-	-	-	-	4	-
TOTAL	108	21776	5.0	17	1479	11.5	9	1680	5.4	134	24935	5.4

Excludes births <500 grams birthweight.

¹ Rate/1000 total births.

5.1.2 Maternal Race and Parity

Fifty seven (5.8/1000) stillborn babies were to primiparous women compared with 59 (5.8/1000) in the 1990 birth cohort. For babies of women whose parity was three or more, the stillbirth rate rose from 9 (3.3/1000) in 1990 to 23 (8.8/1000) in 1991. (Table 5).

TABLE 5:
STILLBIRTHS BY MATERNAL RACE AND PARITY IN WESTERN AUSTRALIA IN 1991

Parity	Caucasian			Aboriginal			Other			Total		
	No.	Total Births	Rate	No.	Total Births	Rate	No.	Total Births	Rate	No.	Total Births	Rate
0	51	8797	5.8	4	461	8.7	2	642	3.1	57	9900	5.8
1-5	41	10947	3.7	6	620	9.7	7	870	8.0	54	12437	4.3
3-4	16	1834	8.7	7	289	24.2	-	145	-	23	2268	10.1
≥5	-	198	-	-	109	-	-	23	-	-	330	-
TOTAL	108	21776	5.0	17	1479	11.5	9	1680	5.4	134	24935	5.4

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 (18.8/1000) compares to a 5.0/1000 stillbirth rate for all singleton births. For singleton births the rate of stillbirths among babies of Aboriginal women (9.7/1000) is higher than for total births (5.0/1000) (Table 6).

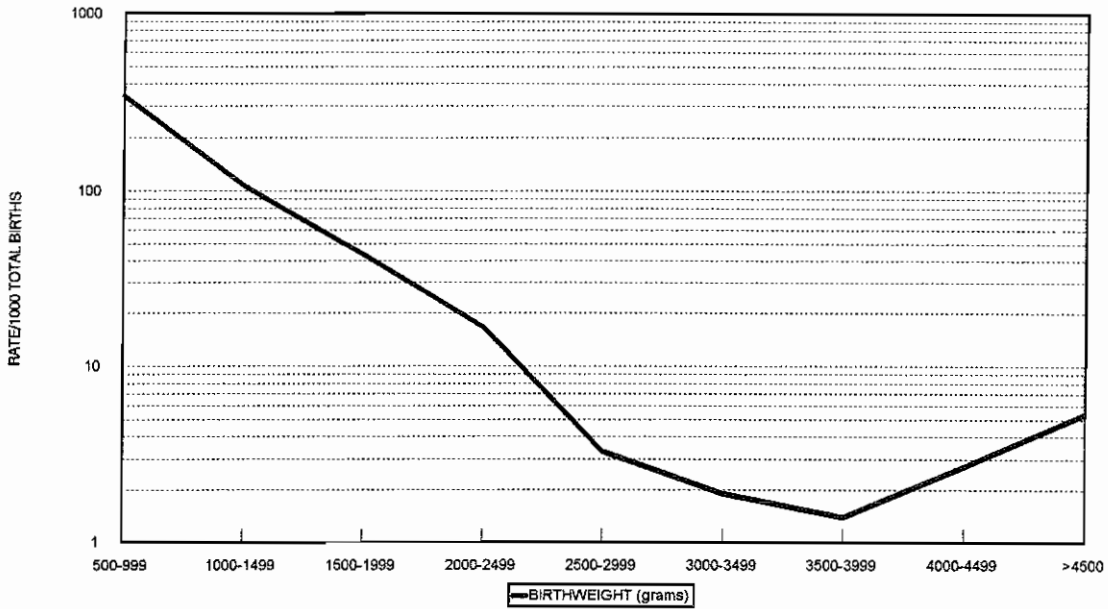
TABLE 6:
CONDITION, PLURALITY AND MATERNAL RACE OF BIRTHS IN WESTERN AUSTRALIA 1991

Maternal Race		Plurality		
		Singleton	Multiple	TOTAL
Caucasian	Total Births	21200	576	21776
	Live Births	21100	568	21668
	Stillbirths	100	8	108
	Rate	4.7	13.9	5.0
Aboriginal	Total Births	1446	33	1479
	Live Births	1432	30	1462
	Stillbirths	14	3	17
	Rate	9.7	90.9	11.5
Other	Total Births	1652	28	1680
	Live Births	1644	27	1671
	Stillbirths	8	1	9
	Rate	4.8	35.7	5.4
Total	Total Births	24298	637	24935
	Live Births	24176	625	24801
	Stillbirths	122	12	134
	Rate	5.0	18.8	5.4

Excludes births <500 grams birthweight.

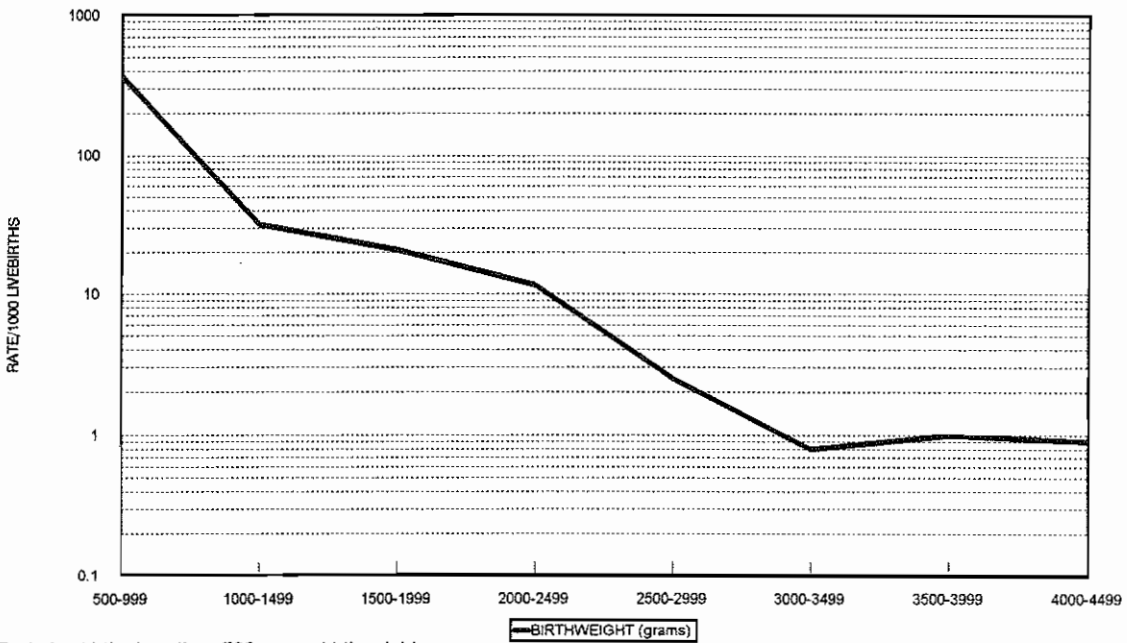
¹ Rate/1000 total births.

FIGURE III
 BIRTHWEIGHT DISTRIBUTION OF STILLBIRTHS
 IN WESTERN AUSTRALIA IN 1991



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

FIGURE IV
 BIRTHWEIGHT DISTRIBUTION OF NEONATAL DEATHS
 IN WESTERN AUSTRALIA IN 1991



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

5.1.4 Maternal Race and Birthweight

The rate of stillbirths for low birthweight babies was 54.8/1000. The lowest stillbirth rate (1.4/1000) was for babies with birthweight 3500-3999 grams. (Table 7, Figure III).

TABLE 7 :
STILLBIRTH PROPORTION BY MATERNAL RACE AND BIRTHWEIGHT DISTRIBUTION IN WESTERN AUSTRALIA IN 1991

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	27	83	325.3	7	15	466.7	3	10	(300.0)	37	108	342.6
1000-1499	13	144	90.3	4	26	(153.8)	2	7	(285.7)	19	177	107.3
1500-1999	13	254	51.2	-	33	-	-	13	-	13	300	43.3
2000-2499	12	759	15.8	3	139	(21.6)	1	68	(14.7)	16	966	16.6
<2500	65	1240	52.4	14	213	65.7	6	98	61.2	85	1551	54.8
2500-2999	11	3277	3.4	1	347	(2.9)	1	337	(3.0)	13	3961	3.3
3000-3499	15	7926	1.9	1	534	(1.9)	1	714	(1.4)	17	9174	1.9
3500-3999	10	6923	1.4	1	293	(3.4)	-	422	-	11	7638	1.4
4000-4499	5	2063	2.4	-	76	-	1	99	(10.1)	6	2238	2.7
≥4500	2	347	(5.8)	-	16	-	-	10	-	2	373	(5.4)
TOTAL	108	21776	5.0	17	1479	11.5	9	1680	5.4	134	24935	5.4

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 60 (44.8%) stillborn babies with cause unknown and 30 (22.4%) stillbirths with extremely low birthweight. Lethal congenital malformations resulted in 15 (11.2%) stillbirths and a further 19 (14.2%) stillbirths resulted from complications of placenta and/or cord (Table 8).

The high percentage of unexplained stillbirths may be reduced if autopsies were performed on more babies. Of the 134 stillborn babies, it is known that 74 (55.2%) had autopsies and 35 (26.1%) did not. It is not known whether the remaining 25 (18.7%) stillborn babies underwent autopsy.

Eighty four (62.7%) stillbirths were recorded as antepartum deaths, 29 (21.6%) were recorded as intrapartum deaths and for 21 (15.7%) the time of death was unknown.

TABLE 8 :
CAUSE OF STILLBIRTH BY MATERNAL RACE IN WESTERN AUSTRALIA IN 1991

Cause of Death	Maternal Race						Total		Total	
	Caucasian		Aboriginal		Other		1991		1992	
	No.	%	No.	%	No.	%	No.	%	No.	%
Legal Congenital Malformation	11	10.2	2	11.8	2	22.2	15	11.2	15	12.7
Extremely Low Birth Weight (<1000g)*	23	21.3	6	35.3	1	11.1	30	22.4	23	19.5
Unknown	48	44.4	7	41.2	5	55.5	60	44.8	47	39.8
Maternal: Obstetric	1	0.9	-	-	-	-	1	0.8	2	1.7
Maternal: Medical	-	-	1	5.9	-	-	1	0.8	3	2.5
Maternal: Hypertension	5	4.6	-	-	-	-	5	3.7	5	4.2
Placenta and Cord	17	15.7	1	5.9	1	11.1	19	14.2	16	13.6
Other	3	2.8	-	-	-	-	3	2.2	7	5.9
TOTAL	108	100.0	17	100.0	9	100.0	134	100.0	118	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 68 neonatal deaths among the 24801 livebirths in 1991¹. The overall neonatal mortality proportion was 2.7/1000 livebirths. For babies of Aboriginal women neonatal mortality was 4.8/1000 livebirths which is higher than for babies of Caucasian women (2.4/1000) and the rate for babies of women of other races (6.0/1000). (Table 3). An additional two deaths among babies born outside the State were recorded in Western Australia and not included in this cohort Report.

The figures for neonatal mortality by Health Service Management Region of maternal residence are provided in Table 3. However, it should be noted that due to small numbers of births in each country Region, the proportions do fluctuate markedly.³

5.2.1 Maternal Race and Maternal Age

Of the 68 liveborn babies who died within the first 28 days of life, 6 (3.7/1000) were born to teenage mothers. In the age group where the highest number of births occurred (25-29 years) the neonatal mortality proportion was 1.6/1000. The rate of neonatal deaths among babies of Aboriginal mothers (4.8/1000) is higher than that for babies of Caucasian women (2.4/1000) (Table 9).

TABLE 9 :
NEONATAL DEATHS BY MATERNAL RACE AND MATERNAL AGE IN WESTERN AUSTRALIA IN 1991

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	-	26	-	-	51	-	-	2	-	-	79	-
16	1	90	11.1	-	61	-	-	1	-	1	152	6.6
17	-	199	-	1	90	11.1	-	3	-	1	292	3.4
18	-	313	-	-	123	-	2	17	117.6	2	453	4.4
19	2	508	3.9	-	129	-	-	24	-	2	661	3.0
≤19	3	1136	2.6	1	454	2.2	2	47	42.6	6	1637	3.7
20-24	18	4391	4.1	3	546	5.5	3	246	12.2	24	5183	4.6
25-29	11	8065	1.4	3	293	10.2	-	553	-	14	8911	1.6
30-34	16	5965	2.7	-	124	-	1	529	1.9	17	6618	2.6
35-39	3	1847	1.6	-	39	-	4	247	16.2	7	2133	3.3
40-44	-	260	-	-	6	-	-	49	-	-	315	-
≥45	-	4	-	-	-	-	-	-	-	-	4	-
TOTAL	51	21668	2.4	7	1462	4.8	10	1671	6.0	68	24801	2.7

Excludes births <500 grams birthweight.

¹ Rate/1000 livebirths.

5.2.2 Maternal Race and Parity

Thirty three (2.7/1000) neonatal deaths were to women with a previous parity of one or two. A lower rate was recorded for babies of women with parity of three or more (2.3/1000) (Table 10).

TABLE 10 :
NEONATAL DEATHS BY MATERNAL RACE AND PARITY IN WESTERN AUSTRALIA IN 1991

Parity	Maternal Race									Total		
	Caucasian			Aboriginal			Other					
	No.	Live Births	Rate	No.	Live Births	Rate	No.	Live Births	Rate	No.	Live Births	Rate
0	25	8746	2.9	1	457	2.2	3	640	4.7	29	9843	2.9
1-2	24	10906	2.2	4	614	6.5	5	863	5.8	33	12383	2.7
3-4	1	1818	0.6	2	282	7.1	2	145	13.8	5	2245	2.2
≥5	1	198	5.0	-	109	-	-	23	-	1	330	3.0
TOTAL	51	21668	2.4	7	1462	4.8	10	1671	6.0	68	24801	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 14.4/1000 livebirths for multiple births. There were no triplet births of babies of either Aboriginal women or women of other races (Table 11).

TABLE 11:
NEONATAL DEATHS BY MATERNAL RACE AND PLURALITY IN WESTERN AUSTRALIA IN 1991

Plurality	Maternal Race									Total		
	Caucasian			Aboriginal			Other					
	No.	Live Births	Rate	No.	Live Births	Rate	No.	Live Births	Rate	No.	Live Births	Rate
Singleton	45	21100	2.1	6	1432	4.2	8	1644	4.9	59	24176	2.4
Twins	5	550	9.1	1	30	33.3	2	27	74.1	8	607	13.2
Triplets	1	18	55.6	-	-	-	-	-	-	1	18	55.6
TOTAL	51	21668	2.4	7	1462	4.8	10	1671	6.0	68	24801	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 (25.1/1000) is lower than for low birthweight neonatal deaths of babies born to Caucasian women (25.5/1000) (Table 12, Figure IV).

TABLE 12:
NEONATAL MORTALITY BY MATERNAL RACE AND BIRTHWEIGHT DISTRIBUTION IN WESTERN AUSTRALIA IN 1991

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	11	56	196.4	3	8	(375.0)	5	7	714.3	19	71	267.6
1000-1499	4	131	30.5	-	22	-	1	5	(200.0)	5	158	31.6
1500-1999	6	241	24.9	-	33	-	-	13	-	6	287	20.9
2000-2499	9	747	12.0	2	136	(14.8)	-	67	-	11	950	11.6
<2500	30	1175	25.5	5	199	25.1	6	92	65.2	41	1466	28.0
2500-2999	8	3266	2.4	1	346	(2.9)	1	336	(3.0)	10	3948	2.5
3000-3499	4	7911	(0.5)	1	533	(1.9)	2	713	(2.8)	7	9157	0.8
3500-3999	7	6913	1.0	-	292	-	1	422	(2.4)	8	7627	1.0
4000-4499	2	2058	(1.0)	-	76	-	-	98	-	2	2232	(0.9)
≥4500	-	345	-	-	16	-	-	10	-	-	371	-
TOTAL	51	21668	2.4	7	1462	4.8	10	1671	6.0	68	24801	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 (75.0%) of neonatal deaths occurred in the first week of life, 48.6% occurring within the first 48 hours of life. Among babies of Aboriginal women 57.1% of neonatal deaths occurred in the first seven days of life compared with 78.4% of babies born to Caucasian women (Table 13).

TABLE 13 :
AGE AT NEONATAL DEATHY BY MATERNAL RACE IN WESTERN AUSTRALIA IN 1991

Age at Death	Maternal Race						Total	
	Caucasian		Aboriginal		Other			
	No.	%	No.	%	No.	%	No.	%
< day 1	20	39.2	2	28.6	3	30.0	25	36.8
day 1	4	7.8	1	14.3	3	30.0	8	11.8
day 2	4	7.8	-	-	1	10.0	5	7.4
day 3	5	9.8	1	14.3	-	-	6	8.8
day 4	6	11.8	-	-	-	-	6	8.8
day 5	-	-	-	-	-	-	-	-
day 6	1	2.0	-	-	-	-	1	1.5
day 7	-	-	-	-	-	-	-	-
day ≤ 7	40	78.4	4	57.1	7	70.0	51	75.0
day 8 - 14	3	5.9	2	28.6	2	20.0	7	10.3
day 15 - 21	6	11.8	-	-	-	-	6	8.8
day 22 - 28	2	3.9	1	14.3	1	10.0	4	5.9
TOTAL	51	100.0	7	100.0	10	100.0	68	100.0

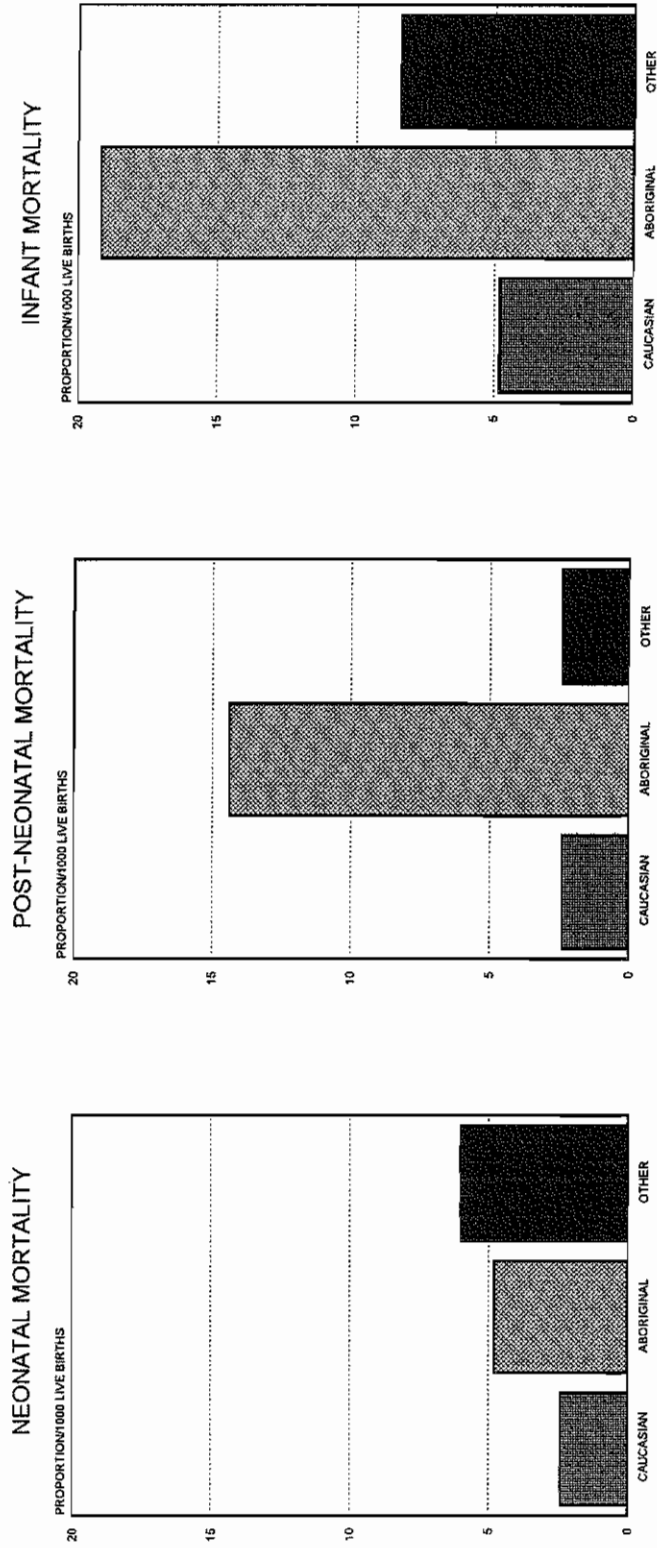
Excludes births <500 grams birthweight

5.2.6 Causes of Neonatal Deaths

Lethal congenital malformation in 41 babies (60.3%) and low birthweight for 16 babies (23.5%) were the main causes of neonatal death in the 1991 birth cohort.

FIGURE V

NEONATAL, POST-NEONATAL AND INFANT MORTALITY,
 ABORIGINAL AND NON-ABORIGINAL,
 WESTERN AUSTRALIA, 1991



Excludes births less than 500 grams birthweight

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

TABLE 14 :
CAUSE OF NEONATAL DEATH BY MATERNAL RACE IN WESTERN AUSTRALIA IN 1991

Cause of Death	Maternal Race						Total	
	Caucasian		Aboriginal		Other		No.	%
	No.	%	No.	%	No.	%		
Legal Congenital Malformation	30	58.8	3	42.9	8	80.0	41	60.3
Low Birth Weight (<2500g)	11	21.6	3	42.9	2	20.0	16	23.5
Asphyxia	4	7.8	-	-	-	-	4	5.9
Pregnancy conditions	-	-	-	-	-	-	-	-
Infections	1	2.0	-	-	-	-	1	1.5
Hydrops fetalis	1	2.0	-	-	-	-	1	1.5
Other	1	2.0	-	-	-	-	1	1.5
Sudden Infant Deaths	2	3.9	1	14.3	-	-	3	4.4
Unknown	1	2.0	-	-	-	-	1	1.5
TOTAL	51	100.0	7	100.0	10	100.0	68	100.0

Excludes births < 500 grams birthweight.

5.3 Post Neonatal Deaths

There were 77 post-neonatal deaths identified amongst the 1991 livebirths, a proportion of 3.1/1000 livebirths (Table 15 and Table 37).

Post-neonatal mortality for babies of Aboriginal women was 14.4/1000 livebirths, six times the rate of 2.4/1000 for babies of Caucasian women. For babies born to women of other races the rate was 2.4/1000 (Table 15, Table 30 and Figure IV).

Post-neonatal deaths in relation to Health Service Management Region of maternal residence are shown in Table 15. It should be noted however, that due to small numbers of births in each country Region the rates do vary from year to year and may be considered unrepresentative.

TABLE 15 :
POST-NEONATAL AND INFANT MORTALITY BY MATERNAL RESIDENCE AND MATERNAL RACE IN WESTERN AUSTRALIA IN 1991

Health Service Management Region of Maternal Residence	Maternal Race													
	Caucasian			Aboriginal			Other			Total				
	Post-Neonatal No.	Rate	Infant No.	Rate	Infant No.	Rate	Post-Neonatal No.	Rate	Infant No.	Rate	Post-Neonatal No.	Rate	Infant No.	Rate
<u>Metropolitan</u>														
North	9	1.9	24	5.0	1	(9.8)	3	(7.1)	4	(9.5)	13	2.5	29	5.5
East	10	2.0	21	4.3	2	(10.9)	1	(1.9)	5	11.6	13	2.3	28	5.0
South	9	1.7	16	3.0	2	(12.9)	-	-	3	(6.5)	11	1.8	22	3.7
<u>Non-Metropolitan</u>														
South West	12	5.8	18	8.6	1	(15.6)	-	-	-	-	13	6.0	19	8.7
Great Southern	4	(3.9)	8	7.9	-	-	-	-	-	-	4	(3.6)	8	7.2
Central Wheatbelt	2	(2.5)	4	(5.0)	1	(17.9)	-	-	-	-	3	(3.4)	5	5.7
Goldfields	4	(4.4)	5	5.5	3	(23.3)	-	-	2	(48.8)	7	6.5	10	9.2
Mid West Gascoyne	1	(1.2)	3	(3.5)	2	(16.9)	-	-	-	-	3	(2.8)	6	5.5
Pilbara	1	(1.4)	3	(4.1)	2	32.9	-	-	-	-	3	(3.1)	8	8.2
Kimberley	-	-	1	(4.7)	6	21.7	-	-	-	-	6	10.0	9	15.0
<u>Outside WA</u>														
TOTAL	52	2.4	103	4.8	21	19.2	4	(2.4)	14	8.4	77	3.1	145	5.8

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
CHILD AND COMMUNITY HEALTH SERVICES

5.3.1 Maternal Race and Maternal Age

The rate of post-neonatal deaths among babies of teenage women was 7.9/1000 livebirths. Among babies born to Aboriginal women 5 (11.0/1000) post-neonatal deaths were to teenage mothers. (Table 16).

TABLE 16 :
POST-NEONATAL DEATHS BY MATERNAL RACE AND MATERNAL AGE IN WESTERN AUSTRALIA IN 1991

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	1	26	38.5	1	51	19.6	-	2	-	2	79	25.3
16	2	90	22.2	-	61	-	-	1	-	2	152	13.2
17	2	199	10.1	1	90	11.1	-	3	-	3	292	10.3
18	2	313	6.4	2	123	16.3	-	17	-	4	453	8.8
19	1	508	2.0	1	129	7.8	-	24	-	2	661	3.0
≤19	8	1136	7.0	5	454	11.0	-	47	-	13	1637	7.9
20-24	11	4391	2.5	11	546	20.1	-	246	-	22	5183	4.2
25-29	19	8065	2.4	4	293	13.7	2	553	3.6	25	8911	2.8
30-34	9	5965	1.5	1	124	8.1	2	529	3.8	12	6618	1.8
35-39	3	1847	1.6	-	39	-	-	247	-	3	2133	1.4
40-44	2	260	7.7	-	6	-	-	49	-	2	315	6.3
≥45	-	4	-	-	-	-	-	-	-	-	4	-
TOTAL	52	21668	2.4	21	1462	14.4	4	1671	2.4	77	24801	3.1

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 (6.5/1000) and babies of separated, divorced or widowed women (5.3/1000), than for women socially supported by a partner in a marriage or defacto relationship (2.7/1000) (Table 17).

TABLE 17:
POST-NEONATAL DEATHS BY MATERNAL RACE AND CONJUGAL STATE IN WESTERN AUSTRALIA IN 1991

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	8	1886	4.2	8	513	15.6	-	67	-	16	2476	6.5
Married/defacto	44	19607	2.2	12	938	12.8	4	1592	2.5	60	22137	2.7
Other	-	165	-	1	11	90.9	-	12	-	1	188	5.3
TOTAL	52	21668	2.4	21	1462	14.4	4	1671	2.4	77	24801	3.1

Excludes births < 500 grams birthweight.

¹ Rate/1000 livebirths.

² Other includes separated, divorced and widowed.

5.3.3 Maternal Race and Parity

Almost one third (31.2%) of babies who died in the post-neonatal period were born to primiparous mothers, and a further 51.9% were to women with a parity of 1-2. The rates for these groups were 2.4/1000 for primiparous women, 3.2/1000 for women with parity 1-2, 4.5/1000 for women with parity 3-4 and 9.1/1000 for women with parity of 5 or more. (Table 18).

TABLE 18 :
POST-NEONATAL DEATHS BY MATERNAL RACE AND PARITY IN WESTERN AUSTRALIA IN 1991

Parity	Maternal Race									Total		
	Caucasian			Aboriginal			Other					
	No.	Live Births	Rate	No.	Live Births	Rate	No.	Live Births	Rate	No.	Live Births	Rate
0	20	8746	2.3	3	457	6.6	1	640	1.6	24	9843	2.4
1-2	26	10906	2.4	11	614	17.9	3	863	3.5	40	12383	3.2
3-4	5	1818	2.8	5	282	17.7	-	145	-	10	2245	4.5
≥5	1	198	5.1	2	109	18.3	-	23	-	3	330	9.1
TOTAL	52	21668	2.4	21	1462	14.4	4	1671	2.4	77	24801	3.1

Excludes births < 500 grams birthweight.

¹ Rate/1000 livebirths.

5.3.4 Maternal Race and Plurality

Examination of the 77 post-neonatal deaths in 1991 by plurality revealed that for singleton births the rate was 2.9/1000 and for multiple births the rate was 9.6/1000 livebirths. Among twin babies the post-neonatal death rate was 9.9/1000. (Table 19).

TABLE 19:
POST-NEONATAL DEATHS BY MATERNAL RACE AND PLURALITY IN WESTERN AUSTRALIA IN 1991

Plurality	Maternal Race									Total		
	Caucasian			Aboriginal			Other					
	No.	Live Births	Rate	No.	Live Births	Rate	No.	Live Births	Rate	No.	Live Births	Rate
Singleton	47	21100	2.2	20	1432	14.0	4	1644	2.4	71	24176	2.9
Twins	5	550	9.1	1	30	33.3	-	27	-	6	607	9.9
Triplets	-	18	-	-	-	-	-	-	-	-	18	-
TOTAL	52	21668	2.4	21	1462	14.4	4	1671	2.4	77	24801	3.1

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 (40.2/1000) was higher than the rate for low birthweight babies of Caucasian women (12.8/1000) (Table 20).

TABLE 20:
POST-NEONATAL MORTALITY BY MATERNAL RACE AND BIRTHWEIGHT DISTRIBUTION IN WESTERN AUSTRALIA IN 1991

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	4	56	(71.4)	1	8	(125.0)	-	7	-	5	71	70.4
1000-1499	3	131	(22.9)	1	22	(45.5)	-	5	-	4	158	(25.3)
1500-1999	1	241	(4.1)	1	33	(30.3)	1	13	(76.9)	3	287	(10.5)
2000-2499	7	747	9.4	5	136	36.8	-	67	-	12	950	12.6
<2500	15	1175	12.8	8	199	40.2	1	92	(10.9)	24	1466	16.4
2500-2999	12	3266	3.7	4	346	(11.6)	1	336	(3.0)	17	3948	4.3
3000-3499	18	7911	2.3	9	533	16.9	-	713	-	27	9157	2.9
3500-3999	6	6913	0.9	-	292	-	2	422	(4.7)	8	7627	1.0
4000-4499	1	2058	(0.5)	-	76	-	-	98	-	1	2232	(0.4)
≥4500	-	345	-	-	16	-	-	10	-	-	371	-
TOTAL	52	21668	2.4	21	1462	14.4	4	1671	(2.4)	77	24801	3.1

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 (46.8%) (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 then rose to 14.4 in 1991.

Lethal congenital malformation remained the second highest known cause, to which 20 (26.0%) 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 and then rose to 15.6% in 1991 (Table 21).

TABLE 21 :
CAUSE OF POST-NEONATAL DEATH BY MATERNAL RACE IN WESTERN AUSTRALIA IN 1991

Cause of Death	Maternal Race						Total 1991		Total 1990	
	Caucasian		Aboriginal		Other		No.	%	No.	%
	No.	%	No.	%	No.	%				
Sudden Infant Death	25	48.1	10	47.6	1	25.0	36	46.8	52	59.8
Lethal Congenital Malformation	17	32.7	2	9.5	1	25.0	20	26.0	15	17.2
Infection - Respiratory	2	3.8	5	23.8	-	-	7	9.1	4	4.6
Infection - Meningitis	-	-	1	4.8	-	-	1	1.3	4	4.6
Infection - Other	1	1.9	2	9.5	1	25.0	4	5.2	-	-
Other	7	13.5	1	4.8	1	25.0	9	11.7	8	9.2
Unknown	-	-	-	-	-	-	-	-	4	4.6
TOTAL	52	100.0	21	27.3	4	100.0	77	100.0	87	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 was during the July-September seasonal quarter of the year (Table 22).

TABLE 22
CAUSE OF POST-NEONATAL DEATH BY SEASONAL INCIDENCE IN WESTERN AUSTRALIA IN 1991

Cause of Death	Jan-Mar		Apr - Jun		Jul-Sep		Oct-Dec		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Sudden Infant Death	7	41.2	10	47.6	9	50.0	10	47.6	36	46.8
Lethal Congenital Malformation	2	11.8	6	28.6	4	22.2	8	38.1	20	26.0
Infection	3	17.6	5	23.8	2	11.1	2	9.5	12	15.6
Other/Unknown	5	29.4	-	-	3	16.7	1	4.8	9	11.7
TOTAL	17	100.0	21	100.0	18	100.0	21	100.0	77	100.0

Excludes births <500 grams birthweight.

SOURCE: MDWIVES' NOTIFICATION SYSTEM
REGISTRAR GENERAL'S OFFICE

6. PERINATAL MORTALITY IN WESTERN AUSTRALIA IN THE 1991 BIRTH COHORT

6.1 Perinatal Mortality

There were 202 perinatal deaths identified in the 1991 birth cohort which gave a perinatal mortality rate of 8.1/1000 total births (Table 3 and Table 23). This compares with rates of 10.2/1000 in 1989 and 7.9/1000 in 1990. Among babies born to Aboriginal women the rate (16.2/1000) was higher than for perinatal deaths of babies of Caucasian women (7.3/1000) and for perinatal deaths of babies born to women of other races (11.3/1000) (Table 23).

TABLE 23 :
STILLBIRTHS, NEONATAL AND PERINATAL MORTALITY BY MATERNAL RACE IN WESTERN AUSTRALIA IN 1991

Type of Death	Maternal Race						Total	
	Caucasian		Aboriginal		Other			
	No.	Rate	No.	Rate	No.	Rate	No.	Rate
Stillbirths	108	5.0	17	11.5	9	5.4	134	5.4
Neonatal Mortality	51	2.4	7	4.8	10	6.0	68	2.7
Perinatal Mortality	159	7.3	24	16.2	19	11.3	202	8.1

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 Service Management Region 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 is lowest for babies of women aged 25-34 years, (6.9/1000) and the risk increases toward the extremes of the fertile age group.

Fifteen (9.1/1000) perinatal deaths were among babies of women in their teenage years. Another 26 (10.5/1000) 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 1991

Maternal Age	Maternal Race									Total		
	Caucasian			Aboriginal			Other					
	No.	Total Births	Rate	No.	Total Births	Rate	No.	Total Births	Rate	No.	Total Births	Rate
≤15	-	26	-	-	51	-	-	2	-	-	79	-
16	1	90	11.1	-	61	-	-	1	-	1	152	6.6
17	3	202	14.9	1	90	11.1	-	3	-	4	295	13.6
18	3	316	9.4	-	123	-	2	17	117.6	5	456	11.0
19	4	510	7.8	1	130	7.7	-	24	-	5	664	7.6
≤19	11	1144	9.6	2	455	4.4	2	47	42.6	15	1646	9.1
20-24	37	4410	8.4	11	554	19.9	5	248	20.2	53	5212	10.2
25-29	45	8099	5.6	8	298	26.8	3	556	5.4	56	8953	6.3
30-34	48	5997	8.0	-	124	-	4	532	7.5	52	6653	7.8
35-39	17	1861	9.1	2	41	48.8	5	248	20.2	24	2150	11.2
40-44	1	261	3.8	1	7	142.9	-	49	-	2	317	6.3
≥45	-	4	-	-	-	-	-	-	-	-	4	-
TOTAL	159	21776	7.3	24	1479	16.2	19	1680	11.3	202	24935	8.1

Excludes births <500 grams birthweight.

¹ Rate/1000 total births.

6.3 Maternal Race and Parity

The perinatal mortality rate of babies born to primiparous women was 8.7/1000 and the rate for babies born to women with a parity of 1-2 was 7.0/1000. A higher rate of perinatal deaths (11.2/1000) was 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 1991

Parity	Caucasian			Aboriginal			Other			Total		
	Total			Total			Total			Total		
	No.	Births	Rate	No.	Births	Rate	No.	Births	Rate	No.	Births	Rate
0	76	8797	8.6	5	461	10.8	5	642	7.8	86	9900	8.7
1-5	65	10947	5.9	10	620	16.1	12	870	12.4	87	12437	7.0
3-4	17	1834	9.3	9	289	31.1	2	145	13.8	28	2268	12.3
≥5	1	198	5.1	-	109	-	-	23	-	1	330	3.0
TOTAL	159	21776	7.3	24	1479	16.2	19	1680	11.3	202	24935	8.1

Excludes births < 500 grams birthweight.

¹ Rate/1000 total births.

6.4 Maternal Race and Birthweight

More than half (62.4%) of all perinatal deaths (126 81.2/1000) 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 1991

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	83	457.8	10	15	666.7	8	10	800.0	56	108	518.5
1000-1499	17	144	118.1	4	26	(153.8)	3	7	(428.6)	24	177	135.6
1500-1999	19	254	74.8	-	33	-	-	13	-	19	300	63.3
2000-2499	21	759	27.7	5	139	36.0	1	68	(14.7)	27	966	28.0
<2500	95	1240	76.6	19	213	89.2	12	98	122.4	126	1551	81.2
2500-2999	19	3277	5.8	2	347	(5.8)	2	337	(5.9)	23	3961	5.8
3000-3499	19	7926	2.4	2	534	(3.7)	3	714	(4.2)	24	9174	2.6
3500-3999	17	6923	2.5	1	293	(3.4)	1	422	(2.4)	19	7638	2.5
4000-4499	7	2063	3.4	-	76	-	1	99	(10.1)	8	2238	3.6
≥ 4500	2	347	(5.8)	-	16	-	-	10	-	2	373	(5.4)
TOTAL	159	21776	7.3	24	1479	16.2	19	1680	11.3	202	24935	8.1

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 107 (8.4/1000) male and 95 (7.8/1000) female perinatal deaths among those babies born in 1991.

Among babies born to Caucasian women the perinatal death rate for males (7.8/1000) was higher than for the perinatal death rate for females (6.8/1000). The rate of perinatal deaths among male babies of Aboriginal woman (9.4/1000) was lower than the perinatal death rate for females (23.2/1000) and among babies of women of other races the rates were 15.0/1000 male and 7.4/1000 female (Table 27).

TABLE 27 :
PERINATAL DEATHS BY MATERNAL RACE AND SEX IN WESTERN AUSTRALIA IN 1991

Sex	Maternal Race									Total		
	Caucasian			Aboriginal			Other					
	No.	Births	Rate	No.	Births	Rate	No.	Births	Rate	No.	Births	Rate
Male	87	11128	7.8	7	745	9.4	13	864	15.0	107	12737	8.4
Female	72	10648	6.8	17	734	23.2	6	816	7.4	95	12198	7.8
TOTAL	159	21776	7.3	24	1479	16.2	19	1680	11.3	202	24935	8.1

Excludes births <500 grams birthweight.

¹ Rate/1000 total births.

6.6 Maternal Race and Conjugal State

One sixth (11.2/1000) of perinatal deaths were among babies of women reported as socially unsupported by a partner. This represents a decrease since the 1990 cohort report (9.4/1000). The increased social acceptance of defacto relationships may have influenced reporting (Table 28).

TABLE 28 :
PERINATAL DEATHS BY MATERNAL RACE AND CONJUGAL STATE IN WESTERN AUSTRALIA IN 1991

Conjugal State	Maternal Race									Total		
	Caucasian			Aboriginal			Other					
	No.	Births	Rate	No.	Births	Rate	No.	Births	Rate	No.	Births	Rate
Single	20	1908	10.5	8	521	15.4	2	67	29.9	30	2496	12.0
Married/defacto	139	19703	7.1	16	947	16.9	17	1601	10.6	172	22251	7.7
² Other	-	165	-	-	11	-	-	12	-	-	188	-
TOTAL	159	21776	7.3	24	1479	16.2	19	1680	11.3	202	24935	8.1

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 1991 BIRTH COHORT

7.1 Infant Deaths

There were 145 infant deaths identified amongst the 24801 livebirths in 1991. Of these, 68 were neonatal deaths and 77 were post-neonatal deaths. The infant mortality rate for Western Australia in 1991 was 5.8/1000 livebirths (Tables 15 and 29).

Infant mortality among babies born to Aboriginal women (19.2/1000) 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 and then rose to 14.2/1000 in 1991 (Table 41).

7.2 Maternal Race and Maternal Age

The infant mortality rate is greatest for babies of teenage women (11.6/1000). The infant mortality rate for babies of Aboriginal teenage mothers (13.2/1000) was higher than that for babies of Caucasian teenage mothers (9.7/1000) (Table 29).

TABLE 29 :
INFANT DEATHS BY MATERNAL RACE AND MATERNAL AGE IN WESTERN AUSTRALIA IN 1991

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	1	26	38.4	1	51	19.6	-	2	-	2	79	25.3
16	3	90	33.3	-	61	-	-	1	-	3	152	19.7
17	2	199	10.1	2	90	22.2	-	3	-	4	292	13.7
18	2	313	6.4	2	12	16.3	2	17	117.7	6	453	13.2
19	3	508	5.9	1	129	7.8	-	24	-	4	661	6.1
≤19	11	1136	9.7	6	454	13.2	2	47	42.6	19	1637	11.6
20-24	29	4391	6.6	14	546	25.6	3	246	12.2	46	5183	8.9
25-29	30	8065	3.7	7	293	23.9	2	553	3.6	39	8911	4.4
30-34	25	5965	4.2	1	124	8.1	3	529	5.7	29	6618	4.4
35-39	6	1847	3.2	-	39	-	4	247	16.2	10	2133	4.7
40-44	2	260	7.7	-	6	-	-	49	-	2	315	6.3
≥45	-	4	-	-	-	-	-	-	-	-	4	-
TOTAL	103	21668	4.8	28	1462	19.2	14	1671	8.4	145	24801	5.8

Excludes births <500 grams birthweight.

¹ Rate/1000 livebirths.

7.3 Maternal Race and Conjugal State

The infant mortality rate (10.1/1000) among babies born to single, separated, divorced or widowed women is far greater than the rate for babies of women reported to be in a marriage or defacto relationship (5.3/1000) (Table 30).

TABLE 30 :
INFANT DEATHS BY MATERNAL RACE AND CONJUGAL STATE IN WESTERN AUSTRALIA IN 1991

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	16	1886	8.5	8	513	15.6	2	67	29.9	26	2476	10.5
Married/defacto	87	19607	4.4	19	938	20.3	12	1592	7.5	118	22137	5.3
Other	-	165	-	1	11	90.9	-	12	-	1	188	5.3
TOTAL	103	21668	4.8	28	1462	19.2	14	1671	8.4	145	24801	5.8

Excludes births <500 grams birthweight.

¹ Rate/1000 livebirths.

² Other includes separated, divorced and widowed.

7.4 Maternal Race and Parity

Overall, higher rates of infant death were recorded among babies of women whose parity was 3 to 4 (6.7/1000) and 5 or more (12.1/1000).

TABLE 31 :
INFANT DEATHS BY MATERNAL RACE AND PARITY IN WESTERN AUSTRALIA IN 1991

Parity	Maternal Race									Total		
	Caucasian			Aboriginal			Other					
	No.	Live Births	Rate	No.	Live Births	Rate	No.	Live Births	Rate	No.	Live Births	Rate
0	45	8746	5.1	4	457	8.8	4	640	6.3	53	9843	5.4
1-2	50	10906	4.6	15	614	24.4	8	863	9.3	73	12383	5.9
3-4	6	1818	3.3	7	282	24.8	2	145	13.8	15	2245	6.7
≥5	2	198	10.1	2	109	18.3	-	23	-	4	330	12.1
TOTAL	103	21668	4.8	28	1462	19.2	14	1671	8.4	145	24801	5.8

Excludes births < 500 grams birthweight.

¹ Rate/1000 livebirths.

7.5 Maternal Race and Plurality

Infant mortality for multiple births (24.0/1000) was four times the rate for singleton births (5.4/1000). The infant death rate (18.2/1000) for twin babies born to Caucasian women in 1991 was far lower than the rate (25.3/1000) in 1990 (Table 32).

TABLE 32:
INFANT DEATHS BY MATERNAL RACE AND PLURALITY IN WESTERN AUSTRALIA IN 1991

Plurality	Maternal Race									Total		
	Caucasian			Aboriginal			Other					
	No.	Live Births	Rate	No.	Live Births	Rate	No.	Live Births	Rate	No.	Live Births	Rate
Singleton	92	21100	4.4	26	1432	18.2	12	1644	7.3	130	24176	5.4
Twins	10	550	18.2	2	30	66.7	2	27	74.1	14	607	23.1
Triplets	1	18	55.6	-	-	-	-	-	-	1	18	55.6
TOTAL	103	21668	4.8	28	1462	19.2	14	1671	8.4	145	24801	5.8

Excludes births < 500 grams birthweight.

¹ Rate/1000 livebirths.

7.6 Maternal Race and Babies' Sex

The infant death rates were 6.9/1000 male and 4.7/1000 female. Among babies born to Caucasian women the infant death rate for males (5.8/1000) was higher than the infant death rate for females (3.7/1000). For babies of Aboriginal mothers the infant death rate for males (18.9/1000) was lower than the infant death rate for females (19.4/1000) and for infants of women of other races the infant death rate for males (11.6/1000) was higher than the infant death rate for females (4.9/1000) (Table 33).

TABLE 33 :
INFANT DEATHS BY MATERNAL RACE AND SEX IN WESTERN AUSTRALIA IN 1991

Sex	Maternal Race									Total		
	Caucasian			Aboriginal			Other					
	No.	Live Births	Rate	No.	Live Births	Rate	No.	Live Births	Rate	No.	Live Births	Rate
Male	64	11071	5.8	14	741	18.9	10	859	11.6	88	12671	6.9
Female	39	10597	3.7	14	721	19.4	4	812	4.9	57	12130	4.7
TOTAL	103	21668	4.8	28	1462	19.2	14	1671	8.4	145	24801	5.8

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 (44.8%) of all infant deaths. A rate of 44.3/1000 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 1.9/1000. An infant mortality rate (65.3/1000) for low birthweight babies of Aboriginal women was higher than the rate (38.3/1000) for low birthweight babies of Caucasian women (Table 34).

TABLE 34:
INFANT MORTALITY BY MATERNAL RACE AND BIRTHWEIGHT DISTRIBUTION IN WESTERN AUSTRALIA IN 1991

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	15	56	267.9	4	8	(500.0)	5	7	714.3	24	71	338.0
1000-1499	7	131	53.4	1	22	(45.5)	1	5	(200.0)	9	158	57.0
1500-1999	7	241	29.0	1	33	(30.3)	1	13	(76.9)	9	287	31.4
2000-2499	16	747	21.4	7	136	51.5	-	67	-	23	950	24.2
<2500	45	1175	38.3	13	199	65.3	7	92	76.1	65	1466	44.3
2500-2999	20	3266	6.1	5	346	14.5	2	336	(6.0)	27	3948	6.8
3000-3499	22	7911	2.8	10	533	18.8	2	713	(2.8)	34	9157	3.7
3500-3999	13	6913	1.9	-	292	-	3	422	(7.1)	16	7627	2.1
4000-4499	3	2058	(1.5)	-	76	-	-	98	-	3	2232	(1.3)
≥4500	-	345	-	-	16	-	-	10	-	-	371	-
TOTAL	103	21668	4.8	28	1462	19.2	14	1671	8.4	145	24801	5.8

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

Almost half (49.0%) the infant deaths occurred in the neonatal period, with most (98.6%) deaths occurring within 24 weeks of birth (Table 35).

TABLE 35 :
INFANT DEATHS BY MATERNAL RACE AND AGE AT DEATH IN WESTERN AUSTRALIA IN 1991

Age at Death in Weeks	Maternal Race						Total	
	Caucasian		Aboriginal		Other			
	No.	%	No.	%	No.	%	No.	%
1-4	53	51.5	7	25.0	11	78.6	71	49.0
5-8	17	16.5	4	14.3	1	7.1	22	15.2
9-12	10	9.7	4	14.3	-	-	14	9.7
13-16	4	3.9	3	10.7	-	-	7	4.8
17-20	6	5.8	1	3.6	-	-	7	4.8
21-24	5	4.9	3	10.7	2	14.3	10	6.9
25-52	-	-	2	7.1	-	-	2	1.4
TOTAL	103	100.0	28	100.0	14	100.0	145	100.0

Excludes births <500 grams birthweight.

7.9 Causes of Infant Death

The major causes of infant deaths remain lethal congenital malformations for 61 (42.1%) babies, Sudden Infant Death Syndrome for 39 (26.9%) and low birthweight (<2500 grams) for 16 (11.0%) babies. Infection remained a significant cause of infant mortality among babies of Aboriginal mothers (Table 36).

TABLE 36 :
CAUSE OF INFANT DEATHS AND MATERNAL RACE IN WESTERN AUSTRALIA IN 1991

Cause of Death	Maternal Race						Total	
	Caucasian		Aboriginal		Other			
	No.	%	No.	%	No.	%	No.	%
Legal Congenital Malformation	47	45.6	5	17.9	9	64.3	61	42.1
Low Birth Weight (<2500g)	11	10.7	3	10.7	2	14.3	16	11.0
Asphyxia	4	3.9	-	-	-	-	4	2.8
Pregnancy conditions	-	-	-	-	-	-	-	-
Infections	4	3.9	8	28.6	1	7.1	13	9.0
Hydrops fetalis	1	1.0	-	-	-	-	1	0.7
Other	8	7.8	1	3.6	1	7.1	10	6.9
Sudden Infant Deaths	27	26.2	11	39.3	1	7.1	39	26.9
Unknown	1	1.0	-	-	-	-	1	0.7
TOTAL	103	100.0	28	100.0	14	100.0	145	100.0

Excludes births <500 grams birthweight.

TABLE 37 :
NEONATAL, POST-NEONATAL AND INFANT MORTALITY BY MATERNAL RACE IN WESTERN AUSTRALIA IN 1991

Type of Death	Maternal Race						Total	
	Caucasian		Aboriginal		Other			
	No.	Rate	No.	Rate	No.	Rate	No.	Rate
Neonatal Mortality	51	2.4	7	4.8	10	6.0	68	2.7
Post-Neonatal Mortality	52	2.4	21	14.4	4	2.4	77	3.1
Infant Mortality	103	4.8	28	19.2	14	8.4	145	5.8

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 1991

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	-	-	-	28	-	-	1	51	19.6	1	28	35.7	2	79	25.3
16-19	2	404	13	1163	15	1567	5	403	12.4	12	1155	10.4	17	1558	10.9
20-29	19	852	90	13313	109	14165	21	839	25.0	64	13255	4.8	85	14094	6.0
30-39	2	165	74	8638	76	8803	1	163	6.1	38	8588	4.4	39	8751	4.5
≥40	1	7	1	314	2	321	-	6	-	2	313	6.4	2	319	6.3
Total	24	1479	178	23456	202	24935	28	1462	19.2	117	23339	5.0	145	24801	5.8
<u>Plurality</u>															
Singleton	20	1446	161	22852	181	24298	26	1432	18.2	104	22744	4.6	130	24176	5.4
Multiple	4	33	17	604	21	637	2	30	66.7	13	595	21.8	15	625	24.0
Total	24	1479	178	23456	202	24935	28	1462	19.2	117	23339	5.0	145	24801	5.8
<u>Sex</u>															
Male	7	745	100	11992	107	12737	14	741	18.9	74	11930	6.2	88	12671	6.9
Female	17	734	78	11464	95	12198	14	721	19.4	43	11409	3.8	57	12130	4.7
Total	24	1479	178	23456	202	24935	28	1462	19.2	117	23339	5.0	145	24801	5.8

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 - 1991

8.1 Crude Birth Rates and Total Births 1980 - 1991

Over the past decade, the crude birth rate for Western Australia has gradually reduced from 16.6/1000 in 1982 to 15.2/1000 in 1991.

Among Aboriginal women, the crude birth rate remained relatively stable ranging between 33.0/1000 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 1980-1990

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

SOURCE : Livebirths - MIDWIVES' NOTIFICATION SYSTEM
Population data - ESTIMATED RESIDENT POPULATION BY AGE, SEX AND ABORIGINALITY 1981-1991, Health Services Statistics and Epidemiology Branch, HDWA January 1994
*1980 population data - AUSTRALIAN BUREAU OF STATISTICS - Cat. No. 3201.0.
Aboriginal population data - CHILD AND COMMUNITY HEALTH SERVICES

8.2.1 Stillbirths, Neonatal and Perinatal Mortality 1980 - 1991

Western Australian stillbirth rates showed a general downward trend from 7.5/1000 total births in 1980 to 5.4/1000 in 1991 (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 5.0/1000 in 1991. 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, 1980-1991

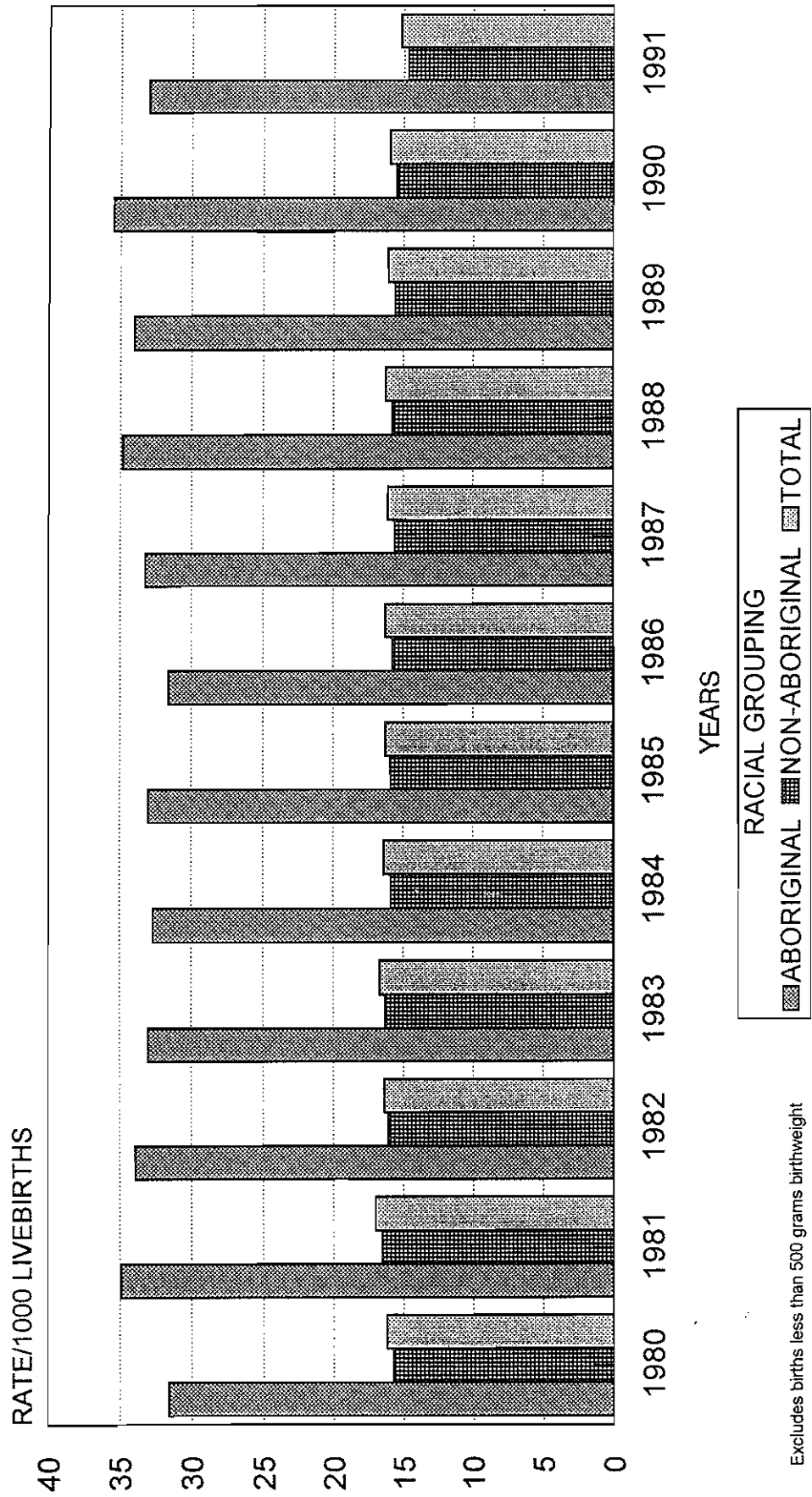


FIGURE VII

STILLBIRTH PROPORTIONS AND RACIAL GROUPING OF BIRTHS IN W.A. 1980-1991

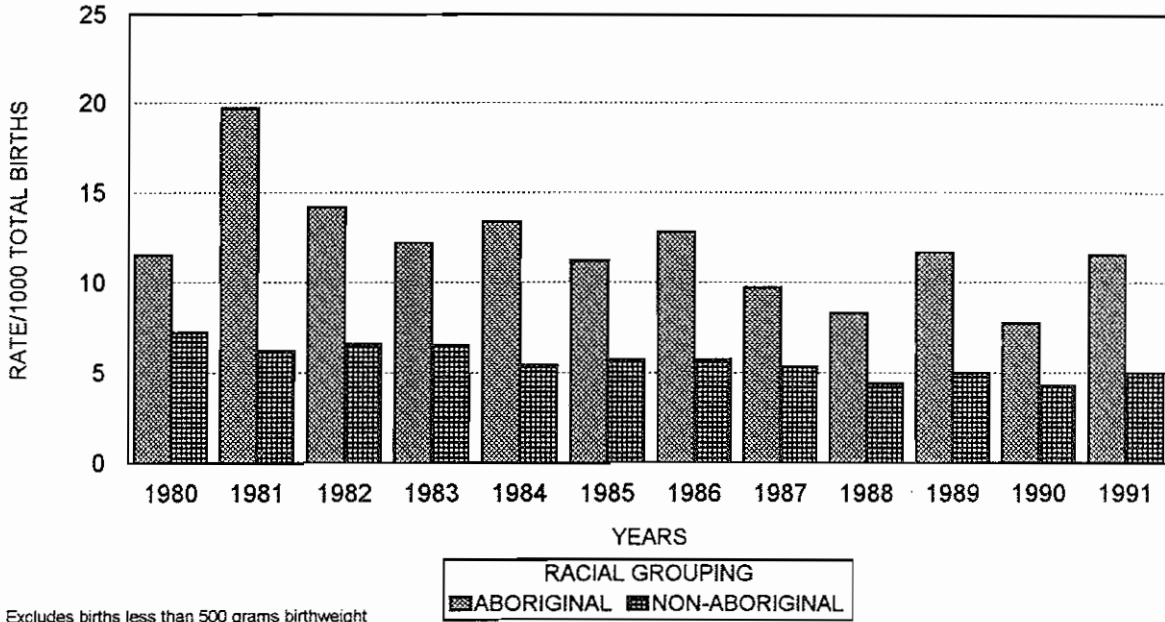


FIGURE VIII

PERINATAL MORTALITY AND RACIAL GROUPING FOR WESTERN AUSTRALIAN BIRTHS, 1980-1991

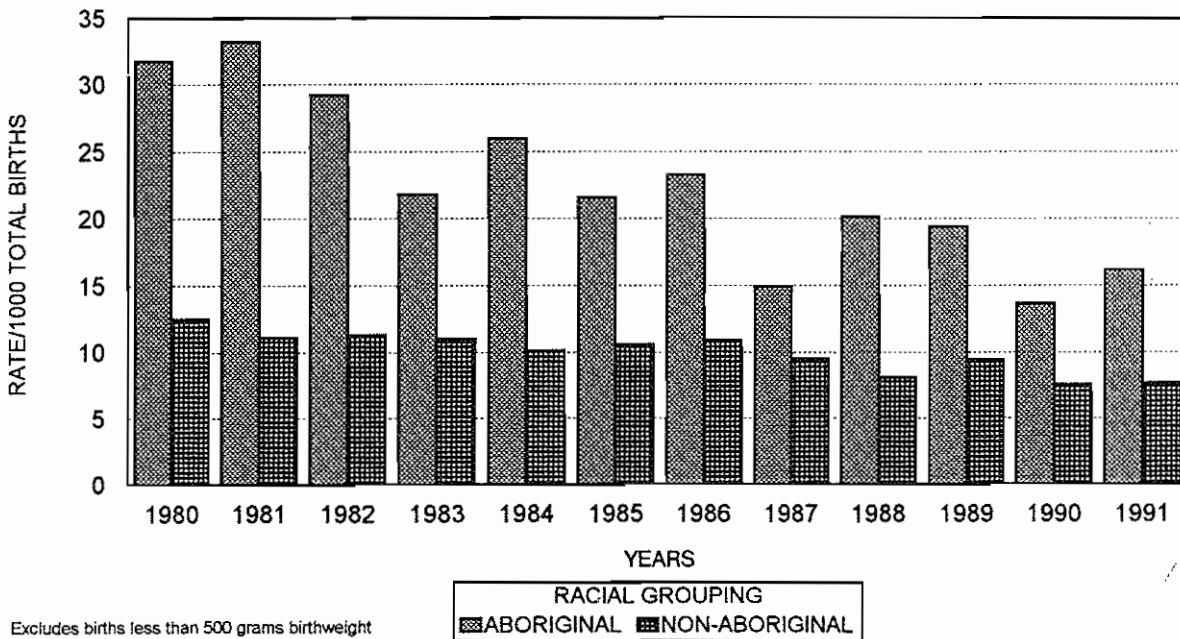


TABLE 40 :
STILLBIRTHS, NEONATAL AND PERINATAL MORTALITY FOR ABORIGINAL AND NON-ABORIGINAL BIRTHS IN WESTERN AUSTRALIA 1980-1990

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	20.4	104	5.3	33	31.7	247	12.5	280	13.5
1981	22	131	153	15	13.7	103	4.9	37	33.2	234	11.1	271	12.2
1982	16	139	155	17	15.3	101	4.8	33	29.2	240	11.3	273	12.2
1983	14	143	157	11	9.7	97	4.5	25	21.8	240	11.0	265	11.5
1984	16	118	134	15	12.8	101	4.7	31	26.0	219	10.1	250	10.9
1985	14	112	136	13	10.5	96	4.4	27	21.6	232	10.6	259	11.1
1986	16	128	146	13	10.6	116	5.2	29	23.3	246	10.9	275	11.5
1987	13	9.7	121	7	5.3	96	4.2	20	14.9	217	9.5	237	9.8
1988	12	8.3	105	17	11.9	87	3.7	29	20.1	192	8.1	221	8.8
1989	17	11.7	121	11	7.7	110	4.6	28	19.4	231	9.4	259	10.2
1990	12	7.7	106	9	5.9	78	3.2	21	13.6	184	7.5	205	7.9
1991	17	11.5	117	7	4.8	61	2.6	24	16.2	178	7.6	202	8.1

Excludes births <500 grams birthweight.

1980 - 1983 based on year of death.

1984 - 1991 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 twelve year period from 1980-1991. The rate of 20.4/1000 livebirths in 1980 reduced to 4.8/1000 livebirths in 1991. For babies of non-Aboriginal women, neonatal mortality rates reduced from 5.3/1000 in 1980 to 2.6/1000 in 1991 (Table 40, Figure IX).

8.2.3 Perinatal Mortality

Comparison of perinatal mortality for 1984-91, the seven years where the birth cohort method was employed, showed that overall the rate has decreased from 10.9/1000 total births in 1984 to 8.1/1000 in 1991. Overall a reduction of 5.4/1000 (13.5/1000 in 1980 to 8.1/1000 in 1991) occurred over twelve years. It was apparent that the reduction in the perinatal mortality among babies of Aboriginal women from 31.7/1000 in 1980 to 16.2/1000 in 1991, 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 - 1991

Over the twelve year period from 1980 to 1991 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 1991. Rates for post-neonatal deaths decreased slightly from 3.2/1000 in 1980 to 3.1/1000 in 1991 and infant mortality rates reduced from 9.3/1000 in 1980 to 5.8/1000 in 1991 (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 and 19.2/1000 in 1991 (Table 41).

Infant death 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 was six times the rate of deaths among babies of non-Aboriginal women.

TABLE 41 :
NEONATAL, POST-NEONATAL AND INFANT MORTALITY FOR ABORIGINAL AND NON-ABORIGINAL BIRTHS IN WESTERN AUSTRALIA 1980-1990

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
	20.4	5.3	6.1	10.7	2.8	3.2	31.1	8.1	9.3
1981	15	103	118	6	63	69	21	166	187
	13.7	4.9	5.4	5.5	3.0	3.1	19.2	7.9	8.5
1982	17	101	118	11	69	80	28	170	198
	15.3	4.8	5.3	9.9	3.3	3.6	25.2	8.1	8.9
1983	11	97	108	17	59	76	28	156	184
	9.7	4.5	4.7	15.0	2.7	3.3	24.7	7.2	8.0
1984	15	101	116	14	75	89	29	176	205
	12.8	4.7	5.1	11.9	3.5	3.9	24.7	8.1	9.0
1985	13	96	109	19	58	77	32	154	186
	10.5	4.4	4.7	15.4	2.6	3.3	25.9	7.0	8.0
1986	13	116	129	12	59	71	25	175	200
	10.6	5.2	5.4	9.8	2.6	3.0	20.3	7.8	8.4
1987	7	96	103	18	64	82	25	160	185
	5.3	4.2	4.3	13.6	2.8	3.4	18.8	7.1	7.7
1988	17	87	104	24	58	82	41	145	186
	11.9	3.7	4.2	16.8	2.5	3.3	28.7	6.2	7.5
1989	11	110	121	21	56	77	32	166	198
	7.7	4.6	4.8	14.7	2.3	3.0	22.4	6.9	7.8
1990	9	78	87	16	71	87	25	149	174
	5.9	3.2	3.4	10.4	2.9	3.4	16.3	6.1	6.7
1991	7	61	68	21	56	77	28	117	145
	4.8	2.6	2.7	14.4	2.4	3.1	19.2	5.0	5.8

Excludes births <500 grams birthweight.

1980 - 1983 based on year of death.

1984 - 1991 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, 1980-1991

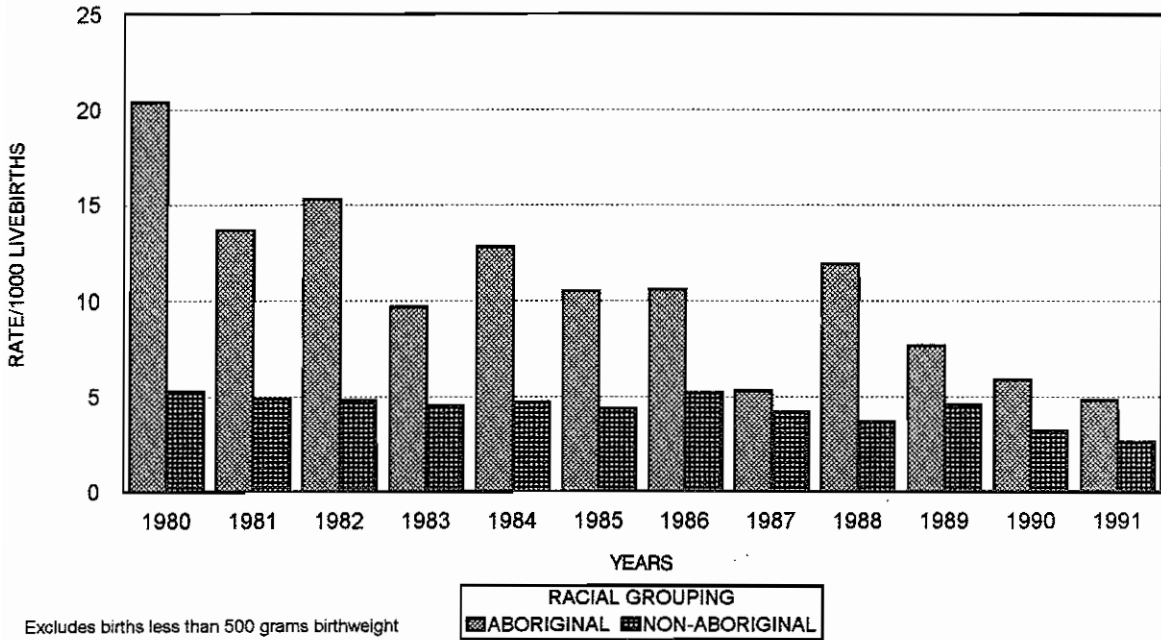


FIGURE X
POSTNEONATAL MORTALITY, RACIAL GROUPING
FOR WESTERN AUSTRALIAN BIRTHS, 1980-1991

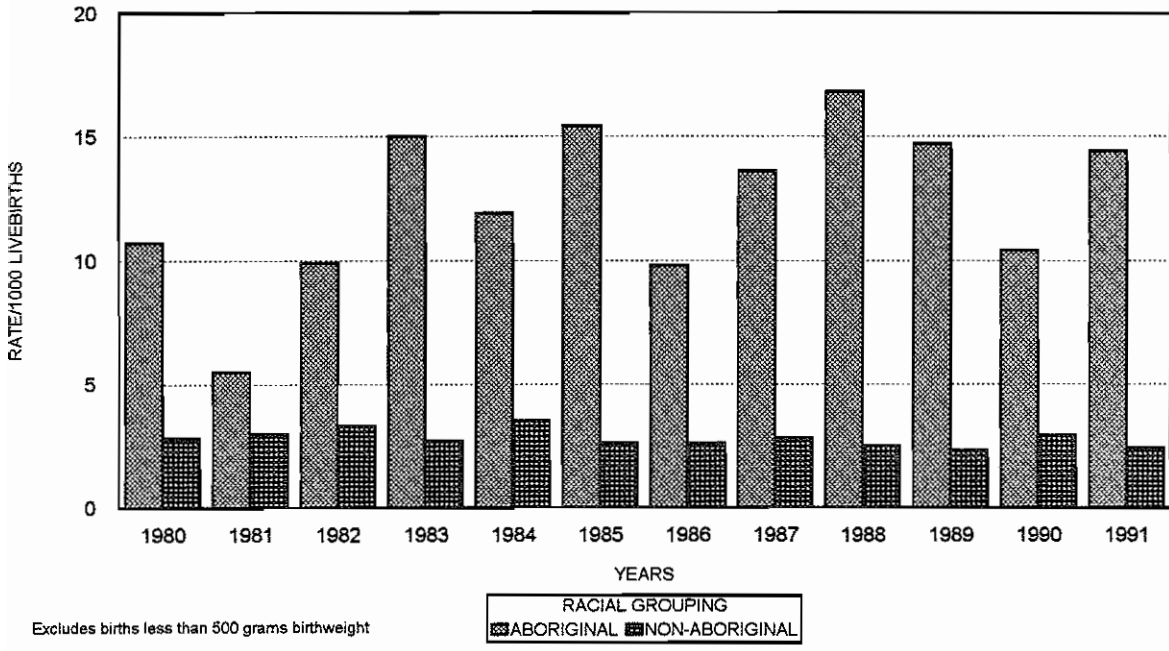
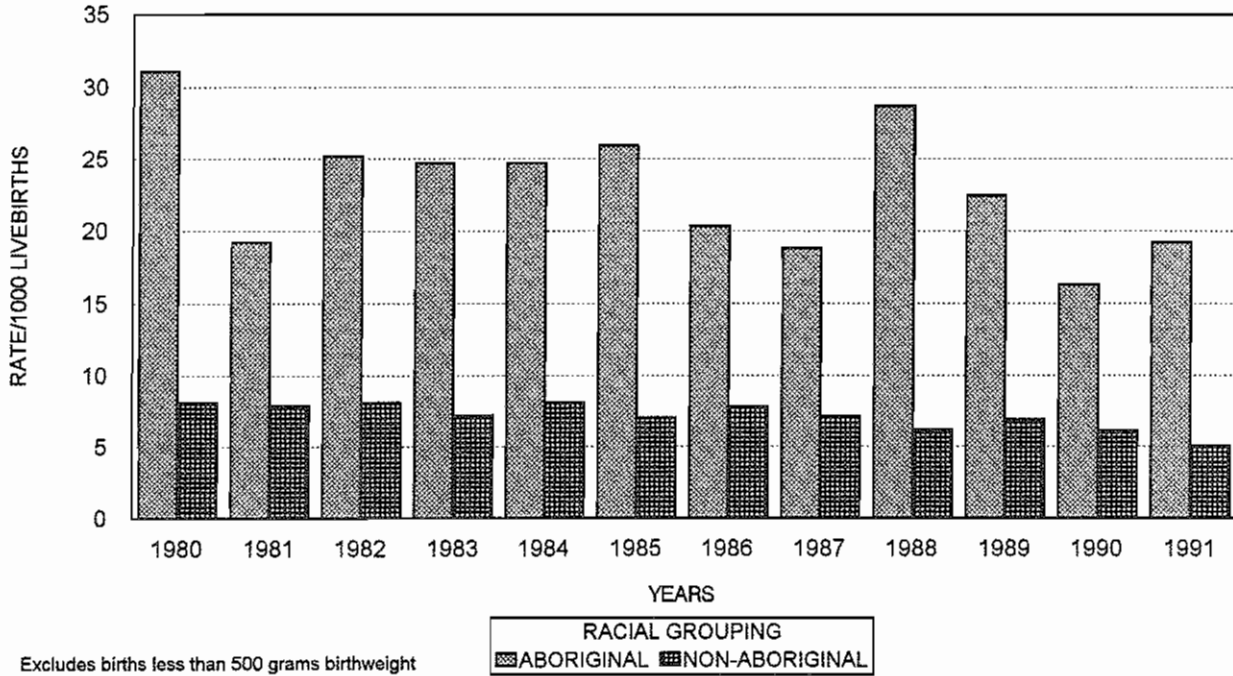


FIGURE XI

INFANT MORTALITY AND RACIAL GROUPING FOR WESTERN AUSTRALIAN BIRTHS, 1980-1991



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1. Gee, V. Perinatal Statistics in Western Australia. Ninth Annual Report of the Midwives' Notification System for 1991. Health Department of Western Australia, Perth. September 1992.
2. Gee, V. Perinatal and Infant Mortality Identified by Maternal Race. The 1990 Western Australian Birth Cohort, Health Department of Western Australia, Perth. December 1992.
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 lacto) () 2
 other ()

Race: (please specify) ()

Caucasian () 1
 Aboriginal (full or part) () 2
 Other (please specify) () 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 () 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 a.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—
 a.m. and date
 p.m.

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

Registration Number

3

2

8

6

9

10

11

12

14

4

7

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
* Morbid conditions, if any, giving rise to the above cause, stating the underlying condition 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

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)

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 condition 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, ashenia, 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.....

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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