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THE 1988 WESTERN AUSTRALIAN BIRTH COHORT

PERINATAL AND INFANT MORTALITY IDENTIFIED BY MATERNAL RACE

VIVIEN GEE, RN, RM, BAppSc (Nursing, Curtin)
Epidemiology and Research Branch

September 1990

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.
Health Department of Western Australia

**Statistical Series/23
Health Department of
Western Australia
Perth**

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TABLE OF CONTENTS Continued

	<u>PAGE</u>
6. PERINATAL MORTALITY IN WESTERN AUSTRALIA IN THE 1988 BIRTH COHORT	32
6.1 Perinatal Mortality	32
6.2 Maternal Race and Maternal Age	33
6.3 Maternal Race and Parity	34
6.4 Maternal Race and Birthweight	34
6.5 Maternal Race and Babies Sex	35
6.6 Maternal Race and Conjugal State	36
7. INFANT MORTALITY IN WESTERN AUSTRALIA IN THE 1988 BIRTH COHORT	37
7.1 Infant Deaths	37
7.2 Maternal Race and Maternal Age	37
7.3 Maternal Race and Conjugal State	38
7.4 Maternal Race and Parity	38
7.5 Maternal Race and Plurality	39
7.6 Maternal Race and Babies Sex	40
7.7 Maternal Race and Birthweight	40
7.8 Maternal Race and Age at Infant Death	41
7.9 Causes of Infant Death	42
8. BIRTH TRENDS, PERINATAL AND INFANT MORTALITY IN WESTERN AUSTRALIA IN 1980-1988	45
8.1 Crude Birth Rates and Total Births, 1980-1988	45
8.2.1. Stillbirths, Neonatal and Perinatal Mortality	45
8.2.2. Neonatal Mortality	48
8.2.3. Perinatal Mortality	48
8.3 Neonatal, Post-neonatal and Infant Mortality, 1980-1988	48
REFERENCES	55
APPENDICES	56
A. Notification of Case Attended Form 2	56
B. Medical Certificate of Cause of Perinatal Death	57
C. Medical Certificate of Cause of Death	58

SUMMARY

The Midwives' Notification System of Western Australia indentified 25079 births of ≥ 500 grams birthweight, to 24736 women during 1988. Of these babies, 117 were stillborn, and a further 186 babies died within the first twelve months.

The overall stillborn proportion was 4.7/1000 total births. Among babies born to Caucasian women the proportion was 4.6/1000, for babies of Aboriginal women 8.3/1000 and for babies of women of other races the proportion was 2.6/1000 total births. The stillbirth proportion of 4.6/1000 among singleton births was approximately half that (8.9/1000) for multiple births.

Of babies born to teenage women 8 (4.8/1000) were stillborn. Consideration of maternal parity showed a lower stillbirth proportion for primiparous women (5.2/1000) than among babies of women whose parity was 3 or more (6.8/1000) (Table 5).

The causes of stillbirths were unexplained for 43 (36.8%) babies and the deaths of 30 (25.6%) babies were attributed to extremely low birth weight (< 1000 grams). Lethal congenital abnormalities were the cause of death for 17 (14.5%) stillbirths (Table 9).

There were 104 neonatal deaths, giving a neonatal mortality proportion of 4.2/1000 livebirths; for babies of Caucasian women the proportion was 3.8/1000, for babies of Aboriginal mothers 11.9/1000 and for babies of women of other races 2.6/1000 (Table 4).

Post neonatal deaths numbered 82 (3.3/1000 livebirths) babies. Forty eight (58.5%) of these were attributed to Sudden Infant Death Syndrome and 13 (15.9%) to lethal congenital malformations (Table 22). The majority of these post neonatal deaths occurred during the winter months of April to September (Table 23).

The perinatal mortality proportion was 8.8/1000 total births. For babies of Caucasian women the proportion was 8.3/1000, for babies of Aboriginal women 20.1/1000 and babies of women of other races 5.2/1000. Perinatal deaths amongst babies born to Aboriginal teenage mothers (19.2/1000) was greater than for babies born to Caucasian women in the same age group (7.1/1000) (Table 25). The proportion of perinatal mortality among babies of single women (13.7/1000) and of babies of separated, divorced or widowed women (16.5/1000) was noticeably higher than the proportion (8.1/1000) for babies of women reported to be socially supported by a male partner (Table 29).

Infant deaths numbered 186, being 104 neonatal deaths and 82 post neonatal deaths. These numbers represent an overall proportion of 7.5/1000 livebirths (Table 39).

Among babies of Aboriginal women the infant death proportion (28.7/1000) was more than three times the overall proportion (7.5/1000). The proportion of infant deaths attributed to Sudden Infant Death Syndrome among babies of Aboriginal women was 14.7/1000 livebirths.

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

The major causes of infant death remain lethal congenital malformation (26.9%), Sudden Infant Death Syndrome (30.1%) and low birthweight related disorders (24.2%) (Table 37).

Babies born to Aboriginal mothers have higher proportions of perinatal and infant mortality than those babies born to non-Aboriginal women. Although the infant mortality proportion among babies of Aboriginal women has substantially decreased over the past seven years from, 31.3/1000 in 1980 to 28.7/1000 in 1988, it still remains more than three times that of the overall infant mortality proportion (7.5/1000) of livebirths in 1988. (Table 42).

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- . The Australian Bureau of Statistics for population estimates;
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TABLES

	<u>PAGE</u>
BIRTHS	
1. Maternal Race and Condition of Births in Western Australia 1988.	6
2. Livebirths and Total Births by Statistical Division of Maternal Residence and Maternal Race in Western Australia in 1988.	7
3. Maternal Age and Maternal Race for Women Confined in Western Australia in 1988.	9
STILLBIRTHS, NEONATAL AND POST-NEONATAL MORTALITY	
4. Stillbirths, Neonatal and Perinatal Deaths by Statistical Division of Maternal Residence and Maternal Race in Western Australia in 1988.	12
5. Stillbirths by Maternal Race and Maternal Age in Western Australia in 1988.	13
6. Stillbirths by Maternal Race and Parity in Western Australia in 1988.	13
7. Condition, Plurality and Maternal Race of Births in Western Australia, in 1988.	14
8. Stillbirth Proportion by Maternal Race and Birthweight Distribution in Western Australia in 1988.	16
9. Cause of Stillbirth by Maternal Race in Western Australia in 1988.	17
10. Neonatal Deaths by Maternal Race and Maternal Age in Western Australia in 1988.	18
11. Neonatal Deaths by Maternal Race and Parity in Western Australia in 1988.	19
12. Neonatal Deaths by Maternal Race and Plurality in Western Australia in 1988.	19
13. Neonatal Mortality by Maternal Race and Birthweight Distribution in Western Australia in 1988.	21
14. Age at Neonatal Death by Maternal Race in Western Australia in 1988.	22
15. Cause of Neonatal Death by Maternal Race in Western Australia in 1988.	24
16. Post-Neonatal and Infant Mortality by Statistical Division of Maternal Residence and Maternal Race in Western Australia in 1988.	25

TABLES Continued

	<u>PAGE</u>
17. Post-Neonatal Deaths by Maternal Race and Maternal Age in Western Australia in 1988.	26
18. Post-Neonatal Deaths by Maternal Race and Conjugal State in Western Australia in 1988.	27
19. Post-Neonatal Deaths by Maternal Race and Parity in Western Australia in 1988.	27
20. Post-Neonatal Deaths by Maternal Race and Plurality in Western Australia in 1988.	28
21. Post-Neonatal Mortality by Maternal Race and Birthweight Distribution in Western Australia in 1988.	29
22. Cause of Post-Neonatal Death by Maternal Race in Western Australia in 1988.	30
23. Cause of Post-Neonatal Death by Seasonal Incidence in Western Australia in 1988.	31
PERINATAL MORTALITY	
24. Stillbirths, Neonatal and Perinatal Mortality by Maternal Race in Western Australia in 1988.	32
25. Perinatal Deaths by Maternal Race and Maternal Age in Western Australia in 1988.	33
26. Perinatal Deaths by Maternal Race and Parity in Western Australia in 1988.	34
27. Perinatal Deaths by Maternal Race and Birthweight Distribution in Western Australia in 1988.	35
28. Perinatal Deaths by Maternal Race and Sex in Western Australia in 1988.	36
29. Perinatal Deaths by Maternal Race and Conjugal State in Western Australia in 1988.	36
INFANT MORTALITY	
30. Infant Deaths by Maternal Race and Maternal Age in Western Australia in 1988.	37
31. Infant Deaths by Maternal Race and Conjugal State in Western Australia in 1988.	38
32. Infant Deaths by Maternal Race and Parity in Western Australia in 1988.	39
33. Infant Deaths by Maternal Race and Plurality in Western Australia in 1988.	39

TABLES Continued

	<u>PAGE</u>
34. Infant Deaths by Maternal Race and Sex in Western Australia in 1988.	40
35. Infant Mortality by Maternal Race and Birthweight Distribution in Western Australia in 1988.	41
36. Infant Deaths by Maternal Race and Age at Death in Western Australia in 1988.	41
37. Cause of Infant Deaths and Maternal Race in Western Australia in 1988.	42
38. Perinatal and Infant Mortality of Maternal Age, Pluarlity and Sex in Western Australia in 1988.	43
39. Neonatal, Post-Neonatal and Infant Mortality by Maternal Race in Western Australia in 1988.	44
BIRTH TRENDS	
40. Crude Birth Rates for Aboriginal and Non-Aboriginal Western Australian Birth, 1980-1988.	45
41. Stillbirths, Neonatal and Perinatal Mortality for Aboriginal and Non-Aboriginal Births in Western Australia, 1980-1988.	47
42. Neonatal, Post-Neonatal and Infant Mortality for Aboriginal and Non-Aboriginal Births in Western Australia, 1980-1988	51

FIGURES

	<u>PAGE</u>
I	CRUDE BIRTH RATE, PERINATAL AND INFANT MORTALITY BY STATISTICAL DIVISION OF MATERNAL RESIDENCE IN WESTERN AUSTRALIA IN 1988. 8
II	STILLBIRTHS, NEONATAL AND PERINATAL MORTALITY FOR CAUCASIAN, ABORIGINAL AND OTHER RACIAL GROUPS IN WESTERN AUSTRALIA IN 1988. 11
III	BIRTHWEIGHT DISTRIBUTION OF STILLBIRTHS IN WESTERN AUSTRALIA IN 1988. 15
IV	BIRTHWEIGHT DISTRIBUTION OF NEONATAL DEATHS IN WESTERN AUSTRALIA IN 1988. 20
V	NEONATAL, POST-NEONATAL AND INFANT MORTALITY FOR CAUCASIAN, ABORIGINAL AND OTHER RACIAL GROUPS IN WESTERN AUSTRALIA IN 1988. 23
VI	CRUDE BIRTH RATES AND RACIAL GROUPINGS FOR WESTERN AUSTRALIAN BIRTHS, 1980-1988. 46
VII	STILLBIRTH PROPORTION AND RACIAL GROUPING OF BIRTHS IN WESTERN AUSTRALIA, 1980-1988. 49
VIII	PERINATAL MORTALITY AND RACIAL GROUPING FOR WESTERN AUSTRALIAN BIRTHS, 1980-1988. 50
IX	NEONATAL MORTALITY FOR RACIAL GROUPING FOR WESTERN AUSTRALIAN BIRTHS, 1980-1988. 52
X	POST-NEONATAL MORTALITY AND RACIAL GROUPING FOR WESTERN AUSTRALIAN BIRTHS, 1980-1988. 53
XI	INFANT MORTALITY AND RACIAL GROUPING FOR WESTERN AUSTRALIAN BIRTHS, 1980-1988. 54

1. INTRODUCTION

This report is the fifth 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 1988 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. 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.

Postneonatal 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.

3. DATA COLLECTION

The Western Australian Midwives' Notification System forms the basis of this fifth 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.

There were three additional post neonatal deaths of babies born outside Western Australia during 1988 not included in this report. All were babies of Caucasian mothers. The causes of death for two babies were lethal congenital malformation at 17 weeks and S.I.D.S. at 12 weeks. The third baby died as a result of injuries received in a motor vehicle accident aged 11 months.

Information related to deaths of liveborn babies was obtained from the Registrar General's Office, the Hospital Morbidity System, the Community and Child Health Services 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 is complete.

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.

4. BIRTHS IN WESTERN AUSTRALIA IN 1988

4.1 Births Incidence

Midwives' forms received by this department indicate that 25,079 babies were born to 24736 women during 1988. This report includes statistics only on those babies whose birthweight was equal to or greater than 500 grams.

Examination of births showed that 22,098 (88.1%) were born to Caucasian women, 1,440 (5.7%) to Aboriginal women and 1,541 (6.1%) to women of other racial groups (Table 1).

4.2 Place of Birth

The majority 24,827 (99.0%) births occurred in hospital. Of these, births in metropolitan hospitals numbered 18,513 (74.6%) and non-metropolitan hospital births were 6,314 (25.4%).

There were 252 (1.0%) non hospital births including 77 (0.3%) born before arrival at hospital and 175 (0.7%) planned supervised homebirths.¹

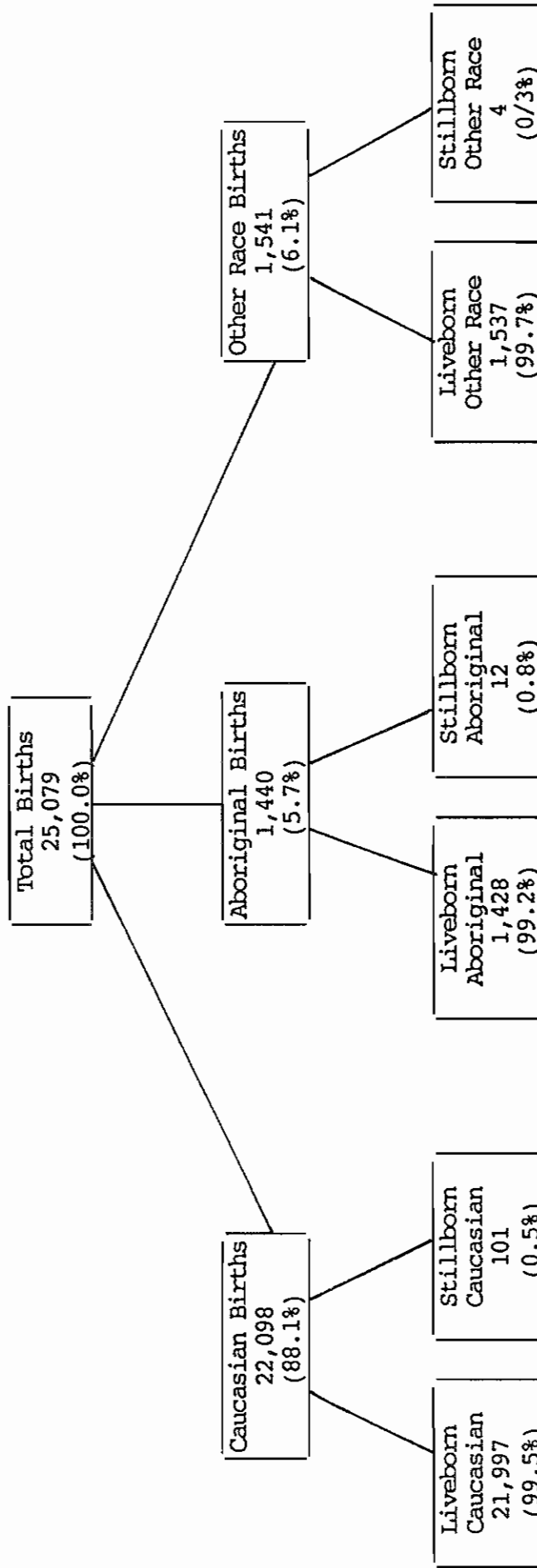
4.3 Maternal Place of Residence

Assessment of location of women bearing children throughout the State shows that the majority of births 17,054 (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 16.0/1000 total population was identified for Western Australia during 1988. The area with the lowest crude birth rate (15.0/1000 total population) was the Perth Statistical Division (Figure 1).

TABLE 1 : MATERNAL RACE AND CONDITION OF BIRTHS IN WESTERN AUSTRALIA IN 1988



Excludes births <500 grams birthweight.

TABLE 2 : LIVEBIRTHS AND TOTAL BIRTHS BY HEALTH SERVICE MANAGEMENT REGION MATERNAL RESIDENCE AND MATERNAL RACE IN WESTERN AUSTRALIA IN 1988

Health Service Management Region	Maternal Race															
	Caucasian				Aboriginal				Other				Total			
	Live-born No.	%	Total No.	%	Live-born No.	%	Total No.	%	Live-born No.	%	Total No.	%	Live-born No.	%	Total No.	%
<u>Metropolitan</u>																
North	4985	22.7	5008	22.7	97	6.8	97	6.7	371	24.1	371	24.1	5453	21.9	5476	21.8
North East	3983	18.1	4000	18.1	118	8.3	119	8.3	419	27.3	423	27.5	4520	18.1	4542	18.1
South	2640	12.0	2652	12.0	64	4.5	64	4.4	112	7.3	112	7.3	2816	11.3	2828	11.3
South East	3710	16.9	3729	16.9	91	6.4	91	6.3	388	25.2	388	25.2	4189	16.8	4208	16.8
<u>Non-Metropolitan</u>																
South West	2005	9.1	2010	9.1	59	4.1	59	4.1	34	2.2	34	2.2	2098	8.4	2103	8.4
Great Southern	1051	4.8	1056	4.8	77	5.4	79	5.5	26	1.7	26	1.7	1154	4.6	1161	4.6
Central Wheatbelt	834	3.8	837	3.8	59	4.1	60	4.2	6	0.4	6	0.4	899	3.6	903	3.6
Goldfields	946	4.3	956	4.3	117	8.2	120	8.3	37	2.4	37	2.4	1100	4.4	1113	4.4
Mid West Gascoyne	836	3.8	839	3.8	197	13.8	199	13.8	36	2.3	36	2.3	1069	4.3	1074	4.3
Pilbara	791	3.6	795	3.6	142	9.9	143	9.9	85	5.5	85	5.5	1018	4.1	1023	4.1
Kimberley	204	0.9	204	0.9	405	28.4	407	28.3	23	1.5	23	1.5	632	2.5	634	2.5
Outside WA	12	0.1	12	0.1	2	0.1	2	0.1	-	-	-	-	14	0.1	14	0.1
TOTAL	21997	100.0	22098	100.0	1428	100.0	1440	100.0	1537	100.0	1541	100.0	24962	100.0	25079	100.0

Excludes births <500 grams birthweight.

FIGURE I

CRUDE BIRTH RATE, PERINATAL AND INFANT MORTALITY
 BY HEALTH SERVICE MANAGEMENT REGION OF MATERNAL RESIDENCE
 FOR BIRTHS IN WESTERN AUSTRALIA IN 1988

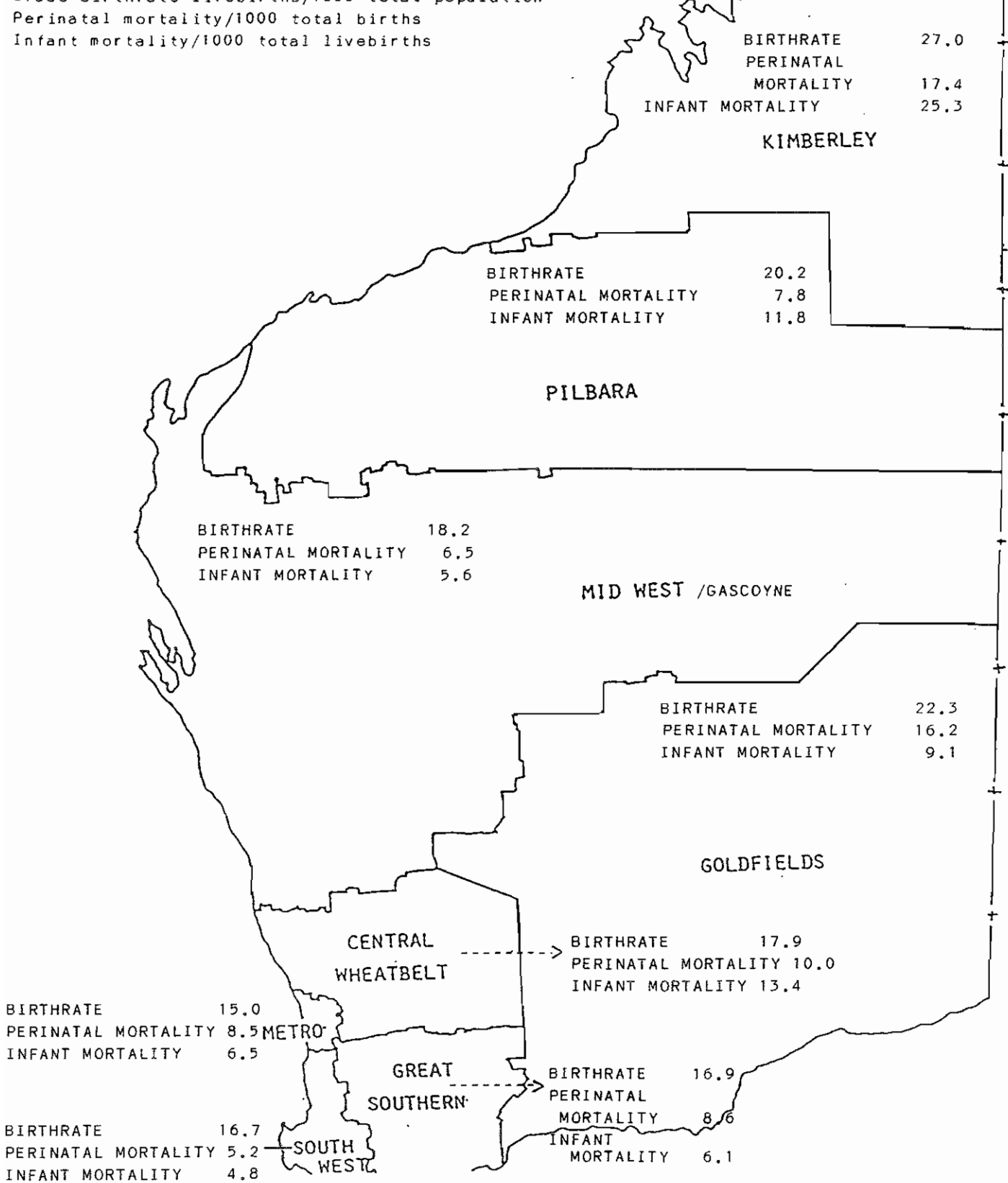
Overall Rates for WA:

Crude birthrate	16.0
Perinatal Mortality	8.8
Infant Mortality	7.5

Crude birthrate-livebirths/1000 total population

Perinatal mortality/1000 total births

Infant mortality/1000 total livebirths



4.5 Condition of Births

Analysis of the condition at birth showed 24962 (99.5%) babies were liveborn and 117 (0.5%) babies were stillborn.¹ Livebirths to Caucasian women numbered 21,997 (99.5%) and stillbirths 101 (0.5%). Among Aboriginal women there were 1,428 (99.2%) liveborn and 12 (0.8%) stillborn babies. For women of other races there were 1,537 (99.7%) livebirths and 4 (0.3%) stillbirths (Table 1).

4.6 Maternal Age and Births

Consideration of maternal age shows that the highest number of women confined (9,638, 38.4%) were in the 25 to 29 year age category.

Women in their teenage years accounted for 1,636 (6.5%) of total confinements. Almost a third (32.6%) of Aboriginal women confined were teenagers. This contrasts with Caucasian women of whom 5.1% were teenagers and women of other races with 2.3% teenage confinements. Women aged 40 years or more represented 0.9% of all women confined (Table 3).

TABLE 3 : MATERNAL AGE AND MATERNAL RACE OF WOMEN CONFINED IN WESTERN AUSTRALIA IN 1988

Maternal Age	Maternal Race						Total	
	Caucasian		Aboriginal		Other		No.	%
	No.	%	No.	%	No.	%		
≤ 13	1	-	4	0.3	-	-	5	-
14	5	-	15	1.0	-	-	20	0.1
15	22	0.1	29	2.0	-	-	51	0.2
16	80	0.4	73	5.1	3	0.2	156	0.6
17	206	0.9	104	7.2	9	0.6	319	1.3
18	322	1.5	111	7.7	8	0.5	441	1.8
19	495	2.2	134	9.3	15	1.0	644	2.6
≤ 19	1131	5.1	470	32.6	35	2.3	1636	6.5
20-24	4841	21.9	518	36.0	230	14.9	5589	22.3
25-29	8855	40.1	271	18.8	512	33.2	9638	38.4
30-34	5466	24.7	143	9.9	500	32.5	6109	24.4
35-39	1605	7.3	37	2.6	231	15.0	1873	7.5
40-44	196	0.9	1	0.1	33	2.1	230	0.9
≥ 45	4	-	-	-	-	-	4	-
TOTAL	22098	100.0	1440	100.0	1541	100.0	25079	100.0

Excludes births <500 grams birthweight.

5. STILLBIRTHS, NEONATAL AND POST-NEONATAL MORTALITY IN WESTERN AUSTRALIA IN THE 1988 BIRTH COHORT

5.1 Stillbirths

There were 117 stillbirths in Western Australia during the 1988 year which were equal to or greater than 500 grams birthweight. The stillbirth proportion for the State was 4.7/1000 total births (Table 4).

The stillbirth proportion for babies of Aboriginal women (8.3/1000) was high compared to that for babies of Caucasian women (4.6/1000) and for babies of women of other racial groups (2.6/1000).

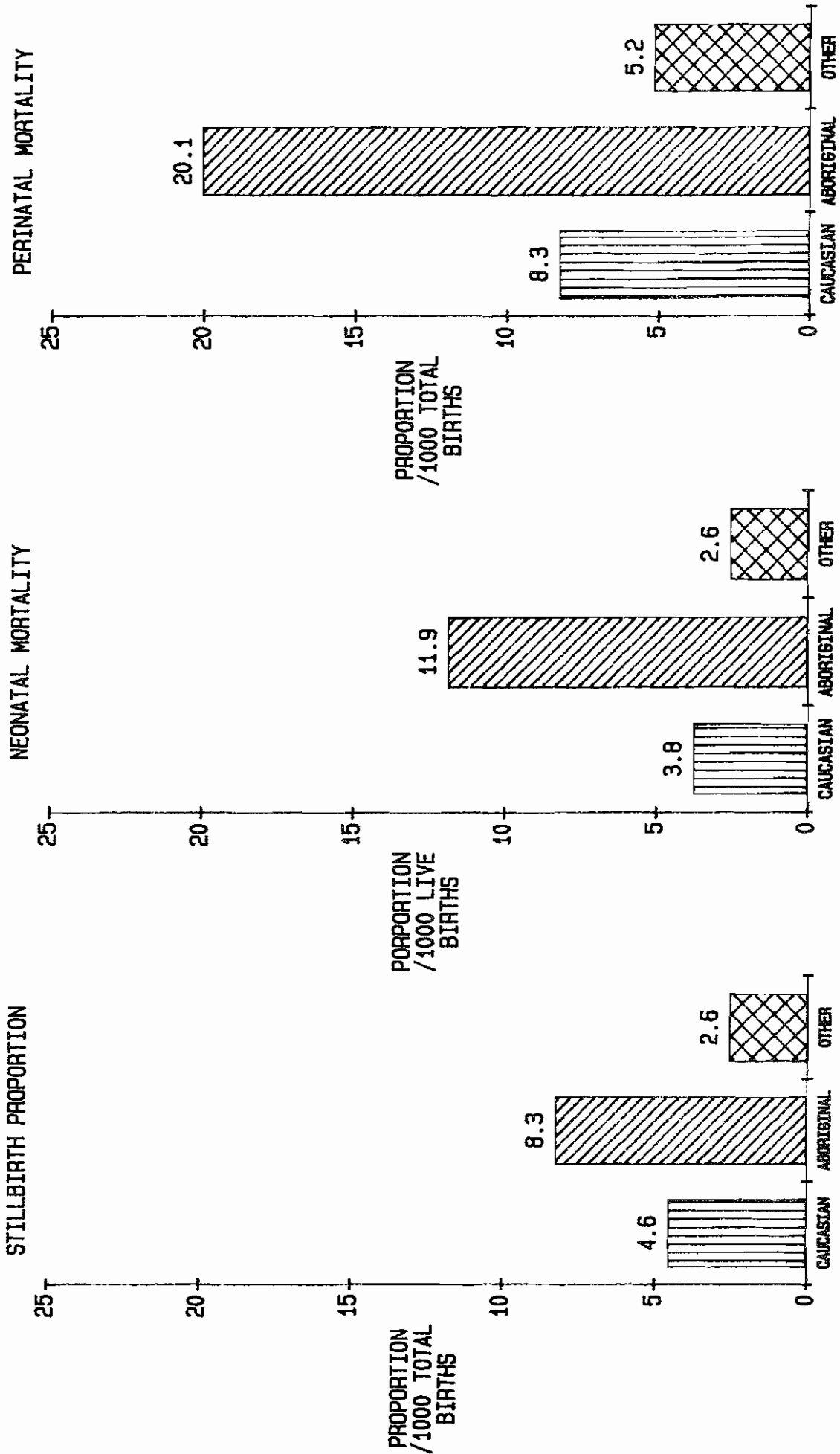
Stillbirth proportions relating to Health Service Management Regions of maternal residence are shown on Table 4. It should be noted, however, that due to small numbers of births in each country division the proportions do vary from year to year and may be considered unrepresentative on an annual basis. (Table 4, Figure II).

5.1.1 Maternal Race and Maternal Age

The overall proportion of stillbirths was 4.7/1000 total births. For babies of teenage mothers, the proportion was 4.8/1000 and among babies of Aboriginal teenage mothers the proportion was 8.5/1000 total births. Among women aged 25-29 years, the group with the highest number of births overall, the stillbirth proportion was low at 4.2/1000 total births. Among babies of women aged 35 years and over 20 (9.5/1000) stillbirths occurred (Table 5).

FIGURE II

STILLBIRTHS, NEONATAL AND PERINATAL MORTALITY FOR ABORIGINALS AND NON-ABORIGINALS IN WESTERN AUSTRALIA IN 1988



Excludes births less than 500 grams birthweight

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

TABLE 4 : STILLBIRTHS, NEONATAL AND PERINATAL DEATHS BY HEALTH SERVICE MANAGEMENT REGION OF MATERNAL RESIDENCE AND MATERNAL RACE IN WESTERN AUSTRALIA IN 1988

Health Service Management Region	Maternal Race												Total											
	Caucasian				Aboriginal				Other				Still- births No. Prop ⁿ	Neo- natal No. Prop ⁿ	Peri- natal No. Prop ⁿ									
	Still- births No. Prop ⁿ	Neo- natal No. Prop ⁿ	Peri- natal No. Prop ⁿ	Still- births No. Prop ⁿ	Neo- natal No. Prop ⁿ	Peri- natal No. Prop ⁿ	Still- births No. Prop ⁿ	Neo- natal No. Prop ⁿ	Peri- natal No. Prop ⁿ	Still- births No. Prop ⁿ	Neo- natal No. Prop ⁿ	Peri- natal No. Prop ⁿ												
Metropolitan	17	3.4	12	2.4	29	5.8	1	(10.3)	-	-	1	(10.3)	4	(10.8)	1	(2.7)	5	13.5	22	4.0	13	2.4	35	6.4
North	23	5.8	18	4.5	41	10.3	-	-	-	-	-	-	-	-	3	(7.2)	3	(7.1)	23	5.1	21	4.7	44	9.7
North East	12	4.5	16	6.1	28	10.6	-	-	-	-	-	-	-	-	-	-	-	-	12	4.2	16	5.7	28	9.9
South	19	5.1	19	5.1	38	10.2	-	-	-	-	-	-	-	-	-	-	-	-	19	4.5	19	4.5	38	9.0
Non Metropolitan	5	2.5	5	2.5	10	5.0	-	-	1	(17.0)	1	(17.0)	-	-	-	-	-	-	5	2.4	6	2.4	11	5.2
South West	5	4.7	3	(2.9)	8	7.6	2	(25.3)	-	-	2	(25.3)	-	-	-	-	-	-	7	6.0	3	(2.6)	10	8.6
Great Southern	3	(3.6)	4	(4.8)	7	8.4	1	(17.0)	1	(17.0)	2	(33.3)	-	-	-	-	-	-	4	(4.4)	5	5.6	9	10.0
Central Wheatbelt	10	10.5	2	(2.1)	12	12.6	3	(25.0)	3	(25.6)	6	50.0	-	-	-	-	-	-	13	11.7	5	4.6	18	16.2
Goldfields	3	(3.6)	-	-	3	(3.6)	2	(10.1)	2	(10.1)	4	(20.1)	-	-	-	-	-	-	5	4.7	2	(1.9)	7	6.5
Mid West Gascoyne	4	(5.0)	2	(2.5)	6	7.6	1	(7.0)	1	(7.0)	2	(14.0)	-	-	-	-	-	-	5	4.9	3	(13.0)	8	7.8
Pilbara	-	-	-	-	-	-	2	(4.9)	9	22.2	11	27.0	-	-	-	-	-	-	2	-	9	(14.2)	11	(17.4)
Kimberley	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	(142.29)	2	(142.9)
Outside WA	-	-	2	(166.7)	2	(166.7)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL	101	4.6	83	3.8	184	8.3	12	8.3	17	11.9	29	20.1	4	(2.6)	4	(2.6)	8	5.2	117	4.7	104	4.2	221	8.8

Excludes births <500 grams birthweight.

- 1 Stillbirth & Perinatal Death proportion/1000 total births.
 - 2 Neonatal Death proportion/1000 Livebirths.
- () Where n^o proportion has been bracketed.

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

TABLE 5 : STILLBIRTHS BY MATERNAL RACE AND MATERNAL AGE IN WESTERN AUSTRALIA IN 1988

Maternal Age	Maternal Race									Total		
	Caucasian			Aboriginal			Other			No.	Total	Prop ¹
	No.	Total	Prop ¹	No.	Total	Prop ¹	No.	Total	Prop ¹			
≤ 15	-	28	-	1	48	20.8	-	-	-	1	76	13.2
16	-	80	-	1	73	13.7	-	3	-	1	156	6.4
17	1	206	4.9	1	104	9.6	-	9	-	2	319	6.3
18	2	322	6.2	-	111	-	-	8	-	2	441	4.5
19	1	495	2.0	1	134	7.5	-	15	-	2	644	3.1
≤ 19	4	1131	3.5	4	470	8.5	-	35	-	8	1636	4.8
20-24	20	4841	4.1	2	518	3.9	-	230	-	22	5589	3.9
25-29	35	8855	4.0	3	271	11.1	2	512	3.9	40	9638	4.2
30-34	25	5466	4.6	1	143	7.0	1	500	2.0	27	6109	4.2
35-39	16	1605	10.0	2	37	54.1	1	231	4.3	19	1873	10.4
40-44	1	196	5.1	-	1	-	-	33	-	1	230	4.4
≥ 45	-	4	-	-	-	-	-	-	-	-	4	-
TOTAL	101	22098	4.6	12	1440	8.3	4	1541	2.6	117	25079	4.7

Excludes births <500 grams birthweight.

¹ Proportion/1000 total births.

5.1.2 Maternal Race and Parity

Fifty (5.2/1000) stillborn babies were to primiparous women compared with 52 (5.5/1000) in the 1987 birth cohort. For babies of women whose parity was three or more the stillbirth proportion rose from 14 (5.9/1000) in 1987 to 17 (6.8/1000) in 1988 (Table 6).

TABLE 6 : STILLBIRTHS BY MATERNAL RACE AND PARITY IN WESTERN AUSTRALIA IN 1988

Parity	Maternal Race									Total		
	Caucasian			Aboriginal			Other			No.	Total Births	Prop ¹
	No.	Total Births	Prop ¹	No.	Total Births	Prop ¹	No.	Total Births	Prop ¹			
0	43	8652	5.0	6	431	13.9	1	591	1.7	50	9674	5.2
1 - 2	45	11490	3.9	3	628	4.8	2	784	2.6	50	12902	3.9
3 - 4	9	1773	5.1	3	268	11.2	1	137	7.3	13	2178	6.0
≥ 5	4	183	21.9	-	113	-	-	29	-	4	325	12.3
TOTAL	101	22098	4.6	12	1440	8.3	4	1541	2.6	117	25079	4.7

Excludes births <500 grams birthweight.

¹ Proportion/1000 total births.

5.1.3 Maternal Race, Condition and Plurality

Consideration of condition and plurality at birth showed that six of the 117 stillborn babies in 1988 were multiple births. This represents a proportion of 8.9/1000 multiple births. Of the 111 singleton stillbirths (4.6/1000 singleton births), those to Aboriginal mothers numbered 12 representing a higher proportion (8.5/1000) of stillbirths among singleton births to Aboriginal women (Table 7).

TABLE 7 : CONDITION, PLURALITY AND MATERNAL RACE OF BIRTHS IN WESTERN AUSTRALIA, 1988

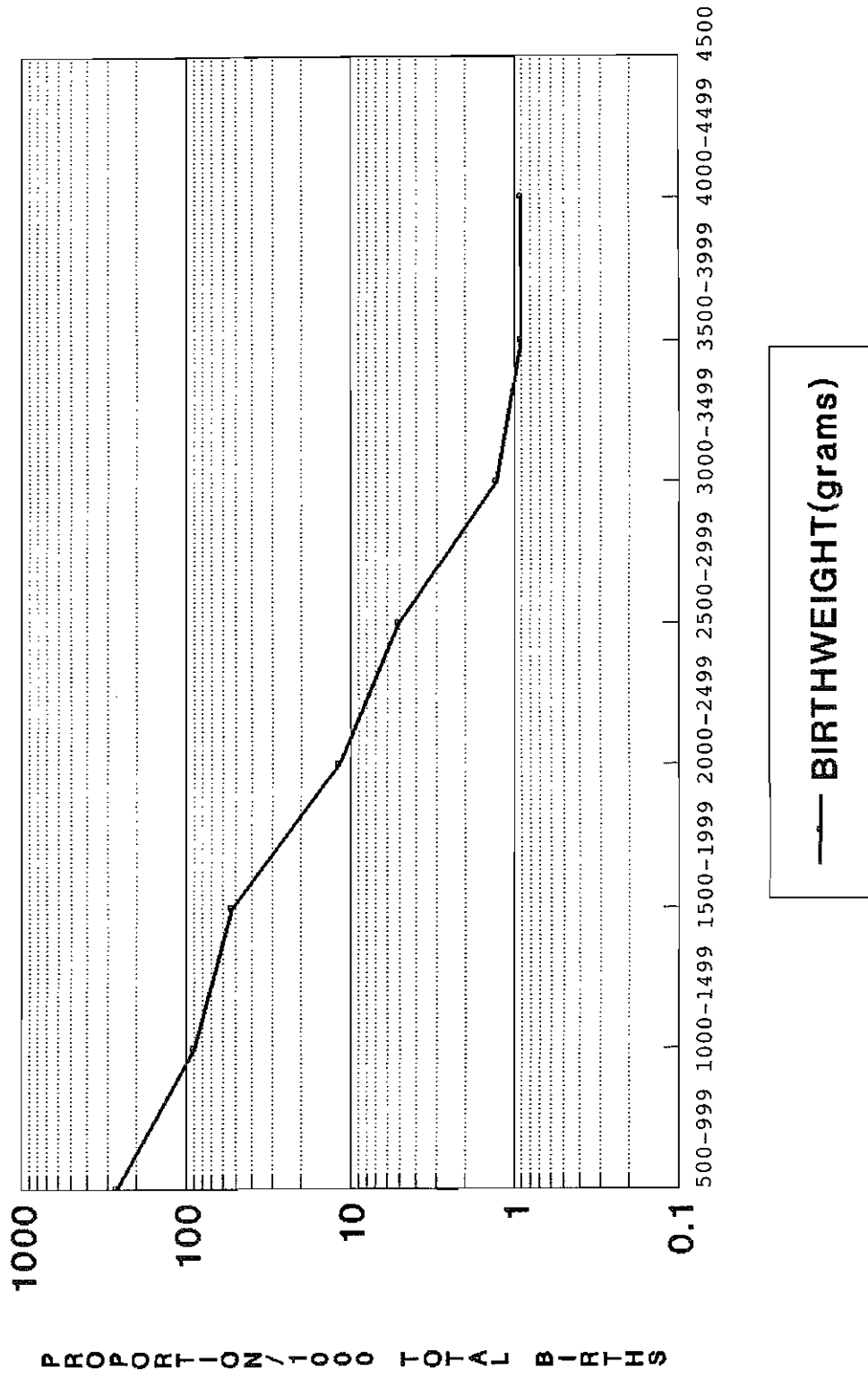
	Maternal Race												Total			
	Caucasian				Aboriginal				Other				Total Live Births	Total Still Births	Total Progn Births	
	Total Births	Live Births	Still Births	Progn Births	Total Births	Live Births	Still Births	Progn Births	Total Births	Live Births	Still Births	Progn Births				
Singleton	21477	21382	95	4.4	1414	1402	12	8.5	1514	1510	4	2.6	24405	24294	111	4.6
Multiple	621	615	6	9.7	26	26	-	-	27	27	-	-	674	668	6	8.9
TOTAL	22098	21997	101	4.6	1440	1428	12	8.3	1541	1537	4	2.6	25079	24962	117	4.7

Excludes births <500 grams birthweight.
¹ Proportion/1000 total births.

5.1.4 Maternal Race and Birthweight

The stillbirth proportion for all races varied inversely for birthweight. The proportion of stillbirths in low birthweight babies was 49.5/1000. The lowest stillbirth proportion (0.9/1000) were for babies of birthweight 3500 grams or more (Table 8, Figure III).

FIGURE III
**BIRTHWEIGHT DISTRIBUTION OF STILLBIRTHS
 IN WESTERN AUSTRALIA IN 1988.**



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

TABLE 8 : STILLBIRTH PROPORTION BY MATERNAL RACE AND BIRTHWEIGHT DISTRIBUTION IN WESTERN AUSTRALIA IN 1988

Birthweight (grams)	Maternal Race									Total		
	Caucasian			Aboriginal			Other			No.	Total Births	Prop ⁿ
	No.	Total Births	Prop ⁿ	No.	Total Births	Prop ⁿ	¹ No.	Total Births	Prop ⁿ			
500 - 999	28	103	271.8	4	16	(250.0)	1	6	(166.7)	33	125	264.0
1000 - 1499	15	146	102.7	1	19	(52.6)	-	14	-	16	179	89.4
1500 - 1999	10	252	39.7	5	38	131.6	1	12	(83.3)	16	302	53.0
2000 - 2499	11	751	14.7	-	115	-	-	65	-	11	931	11.8
< 2500	64	1252	51.1	10	188	53.2	2	97	(20.6)	76	1537	49.5
2500 - 2999	19	3249	5.9	-	320	-	1	321	(3.1)	20	3890	5.1
3000 - 3499	10	8222	1.2	1	496	(2.0)	1	655	(1.5)	12	9373	1.3
3500 - 3999	6	6937	0.9	1	339	(3.0)	-	362	-	7	7638	0.9
4000 - 4499	2	2122	(0.9)	-	82	-	-	87	-	2	2291	(0.9)
≥ 4500	-	316	-	-	15	-	-	19	-	-	350	-
TOTAL	101	22098	4.6	12	1440	8.3	4	1541	(2.6)	117	25079	4.7

Excludes births <500 grams birthweight.

¹ Proportion/1000 total births.

() Where n<5 proportion has been bracketed.

5.1.5 Causes of Stillbirths

There were 43 (36.8% stillborn babies with cause unknown and 30 (25.6%) stillbirths were attributed to extremely low birthweight Lethal congenital malformations resulted in 17 (14.5%) stillbirths and a further 18 (15.4%) stillbirths resulted from complications of placenta and/or cord (Table 9).

The high percentage of unexplained stillbirths would be reduced if autopsies were performed on more babies. Of the 117 stillborn babies, it is known that 70 (59.8%) had autopsies and 37 (31.6%) did not. It is not known whether the remaining 10 (8.5%) stillborn babies underwent autopsy.

Seventy nine (67.5%) stillbirths were recorded as antepartum deaths, 29 (24.8%) were recorded as intrapartum deaths and for 9 (7.7%) the time of death was unknown.

TABLE 9 : CAUSE OF STILLBIRTH BY MATERNAL RACE IN WESTERN AUSTRALIA IN 1988

Cause of Death	Maternal Race						Total	
	Caucasian		Aboriginal		Other			
	No.	%	No.	%	No.	%	No.	%
Lethal Congenital Malformation	15	14.9	2	16.7			17	14.5
Extremely Low Birth Weight (<1000g)*	26	25.7	3	25.0	1	25.0	30	25.6
Unknown	37	36.6	3	25.0	3	75.0	43	36.8
Maternal:								
Obstetric	1	1.0	-	-	-	-	1	0.9
Medical	2	2.0	1	8.3	-	-	3	2.6
Hypertension	5	5.0	-	-			5	4.3
Placenta and Cord	15	14.9	3	25.0	-	-	18	15.4
Other								
TOTAL	101	100.0	12	100.0	6	100.0	117	100.0

Excludes births <500 grams birthweight.

*Any non-malformed stillbirth of birthweight <1000 grams was included in the extremely low birthweight category.

5.2 Neonatal Deaths

There were 104 neonatal deaths from the 24962 livebirths in 1988.¹ The overall neonatal mortality proportion was 4.2/1000 livebirths. For babies of Aboriginal women neonatal mortality was 11.9/1000 livebirths which is much higher than for babies of Caucasian women (3.8/1000) and slightly higher than the proportion for babies of women of other races (2.6/1000) (Table 4).

The figures for neonatal mortality by Health Service Management Region of maternal residence are provided in Table 4. However, it should be noted that due to small numbers of births in each country division, the proportions do fluctuate markedly.³

5.2.1 Maternal Race and Maternal Age

Ten (6.1/1000) of the 104 liveborn babies who died within the first 28 days of life, were born to teenage mothers. In the age group where the highest number of births occurred (25-29 years) the neonatal mortality proportion was 3.8/1000. The proportion of neonatal deaths (10.7/1000) among babies of Aboriginal teenage mothers is much higher than that for babies of Caucasian teenage women (3.6/1000) (Table 10).

TABLE 10 : NEONATAL DEATHS BY MATERNAL RACE AND MATERNAL AGE IN WESTERN AUSTRALIA IN 1988

Maternal Age	Maternal Race									Total		
	Caucasian			Aboriginal			Other			No.	Live Births	Prop ⁿ
	No.	Live Births	Prop ⁿ	No.	Live Births	Prop ⁿ	No.	Live Births	Prop ⁿ			
≤ 15	-	28	-	2	47	42.6	-	-	-	2	75	26.7
16	-	80	-	2	72	27.8	-	3	-	2	155	12.9
17	-	205	-	-	103	-	1	9	111.1	1	317	3.2
18	2	320	6.3	1	111	9.0	-	8	-	3	439	6.8
19	2	494	4.1	-	133	-	-	15	-	2	642	3.1
≤ 19	4	1127	3.6	5	466	10.7	1	35	28.6	10	1628	6.1
20-24	20	4821	4.2	4	516	7.8	-	230	-	24	5567	4.3
25-29	32	8820	3.6	2	268	7.5	2	510	3.9	36	9598	3.8
30-34	17	5441	-	6	142	42.3	1	499	2.0	24	6082	4.0
35-39	8	1589	-	-	35	-	-	230	-	8	1854	4.3
40-44	2	195	-	-	1	-	-	33	-	2	229	8.7
≥ 45	-	4	-	-	-	-	-	-	-	-	4	-
TOTAL	83	21997	3.8	17	1428	11.9	4	1537	2.6	104	24962	4.2

Excludes births <500 grams birthweight.

¹ Proportion/1000 total livebirths.

5.2.2 Maternal Race and Parity

Fifty two (4.0/1000) neonatal deaths were to women with a previous parity of one or two. The highest overall proportions were for babies of women with parity of five or more (12.5/1000) (Table 11).

TABLE 11 : NEONATAL DEATHS BY MATERNAL RACE AND PARITY IN WESTERN AUSTRALIA IN 1988

Parity	Maternal Race									Total		
	Caucasian			Aboriginal			Other					
	No.	Live Births	Prop ¹	No.	Live Births	Prop ¹	No.	Live Births	Prop ¹	No.	Live Births	Prop ¹
0	27	8609	3.1	4	425	9.4	2	590	3.4	33	9624	3.4
1 - 2	43	11445	3.8	8	625	12.8	1	782	1.3	52	12852	4.0
3 - 4	12	1764	6.8	2	265	7.6	1	136	7.4	15	2165	6.9
≥ 5	1	179	5.6	3	113	26.6	-	29	-	4	321	12.5
TOTAL	83	21997	3.8	17	1428	11.9	4	1537	2.6	104	24962	4.2

Excludes births <500 grams birthweight.

¹ Proportion/1000 livebirths.

5.2.3 Maternal Race and Plurality

These data show that a neonatal death proportion of 3.5/1000 livebirths for singleton births and 30.0/1000 livebirths for multiple births. The neonatal death proportion for babies of Caucasian women (27.7/1000) with a multiple birth proportion for babies of Caucasian women (27.9/1000) is higher than for babies of Aboriginal women or women of other racial grouping. There were three (115.4/1000) neonatal deaths among twin births (18.2/1000) to Aboriginal women and no neonatal deaths among twin births (17.6/1000) to women of other races (Table 12).

TABLE 12 : NEONATAL DEATHS BY MATERNAL RACE AND PLURALITY IN WESTERN AUSTRALIA IN 1988

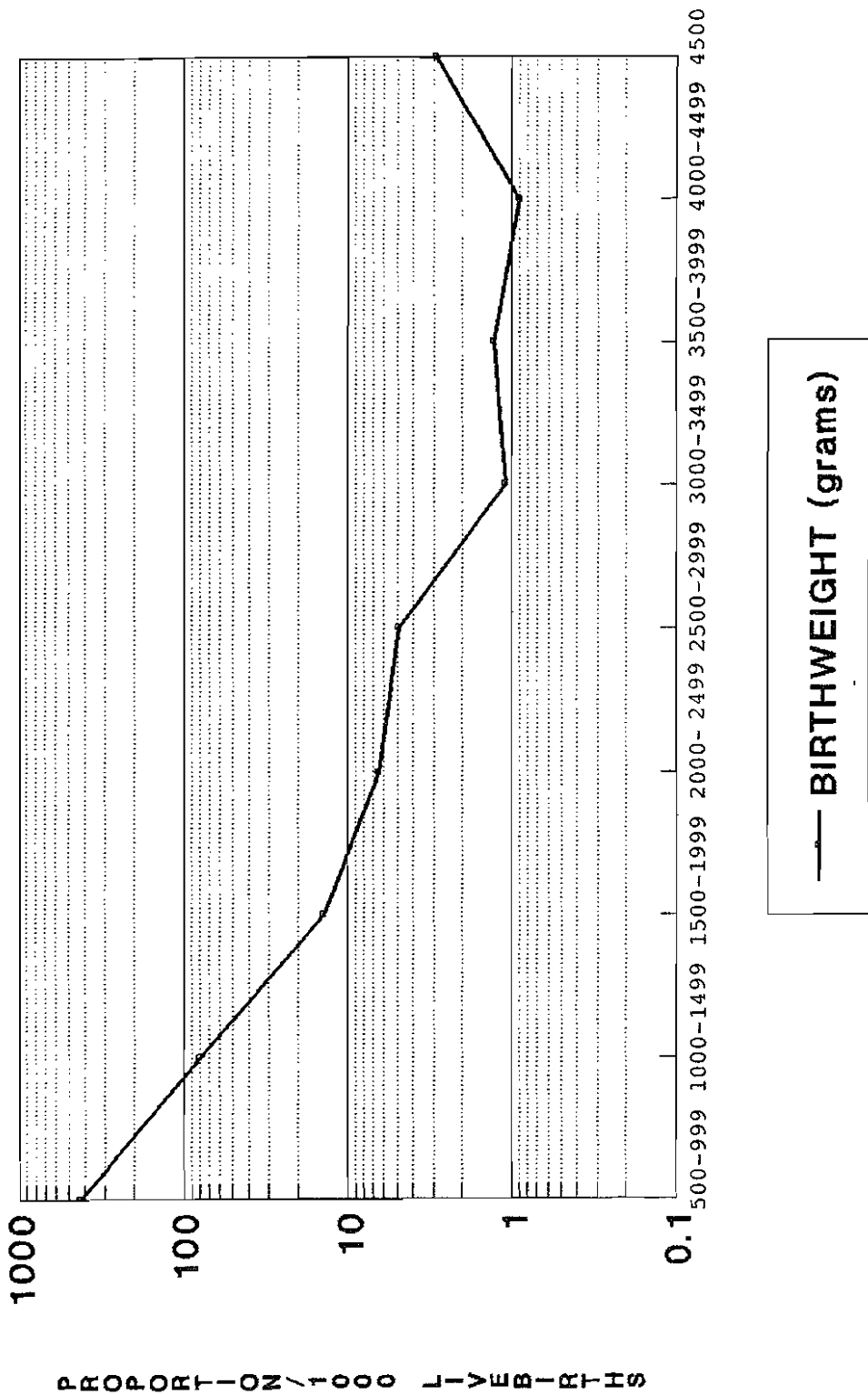
Plurality	Maternal Race									Total		
	Caucasian			Aboriginal			Other					
	No.	Live Births	Prop ¹	No.	Live Births	Prop ¹	No.	Live Births	Prop ¹	No.	Live Births	Prop ¹
Singleton	66	21383	3.1	14	1402	10.0	4	1510	2.7	84	24295	3.5
Twins	14	566	24.7	3	26	115.4	-	27	-	17	619	27.5
Triplets	3	48	62.5	-	-	-	-	-	-	3	48	62.5
TOTAL	83	21997	3.8	17	1428	11.9	4	1537	2.6	104	24962	4.2

Excludes births <500 grams birthweight.

¹ Proportion/1000 livebirths.

FIGURE IV

BIRTHWEIGHT DISTRIBUTION OF NEONATAL DEATHS IN WESTERN AUSTRALIA IN 1988.



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

5.2.4 Maternal Race and Birthweight

As reported for stillbirths, neonatal mortality proportions for all races fell as birthweight rose. The proportion of low birthweight neonatal deaths among babies born to Aboriginal mothers (56.2/1000) is higher than for low birthweight neonatal deaths of babies born to Caucasian women (41.3/1000) and for babies of women of other races (31.6/1000) (Table 13, Figure IV).

TABLE 13 : NEONATAL MORTALITY BY MATERNAL RACE AND BIRTHWEIGHT DISTRIBUTION IN WESTERN AUSTRALIA IN 1988

Birthweight (grams)	Maternal Race									Total		
	Caucasian			Aboriginal			Other			Nb.	Live Births	Prop ⁿ
	Nb.	Live Births	Prop ⁿ	Nb.	Live Births	Prop ⁿ	Nb.	Live Births	Prop ⁿ			
500 - 999	31	75	413.3	7	12	583.3	1	5	(200.0)	39	92	423.9
1000 - 1499	9	131	68.7	2	18	(111.1)	2	14	(142.9)	13	163	79.8
1500 - 1999	4	242	(16.5)	-	33	-	-	11	-	4	286	(14.0)
2000 - 2499	5	740	6.8	1	115	(8.7)	-	65	-	6	920	6.5
< 2500	49	1188	41.3	10	178	56.2	3	95	(31.6)	62	1461	42.4
2500 - 2999	16	3230	5.0	3	320	(9.4)	-	320	-	19	3870	4.9
3000 - 3499	7	8212	0.8	3	495	(6.1)	-	654	-	10	9361	1.1
3500 - 3999	8	6931	1.2	1	338	(3.0)	1	362	(2.8)	10	7631	1.3
4000 - 4499	2	2120	(0.9)	-	82	-	-	87	-	2	2289	(0.9)
≥ 4500	1	316	(3.2)	-	15	-	-	19	-	1	350	(2.9)
TOTAL	83	21997	3.8	17	1428	11.9	4	1537	(2.6)	104	24962	4.2

Excludes births <500 grams birthweight.

¹ Proportion/1000 livebirths.

() Where n<5 proportion has been bracketed.

5.2.5 Maternal Race and Age at Neonatal Death

The majority (82.8%) of neonatal deaths occurred in the first week of life, (70.2%) occurring within the first 48 hours of life. Among babies of Aboriginal women a lower percentage of neonatal deaths occurred in the first seven days of life compared with babies born to Caucasian women (Table 14).

TABLE 14 : AGE AT NEONATAL DEATHS BY MATERNAL RACE IN WESTERN AUSTRALIA
IN 1988

Age at Death	Maternal Race							
	Caucasian		Aboriginal		Other		Total	
	No.	%	No.	%	No.	%	No.	%
< day 1	31	37.4	6	35.3	3	75.0	40	38.5
day 1	22	26.5	4	23.5	-	-	26	25.0
day 2	6	7.2	1	5.9	-	-	7	6.7
day 3	3	3.6	-	-	-	-	3	2.9
day 4	4	4.8	-	-	-	-	4	3.9
day 5	2	2.4	-	-	1	25.0	3	2.9
day 6	2	2.4	-	-	-	-	2	1.9
day 7	1	1.2	-	-	-	-	1	1.0
day ≤1-7	71	85.5	11	64.7	4	100.0	86	82.8
day 8-14	4	4.8	4	23.5	-	-	8	7.7
day 15-21	4	4.8	1	5.9	-	-	5	4.8
day 22-28	4	4.8	1	5.9	-	-	5	4.8
TOTAL	83	100.0	17	100.0	4	100.0	104	100.0

Excludes births <500 grams birthweight.

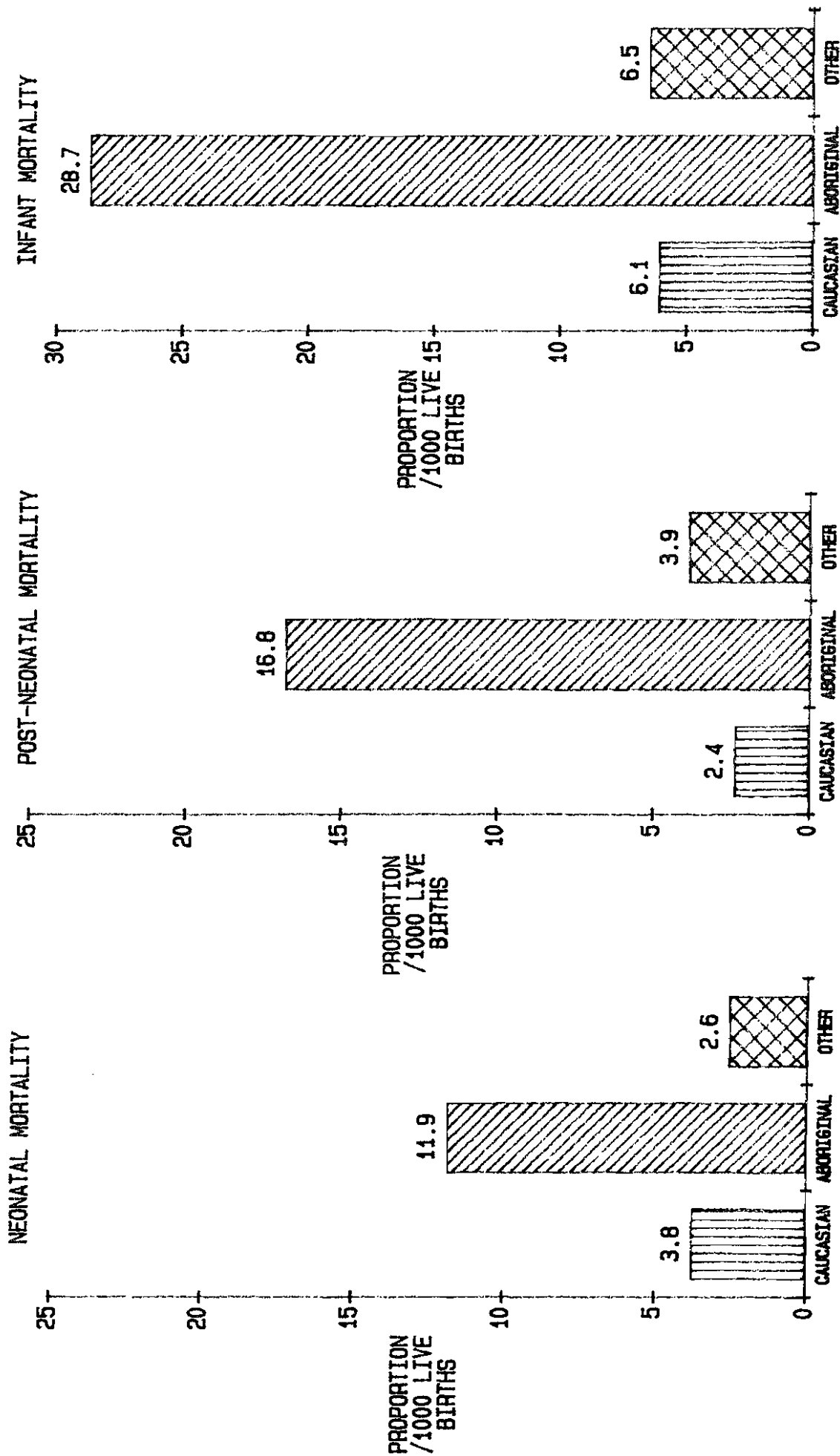
5.2.6 Causes of Neonatal Deaths

Lethal congenital malformation in 38 babies (36.5%) and low birthweight in 45 babies (43.3%) were the main causes of neonatal death in the 1988 birth cohort.

The cause of more than half (58.8%) of neonatal deaths among babies of Aboriginal mothers were recorded as complications arising from low birthweight (Table 15).

FIGURE V

NEONATAL, POST-NEONATAL AND INFANT MORTALITY FOR
 ABORIGINALS AND NON-ABORIGINALS IN WESTERN AUSTRALIA IN 1988



Excludes births less than 500 grams birthweight.

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

TABLE 15 : CAUSE OF NEONATAL DEATH BY MATERNAL RACE IN WESTERN AUSTRALIA
IN 1988

Cause of Death	Maternal Race						Total	
	Caucasian		Aboriginal		Other		No.	%
	No.	%	No.	%	No.	%		
Lethal Congenital Malformation	35	42.2	1	5.9	2	50.0	38	36.5
Low Birthweight (<2500grams)	34	41.0	10	58.8	1	25.0	45	43.3
Asphyxia	7	8.4	2	11.8	-	-	9	8.7
Pregnancy conditions	-	-	-	-	-	-	-	-
Infections	2	2.4	-	-	-	-	2	1.9
Hydrops fetalis	-	-	-	-	-	-	-	-
Other	-	-	1	5.9	1	25.0	2	1.9
Sudden Infant Deaths	5	6.0	3	17.7	-	-	8	7.7
Unknown	-	-	-	-	-	-	-	-
TOTAL	83	100.0	17	100.0	4	100.0	104	100.0

Excludes births <500 grams birthweight.

5.3 Post Neonatal Deaths

There were 82 post-neonatal deaths identified amongst the 1988 livebirths, a proportion of 3.3/1000 livebirths (Table 16 and Table 39).

Post-neonatal mortality for babies of Aboriginal women was 16.8/1000 livebirths which is seven times the proportion of 2.4/1000 for babies of Caucasian women. For babies born to women of other races the proportion was 3.9/1000 (Table 16, Table 31 and Figure IV).

Post-neonatal deaths in relation to Health Service Management Region of maternal residence are shown in Table 16. It should be noted however, that due to small numbers of births in each country division the proportions do vary from year to year and may be considered unrepresentative.

TABLE 16 : POST-NEONATAL AND INFANT MORTALITY BY HEALTH SERVICE MANAGEMENT REGION OF MATERNAL RESIDENCE AND MATERNAL RACE IN WESTERN AUSTRALIA IN 1988

Health Service Management Region	Maternal Race										Total		
	Caucasian		Aboriginal		Other		Post neonatal No.	Infant No.	Post neonatal Propn	Infant Propn	Post neonatal No.	Infant No.	
	Post neonatal No.	Infant No.	Post neonatal No.	Infant No.	Post neonatal No.	Infant No.							
METROPOLITAN													
North	5	17	3	3	1	2	3	2	1	3	2	9	22
North East	6	24	1	1	3	6	1	6	3	1	6	10	31
South	10	26	2	2	-	-	2	-	-	-	-	12	28
South East	8	27	2	2	1	1	2	1	1	2	1	11	30
NON METROPOLITAN													
South West	3	8	1	2	-	-	2	-	-	-	-	4	10
Great Southern	4	7	-	-	-	-	-	-	-	-	-	4	7
Central Wheatbelt	6	10	1	2	-	-	2	-	-	-	-	7	12
Goldfields	4	6	1	4	-	-	4	-	-	-	-	5	10
Mid West Gascoyne	1	1	3	5	-	-	5	-	-	-	-	4	6
Pilbara	5	7	3	4	1	1	4	1	1	11	1	9	12
Kimberley	-	-	7	16	-	-	16	-	-	-	-	7	16
Outside WA	-	2	-	-	-	-	-	-	-	-	-	-	2
TOTAL	52	135	24	41	6	10	41	6	3	3	10	82	186

1 Post-neonatal death proportion/1000 Livebirths.

2 Infant death proportion/1000 Livebirths.

() Where n<5 proportion has been bracketed.

SOURCE: MIDWIVES' NOTIFICATION SYSTEM

REGISTRAR GENERAL'S OFFICE

CHILD AND COMMUNITY HEALTH SERVICES

5.3.1 Maternal Race and Maternal Age

Overall, 14 of the 82 post neonatal deaths were babies of teenage women, representing a proportion of 8.6/1000 livebirths. Among post neonatal deaths of babies born to Aboriginal women however, a third were to teenage mothers with a proportion of 17.2/1000 livebirths (Table 17).

TABLE 17 : POST-NEONATAL DEATHS BY MATERNAL RACE AND MATERNAL AGE IN WESTERN AUSTRALIA IN 1988

Maternal Age	Maternal Race									Total		
	Caucasian			Aboriginal			Other			No.	Live Births	Prop ⁿ
	No.	Live Births	Prop ⁿ	No.	Live Births	Prop ⁿ	No.	Live Births	Prop ⁿ			
≤ 15	-	28	-	2	47	42.6	-	-	-	2	75	26.7
16	-	80	-	2	72	27.8	-	3	-	2	155	12.9
17	-	205	-	1	103	9.7	-	9	-	1	317	3.2
18	-	320	-	3	111	27.0	-	8	-	3	439	6.8
19	6	494	12.2	-	133	-	-	15	-	6	642	9.4
≤ 19	6	1127	5.3	8	466	17.2	-	35	-	14	1628	8.6
20-24	14	4821	2.9	12	516	23.3	1	230	4.4	27	5567	4.9
25-29	19	8820	2.2	3	268	11.2	2	510	3.9	24	9598	2.5
30-34	11	5441	2.0	-	142	-	2	499	4.0	13	6082	2.1
35-39	2	1589	1.3	1	35	28.6	1	230	4.4	4	1854	2.2
40-44	-	195	-	-	1	-	-	33	-	-	229	-
≥ 45	-	4	-	-	-	-	-	-	-	-	4	-
TOTAL	52	21997	2.4	24	1428	16.8	6	1537	3.9	82	24962	3.3

Excludes births <500 grams birthweight.

¹ Proportion/1000 livebirths.

5.3.2 Maternal Race and Conjugal State

Higher proportions of post-neonatal mortality were recorded for babies of single women (8.4/1000) and babies of separated, divorced or widowed women (3.3/1000), than for women socially supported by a male partner in a marriage or defacto relationship (2.7/1000). (Table 18).

TABLE 18 : POST-NEONATAL DEATHS BY MATERNAL RACE AND CONJUGAL STATE IN WESTERN AUSTRALIA IN 1988

Conjugal State	Maternal Race									Total		
	Caucasian			Aboriginal			Other			No.	Live Births	Prop ⁿ
	No.	Live Births	Prop ⁿ	No.	Live Births	Prop ⁿ	No.	Live Births	Prop ⁿ			
Single	10	1927	5.2	12	610	19.7	-	76	-	22	2613	8.4
Married/defacto	41	19794	2.1	12	811	14.8	6	1444	4.2	59	22049	2.7
² Other	1	276	3.6	-	7	-	-	17	-	1	300	3.3
TOTAL	52	21997	2.4	24	1428	16.8	6	1537	3.9	82	24962	3.3

Excludes births <500 grams birthweight.

¹ Proportion/1000 livebirths.

² Other includes separated, divorced and widowed.

5.3.3 Maternal Race and Parity

More than one third (42.7%) of babies who died in the post-neonatal period were born to primiparous mothers, and a further 40.2% were to women with a parity of 1-2. The proportions for these groups were 3.6/1000 for primiparous women, 2.6/1000 for women with parity 1-2, 4.6/1000 for women with parity 3-4 and 12.5/1000 for women with parity of 5 or more (Table 19).

TABLE 19 : POST-NEONATAL DEATHS BY MATERNAL RACE AND PARITY IN WESTERN AUSTRALIA IN 1988

Parity	Maternal Race									Total		
	Caucasian			Aboriginal			Other			No.	Live Births	Prop ⁿ
	No.	Live Births	Prop ⁿ	No.	Live Births	Prop ⁿ	No.	Live Births	Prop ⁿ			
0	23	8609	2.7	10	425	23.5	2	590	3.4	35	9624	3.6
1 - 2	23	11445	2.0	8	625	12.8	2	782	2.6	33	12852	2.6
3 - 4	6	1764	3.4	4	265	15.1	-	136	-	10	2165	4.6
≥ 5	-	179	-	2	113	17.7	2	29	69.0	4	321	12.5
TOTAL	52	21997	2.4	24	1428	16.8	6	1537	3.9	82	24962	3.3

Excludes births <500 grams birthweight.

¹ Proportion/1000 livebirths.

5.3.4 Maternal Race and Plurality

Examination of the 82 post-neonatal deaths in 1988 by plurality revealed that for singleton births the proportion was 3.3/1000 and for multiple births the proportion was 4.5/1000 livebirths. Among twin babies of Caucasian women the post-neonatal death proportion was 3.5/1000. (Table 20).

TABLE 20 : POST-NEONATAL DEATHS BY MATERNAL RACE AND PLURALITY IN WESTERN AUSTRALIA IN 1988

Plurality	Maternal Race									Total		
	Caucasian			Aboriginal			Other			No.	Live Births	Prop ⁿ
	No.	Live Births	Prop ⁿ	No.	Live Births	Prop ⁿ	No.	Live Births	Prop ⁿ			
Singleton	49	21383	2.3	24	1402	17.1	6	1510	4.0	79	24295	3.3
Twins	2	566	3.5	-	26	-	-	27	-	2	619	3.2
Triplets	1	48	20.8	-	-	-	-	-	-	1	48	20.8
TOTAL	52	21977	2.4	24	1428	16.8	6	1537	3.9	82	24962	3.3

Excludes births <500 grams birthweight.
¹ Proportion/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 proportion for low birthweight babies of Aboriginal mothers (39.3/1000) was higher than the proportion for low birthweight babies of Caucasian women (10.1/1000) (Table 21).

TABLE 21 : POST-NEONATAL MORTALITY BY MATERNAL RACE AND BIRTHWEIGHT DISTRIBUTION IN WESTERN AUSTRALIA IN 1988

Birthweight (grams)	Maternal Race									Total		
	Caucasian			Aboriginal			Other			No.	Live Births	Prop ¹
	No.	Live Births	Prop ¹	No.	Live Births	Prop ¹	No.	Live Births	Prop ¹			
500 - 999	7	75	93.3	2	12	(166.7)	-	5	-	9	92	97.8
1000 - 1499	-	131	-	-	18	-	-	14	-	-	163	-
1500 - 1999	2	242	(8.3)	-	33	-	-	11	-	2	286	(7.0)
2000 - 2499	3	740	(4.1)	5	115	43.5	-	65	-	8	920	8.7
< 2500	12	1188	10.1	7	178	39.3	-	95	-	19	1461	13.0
2500 - 2999	10	3230	3.1	5	320	15.6	2	320	(6.3)	17	3870	4.4
3000 - 3499	17	8212	2.1	7	495	14.1	4	654	(6.1)	28	9361	3.0
3500 - 3999	13	6931	1.9	3	338	(8.9)	-	362	-	16	7631	2.1
4000 - 4499	-	2120	-	2	82	(24.4)	-	87	-	2	2289	(0.9)
≥ 4500	-	316	-	-	15	-	-	19	-	-	350	-
TOTAL	52	21997	2.4	24	1428	16.8	6	1537	3.9	82	24962	3.3

Excludes births <500 grams birthweight.

¹ Proportion/1000 livebirths.

() Where n<5 proportion 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 (58.5%) (Table 22). This reflects an increase in the proportion of babies of Aboriginal mothers from 6.8/1000 in 1987 to 12.6/1000 in 1988.

Lethal congenital malformation remained the second biggest known cause to which 13 (15.9%) post-neonatal deaths were attributed. The percentage of post-neonatal deaths due to infection has increased from 9.8% in 1987 to 13.5% in 1988. (Table 22).

TABLE 22 : CAUSE OF POST-NEONATAL DEATH BY MATERNAL RACE IN WESTERN AUSTRALIA IN 1988

Cause of Death	Maternal Race						Total 1988		Total 1987	
	Caucasian		Aboriginal		Other		Nb.	%	Nb.	%
	Nb.	%	Nb.	%	Nb.	%				
Sudden Infant Death Syndrome	28	53.6	18	75.0	2	33.3	48	58.5	50	61.0
Lethal Congenital Malformation	10	19.2	1	4.2	2	33.3	13	15.9	8	9.8
Infection -										
Respiratory	2	3.9	2	8.3	-	-	4	4.9	4	4.9
Meningitis	2	3.9	2	8.3	-	-	4	4.9	3	3.7
Other	2	3.9	1	4.2	-	-	3	3.7	1	1.2
Other	7	13.5	-	-	-	-	7	8.5	15	18.3
Unknown	1	1.9	-	-	2	33.3	3	3.7	1	1.2
TOTAL	52	100.0	24	100.0	6	100.0	82	100.0	82	100.0

Excludes births <500 grams birthweight.

5.3.7 Seasonal Incidence of Post Neonatal Deaths

Examination of the causes of post-neonatal death by months of the year during which these deaths occurred shows that one third of Sudden Infant Deaths (16 babies, 33.3%), were observed during the cooler months from July to September. Deaths among babies with lethal congenital malformations also were more numerous during this time (Table 23).

TABLE 23 : CAUSE OF POST-NEONATAL DEATH BY SEASONAL INCIDENCE IN WESTERN AUSTRALIA IN 1988

Cause of Death	Jan - Mar		Apr - Jun		Jul - Sep		Oct - Dec		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Sudden Infant Death Syndrome	8	66.7	11	50.0	16	61.5	13	59.0	48	58.5
Lethal Congenital Malformation	1	8.3	3	13.6	5	19.2	3	13.6	12	14.6
Infection	2	16.7	5	22.7	3	11.5	2	9.1	12	14.6
Other/Unknown	1	8.3	3	13.6	2	7.7	4	18.2	10	12.2
TOTAL	12	100.0	22	100.0	26	100.0	22	100.0	82	100.0

Excludes births <500 grams birthweight.

SOURCE: MIDWIVES' NOTIFICATION SYSTEM
REGISTRAR GENERAL'S OFFICE

6. PERINATAL MORTALITY IN WESTERN AUSTRALIA IN THE 1988 BIRTH COHORT

6.1 Perinatal Mortality

There were 221 perinatal deaths identified in the 1988 birth cohort which gave a perinatal mortality proportion of 8.8/1000 total births (Table 4 and Table 24). This compared with a proportion of 9.8/1000 in 1987. Among babies born to Aboriginal women the proportion (20.1/1000) was higher than for perinatal deaths of babies of Caucasian women (8.3/1000) and for perinatal deaths of babies born to women of other races (5.2/1000) (Table 24).

TABLE 24 : STILLBIRTHS, NEONATAL AND PERINATAL MORTALITY BY MATERNAL RACE IN WESTERN AUSTRALIA IN 1988

Type of Death	Maternal Race						Total	
	Caucasian		Aboriginal		Other		No.	Prop ⁿ
	No.	Prop ⁿ	No.	Prop ⁿ	No.	Prop ⁿ		
Stillbirth/1000 Total Births	101	4.6	12	8.3	4	2.6	117	4.7
Neonatal/1000 Livebirths	83	3.8	17	11.9	4	2.6	104	4.2
Perinatal/1000 Total Births	184	8.3	29	20.1	8	5.2	221	8.8

Excludes births <500 grams birthweight.

Perinatal deaths in relation to Health Service Management Regions of maternal residence are shown in Table 4. It should be noted however, that due to small numbers of births in each country division the proportions do vary on an annual basis. (Table 4).

6.2 Maternal Race and Maternal Age

Perinatal mortality is lowest for babies of women aged 25-29 years, (7.9/1000 total births) and the risk increases toward the extremes of the fertile age group.

Eighteen (11.0/1000) perinatal deaths were among babies of women in their teenage years. Another 30 (14.2/1000) perinatal deaths were among babies of women 35 years or older. (Table 25).

TABLE 25 : PERINATAL DEATHS BY MATERNAL RACE AND MATERNAL AGE IN WESTERN AUSTRALIA IN 1988

Maternal Age	Maternal Race									Total		
	Caucasian			Aboriginal			Other			No. Births	Total Births	Prop ⁿ
	No.	Total	Prop ⁿ	No.	Total	Prop ⁿ	No.	Total	Prop ⁿ			
≤ 15	-	28	-	3	48	62.5	-	-	-	3	76	39.5
16	-	80	-	3	73	41.1	-	3	-	3	156	19.2
17	1	206	4.9	1	104	9.6	1	9	111.1	3	319	9.4
18	4	322	12.4	1	111	9.0	-	8	-	5	441	11.3
19	3	495	6.1	1	134	7.5	-	15	-	4	644	6.2
≤ 19	8	1131	7.1	9	470	19.2	1	35	28.6	18	1636	11.0
20-24	40	4841	8.3	6	518	11.6	-	230	-	46	5589	8.2
25-29	67	8855	7.6	5	271	18.5	4	512	7.8	76	9638	7.9
30-34	42	5466	7.7	7	143	49.0	2	500	4.0	51	6109	8.4
35-39	24	1605	15.0	2	37	54.1	1	231	4.3	27	1873	14.4
40-44	3	196	15.3	-	1	-	-	33	-	3	230	13.0
≥ 45	-	4	-	-	-	-	-	-	-	-	4	-
TOTAL	184	22098	8.3	29	1440	20.1	8	1541	5.2	221	25079	8.8

Excludes births <500 grams birthweight.

¹ Proportion/1000 total births.

6.3 Maternal Race and Parity

The perinatal mortality proportion to primiparous women was 8.6/1000 and the proportion for babies born to women with a parity of 1 to 2 was 7.9/1000. The highest proportion of perinatal deaths (24.6/1000) was recorded among babies of women with a parity of 5 or more (Table 26).

TABLE 26 : PERINATAL DEATHS BY MATERNAL RACE AND PARITY IN WESTERN AUSTRALIA IN 1988

Parity	Maternal Race									Total		
	Caucasian			Aboriginal			Other			No.	Total Births	Prop ⁿ
	No.	Total Births	Prop ⁿ	No.	Total Births	Prop ⁿ	No.	Total Births	Prop ⁿ			
0	70	8652	8.1	10	431	23.2	3	591	5.1	83	9674	8.6
1 - 2	88	11490	7.7	11	628	17.5	3	784	3.8	102	12902	7.9
3 - 4	21	1773	11.8	5	268	18.7	2	137	14.6	28	2178	12.9
≥ 5	5	183	27.3	3	113	26.6	-	29	-	8	325	24.6
TOTAL	184	22098	8.3	29	1440	20.1	8	1541	5.2	221	25079	8.8

Excludes births <500 grams birthweight.

¹ Proportion/1000 total births.

6.4 Maternal Race and Birthweight

As in the 1987 birth cohort, almost two thirds of all perinatal deaths (138, 89.8/1000) (114.4/1000) 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 >4500 gram categories. Proportions in races other than for babies of Caucasian women are based on small numbers and therefore statistically unreliable. (Table 27).

TABLE 27 : PERINATAL DEATHS BY MATERNAL RACE AND BIRTHWEIGHT DISTRIBUTION
IN WESTERN AUSTRALIA IN 1988

Birthweight (grams)	Maternal Race									Total		
	Caucasian			Aboriginal			Other					
	Nb.	Total Births	Prop ¹	Nb.	Total Births	Prop ¹	Nb.	Total Births	Prop ¹	Nb.	Total Births	Prop ¹
500 - 999	59	103	572.8	11	16	687.5	2	6	(333.3)	72	125	576.0
1000 - 1499	24	146	164.4	3	19	(157.9)	2	14	(142.9)	29	179	162.0
1500 - 1999	14	252	55.6	5	38	131.6	1	12	(83.3)	20	302	66.2
2000 - 2499	16	751	21.3	1	115	(8.7)	-	65	-	17	931	18.3
< 2500	113	1252	90.3	20	188	106.4	5	97	51.6	138	1537	89.8
2500 - 2999	35	3249	10.8	3	320	(9.4)	1	321	(3.1)	39	3890	10.0
3000 - 3499	17	8222	2.1	4	496	(8.1)	1	655	(1.5)	22	9373	2.4
3500 - 3999	14	6937	2.0	2	339	(5.9)	1	362	(2.8)	17	7638	2.2
4000 - 4499	4	2122	(1.9)	-	82	-	-	87	-	4	2291	(1.8)
≥ 4500	1	316	(3.2)	-	15	-	-	19	-	1	350	(2.9)
TOTAL	184	22098	8.3	29	1440	20.1	8	1541	5.2	221	25079	8.8

Excludes births <500 grams birthweight.

¹ Proportion/1000 total births.

() Where n<5 proportion has been bracketed.

6.5 Maternal Race and Babies Sex

There were 135 (10.4/1000) male and 86 (7.1/1000) female perinatal deaths among those babies born in 1988.

Among babies born to Caucasian women the perinatal death proportion for males (10.3/1000) was higher than for the perinatal death proportion for females (6.2/1000). For babies of Aboriginal women the perinatal death proportion for males (18.5/1000) was lower than the perinatal death proportion for females (22.0/1000). The proportion of perinatal deaths among male babies of women of other races (4.9/1000) was lower than the perinatal death proportion for females (5.5/1000) (Table 28).

TABLE 28 : PERINATAL DEATHS BY MATERNAL RACE AND SEX IN WESTERN AUSTRALIA
IN 1988

Sex	Maternal Race									Total		
	Caucasian			Aboriginal			Other			No.	Total Births	Prop ⁿ
	No.	Total Births	Prop ⁿ	No.	Total Births	Prop ⁿ	No.	Total Births	Prop ⁿ			
Male	117	11360	10.3	14	758	18.5	4	813	4.9	135	12931	10.4
Female	67	10738	6.2	15	682	22.0	4	728	5.5	86	12148	7.1
Indeterminate	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL	184	22098	8.3	29	1440	20.1	8	1541	5.2	221	25079	8.8

Excludes births <500 grams birthweight.

¹ Proportion/1000 total births.

6.6 Maternal Race and Conjugal State

One fifth (14.0/1000) of perinatal deaths were among babies of women reported as socially unsupported by a male partner (Table 29). This represents an increase since the 1987 cohort report (12.2/1000) where the increased social acceptance of defacto relationships may have influenced reporting.

TABLE 29 : PERINATAL DEATHS BY MATERNAL RACE AND CONJUGAL STATE IN WESTERN AUSTRALIA IN 1988

Conjugal State	Maternal Race									Total		
	Caucasian			Aboriginal			Other			No.	Total Births	Prop ⁿ
	No.	Total Births	Prop ⁿ	No.	Total Births	Prop ⁿ	No.	Total Births	Prop ⁿ			
Single	22	1937	11.4	13	616	21.1	1	76	13.2	36	2629	13.7
Married/defacto	157	19881	7.9	16	817	19.6	7	1448	4.8	180	22146	8.1
² Other	5	280	17.9	-	7	-	-	17	-	5	304	16.5
TOTAL	184	22098	8.3	29	1440	20.1	8	1541	5.2	221	25079	8.8

Excludes births <500 grams birthweight.

¹ Proportion/1000 total births.

² Other includes separated, divorced and widowed.

7. INFANT MORTALITY IN WESTERN AUSTRALIA IN THE 1988 BIRTH COHORT

7.1 Infant Deaths

There were 186 infant deaths identified amongst the 24,962 livebirths in 1988 (Table 16). Of these, 104 were neonatal deaths and 82 were post-neonatal deaths. The infant mortality proportion for Western Australia in 1988 was 7.5/1000 livebirths (Table 16 and Table 30).

Infant mortality among babies born to Aboriginal women (28.7/1000) was more than four times that for babies born to non-Aboriginal women (Table 42, Figure V). The difference between these groups was reduced by 18.9/1000 in 1985, 12.5/1000 and 1986 to 11.7/1000 in 1987 to rise to 22.5/1000 in 1988.

7.2 Maternal Race and Maternal Age

Babies of teenage women are at greatest risk of dying within 12 months of birth (14.7/1000). The infant mortality proportion for babies of Aboriginal teenage mothers (27.9/1000) was three times that for babies of Caucasian teenage mothers (8.9/1000) (Table 30).

TABLE 30 : INFANT DEATHS BY MATERNAL RACE AND MATERNAL AGE IN WESTERN AUSTRALIA IN 1988

Maternal Age	Maternal Race									Total		
	Caucasian			Aboriginal			Other			No.	Live-Births	Prop ¹
	No.	Live-Births	Prop ¹	No.	Live-Births	Prop ¹	No.	Live-Births	Prop ¹			
≤ 15	-	28	-	4	47	85.1	-	-	-	4	75	53.3
16	-	80	-	4	72	55.6	-	3	-	4	155	25.8
17	-	205	-	1	103	9.7	1	9	111.1	2	317	6.3
18	2	320	6.3	4	111	36.0	-	8	-	6	439	13.7
19	8	494	16.2	-	133	-	-	15	-	8	642	12.5
≤ 19	10	1127	8.9	13	466	27.9	1	35	28.6	24	1628	14.7
20-24	34	4821	7.1	16	516	31.0	1	230	4.4	51	5567	9.2
25-29	51	8820	5.8	5	268	18.7	4	510	7.8	60	9598	6.3
30-34	28	5441	5.2	6	142	42.3	3	499	6.0	37	6082	6.1
35-39	10	1589	6.3	1	35	28.6	1	230	4.4	12	1854	6.5
40-44	2	195	10.3	-	1	-	-	33	-	2	229	8.7
≥ 45	-	4	-	-	-	-	-	-	-	-	4	-
TOTAL	135	21997	6.1	41	1428	28.7	10	1537	6.5	186	24962	7.5

Excludes births <500 grams birthweight.

¹ Proportion/1000 livebirths.

7.3 Maternal Race and Conjugal State

The infant mortality proportion (16.1/1000) among babies born to single women is far greater than the proportion for babies of women in a marriage or defacto relationship (6.4/1000). (Table 31).

TABLE 31 : INFANT DEATHS BY MATERNAL RACE AND CONJUGAL STATE IN WESTERN AUSTRALIA IN 1988

Conjugal State	Maternal Race									Total		
	Caucasian			Aboriginal			Other			No.	Live-Births	Prop ⁿ
	No.	Live-Births	Prop ⁿ	No.	Live-Births	Prop ⁿ	No.	Live-Births	Prop ⁿ			
Single	22	1927	11.4	19	610	31.2	1	76	13.2	42	2613	16.1
Married/defacto	111	19794	5.6	22	811	27.1	9	1444	62.5	142	22049	6.4
² Other	2	276	7.3	-	7	-	-	17	-	2	300	6.7
TOTAL	135	21997	6.1	41	1428	28.7	10	1537	6.5	186	24962	7.5

Excludes births <500 grams birthweight.

¹ Proportion/1000 livebirths.

² Other includes separated, divorced and widowed.

7.4 Maternal Race and Parity

The highest proportion of infant deaths were among babies of women whose parity was 3 to 4 (11.6/1000) and 5 or more (24.9/1000). Five of these infant deaths were babies of Aboriginal mothers raising the proportion for parity 5 or more to 44.3/1000 livebirths (Table 32).

TABLE 32 : INFANT DEATHS BY MATERNAL RACE AND PARITY IN WESTERN AUSTRALIA IN 1988

Parity	Maternal Race									Total		
	Caucasian			Aboriginal			Other			No. Live- Births	Prop ⁿ	
	No. Live- Births	Prop ⁿ		No. Live- Births	Prop ⁿ		No. Live- Births	Prop ⁿ				
0	50	8609	5.8	14	425	32.9	4	590	6.8	68	9624	7.1
1 - 2	66	11445	5.8	16	625	25.6	3	782	3.8	85	12852	6.6
3 - 4	18	1764	10.2	6	265	22.6	1	136	7.4	25	2165	11.6
≥ 5	1	179	5.6	5	113	44.3	2	29	69.0	8	321	24.9
TOTAL	135	21997	6.1	41	1428	28.7	10	1537	6.5	186	24962	7.5

Excludes births <500 grams birthweight.

1 Proportion/1000 livebirths.

7.5 Maternal Race and Plurality

Infant mortality for multiple births (34.5/1000) was five times the proportion for singleton births (6.7/1000). The infant death proportion (28.3/1000) for twin babies born to Caucasian women in 1988 was lower than the proportion (31.2/1000) in 1987. There were no infant deaths among twin births to women of other races (Table 33).

TABLE 33 : INFANT DEATHS BY MATERNAL RACE AND PLURALITY IN WESTERN AUSTRALIA IN 1988

Plurality	Maternal Race									Total		
	Caucasian			Aboriginal			Other			No. Live- Births	Prop ⁿ	
	No. Live- Births	Prop ⁿ		No. Live- Births	Prop ⁿ		No. Live- Births	Prop ⁿ				
Singleton	115	21383	5.4	38	1402	27.1	10	1510	6.6	163	24295	6.7
Twins	16	566	28.3	3	26	115.4	-	27	-	19	619	30.7
Triplets	4	48	83.3	-	-	-	-	-	-	4	48	83.3
TOTAL	135	21997	6.1	41	1428	28.7	10	1537	6.5	186	24962	7.5

Excludes births <500 grams birthweight.

1 Proportion/1000 livebirths.

7.6 Maternal Race and Babies Sex

Infant deaths were proportionately 8.6/1000 male and 6.3/1000 female. Among babies born to Caucasian women the infant death proportion for males (7.2/1000) was higher than the infant death proportion for females (5.1/1000). For babies of Aboriginal mothers the infant death proportion for males (31.8/1000) was higher than the infant death proportion for females (25.2/1000) and for infants of women of other races the infant death proportion for males (6.2/1000) was lower than the infant death proportion for females (6.9/1000) (Table 34).

TABLE 34: INFANT DEATHS BY MATERNAL RACE AND SEX IN WESTERN AUSTRALIA IN 1988

Sex	Maternal Race									Total		
	Caucasian			Aboriginal			Other			No.	Live-	Prop ¹
	No.	Live-	Prop ¹	No.	Live-	Prop ¹	No.	Live-	Prop ¹			
Male	81	11297	7.2	24	754	31.8	5	810	6.2	110	12861	8.6
Female	54	10700	5.1	17	674	25.2	5	727	6.9	76	12101	6.3
TOTAL	135	21997	6.1	41	1428	28.7	10	1537	6.5	186	24962	7.5

Excludes births <500 grams birthweight.

¹ Proportion/1000 livebirths.

7.7 Maternal Race and Birthweight

Low birthweight (less than 2500 grams) babies comprised almost half of all infant deaths. A proportion of 55.4/1000 livebirths was recorded for low birthweight babies. Babies with birthweight of 4000-4499 grams showed higher chance of survival with an infant mortality proportion of 1.8/1000. An infant mortality proportion (95.5/1000) for low birth weight babies of Aboriginal women was much higher than the proportion (51.4/1000) for low birth weight babies of Caucasian women (Table 35).

**TABLE 35 : INFANT MORTALITY BY MATERNAL RACE AND BIRTHWEIGHT DISTRIBUTION
IN WESTERN AUSTRALIA IN 1988**

Birthweight (grams)	Maternal Race									Total		
	Caucasian			Aboriginal			Other			No.	Live Births	Prop ⁿ
	No.	Live Births	Prop ⁿ	No.	Live Births	Prop ⁿ	No.	Live Births	Prop ⁿ			
500 - 999	38	75	506.7	9	12	750.0	1	5	(200.0)	48	92	521.7
1000 - 1499	9	131	68.7	2	18	(111.1)	2	14	(142.9)	13	163	79.8
1500 - 1999	6	242	24.8	-	33	-	-	11	-	6	286	21.0
2000 - 2499	8	740	10.8	6	115	52.2	-	65	-	14	920	15.2
< 2500	61	1188	51.4	17	178	95.5	3	95	(31.6)	81	1461	55.4
2500 - 2999	26	3230	8.1	8	320	25.0	2	320	(6.3)	36	3870	9.3
3000 - 3499	24	8212	2.9	10	495	20.2	4	654	(6.1)	38	9361	4.1
3500 - 3999	21	6931	3.0	4	338	11.8	1	362	(2.8)	26	7631	3.4
4000 - 4499	2	2120	(0.9)	2	82	(24.4)	-	87	-	4	2289	(1.8)
≥ 4500	1	316	(3.2)	-	15	-	-	19	-	1	350	(2.9)
TOTAL	135	21997	6.1	41	1428	28.7	10	1537	6.5	186	24962	7.5

Excludes births <500 grams birthweight.

(1) Proportion/1000 livebirths.

() Where n<5 proportion has been bracketed.

7.8 Maternal Race and Age at Infant Death

Over half (57.5%) of the infant deaths occurred in the neonatal period, with most (91.4%) deaths occurring within 24 weeks of birth. (Table 36).

TABLE 36: INFANT DEATHS BY MATERNAL RACE AND AGE AT DEATH IN WESTERN AUSTRALIA IN 1988

Age at Death in Weeks	Maternal Race						Total	
	Caucasian		Aboriginal		Other		No.	%
	No.	%	No.	%	No.	%		
1 - 4 weeks	85	63.0	18	43.9	4	40.0	107	57.5
5 - 8 weeks	11	8.2	9	22.0	-	-	20	10.8
9 -12 weeks	12	8.9	6	14.6	-	-	18	9.7
13-16 weeks	8	5.9	1	2.4	2	20.0	11	5.9
17-20 weeks	5	3.7	1	2.4	1	10.0	7	3.8
21-24 weeks	4	3.0	3	7.3	-	-	7	3.8
25-52 weeks	10	7.4	3	7.3	3	30.0	16	8.6
TOTAL	135	100.0	41	100.0	10	100.0	186	100.0

Excludes births <500 grams birthweight.

Proportion/1000 livebirths

7.9 Causes of Infant Death

The major causes of infant deaths remain lethal congenital malformations for 50 (26.9%) babies, Sudden Infant Death Syndrome for 56 (30.1%) and low birthweight (<2500 grams) for 45 (24.2%) babies. Infection remained a significant cause of Aboriginal infant mortality among babies of Aboriginal mothers (Table 37).

TABLE 37 : CAUSE OF INFANT DEATHS AND MATERNAL RACE IN WESTERN AUSTRALIA IN 1988

Cause of Death	Maternal Race						Total	
	Caucasian		Aboriginal		Other		No.	%
	No.	%	No.	%	No.	%		
Lethal Congenital Malformation	44	32.6	2	4.9	4	40.0	50	26.9
Low Birthweight (<2500 grams)	34	25.2	10	24.4	1	10.0	45	24.2
Asphyxia	7	5.2	2	4.9	-	-	9	4.8
Pregnancy conditions	-	-	-	-	-	-	-	-
Infections	9	6.7	5	12.2	-	-	14	7.5
Hydrops Fetalis	-	-	-	-	-	-	-	-
Other	7	5.2	1	2.4	1	10.0	9	4.8
Sudden Infant Deaths	33	24.4	21	51.2	2	20.0	56	30.1
Unknown	1	0.7	-	-	2	20.0	3	1.6
TOTAL	135	100.0	41	100.0	10	100.0	186	100.0

Excludes births <500 grams birthweight.

TABLE 38 : PERINATAL AND INFANT MORTALITY BY MATERNAL AGE PLURALITY AND SEX IN WESTERN AUSTRALIA IN 1988

	Perinatal Mortality			Infant Mortality														
	Aboriginal		Total No. Births Propt ⁿ	Aboriginal		Total No. Births Propt ⁿ												
	No. Births Propt ⁿ	Non- Aboriginal No. Births Propt ⁿ		No. Births Propt ⁿ	Non- Aboriginal No. Births Propt ⁿ													
Maternal Age ≤15	3	48 (62.5)	-	28	-	28	4	47 (85.1)	-	28	4	75 (53.3)						
16-19	6	422 (14.2)	9	1138	7.9	15	1560	9.6	9	419	11	1134	9.7	20	1553	12.8		
20-29	11	789 (13.9)	111	14438	7.7	122	15227	8.0	21	784	90	14381	6.3	111	15165	70.9		
30-39	9	180 (50.0)	69	7802	8.4	78	7982	9.8	7	177	42	7759	5.4	49	7936	6.2		
≥40	-	1	-	3	233 (12.9)	3	234	(12.8)	-	1	2	232	(8.6)	2	233	(8.6)		
Plurality Singleton	26	1414	8.5	169	22991	8.5	195	24405	8.0	38	1402	27.1	125	22893	5.5	163	24295	6.7
Multiple	3	26 (115.4)	23	648	35.5	26	674	38.6	3	26 (115.4)	20	641	31.2	23	667	34.5		
Sex Male	14	758	18.5	14	14173	1.0	135	12931	10.4	24	754	31.8	86	12107	7.1	110	12861	8.6
Female	15	682	22.0	15	11466	1.3	86	12148	7.1	17	674	25.2	59	11427	5.2	76	12101	6.3

Excludes births <500 grams birthweight.

- 1 Perinatal death proportion/1000 total births.
 - 2 Infant death proportion/1000 livebirths.
- () Where n<5 proportion has been bracketed.

TABLE 39 : NEONATAL, POST-NEONATAL AND INFANT MORTALITY BY MATERNAL RACE
IN WESTERN AUSTRALIA IN 1988

Type of Death	Maternal Race						Total	
	Caucasian		Aboriginal		Other		No.	Prop ⁿ
	No.	Prop ⁿ	No.	Prop ⁿ	No.	Prop ⁿ		
Neonatal/ 1000 Livebirths	83	3.8	17	11.9	4	2.6	104	4.2
Post-Neonatal/ 1000 Livebirths	52	2.4	24	16.8	6	3.9	82	3.3
Infant/ 1000 Livebirths	135	6.1	41	28.7	10	6.5	186	7.5

Excludes births <500 grams birthweight.

8. BIRTHS, PERINATAL AND INFANT MORTALITY IN WESTERN AUSTRALIA, 1980-1988

8.1 Crude Birth Rates and Total Births, 1980-1988

The crude birth rate for Western Australia has remained relatively stable from 1980 to 1988, at between 16.0/1000 and 16.9/1000 person-years of total population.

Consideration of racial groups shows similar stable trends. The crude birth rate among Aboriginal women (33.9/1000) in 1988, showed little change from 1987 (32.5/1000). Among non-Aboriginal women the crude birth rate ranged between 16.5/1000 in 1981 and 15.6/1000 in 1987 (Table 40, Figure VI).

TABLE 40 : CRUDE BIRTH RATES FOR ABORIGINAL AND NON-ABORIGINAL WESTERN AUSTRALIAN BIRTHS, 1980-1988

Year	Aboriginal			Non-Aboriginal			Total		
	Live-Births	Pop ⁿ	Crude Birth Rate	Live-Births	Pop ⁿ	Crude Birth Rate	Live-Births	Pop ⁿ	Crude Birth Rate
1980	1029	32598	31.6	19595	1236470	15.8	20624	1269068	16.2
1981	1093	33547	32.6	20948	1266509	16.5	22041	1300056	16.9
1982	1113	34552	32.2	21071	1304347	16.1	22184	1338899	16.6
1983	1135	35464	32.0	21737	1333586	16.3	22872	1369050	16.7
1984	1176	36724	32.0	21607	1354513	15.9	22783	1391237	16.4
1985	1235	37992	32.5	21903	1380572	15.9	23138	1418564	16.3
1986	1230	39285	31.3	22463	1419734	15.8	23693	1459019	16.2
1987	1328	40926	32.5	22676	1455133	15.6	24004	1496059	16.0
1988	1428	42165	33.9	23534	1502641	15.7	24962	1544806	16.2

SOURCE : MIDWIVES' NOTIFICATION SYSTEM
 AUSTRALIAN BUREAU OF STATISTICS - Cat. No. 3201.0.
 CHILD AND COMMUNITY HEALTH SERVICES - Aboriginal population data.

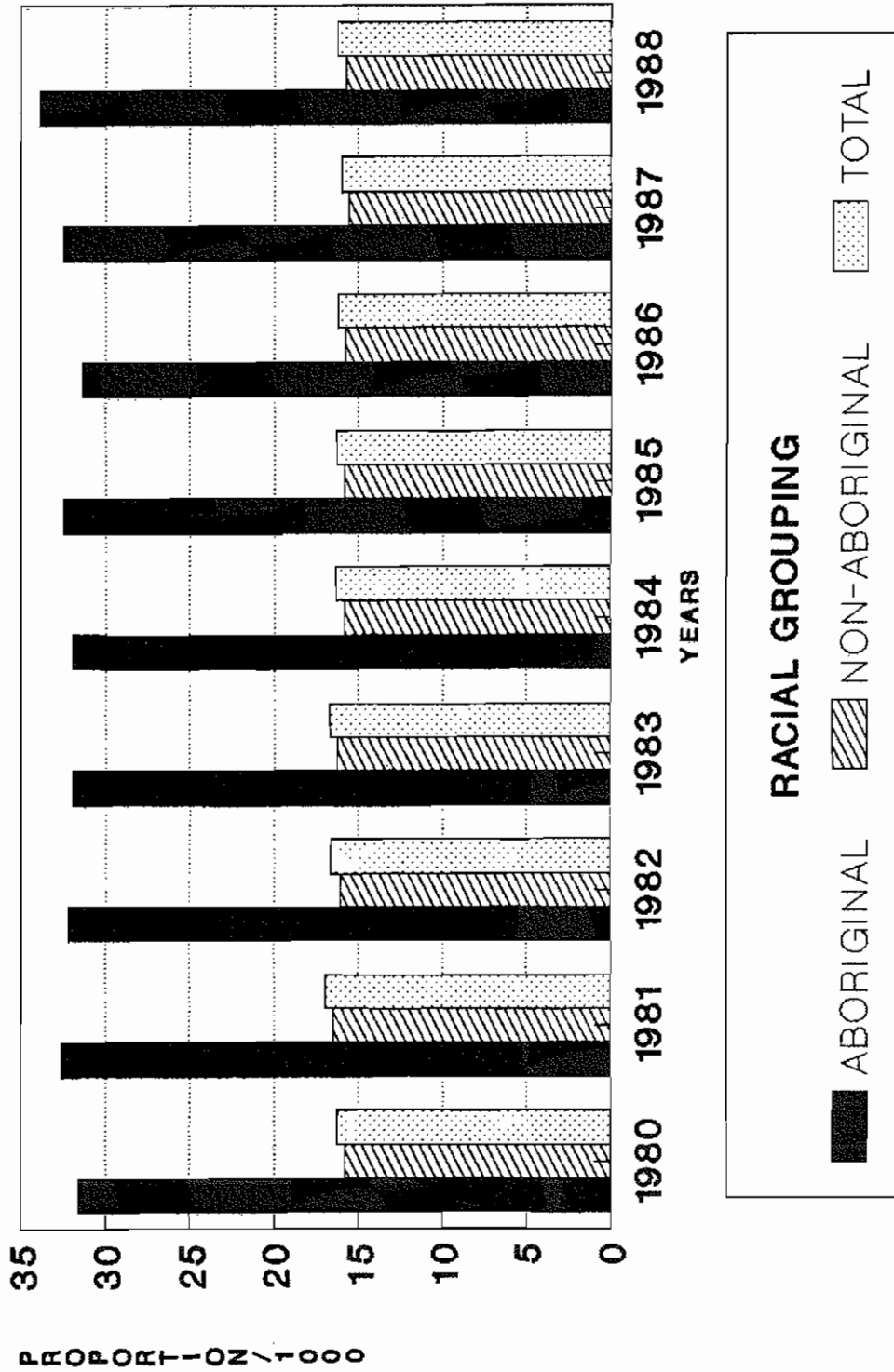
8.2.1 Stillbirths, Neonatal and Perinatal Mortality, 1980-1988

Western Australian stillbirth proportions showed a general downward trend from 7.5/1000 total births in 1980 to 4.7/1000 in 1988 (Table 41).

Consideration of stillbirth proportions and racial groups showed stillbirths among babies of non-Aboriginal women followed this trend while the proportions decreased from 7.2/1000 in 1980 to 4.4/1000 in 1988. Among babies of Aboriginal women, stillbirth proportions were less consistent in their decline and remained approximately double the proportion for stillbirths among babies of non-Aboriginal women (Table 41).

FIGURE VI

CRUDE BIRTH RATES AND RACIAL GROUPING FOR WESTERN AUSTRALIAN BIRTHS, 1980-1988



Excludes births less than 500 grams birthweight.

SOURCE: MIDWIVES' NOTIFICATION SYSTEM

AUSTRALIAN BUREAU OF STATISTICS

COMMUNITY AND CHILD HEALTH SERVICES

TABLE 41 : STILLBIRTHS, NEONATAL AND PERINATAL MORTALITY FOR ABORIGINAL AND NON-ABORIGINAL BIRTHS IN WESTERN AUSTRALIA 1980-1988

Year	Stillbirths			Neonatal Deaths			Perinatal Deaths						
	Aboriginal	Non-Aboriginal	Total	Aboriginal	Non-Aboriginal	Total	Aboriginal	Non-Aboriginal	Total				
	Nb. (1)	Nb. (1)	Nb. (1)	Nb. (2)	Nb. (2)	Nb. (2)	Nb. (3)	Nb. (3)	Nb. (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	142	158	17	15.3	101	4.8	33	29.2	240	11.3	273	12.2
1983	14	142	156	11	9.7	97	4.5	25	21.8	240	11.0	265	11.5
1984	16	134	150	15	12.8	101	4.7	31	26.0	219	10.1	250	10.9
1985	14	136	150	13	10.5	96	4.4	27	21.6	232	10.5	259	11.1
1986	16	130	146	13	10.6	116	5.2	29	23.3	246	10.9	275	11.5
1987	13	121	134	7	5.3	96	4.2	20	14.9	217	9.5	237	9.8
1988	12	105	117	17	11.9	87	3.7	29	20.1	192	8.1	221	8.8

Excludes births < 500 grams birthweight.

1980-1983 based on year of death.
1984-1988 based on year of birth.

- (1) Stillbirth Proportions/1000 total births.
- (2) Neonatal Death Proportion/1000 livebirths.
- (3) Perinatal Death Proportion/1000 total births.

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

8.2.2 Neonatal Mortality

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

The proportion of neonatal mortality among babies of Aboriginal women has reduced during the nine year period from 1980-1988. The proportions of 20.4/1000 livebirths in 1980 reduced to 11.9/1000 livebirths in 1988. For babies of non-Aboriginal women, neonatal mortality proportions reduced from 5.3/1000 in 1980 to 3.7/1000 in 1988 (Table 41, Figure IX).

8.2.3 Perinatal Mortality

Comparison of perinatal mortality for 1984, 1985, 1986, 1987 and 1988 the five years where the birth cohort method was employed, showed that overall the proportion has decreased from 10.9/1000 total births in 1984 to 8.8/1000 in 1988. An overall reduction of 4.7/1000 (13.5 in 1980 to 8.8 in 1988) occurred over nine years. It was apparent that the reduction in the perinatal mortality among babies of Aboriginal women from 33.2/1000 in 1981 to 14.9/1000 in 1987, was greater than among babies born to non-Aboriginal women, over the same period (Table 41).

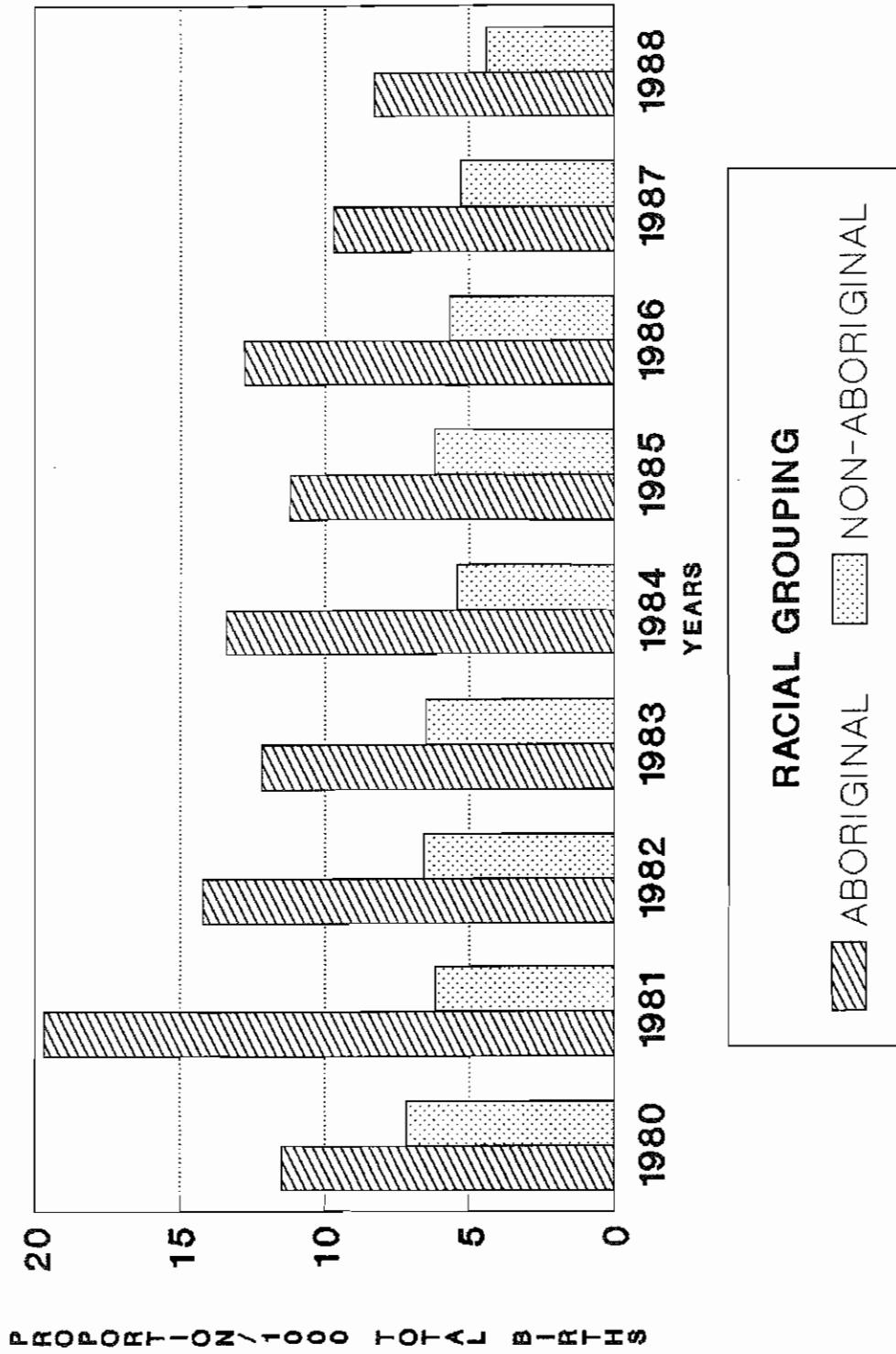
8.3 Neonatal, Post-neonatal and Infant Mortality, 1980-1988

Over the nine year period from 1980 to 1988 neonatal and infant mortality proportions reduced in Western Australia. Post neonatal mortality proportion showed minimal change over the same period. The neonatal mortality proportion reduced from 6.1/1000 in 1980 to 4.2/1000 in 1988. Proportions for post-neonatal deaths increased slightly from 3.2/1000 in 1980 to 3.3/1000 in 1988, and infant mortality proportions reduced from 9.3/1000 in 1980 to 7.5/1000 in 1988 (Table 42, 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 but for 1988 the proportion has increased to 28.7/1000 (Table 42).

Infant death proportions among babies of Aboriginal women at more than four times the proportion for babies of non-Aboriginal women, should be noted for the differences in age at death (Table 36) and the cause of death (Table 37). The proportion of deaths of babies born to Aboriginal women during the postneonatal period was far greater than among deaths of babies of non-Aboriginal women.

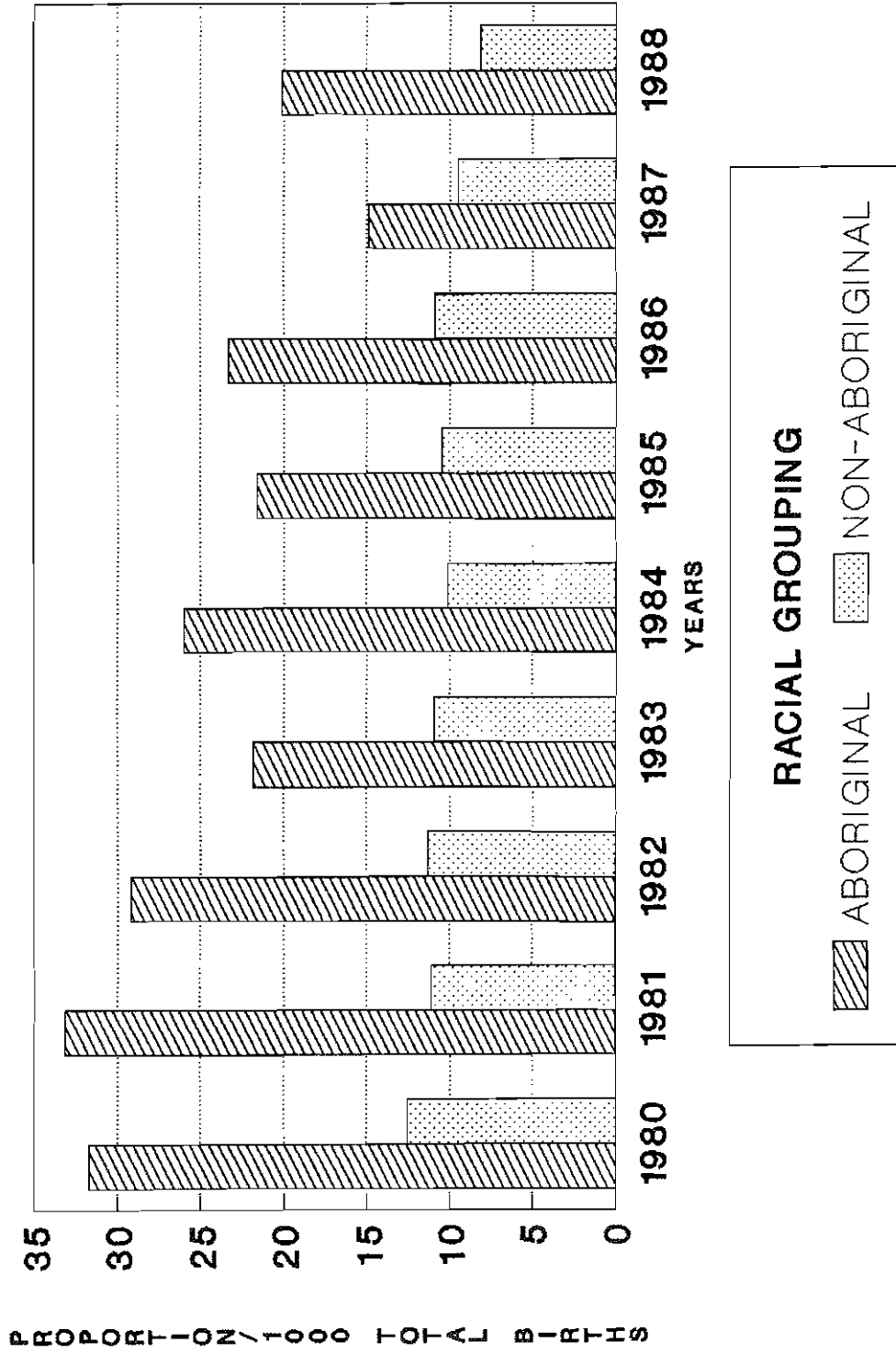
FIGURE VII
STILLBIRTH PROPORTIONS AND RACIAL
GROUPING OF BIRTHS IN WA. 1980-88.



Excludes births less than 500 grams birthweight.
 SOURCE : MIDWIVES' NOTIFICATION SYSTEM ; REGISTRAR GENERAL'S OFFICE

FIGURE VIII

PERINATAL MORTALITY AND RACIAL GROUPING FOR WESTERN AUSTRALIAN BIRTHS, 1980-1988



Excludes births less than 500 grams birthweight.

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

TABLE 42 : NEONATAL, POST-NEONATAL AND INFANT MORTALITY FOR ABORIGINAL AND NON-ABORIGINAL BIRTHS IN WESTERN AUSTRALIA, 1980-1988

Year	Neonatal			Post-neonatal Deaths			Infant Deaths											
	Aboriginal	Non-Aboriginal	Total	Aboriginal	Non-Aboriginal	Total	Aboriginal	Non-Aboriginal	Total									
	No.	Prop ¹	No. Prop ¹	No.	Prop ¹	No. Prop ¹	No.	Prop ¹	No. Prop 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	31.7	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	1116	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

Excludes births <500 grams birthweight.

1980-1983 based on year of death.

1984-1988 based on year of birth.

(1) Neonatal, Postneonatal and Infant Death Proportion/1000 Livebirths.

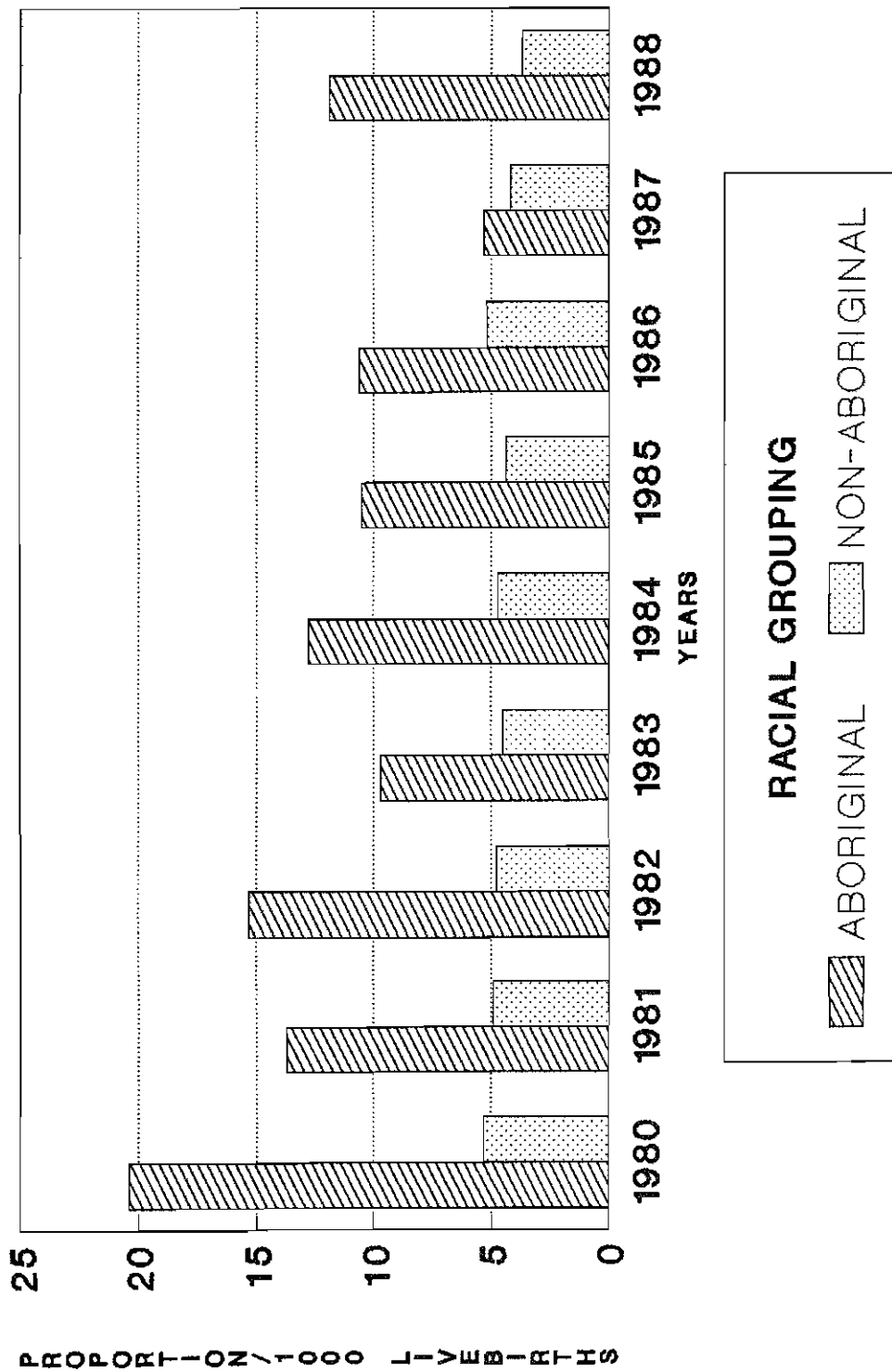
SOURCE : MIDWIVES' NOTIFICATION SYSTEM

REGISTRAR GENERAL'S OFFICE

CHILD AND COMMUNITY HEALTH SERVICES

FIGURE IX

NEONATAL MORTALITY AND RACIAL GROUPING FOR WESTERN AUSTRALIAN BIRTHS, 1980-1988

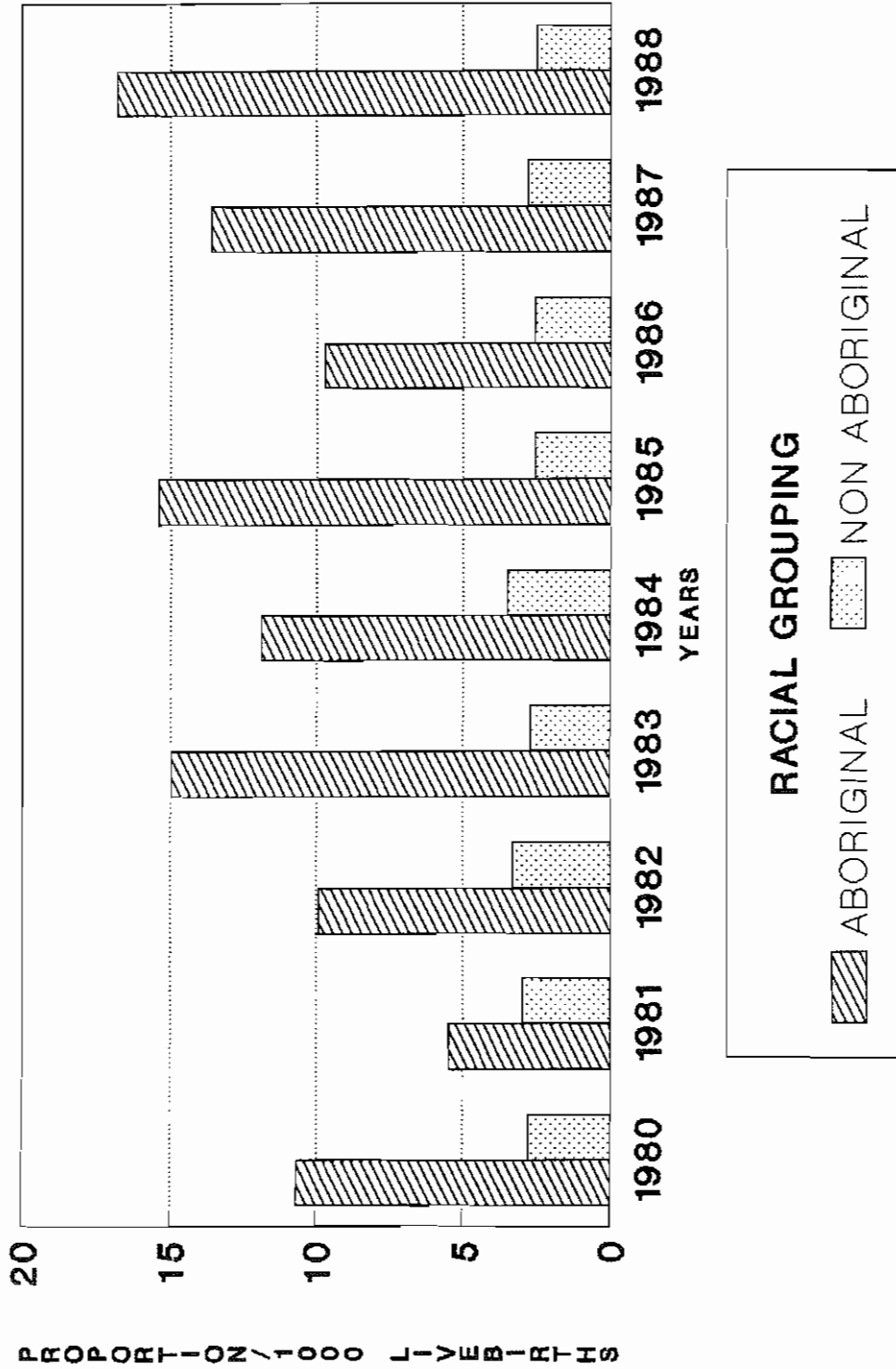


Excludes births less than 500 grams birthweight.

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

FIGURE X

POSTNEONATAL MORTALITY, RACIAL GROUPING FOR WESTERN AUSTRALIAN BIRTHS, 1980-1988

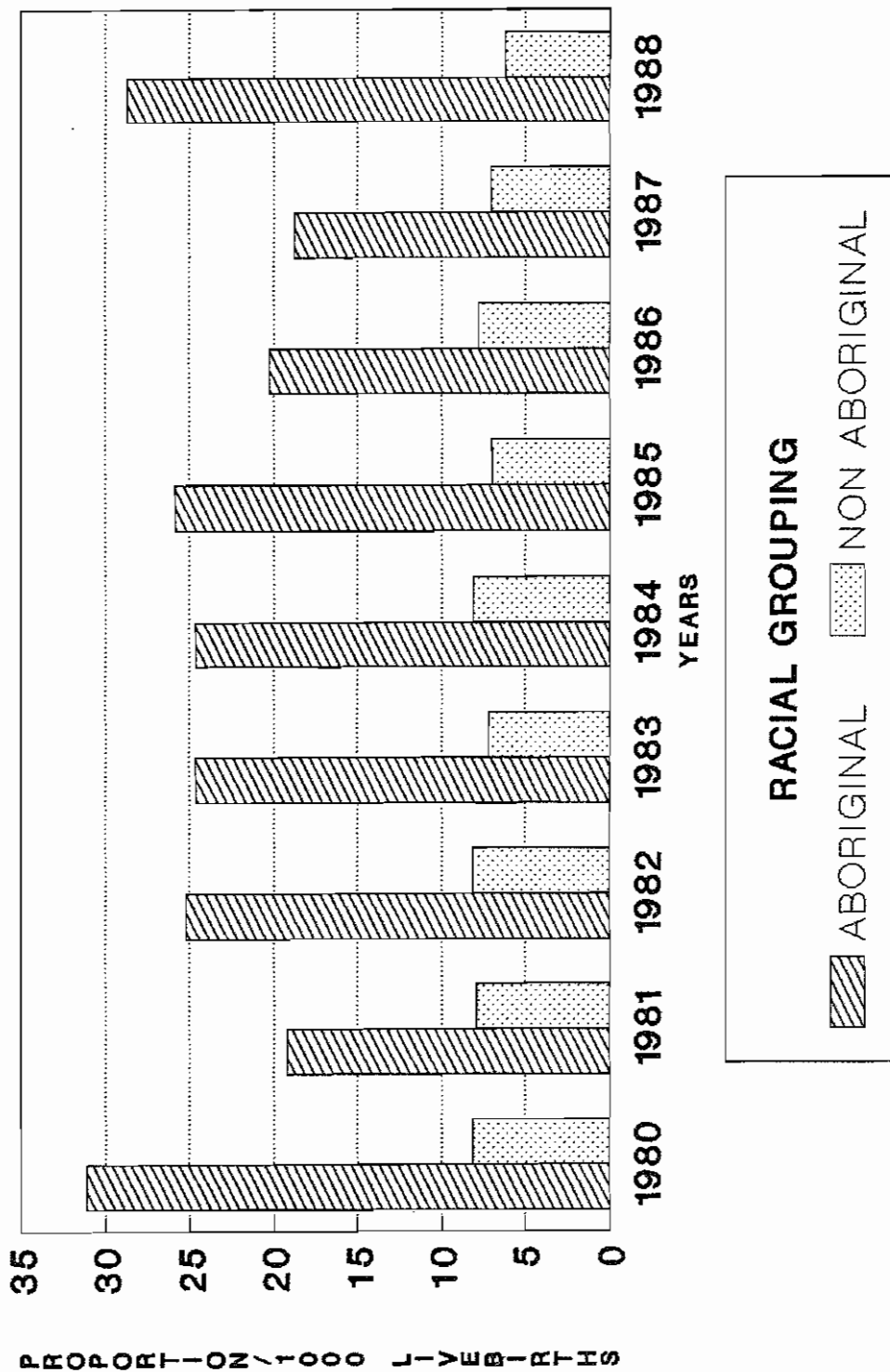


Excludes births less than 500 grams birthweight.

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

FIGURE XI

INFANT MORTALITY AND RACIAL GROUPING FOR WESTERN AUSTRALIAN BIRTHS, 1980-1988



Excludes births less than 500 grams birthweight.

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

REFERENCES

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2. Gee, V. Perinatal and Infant Mortality Identified by Maternal Race. The 1987 Western Australian Birth Cohort, Health Department of Western Australia, Perth, 1989.
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.

NOTIFICATION OF CASE ATTENDED Hospital

PARTICULARS RELATING TO MOTHER

PRINT
IN
BLOCK
LETTERS

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

9 Current Conjugal State	
single	() 1
married (incl. de lacto)	() 2
other	<input type="checkbox"/>
10 Race	
Caucasian	() 1
Aboriginal (full or part)	() 2
Other	() 3
11 Height (cms)	
<input type="text"/>	<input type="text"/>

PREGNANCY	
PREVIOUS PREGNANCIES (excluding this pregnancy)	
Total number of	<input type="text"/>
12 Previous Pregnancies	<input type="text"/>
13 Previous children now living	<input type="text"/>
14 born alive, now dead	<input type="text"/>
15 stillborn	<input type="text"/>
THIS PREGNANCY	
16 Date of LMP	<input type="text"/>
17 This date certain	() 1
not certain	() 2
18 Expected due date	<input type="text"/>
19 Complications of Pregnancy:	
Threatened abortion (under 20 weeks)	() A
urinary tract infection	() B
pre eclampsia	() C
APH - placenta praevia	() D
- abruptio	() E
- other	() F
prem rupture of membranes	() G
20 other	() H
21 Medical Conditions:	
<input type="text"/>	<input type="text"/>

LABOUR AND DELIVERY	
23 Onset of Labour:	
spontaneous	() A
augmented	() C
induced	() B
no labour	() D
24 Presentation:	
vertex	() 1
breech	() 2
other	() 3
25 Type of Delivery:	
normal	() A
vacuum - successful	() B
- failed	() C
forceps - successful	() D
- failed	() E
breech manoeuvre	() F
caesarean - elective	() G
- emergency	() H
Anaesthesia:	
none	() A
general	() B
epidural/spinal	() C
other	() D
26 Hours of established labour:	
<input type="text"/>	<input type="text"/>
27 Complications of Labour, Delivery:	
(include reason for Caesarean)	() A
precipitate delivery	() B
foetal distress	() C
prolapsed cord	() D
cord tight around neck	() E
cephalopelvic disproportion	() F
28 other	
<input type="text"/>	<input type="text"/>

BABY	
Separate Form for each Baby	
Adoption	Yes () No ()
33 Birth Date:	
<input type="text"/>	<input type="text"/>
34 Time (24 hr. clock)	
<input type="text"/>	<input type="text"/>
35 Plurality:	
single birth	() 1
first twin	() 2
second twin	() 3
other multiple birth:	() 4
36 (Specify baby number... of...)	
37 Sex: male	() 1
female	() 2
38 Condition: liveborn	
stillborn	() 2
39 Birthweight (grams)	
<input type="text"/>	<input type="text"/>
40 Length (cms)	
<input type="text"/>	<input type="text"/>
41 Time to Spontaneous Respiration (mins)	
<input type="text"/>	<input type="text"/>
42 Resuscitation:	
none	() 0
intubation	() 3
oxygen only	() 8
other	<input type="checkbox"/>
43 Apgar Score (5 mins)	
<input type="text"/>	<input type="text"/>
Estimated Gestation (weeks)	
<input type="text"/>	<input type="text"/>
44 Congenital Anomalies	
<input type="text"/>	<input type="text"/>
45 Birth Trauma (Eg. cephalhaematoma)	
<input type="text"/>	<input type="text"/>

BABY'S SEPARATION DETAILS	
Date of Discharge	
29 Transfer or Death	
Neonatal Blood Screening	No ()
30 Type of Separation:	
Discharged home	() 1
Died	() 2
Transferred to	() 3
31 Special Care (wholedays only)	
<input type="text"/>	<input type="text"/>
32 Separate HA22 for baby:	
yes, attached	() 2

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

MIDWIFE	
Name	<input type="text"/>
Signature	<input type="text"/>
22 Reg No	Date
<input type="text"/>	<input type="text"/>

44246/11/85--4M SETS -S-7002

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

CAUSE OF DEATH

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

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

PART I

A. CAUSES IN CHILD OR FOETUS

Disease or condition directly leading to death.....

due to f.....

due to f.....

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

due to.....

* 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.....

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

Signature..... Date.....

Name..... Address.....

(Block Letters)

Registration Number

3
2
8
6
9
10
11
12
14
4
7

Approximate Interval Between Onset and Death

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)

II. 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, asthenia, 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.

29737/11/83—2M BKS—MAG 149