

Report of the
ACT Perinatal Mortality Committee

Perinatal Mortality in the ACT
2001-2005

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CHAIRPERSON'S REPORT

We are pleased to produce the first report from the ACT Perinatal Mortality Committee (ACT PMC), and I would like to thank the members for their participation and enthusiasm. The Committee meets two to three times per year and reports to the ACT Clinical Audit Committee each year.

The ACT PMC developed from a few enthusiastic clinicians in 2002 who recognised the importance of collecting perinatal mortality data to allow accurate reporting and comparisons of perinatal deaths within the ACT and nationally. The committee now consists of a fetal medicine specialist, pathologist, neonatologist, representative midwives from each hospital in the region and a representative from the Population Health Research Centre. The committee now provides an annual report to ACT Health on perinatal deaths in the Territory.

The ACT PMC classifies all perinatal deaths in the ACT using the Perinatal Society of Australia and New Zealand - Perinatal Death Classification (PSANZ-PDC) and the Perinatal Society of Australia and New Zealand - Neonatal Death Classification (PSANZ-NDC) (APPENDIX). The majority of members are active in the Perinatal Society of Australia and New Zealand (PSANZ) Perinatal Mortality Special Interest Group, which continues to refine these classifications and implement their use throughout Australia.

As the ACT is a small territory, the ACT PMC has the ability to review all perinatal deaths within the ACT and classify them according to the PSANZ classification systems. Due to the small number of deaths, a five year report is felt to be the most appropriate timeframe to examine perinatal deaths in the Territory.

I would like to acknowledge and thank the staff of the ACT Health's Population Health Research Centre for their support in producing this document along with the contributions from Dr Paul Dugdale, former Chief Health Officer, ACT Health.

Associate Professor Alison Kent
Chairperson, ACT Perinatal Mortality Committee

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LIST OF ABBREVIATIONS

ABS	Australian Bureau of Statistics
ACT	Australian Capital Territory
ACT CAC	ACT Clinical Audit Committee
ACT MPDC	ACT Maternal and Perinatal Data Collection
ACT PMC	ACT Perinatal Mortality Committee
AIHW	Australian Institute of Health and Welfare
ANU	Australian National University
ANZ	Australian and New Zealand
CI	Confidence Interval
Dept	Department
ICD-10-AM	International Statistical Classification of Diseases and Related Health Problems, 10th Revision, Australian modification
NSW	New South Wales
PHRC	Population Health Research Centre
PSANZ	Perinatal Society of Australia and New Zealand
PSANZ-NDC	Perinatal Society of Australia and New Zealand - Neonatal Death Classification
PSANZ-PDC	Perinatal Society of Australia and New Zealand - Perinatal Death Classification
PSANZ-PMC	Perinatal Society of Australia and New Zealand - Perinatal Mortality Classification
RM	Registered midwife
SPSS	Statistical Program for Social Scientists
TOP	Terminations of Pregnancy
WHO	World Health Organization

1. EXECUTIVE SUMMARY

During the period 2001 to 2005, there were 321 perinatal deaths, of which 217 (67.6%) were for ACT residents. The ACT resident perinatal mortality rate was 10.6 per 1,000 total births. The ACT resident fetal death rate was 7.5 per 1,000 total births and the ACT resident neonatal mortality rate 3.2 per 1,000 live births.

It is important to note that perinatal mortality rates in the ACT fluctuate from year to year due to the small number of perinatal deaths each year. With such small numbers a single event, for example the fetal death of triplets, can substantially elevate mortality rates.

The main cause of perinatal death was congenital abnormality (24.9%). Unexplained antepartum death was the next most common cause accounting for 15.2% of perinatal deaths. Spontaneous preterm birth accounted for 14.3% of perinatal deaths. These findings are similar to other jurisdictions.

The most common cause of fetal death was congenital abnormality (28.1%). Unexplained antepartum death accounted for 21.6% of fetal deaths and specific perinatal conditions accounted for 13.7% of fetal deaths. The most common causes of neonatal death were spontaneous preterm birth (34.4%) and congenital abnormality (17.2%).

Preterm delivery (less than 37 weeks gestation) occurred in 7.4% of all births, and 78.0% of perinatal deaths. Extreme prematurity (less than 28 weeks gestation) occurred in 53.0% of perinatal deaths, but only 0.8% of all births.

Multiple births accounted for 19.3% of all perinatal deaths. The perinatal mortality rate for multiple births was 60.5 per 1,000 births in comparison to 8.9 per 1,000 singleton births.

Perinatal mortality and fetal death rates for women aged 40 years or more were significantly higher than the rates for women aged 20 to 39 years.

The rate of perinatal autopsy for the ACT for 2001-2005 was 53.9%. Although this rate compares favourably with other states of Australia, it continues to be lower than the 75% recommended by the Royal College of Obstetricians and Gynaecologists and the Royal College of Pathologists.

There were no significant differences between fetal death rates and perinatal mortality rates for the ACT and Australia between 2001 and 2005 for either the annual rates or for the five-year combined rates. The ACT neonatal mortality rate in 2001 was significantly lower than the Australian rate, however the following years and the five-year combined rate showed no significant difference. These comparisons include fetuses and infants of at least 400 grams birthweight as per the Australian Bureau of Statistics definition.

2. RECOMMENDATIONS

2.1 Congenital abnormalities

The ACT continues to maintain data on congenital abnormalities as a cause of perinatal death, and supports the development of a nation-wide register and epidemiological investigation of congenital anomalies to enable state and territory comparisons.

2.2 Unexplained antepartum death

Unexplained antepartum death causes significant anguish to families, and the ACT should continue to encourage research into the causes of unexplained antepartum death.

2.3 Perinatal autopsy

A high perinatal autopsy rate improves the accuracy of classification of causes of perinatal deaths, as well as the information provided to parents. All parents should be offered the option of an autopsy following a perinatal death. Adequate explanations and written material should be available to assist them with this decision.

All clinical staff involved in perinatal care should be aware of the value of perinatal autopsy.

Clinical practice guidelines for perinatal autopsy and audit should be available for all perinatal clinical care providers.

ACT Health must ensure a high standard of perinatal autopsy is always available.

Autopsy results should be available within six weeks to provide parents with appropriate counselling and adequate perinatal audit.

2.4 General recommendations

ACT Health should consider formalising the collection of perinatal data electronically in order to improve data quality.

3. INTRODUCTION

This is the first report of the ACT Perinatal Mortality Committee (ACT PMC), which was established in 2002. This report reviews data on perinatal mortality in the ACT for the years 2001 to 2005.

Perinatal mortality rates are an indicator of the health status of a given population. The rate of perinatal deaths reflects the risk in the population of a fetus being stillborn or not surviving beyond 28 days of life.

While perinatal death rates are a useful performance indicator for perinatal services in developing countries, in developed countries the rates have fallen to the point that their usefulness as an indicator of the performance of perinatal services has diminished. This is because a large proportion of the perinatal deaths that do occur are the result of serious congenital anomalies or extreme prematurity, and as such may be unavoidable.

3.1 Purpose of the ACT Perinatal Mortality Committee

To provide advice to ACT Health, through the ACT Clinical Audit Committee, on matters that relate to perinatal mortality in the ACT.

3.2 Terms of reference

This committee is a sub-committee of the ACT Maternal Perinatal Information Network Committee.

The membership should consist of:

- An obstetrician with involvement in high-risk pregnancy and fetal medicine;
- A pathologist with involvement in perinatal pathology;
- A neonatologist;
- Midwifery representatives from all delivery campuses;
- Population Health Research Centre representative; and
- Any other members the committee feels are appropriate.

The role of the committee is to:

- Review all perinatal deaths within the ACT;
- Classify all deaths according to the PSANZ classification system;
- Provide an annual report to the ACT Clinical Audit Committee; and
- Provide a five year Public Health Report for the ACT on Perinatal Mortality.

3.3 Provision of data for statistical and research purposes

The ACT PMC has collected information on all perinatal deaths in the ACT from 20 weeks gestation. The Committee is able to release information from the database provided that it does not endanger the confidentiality of families.

ACT Health generally does not publish tables with less than five individuals in each category. However, due to the small number of perinatal deaths each year in the ACT, permission was sought and granted from the ACT Chief Health Officer to publish tables with small numbers in this report.

The Committee reviews all requests for information. Formal research projects must conform to the National Health and Medical Research Council Guidelines, and be approved by the ACT Human Research Ethics Committee.

3.4 Membership

Membership of the ACT Perinatal Mortality Committee

Assoc. Professor Alison Kent (Chairperson)	Dept of Neonatology, The Canberra Hospital
Mrs Maureen Bourne	Population Health Research Centre, ACT Health
Professor Jane Dahlstrom	Dept of Anatomical Pathology, The Canberra Hospital
Professor David Ellwood	Professor of Obstetrics and Gynaecology, The Canberra Hospital
RM Stephanie Ham	Clinical Nurse Consultant, Calvary John James Hospital
RM Jeanne McLauchlan	Clinical Nurse Consultant, The Canberra Hospital
RM Sandra Reddy	Clinical Nurse Consultant, Calvary Hospital

4. METHODS

4.1 Scope

There are four hospitals (two public and two private) in the ACT providing maternity services to ACT residents and residents of the surrounding regions of NSW. During 2001-2005, 15.6 per cent of babies born in the ACT were not usual residents of the ACT. Many of these babies were those of women who were referred to ACT hospitals for tertiary level maternal and neonatal care at The Canberra Hospital during high-risk pregnancies and births.

This is reflected in the percentage of perinatal deaths for babies of women who are not ACT residents. During 2001 to 2005, almost one third (32.4%) of perinatal deaths that occurred in the ACT were for non-ACT residents (Table 1).

Perinatal deaths for both ACT and non-ACT residents are routinely monitored and reviewed. Each hospital performs their own morbidity and mortality review of perinatal deaths. A confidential form is completed on each perinatal death in the ACT and forwarded to the ACT Perinatal Mortality Committee (ACT PMC). An annual presentation is made to the ACT Clinical Audit Committee (ACT CAC) of perinatal deaths and recommendations are implemented as required.

Table 1: Perinatal deaths by state of residence, ACT, 2001 - 2005

	Fetal death		Neonatal death		Perinatal deaths	
	No.	%	No.	%	No.	%
ACT residents	153	75.0	64	54.7	217	67.6
Non ACT residents	51	25.0	53	45.3	104	32.4
Total	204	100.0	117	100.0	321	100.0

Note: Annual data are presented in Table 19.

Source: ACT Perinatal Deaths Data Collection, ACT Health

This report includes perinatal deaths for babies of ACT residents where the birth occurred in the ACT. Residents from other jurisdictions have been excluded to allow population based analysis. It does not include ACT residents who gave birth outside the ACT; however this number is very small each year. For example, during 2004 only seven of the 4,019 ACT resident women who gave birth did so in other jurisdictions (0.2%).²

4.2 Clinical classification

All perinatal deaths are classified according to the primary cause of death using the Perinatal Society of Australia and New Zealand - Perinatal Death Classification (PSANZ-PDC)¹ and the Perinatal Society of Australia and New Zealand - Neonatal Death Classification (PSANZ-NDC). The use of this system allows comparison of perinatal deaths across Australia, ensuring that the aetiology of perinatal deaths is considered, identification of potential preventable factors occurs, and possible areas of research in perinatal mortality are identified.

4.3 Data collection

The major source of data is the ACT Confidential Report on Perinatal Death Forms (Appendix B), which includes placental pathology and autopsy details. Data is cross-referenced with that from the ACT Maternal Perinatal Data Collection, the ACT Admitted Patient Care data collection and the ACT ABS Deaths data.

All perinatal deaths occurring at The Canberra Hospital have forms completed by the Chairperson of the Perinatal Mortality Committee. For perinatal deaths occurring at the other ACT hospitals, the forms are completed by the midwifery representatives or a designated person and sent to the Chairperson of the Perinatal Mortality Committee. The committee meets twice yearly to review and classify all cases.

The ACT Maternal and Perinatal Data Collection (ACT MPDC) collects information and reports on live births and fetal deaths of at least 20 weeks gestation or at least 400 grams in birthweight in the ACT. Data are collected on births that occur in hospitals, birth centres and in the community. These data are validated against the ACT Admitted Patient Care Data Collection and ABS Deaths data to ensure quality and completeness. The ACT MPDC is provided to the National Perinatal Data Collection for national reporting.

The ABS perinatal death data includes perinatal deaths registered with Birth, Deaths and Marriages in each of the States and Territories in Australia. These data are reported annually by the ABS by the mother's usual state of residence.

4.4 Statistical analysis

The analysis for this report was conducted using an SPSS 15.0 syntax file. Mortality rates and confidence intervals were calculated in Excel 2000.

Results described as statistically significant are significant at the $p < 0.05$ level and where appropriate, confidence intervals are included in the report. A confidence interval is a computed interval with a given probability (for example, 95%) that the true value of a statistic, such as a rate, mean or proportion is contained within the interval. When the confidence intervals of two estimated values do not overlap, the values are statistically different.

Differences between means (averages) were assessed using t-tests. The t-test assesses whether the means of two groups are statistically different from each other. Results were evaluated at the $p < 0.05$ level.

Due to the rounding of percentages some percentage totals may not add up to 100.0%. However, the total is still displayed in the table as 100.0.

4.5 Definitions

Fetal death

Also known as stillbirth, fetal death is defined in the Registrar of Births, Deaths and Marriages Act, 1962 as:

“a child whose heart has not beaten after it has been completely expelled or extracted from its mother and who is either of not less than 20 weeks gestation or of not less than 400g by weight at birth”.

Fetal death rate

The number of fetal deaths per 1,000 total births.

Live birth

A live birth is defined in the Registration of Births, Deaths and Marriages Act, 1962 as:

“a child whose heart has beaten after it has been completely expelled or extracted from its mother”.

Neonatal death

The death of an infant within 28 days of birth.

Neonatal mortality rate

The number of deaths of live born infants under 28 days of age per 1,000 live births.

Infant death

The death of a live born infant under one year of age and includes neonatal deaths and post-neonatal deaths up to 1 year.

Infant mortality rate

The number of deaths of infants under 1 year of age per 1,000 live births.

Perinatal death

Refers to a fetal death or a neonatal death.

Perinatal mortality rate

The number of fetal and neonatal deaths per 1,000 total births.

5. PERINATAL MORTALITY RATES AND TRENDS

5.1 Perinatal mortality rates

The perinatal mortality rate for the ACT over the five year period from 2001 to 2005 was 10.6 per 1,000 total births. This comprised a fetal death rate of 7.5 per 1,000 total births and a neonatal mortality rate of 3.2 per 1,000 live births.

The mortality rates in Table 2 include babies born with a birthweight of less than 400 grams who were born at 20 weeks gestation or more, as these are included in the Perinatal National Minimum Dataset. However, these babies have a high risk of death and during this time period none survived. When these cases are excluded, the perinatal mortality rate decreases to 8.7 per 1,000 total births (see Section 6).

Table 2: Fetal, neonatal and perinatal deaths, ACT residents, 2001 - 2005

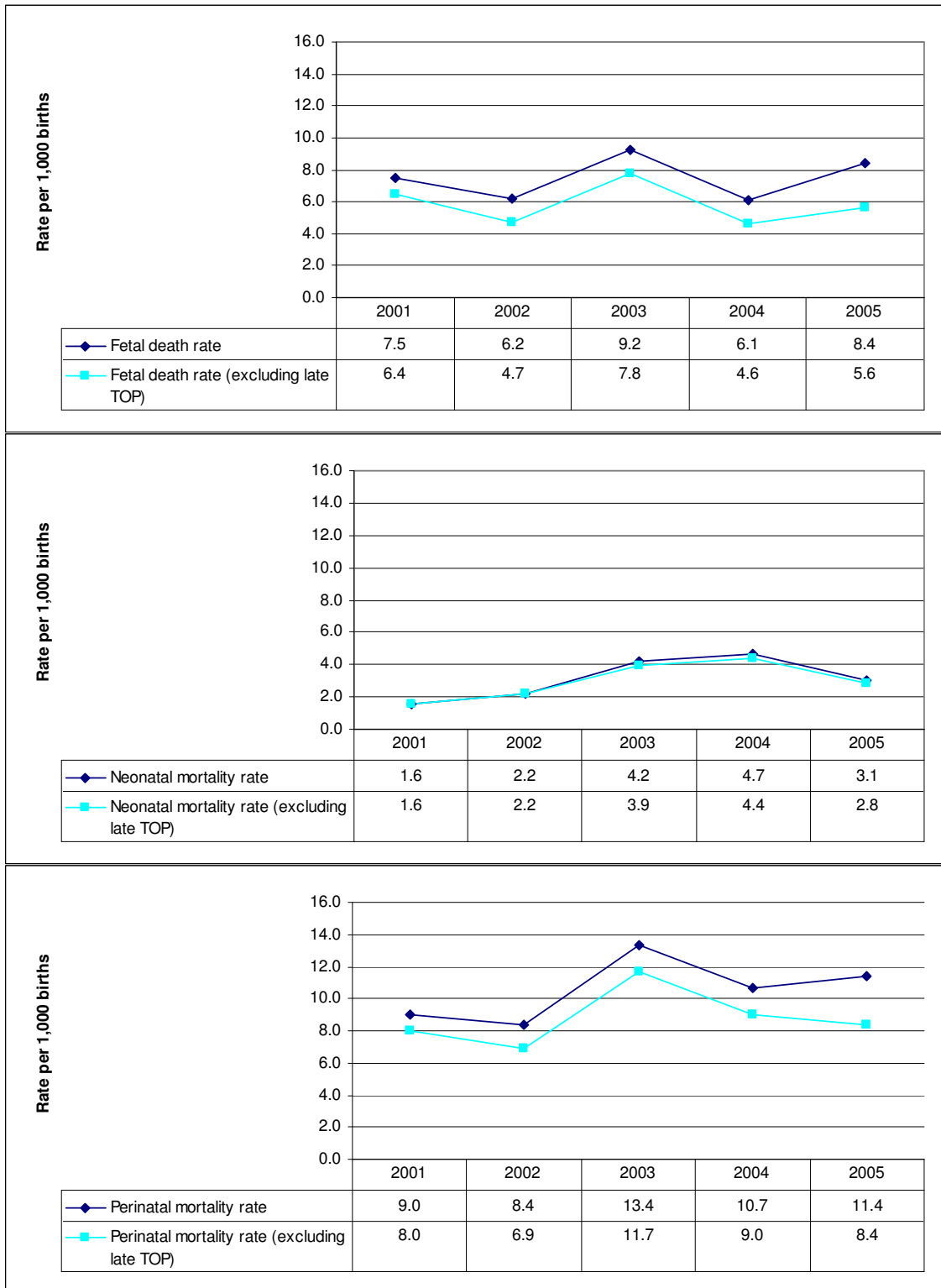
Year	Total births	Live births	Fetal deaths			Neonatal deaths			Perinatal deaths		
			No.	Rate	95% CI	No.	Rate	95% CI	No.	Rate	95% CI
2001	3,887	3,858	29	7.5	4.8 - 10.2	6	1.6	0.3 - 2.8	35	9.0	6.0 - 12.0
2002	4,047	4,022	25	6.2	3.8 - 8.6	9	2.2	0.8 - 3.7	34	8.4	5.6 - 11.2
2003	4,111	4,073	38	9.2	6.3 - 12.2	17	4.2	2.2 - 6.2	55	13.4	9.9 - 16.9
2004	4,110	4,085	25	6.1	3.7 - 8.5	19	4.7	2.6 - 6.7	44	10.7	7.6 - 13.9
2005	4,282	4,246	36	8.4	5.7 - 11.1	13	3.1	1.4 - 4.7	49	11.4	8.3 - 14.6
Total	20,437	20,284	153	7.5	6.3 - 8.7	64	3.2	2.4 - 3.9	217	10.6	9.2 - 12.0

Note: Fetal death rates and perinatal death rates are per 1,000 births. Neonatal death rates are per 1,000 live births.
Source: ACT Maternal and Perinatal Data Collection, ACT Health and ACT Perinatal Deaths Data Collection, ACT Health

Late terminations of pregnancy (terminations at 20 weeks gestation or more) for congenital abnormalities contribute to the perinatal mortality rate. There were 34 late terminations in the ACT between 2001 and 2005. The Canberra Hospital is currently the only hospital that performs late terminations for congenital abnormalities in the ACT, however during this reporting period John James Memorial Hospital did perform some late terminations.

When late terminations of pregnancy are removed, the perinatal death rate decreases to 8.4 per 1,000 births. Figure 1 compares the fetal, neonatal and perinatal mortality rates for ACT residents from 2001 to 2005.

Figure 1: Fetal, neonatal and perinatal mortality rates corrected for late terminations, ACT residents, 2001 - 2005



Note: TOP refers to Terminations of Pregnancy.

Source: ACT Maternal and Perinatal Data Collection, ACT Health and ACT Perinatal Deaths Data Collection, ACT Health

5.2 Antecedent cause of perinatal mortality

The main causes of perinatal mortality using the Perinatal Society of Australia and New Zealand - Perinatal Death Classification (PSANZ-PDC) system are presented in Table 3. The four leading causes of perinatal deaths were: congenital abnormality, unexplained antepartum death, spontaneous preterm birth, and specific perinatal conditions. This is discussed in more detail below.

Table 3: Perinatal death by antecedent cause of death, ACT, 2001 - 2005

PSANZ-PDC	Fetal deaths			Neonatal deaths			Perinatal deaths		
	No.	%	Rate	No.	%	Rate	No.	%	Rate
Congenital abnormality	43	28.1	2.1	11	17.2	0.5	54	24.9	2.6
Perinatal infection	5	3.3	0.2	3	4.7	0.1	8	3.7	0.4
Hypertension	3	2.0	0.1	2	3.1	0.1	5	2.3	0.2
Antepartum haemorrhage	16	10.5	0.8	5	7.8	0.2	21	9.7	1.0
Maternal conditions	0	0.0	0.0	1	1.6	0.0	1	0.5	0.0
Specific perinatal conditions	21	13.7	1.0	5	7.8	0.2	26	12.0	1.3
Hypoxic peripartum deaths	5	3.3	0.2	4	6.3	0.2	9	4.1	0.4
Fetal growth restriction	16	10.5	0.8	4	6.3	0.2	20	9.2	1.0
Spontaneous preterm	9	5.9	0.4	22	34.4	1.1	31	14.3	1.5
Unexplained antepartum death	33	21.6	1.6	0	0.0	0.0	33	15.2	1.6
No obstetric antecedent	2	1.3	0.1	7	10.9	0.3	9	4.1	0.4
Total	153	100.0	7.5	64	100.0	3.2	217	100.0	10.6

Note: Fetal death rates and perinatal death rates are per 1,000 births. Neonatal death rates are per 1,000 live births. PSANZ-PDC refers to Perinatal Society of Australia and New Zealand - Perinatal Death Classification.

Source: ACT Maternal and Perinatal Data Collection, ACT Health and ACT Perinatal Deaths Data Collection, ACT Health, 2001 - 2005

Of the 54 perinatal deaths attributed to congenital abnormalities 43 were fetal deaths and 11 neonatal deaths. The most frequent congenital abnormalities were chromosomal (31.5%; 17), central nervous system (20.4%; 11), and urinary (14.8%; 8).

There were 33 unexplained antepartum deaths contributing to 15.2% of perinatal deaths. Fourteen (42.4%) of these perinatal deaths occurred at less than 28 weeks gestation, 11 (33.3%) occurred between 28 to 36 weeks gestation and eight (24.3%) at 37 weeks or more gestation. Uteroplacental insufficiency or chronic villitis was seen in the placental pathology of seven (21.2%) of these perinatal deaths.

Spontaneous preterm birth was the third most common cause of perinatal death identified during this period, contributing to 14.3% of cases.

Of the 26 deaths attributed to specific perinatal conditions, twin-twin-transfusion syndrome accounted for 46.2% (12 deaths) and antepartum cord complications for 38.5% (ten deaths). Uterine abnormalities including cervical incompetence were attributed to two of the deaths. The remainder were as a consequence of alloimmune disease and idiopathic hydrops.

Placental abruption was the diagnosis in the majority of antepartum haemorrhage deaths.

Perinatal infection contributed to 3.7% of perinatal deaths. Group B streptococcus and Escherichia coli accounted for the majority of infections.

5.3 Perinatal mortality by gestational age and birthweight

Two important factors determining a baby's health are birthweight and gestational age. Infants with extremely low birthweight and gestational age have a high risk of perinatal death.

Preterm births (those that delivered at less than 37 weeks) accounted for 7.4% of all births and 78% of perinatal deaths. Very preterm births (those that delivered at less than 28 weeks gestation) accounted for 0.8% of all births and 53% of all perinatal deaths. The risk of perinatal death at term (deliveries at 37 weeks gestation or more) was 2.5 per 1,000 total births compared with 709.9 per 1,000 births for babies born at less than 28 weeks gestation. The four main causes of perinatal death for babies born at 37 weeks gestation or more were congenital abnormalities, unexplained antepartum death, hypoxic peripartum death and fetal growth restriction.

Table 4: Perinatal deaths by cause and gestational age, ACT, 2001 - 2005

PSANZ-PDC	Less than 28 weeks		Gestational age				Total	
	No.	%	28 to 36 weeks		37 weeks or more		No.	%
Congenital abnormality	36	31.3	10	18.5	8	16.7	54	24.9
Perinatal infection	3	2.6	2	3.7	3	6.3	8	3.7
Hypertension	5	4.3	0	0.0	0	0.0	5	2.3
Antepartum haemorrhage	7	6.1	11	20.4	3	6.3	21	9.7
Maternal conditions	0	0.0	1	1.9	0	0.0	1	0.5
Specific perinatal conditions	13	11.3	7	13.0	6	12.5	26	12.0
Hypoxic peripartum deaths	2	1.7	0	0.0	7	14.6	9	4.1
Fetal growth restriction	7	6.1	6	11.1	7	14.6	20	9.2
Spontaneous preterm	27	23.5	4	7.4	0	0.0	31	14.3
Unexplained antepartum death	14	12.2	11	20.4	8	16.7	33	15.2
No obstetric antecedent	1	0.9	2	3.7	6	12.5	9	4.1
Total	115	100.0	54	100.0	48	100.0	217	100.0
Rate per 1,000 births	709.9		40.1		2.5		10.6	

Note: Due to the rounding of percentages totals may not equal 100.0%.

PSANZ-PDC refers to Perinatal Society of Australia and New Zealand - Perinatal Death Classification

Source: ACT Maternal and Perinatal Data Collection, ACT Health and ACT Perinatal Deaths Data Collection, ACT Health, 2001 - 2005

Low birthweight babies (those with a birthweight less than 2,500 grams) accounted for 6.2% of all births and 79.7% of all perinatal deaths. Infants with birthweight less than 1,000 grams (0.8% of all births) accounted for 58.5% of perinatal deaths.

The perinatal mortality rate for babies with a birthweight less than 1,000 grams was 751.5 per 1,000 births compared with 2.3 per 1,000 births for babies weighing over 2,500 grams.

Table 5: Perinatal deaths by cause and birthweight, ACT, 2001 - 2005

PSANZ-PDC	Less than 1,000 grams		1,000 to 2,499 grams		2,500 grams or more		Total	
	No.	%	No.	%	No.	%	No.	%
Congenital abnormality	40	31.5	9	19.6	5	11.4	54	24.9
Perinatal infection	3	2.4	2	4.3	3	6.8	8	3.7
Hypertension	5	3.9	0	0.0	0	0.0	5	2.3
Antepartum haemorrhage	9	7.1	5	10.9	7	15.9	21	9.7
Maternal conditions	0	0.0	0	0.0	1	2.3	1	0.5
Specific perinatal conditions	15	11.8	7	15.2	4	9.1	26	12.0
Hypoxic peripartum deaths	2	1.6	1	2.2	6	13.6	9	4.1
Fetal growth restriction	11	8.7	8	17.4	1	2.3	20	9.2
Spontaneous preterm	27	21.3	4	8.7	0	0.0	31	14.3
Unexplained antepartum death	14	11.0	10	21.7	9	20.5	33	15.2
No obstetric antecedent	1	0.8	0	0.0	8	18.2	9	4.1
Total	127	100.0	46	100.0	44	100.0	217	100.0
Rate per 1,000 births	751.5		42.0		2.3		10.6	

Note: Due to the rounding of percentages totals may not equal 100.0%.

PSANZ-PDC refers to Perinatal Society of Australia and New Zealand - Perinatal Death Classification.

Source: ACT Maternal and Perinatal Data Collection, ACT Health and ACT Perinatal Deaths Data Collection, ACT Health, 2001 - 2005

5.4 Fetal deaths by birthweight and gestational age

There were 153 fetal deaths (fetal death in-utero or intrapartum death) between 2001 and 2005 (Table 6). The majority of fetal deaths occurred where the fetus weighted less than 2,500 grams (83.6%) and/or was less than 37 weeks gestation (79.8%). Only one fetal death in-utero was associated with maternal hypertension.

Table 6: Fetal deaths by birthweight and gestational age, ACT, 2001 - 2005

	No.	%
Birthweight		
Less than 1,000 grams	94	61.4
1,000 to 2,499 grams	34	22.2
2,500 grams or more	25	16.3
Total	153	100.0
Gestational age		
Less than 28 weeks gestation	85	55.6
28 to 36 weeks gestation	37	24.2
37 weeks gestation or more	31	20.3
Total	153	100.0

Note: Due to the rounding of percentages totals may not equal 100.0%.

Source: ACT Perinatal Deaths Data Collection, ACT Health

5.5 Neonatal mortality

Neonatal deaths were classified using the Perinatal Society of Australia and New Zealand - Neonatal Death Classification¹ (PSANZ-NDC) system. One quarter of neonatal deaths were attributed to extreme prematurity (25.0%) followed by neurological disorders (20.3%), cardio-respiratory disorders (18.8%) and congenital abnormalities (17.2%) (Table 7). These are discussed in more detail below.

There were 31.5 neonatal deaths per 10,000 ACT resident live births during 2001 to 2005. There were 7.9 neonatal deaths per 10,000 live births due to extreme prematurity, 6.4 per 10,000 live births due to neurological conditions, 5.9 per 10,000 live births due to cardio-respiratory disorders and 5.4 per 10,000 live births due to congenital abnormalities.

Table 7: Neonatal deaths by cause, ACT, 2001 - 2005

PSANZ-NDC	No.	%	Rate
Congenital abnormality	11	17.2	5.4
Extreme prematurity	16	25.0	7.9
Cardio-respiratory disorders	12	18.8	5.9
Infection	8	12.5	3.9
Neurological	13	20.3	6.4
Gastrointestinal	2	3.1	1.0
Other	2	3.1	1.0
Total	64	100.0	31.5

Note: Rate is per 10,000 live births.

PSANZ-NDC refers to Perinatal Society of Australia and New Zealand - Neonatal Death Classification.

Source: ACT Perinatal Deaths Data Collection, ACT Health

Sixteen neonatal deaths were due to extreme prematurity (these are infants less than 24 weeks gestation and less than 600 grams birthweight). Of these deaths 81.3% (13 of 16) were considered pre-viable and were not resuscitated. Three infants had unsuccessful resuscitation attempts.

Of the 13 neonatal deaths attributable to neurological conditions, seven were due to hypoxic ischaemic encephalopathy, five to intraventricular or intracerebral haemorrhage and one to the category of other neurological abnormality.

Cardiorespiratory conditions caused 12 neonatal deaths, with the main cause identified as pulmonary hypoplasia (8 deaths; 66.7%). There were no deaths attributed to meconium aspiration syndrome.

Of the 11 neonatal deaths attributed to congenital abnormalities, four were classified as central nervous system abnormalities, two cardiovascular system abnormalities and five were classified under other congenital abnormalities.

Of the eight neonatal deaths attributed to infection, two were from congenital bacterial infections, five from acquired bacterial infection and one from viral infection.

There were two neonatal deaths attributed to gastrointestinal conditions.

There was only one neonatal death throughout the five year period where there was an undetermined/unknown cause of death.

5.6 Cause of neonatal mortality by gestational age and birthweight

Extreme prematurity (birth less than 28 weeks gestation) accounted for 46.9% of neonatal deaths. Being born premature (less than 37 weeks gestation) contributed to 73.0% of neonatal deaths. The neonatal mortality rate for pre-term babies (less than 37 weeks gestation) was 35.1 per 1,000 live births and the overall neonatal mortality rate was 3.2 per 1,000 live births.

Table 8: Neonatal deaths by cause and gestational age in the ACT, 2001 - 2005

PSANZ-NDC	Gestational age						Total	
	Less than 28 weeks		28 to 36 weeks		37 weeks or more			
	No.	%	No.	%	No.	%	No.	%
Congenital abnormality	3	10.0	1	5.9	7	41.2	11	17.2
Extreme prematurity	16	53.3	0	0.0	0	0.0	16	25.0
Cardio-respiratory disorders	3	10.0	9	52.9	0	0.0	12	18.8
Infection	3	10.0	4	23.5	1	5.9	8	12.5
Neurological	5	16.7	1	5.9	7	41.2	13	20.3
Gastrointestinal	0	0.0	1	5.9	1	5.9	2	3.1
Other	0	0.0	1	5.9	1	5.9	2	3.1
Total	30	100.0	17	100.0	17	100.0	64	100.0
Rate per 1,000 live births	638.3		13.2		0.9		3.2	

Note: Due to the rounding of percentages totals may not equal 100.0%.

PSANZ-NDC refers to Perinatal Society of Australia and New Zealand - Neonatal Death Classification.

Source: ACT Perinatal Deaths Data Collection, ACT Health

Extremely low birthweight (less than 1,000 grams) accounted for 33 (51.6%) of neonatal deaths (Table 9). Seventy percent of neonatal deaths (70.3%) were of babies with a birthweight of less than 2,500 grams. The neonatal mortality rate for low birthweight babies (less than 2,500 grams) was 41.1 per 1,000 live births.

Table 9: Neonatal deaths by cause and birthweight, ACT, 2001 - 2005

PSANZ-NDC	Birthweight						Total	
	Less than 1,000 grams		1,000 to 2,499 grams		2,500 grams or more			
	No.	%	No.	%	No.	%	No.	%
Congenital abnormality	3	9.1	1	8.3	7	36.8	11	17.2
Extreme prematurity	16	48.5	0	0.0	0	0.0	16	25.0
Cardio-respiratory disorders	6	18.2	4	33.3	2	10.5	12	18.8
Infection	3	9.1	3	25.0	2	10.5	8	12.5
Neurological	5	15.2	2	16.7	6	31.6	13	20.3
Gastrointestinal	0	0.0	2	16.7	0	0.0	2	3.1
Other	0	0.0	0	0.0	2	10.5	2	3.1
Total	33	100.0	12	100.0	19	100.0	64	100.0
Rate per 1,000 live births	687.5		11.5		1.0		3.2	

Note: Due to the rounding of percentages totals may not equal 100.0%.

PSANZ-NDC refers to Perinatal Society of Australia and New Zealand - Neonatal Death Classification.

Source: ACT Perinatal Deaths Data Collection, ACT Health

5.7 Place, type and time of perinatal and neonatal death

Perinatal deaths were also classified into the following categories: fetal death in-utero, intrapartum death, termination of pregnancy, labour ward death and neonatal intensive care death. Two infants died in the emergency department and were not admitted to the neonatal unit, one at two weeks of age from a congenital abnormality, and one following delivery at home with a congenital abnormality. These cases have been classified as neonatal intensive care deaths.

Eighty one percent (81.6%) of perinatal deaths occurred prior to delivery or in the labour ward, Seventeen per cent (17.1%) of these were terminations of pregnancy for congenital abnormalities. Of the labour ward deaths 70% (14 of 20) were less than 28 weeks gestation. Six labour ward deaths were for babies 28 weeks gestation or above, four of these died from pulmonary hypoplasia.

Table 10: Place and type of perinatal death, ACT, 2001 - 2005

Type of perinatal death	No.	%
Fetal death in utero	97	44.7
Intrapartum death	23	10.6
Termination of pregnancy	37	17.1
Labour ward death	20	9.2
Neonatal death	40	18.4
Total	217	100.0

Note: Due to the rounding of percentages totals may not equal 100.0%.
Source: ACT Perinatal Deaths Data Collection, ACT Health

Just over one third (35.0%; 14 of 40) of the neonatal deaths in the Centre for Newborn Care at The Canberra Hospital occurred within the first 24 hours of life, and 45.0% were less than or equal to 1,500 grams (18 of 40) (Table 11). Seventy per cent (70.0%) of neonatal deaths in the neonatal intensive care unit occurred within the first week of life (Table 11).

Table 11: Birthweight and time of neonatal death, Centre for Newborn Care, The Canberra Hospital, ACT, 2001 - 2005

Birthweight	1 day or less	2-3 days	4-7 days	8-14 days	15-21 days	22-28 days	Total
	No.	No.	No.	No.	No.	No.	
Less than 1,500 grams	4	4	5	2	2	1	18
1,500 to 2,499 grams	4	2	0	0	0	0	6
2,500 grams or more	6	2	1	3	4	0	16
Total	14	8	6	5	6	1	40

Source: ACT Perinatal Deaths Data Collection, ACT Health

5.8 Multiple births

During 2001 to 2005 the percentage of babies born from multiple pregnancies in the ACT was 3.2% of the total number of babies born, similar to the percentage of multiple births for Australia (2004: 3.3%).² There were 36 deaths involving twins and 6 deaths involving triplets, contributing to 19.4% of all perinatal deaths.

The fetal, neonatal and perinatal death rates for multiple births were significantly higher than for singleton births ($p < 0.05$) (Table 12).

Table 12: Perinatal deaths by plurality, ACT, 2001 - 2005

Plurality	Total births	Live births	Fetal deaths			Neonatal deaths			Perinatal deaths		
			No.	Rate	95% CI	No.	Rate	95% CI	No.	Rate	95% CI
Singleton	19,743	19,617	126	6.4	5.3 - 7.5	49	2.5	1.8 - 3.2	175	8.9	7.6 - 10.2
Twins	670	643	27	40.3	25.4 - 55.2	9	14.0	4.9 - 23.1	36	53.7	36.7 - 70.8
Triplets	24	24	0	0.0	0.0 - 0.0	6	250.0	76.8 - 423.2	6	250.0	76.8 - 423.2
Multiple births	694	667	27	38.9	24.5 - 53.3	15	22.5	11.2 - 33.7	42	60.5	42.8 - 78.3
Total	20,437	20,284	153	7.5	6.3 - 8.7	64	3.2	2.4 - 3.9	217	10.6	9.2 - 12.0

Note: Fetal death rates and perinatal death rates are per 1,000 births. Neonatal death rates are per 1,000 live births.
Source: ACT Maternal and Perinatal Data Collection, ACT Health and ACT Perinatal Deaths Data Collection, ACT Health, 2001 - 2005

The percentage of extremely low birthweight perinatal deaths (less than 1,000 grams) was not significantly different for multiple births (68.3%) and singleton births (55.8%).

The main causes of perinatal death in singleton babies were congenital abnormalities (28.0%), unexplained antepartum death (16.0%), spontaneous preterm birth (12.0%) and antepartum haemorrhage (10.9%). The main causes of perinatal deaths in multiple birth babies were specific perinatal conditions (38.1%), spontaneous preterm birth (23.8%) and unexplained antepartum death (11.9%) (Table 13). Twin to twin transfusion syndrome contributed to 12 of the 16 perinatal deaths of multiple birth babies in the specific perinatal conditions category.

Multiple birth babies were significantly more likely to die from a spontaneous preterm birth than singleton babies (RR = 2.0, p<0.05). The risk of dying of a specific perinatal condition was significantly higher for multiple birth babies (RR = 6.7, p<0.05), primarily due to the inclusion of twin to twin transfusion syndrome in this category.

Table 13: Perinatal deaths by cause and plurality, ACT, 2001 - 2005

PSANZ-PDC	Singleton			Multiple			Relative Risk	95% CI	
	No.	%	Rate	No.	%	Rate		Low	High
Congenital abnormality	49	28.0	2.5	5	11.9	7.2	0.4	0.2	1.0
Perinatal infection	6	3.4	0.3	2	4.8	2.9	1.4	0.3	6.6
Hypertension	5	2.9	0.3	0	0.0	0.0			
Antepartum haemorrhage	19	10.9	1.0	2	4.8	2.9	0.4	0.1	1.8
Maternal conditions	1	0.6	0.1	0	0.0	0.0			-
Specific perinatal conditions	10	5.7	0.5	16	38.1	23.1	6.7	3.3	13.6
Hypoxic peripartum deaths	8	4.6	0.4	1	2.4	1.4	0.5	0.1	4.1
Fetal growth restriction	20	11.4	1.0	0	0.0	0.0			-
Spontaneous preterm	21	12.0	1.1	10	23.8	14.4	2.0	1.0	3.9
Unexplained antepartum death	28	16.0	1.4	5	11.9	7.2	0.7	0.3	1.8
No obstetric antecedent	8	4.6	0.4	1	2.4	1.4	0.5	0.1	4.1
Total	175	100.0	8.9	42	100.0	60.5			

Note: Rates are per 1,000 births.
Due to the rounding of percentages totals may not equal 100.0%.
PSANZ-PDC refers to Perinatal Society of Australia and New Zealand - Perinatal Death Classification.
Source: ACT Perinatal Deaths Data Collection, ACT Health, 2001 - 2005

5.9 Maternal characteristics

Maternal age is an important risk factor for adverse perinatal outcomes. Adverse outcomes are more likely to occur in younger (less than 20 years) or older (greater than 40 years) mothers.²

The ACT perinatal mortality and fetal death rates for women aged 40 years or more were significantly higher than the mortality rate for women aged 20 to 39 years ($p < 0.05$) (Table 14). There was no significant relationship between maternal age and neonatal death rates.

Table 14: Perinatal deaths by maternal age, ACT, 2001 - 2005

Maternal age	Total births	Live births	Fetal deaths			Neonatal deaths			Perinatal deaths		
			No.	Rate	95% CI	No.	Rate	95% CI	No.	Rate	95% CI
Less than 20 years	595	591	4	6.7	0.2 - 13.3	3	5.1	0.7 - 10.8	7	11.8	3.1 - 20.4
20-29 years	8,139	8,090	49	6.0	4.3 - 7.7	26	3.2	2.0 - 4.4	75	9.2	7.1 - 11.3
30-39 years	10,965	10,882	83	7.6	5.9 - 9.2	32	2.9	1.9 - 4.0	115	10.5	8.6 - 12.4
40 years or more	738	721	17	23.0	12.2 - 33.9	3	4.2	0.5 - 8.9	20	27.1	15.4 - 38.8
Total	20,437	20,284	153	7.5	6.3 - 8.7	64	3.2	2.4 - 3.9	217	10.6	9.2 - 12.0

Note: Fetal death rates and perinatal death rates are per 1,000 births. Neonatal death rates are per 1,000 live births.
Source: ACT Maternal and Perinatal Data Collection, and ACT Perinatal Deaths Data Collection, 2001 - 2005

The average age of women who experienced a perinatal death was 30.1 years. Nine percent (8.5%) of women had conceived with assisted reproduction technology. Fifteen percent (15.2%) of women were documented to smoke cigarettes, 2.3% marijuana, 0.5% methadone and 2.8% as using other illicit drugs.

There were no significant differences in perinatal death rates for women who smoked during pregnancy compared with non-smokers or for primigravida women compared with multigravida women.

5.10 Aboriginal and Torres Strait Islander perinatal mortality

In the years 2001-2005 there were only two perinatal deaths for babies born to Aboriginal and Torres Strait Islander women. There is no evidence of a higher rate of perinatal deaths for Aboriginal and Torres Strait Islander people in the ACT.

5.11 Perinatal autopsy

The perinatal autopsy rate for the ACT from 2001-2005 was 53.9% (Table 15). Perinatal autopsy was declined for 28.6% of babies and a request for autopsy was not requested for 11.1% of babies.

In 2005, the perinatal autopsy rate for South Australia was 51%³; New South Wales was 37.7%⁴; Victoria was 28.6%⁵; and Queensland was 26.3%⁶.

Table 15: Perinatal autopsy by type of perinatal death, ACT, 2001 - 2005

Perinatal autopsy	Fetal death		Neonatal death		Total	
	No	%	No	%	No	%
Performed	86	56.2	31	48.4	117	53.9
Declined	33	21.6	29	45.3	62	28.6
Not requested	21	13.7	3	4.7	24	11.1
Not stated	13	8.5	1	1.6	14	6.5
Total	153	100.0	64	100.0	217	100.0

Note: Due to the rounding of percentages totals may not equal 100.0%.

Source: ACT Perinatal Deaths Data Collection, ACT Health, 2001 - 2005

Perinatal autopsies were performed for 56.2% of fetal deaths and 48.4% of neonatal death. Perinatal autopsy was declined for almost half (45.3%) of neonatal deaths compared with 21.6% of fetal deaths (Table 15).

Perinatal autopsy was performed most frequently for maternal conditions (100%), deaths with no obstetric antecedent (77.8%), perinatal infection (75.0%) and unexplained antepartum death (72.7%).

Table 16: Perinatal autopsy by cause and type of death, ACT, 2001 - 2005

PSANZ-PDC	Fetal deaths		Neonatal deaths		Perinatal deaths	
	No.	%	No.	%	No.	%
Congenital abnormality	20	46.5	6	54.5	26	48.1
Perinatal infection	3	60.0	3	100.0	6	75.0
Hypertension	2	66.7	0	0.0	2	40.0
Antepartum haemorrhage	5	31.3	1	20.0	6	28.6
Maternal conditions	0	0.0	1	100.0	1	100.0
Specific perinatal conditions	9	42.9	2	40.0	11	42.3
Hypoxic peripartum deaths	4	80.0	2	50.0	6	66.7
Fetal growth restriction	13	81.3	1	25.0	14	70.0
Spontaneous preterm	5	55.6	9	40.9	14	43.3
Unexplained antepartum death	24	72.7	0	0.0	24	72.7
No obstetric antecedent	1	50.0	6	85.7	7	77.8
Total	86	56.2	31	48.4	117	53.7

Note: Percentages refer to the percentage of autopsies performed in each category. For example 46.5% of fetal deaths within the congenital abnormality category had an autopsy.

PSANZ-PDC refers to Perinatal Society of Australia and New Zealand - Perinatal Death Classification.

Source: ACT Perinatal Deaths Data Collection, ACT Health, 2001 - 2005

6. COMPARISON WITH NATIONAL DATA

6.1 Perinatal mortality rates

Comparisons of perinatal mortality rates across jurisdictions require the same definitions and criteria to be applied to the data. The definition used by the Australian Bureau of Statistics is based on birthweight, with the inclusion of all fetuses and infants of at least 400 grams birthweight regardless of gestational age. Gestational age is only considered when birthweight is unknown.⁷

These criteria have been applied to the ACT Maternal and Perinatal data and the ACT Perinatal Deaths data in Table 17. There was no significant difference between fetal death rates and perinatal mortality rates for the ACT and Australia between 2001 and 2005 for either the annual rates or for the five-year combined rates. The ACT neonatal mortality rate in 2001 was significantly lower than the Australian rate, however the following years and the five-year combined rate showed no significant difference.

Table 17: Fetal, neonatal and perinatal mortality rates, birthweight of 400 grams or more, ACT and Australia, 2001 - 2005

Type of deaths	Year	ACT residents			Australia		
		Rate	95% CI		Rate	95% CI	
Fetal deaths	2001	6.4	3.9	- 8.9	5.2	4.9	- 5.5
	2002	4.4	2.4	- 6.5	4.9	4.6	- 5.2
	2003	7.5	4.9	- 10.2	5.1	4.8	- 5.4
	2004	4.6	2.5	- 6.7	5.3	5.0	- 5.6
	2005	5.6	3.4	- 7.8	5.4	5.1	- 5.7
	2001 - 2005	5.7	4.7	- 6.8	5.2	5.1	- 5.3
Neonatal deaths	2001	1.6	0.3	- 2.8	3.3	3.0	- 3.5
	2002	2.2	0.8	- 3.7	3.1	2.9	- 3.3
	2003	3.4	1.6	- 5.2	2.9	2.7	- 3.1
	2004	4.7	2.6	- 6.7	2.8	2.6	- 3.0
	2005	3.1	1.4	- 4.7	3.1	2.9	- 3.3
	2001 - 2005	3.0	2.3	- 3.8	3.0	2.9	- 3.1
Perinatal deaths	2001	8.0	5.2	- 10.8	8.4	8.1	- 8.8
	2002	6.7	4.2	- 9.2	8.0	7.7	- 8.4
	2003	10.9	7.8	- 14.1	8.0	7.7	- 8.4
	2004	9.2	6.3	- 12.2	8.0	7.7	- 8.4
	2005	8.6	5.9	- 11.4	8.5	8.1	- 8.8
	2001 - 2005	8.7	7.4	- 10.0	8.2	8.0	- 8.3

Note: Fetal death rates and perinatal death rates are per 1,000 births. Neonatal death rates are per 1,000 live births.
Source: ACT Maternal and Perinatal Data Collection, ACT Health, ACT Perinatal Deaths Data Collection, ACT Health and Causes of Death, Australia, ABS Cat. No. 3303.0

It should be noted that the ABS reports by year of death registration, whereas ACT Health reports using a year of birth cohort. Therefore there are slight differences in the number of perinatal deaths reported each year.

6.2 Antecedent causes of death

The main antecedent causes of perinatal death in the ACT were congenital anomalies, unexplained antepartum deaths, spontaneous preterm births and specific perinatal conditions. This is similar to the most frequent causes of perinatal mortality in Victoria, South Australia and Queensland (Table 18). The percentage of perinatal deaths due to maternal conditions in Victoria (24.1%) was significantly higher than the ACT (0.5%), South Australia (1.0%), and Queensland (3.9%). This was due to the inclusion of terminations of pregnancy for reasons other than congenital abnormalities in this category in Victoria.

The percentage of perinatal deaths due to congenital abnormalities, spontaneous preterm births and specific perinatal conditions did not differ significantly between jurisdictions. However, the percentage of unexplained antepartum deaths in South Australia during 2005 was significantly lower than the rate for the ACT during 2001 to 2005. This is most likely to be due to the fluctuations in percentages based on the small number of perinatal deaths in both the ACT and South Australia. During 2001 to 2005 the percentage of unexplained antepartum deaths in South Australia ranged from 7.8% in 2005 to 18.8% in 2003.⁸

Table 18: Antecedent causes of perinatal deaths, ACT, Victoria South Australia and Queensland, 2001 - 2005

PSANZ-PDC	ACT 2001-2005		Victoria ^{a,b.} 2005		South Australia 2005		Queensland 2004	
	No.	%	No.	%	No.	%	No.	%
Congenital abnormality	54	24.9	187	22.1	56	29.2	121	22.2
Unexplained antepartum death	33	15.2	112	13.2	15	7.8	128	23.5
Spontaneous preterm	31	14.3	145	17.1	31	16.1	121	22.2
Specific perinatal conditions	26	12.0	58	6.9	19	9.9	40	7.3
Antepartum haemorrhage	21	9.7	46	5.4	18	9.4	45	8.3
Fetal growth restriction	20	9.2	34	4.0	16	8.3	16	2.9
Hypoxic peripartum deaths	9	4.1	17	2.0	9	4.7	14	2.6
No obstetric antecedent	9	4.1	3	0.4	1	0.5	14	2.6
Perinatal infection	8	3.7	16	1.9	16	8.3	11	2.0
Hypertension	5	2.3	24	2.8	9	4.7	14	2.6
Maternal conditions	1	0.5	204	24.1	2	1.0	21	3.9
Total	217	100.0	846	100.0	192	100.0	545	100.0

a. Maternal conditions include terminations of pregnancy at 20 weeks gestation or more for psychosocial indications (no fetal anomaly). There were 197 fetal deaths classified in this category.

b. Congenital abnormality includes terminations of pregnancy at 20 weeks or more gestation.

PSANZ-PDC refers to Perinatal Society of Australia and New Zealand - Perinatal Death Classification.

Source: ACT Perinatal Deaths Data Collection, ACT Health, 2001 to 2005; Consultative Council on Obstetric and Paediatric Mortality and Morbidity, Victoria, 2005⁹; Maternal, Perinatal and Infant Mortality Committee, South Australia 2005¹⁰ and Perinatal Statistics, 2004, Queensland Health.¹¹

7. APPENDIX A - SUMMARY OF PERINATAL DEATHS

Table 19: Summary of perinatal deaths by state of residence, by year, ACT, 2001 - 2005

Year	Type of death	ACT residents		Non ACT residents		Total	
		No.	%	No.	%	No.	%
2001	Fetal deaths	29	82.9	6	33.3	35	66.0
	Neonatal deaths	6	17.1	12	66.7	18	34.0
	Perinatal deaths	35	100.0	18	100.0	53	100.0
2002	Fetal deaths	25	73.5	10	40.0	35	59.3
	Neonatal deaths	9	26.5	15	60.0	24	40.7
	Perinatal deaths	34	100.0	25	100.0	59	100.0
2003	Fetal deaths	38	69.1	15	55.6	53	64.6
	Neonatal deaths	17	30.9	12	44.4	29	35.4
	Perinatal deaths	55	100.0	27	100.0	82	100.0
2004	Fetal deaths	25	56.8	8	50.0	33	55.0
	Neonatal deaths	19	43.2	8	50.0	27	45.0
	Perinatal deaths	44	100.0	16	100.0	60	100.0
2005	Fetal deaths	36	73.5	12	66.7	48	71.6
	Neonatal deaths	13	26.5	6	33.3	19	28.4
	Perinatal deaths	49	100.0	18	100.0	67	100.0
Total	Fetal deaths	153	70.5	51	49.0	204	63.6
	Neonatal deaths	64	29.5	53	51.0	117	36.4
	Perinatal deaths	217	100.0	104	100.0	321	100.0

Note: State of residence refers to maternal state of residence.

Source: ACT Maternal and Perinatal Data Collection, and ACT Perinatal Deaths Data Collection, ACT Health

8. APPENDIX B - ACT PERINATAL DEATH FORM – 2005



Mother's Sticky Label

ACT CONFIDENTIAL REPORT ON PERINATAL DEATH

Return completed form to:

Infant's Sticky Label

Dr Alison Kent
Centre of Newborn Care
Maternity Unit
The Canberra Hospital
P.O. Box 11, Woden, ACT 2606

Copy sent to Dr Alison Kent Yes / No
Copy placed in patient notes Yes / No

ACT CONFIDENTIAL REPORT ON PERINATAL DEATH

Date information collected/...../.....

Information collected by

<p>Father's Surname</p> <p>Father's Suburb Postcode</p> <p>Family Status</p> <p>1 Never Married 5 Married/Defacto</p> <p>2 Widowed</p> <p>3 Separated 6 Not Stated</p> <p>4 Divorced</p> <p>Indigenous Status</p> <p>1 Aboriginal</p> <p>2 Torres Strait Islander</p> <p>3 Aboriginal and Torres Strait Islander</p> <p>4 Non indigenous</p> <p>9 Not stated</p> <p>Classification</p> <p>1 Public 2 Private</p> <p>Previous Pregnancies? 0 No 1 Yes</p> <p>Number of:</p> <p>_____ Live Births (survived to 28 days)</p> <p>_____ Neonatal Deaths (NND)</p> <p>_____ Stillbirths</p> <p>_____ Spontaneous abortion</p> <p>_____ Induced abortion</p> <p>_____ Ectopic pregnancies</p> <p><small>Note: Livebirths, NND and stillbirths must be 20 weeks gestation or at least 400 grams in birth weight</small></p> <p>History of multiple births 0 No 1 Yes</p> <p>This Pregnancy</p> <p>Gravidity _____ Parity _____ (exclude this pregnancy)</p> <p>Date of last menstrual period/...../.....</p> <p>Clinically estimated gestation (weeks) _____</p>	<p>Maternal medical conditions while pregnant (may circle more than one)</p> <p>1 Type II Diabetes Mellitus</p> <p>2 Chronic renal disease</p> <p>3 Essential hypertension</p> <p>4 Epilepsy</p> <p>5 Cardiac disease</p> <p>6 Maternal injury</p> <p>7 Abdominal operation</p> <p>8 Malignancy (specify)</p> <p>9 Infection (specify)</p> <p>10 Maternal death (specify cause)</p> <p>88 Other</p> <p>Obstetric Complications (may circle more than one)</p> <p>1 APH/Placenta praevia</p> <p>2 APH-other</p> <p>3 Abruption placenta</p> <p>4 Pregnancy induced hypertension</p> <p>5 Pre labour ruptured membranes</p> <p>6 ROM < 24 hours</p> <p>7 ROM > 24 hours</p> <p>8 Gestational diabetes</p> <p>9 Threatened abortion</p> <p>10 Threatened preterm labour</p> <p>11 Fetal distress</p> <p>12 IUGR</p> <p>13 Oligohydramnios</p> <p>14 Polyhydramnios</p> <p>15 Twin twin transfusion syndrome (TTTS)</p> <p>16 Fetal anomaly</p> <p>88 Other (specify)</p> <p>.....</p> <p>.....</p>
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<p>Procedures and Operations</p> <p>Number of ultrasounds _____</p> <p>0 None 1 Cardiocography 2 Chorionic villus sampling 3 Amniocentesis < 20 weeks 4 Amniocentesis > 20 weeks 5 X-Ray 6 CT Scan/MRI 7 Cervical suture</p> <p style="text-align: right;">No Yes</p> <p>Assisted conception.....0..... 1</p> <p>1 Hyperovulation 2 IVF/GIFT 3 Other (specify) 4 Not stated</p> <p>Responsibility for Antenatal Care</p> <p>1 Obstetrician 2 General practitioner 3 Midwife (with max 2 GP) 4 Antenatal clinic 7 Birth centre or CMP protocols 5 Shared care 9 Not stated</p> <p>Duration of pregnancy at first visit _____</p> <p>No. of visits</p> <p>1 None 2 1 to 5 3 6 to 10 4 11 to 15 5 16 to 20 6 More than 20</p> <p>Baby's Place of Birth</p> <p>1 The Canberra Hospital 2 TCH Birth Centre 3 Calvary Public 4 Calvary Private 5 John James Memorial 6 National Capital Private 7 Home 8 Born before arrival</p> <p>Intended Place of birth at onset of labour</p> <p>1 Hospital 2 Birth centre 4 Home</p> <p>Was mother transferred Antenatally?</p> <p>1 No 2 Prior to labour 3 During labour</p> <p>Transferred from</p> <p>1 Planned homebirth 2 Birth centre 3 Another ACT hospital 4 Interstate hospital</p> <p>Reason for transfer</p>	<p>Drugs during pregnancy?</p> <p style="text-align: right;">No Yes</p> <p>Nicotine/Cigarettes.....0..... 1 Heroin.....0..... 1 Methadone.....0..... 1 Cocaine.....0..... 1 Marijuana.....0..... 1 Other (specify).....0..... 1</p> <p>Onset and type of labour</p> <p>1 Spontaneous 2 Induction 3 No labour</p> <p style="text-align: right;">No Yes</p> <p>Augmented.....0..... 1</p> <p>Method of augmentation or induction</p> <p>1 Oxytocin 2 Prostaglandins 3 ARM 4 Other (specify).....</p> <p>Reason for augmentation or induction</p> <p>Corticosteroids</p> <p>0 Not stated 1 None 2 Less than 24 hours prior to baby's birth 3 Complete 4 More than 7 days before baby's birth</p> <table border="0"> <tr> <td>Analgesia</td> <td>Anaesthesia</td> </tr> <tr> <td>1 None</td> <td>1 None</td> </tr> <tr> <td>2 Nitrous oxide</td> <td>2 Local to perineum</td> </tr> <tr> <td>3 IMI Narcotic</td> <td>3 Pudendal</td> </tr> <tr> <td>4 Epidural</td> <td>4 Epidural</td> </tr> <tr> <td>5 Spinal</td> <td>5 Spinal</td> </tr> <tr> <td>8 Other (specify).....</td> <td>6 General</td> </tr> <tr> <td></td> <td>8 Other (specify).....</td> </tr> </table> <p>Presentation</p> <p>1 Vertex 2 Breech 3 Face 4 Brow 8 Other (compound specify).....</p> <p>Method of birth</p> <p>1 Spontaneous cephalic 2 Forceps 3 Vaginal breech 4 Caesarean Section 5 Vacuum extraction 8 Other (specify).....</p> <p>If Caesarean Section was there a medical or obstetric emergency?0 No... 1 Yes</p> <p>Complications of labour and birth</p> <p>1 None 2 Fetal distress 3 Cord prolapse 4 Obstructed labour 5 PPH 6 Retained placenta 7 Major infection 8 Uterine rupture</p>	Analgesia	Anaesthesia	1 None	1 None	2 Nitrous oxide	2 Local to perineum	3 IMI Narcotic	3 Pudendal	4 Epidural	4 Epidural	5 Spinal	5 Spinal	8 Other (specify).....	6 General		8 Other (specify).....
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<p>Birth Outcome</p> <p>0 Stillbirth</p> <p>2 Neonatal Death</p> <p>Date of birth/stillbirth/...../.....</p> <p>Date of Neonatal Death/...../.....</p> <p>Age at deathday(s)hour(s)</p> <p>Sex</p> <p>1 Male 2 Female 3 Indeterminate</p> <p>Plurality</p> <p>1 Singleton 2 Twins 3 Triplets 8 Other</p> <p>Birth weight.....grams</p> <p>Head circumferencecm</p> <p>Lengthcm</p> <p>Apgar</p> <p> At 1 minute _____</p> <p> At 5 minutes _____</p> <p>Resuscitation – Active measures</p> <p>1 None</p> <p>2 Suction</p> <p>3 Oxygen therapy</p> <p>4 IPPV – bag and mask</p> <p>5 IPPV – intubation</p> <p>6 External cardiac massage</p> <p>Laryngoscopy1 Yes2 No</p> <p>Resuscitation – Drug therapy</p> <p>1 None</p> <p>2 Narcotic antagonist</p> <p>3 Sodium bicarbonate</p> <p>4 Adrenaline</p> <p>5 Other drugs (specify)</p> <p>Who performed resuscitation?</p> <p>0 Not done</p> <p>1 Neonatologist 5 Neonatal Registrar</p> <p>2 Paediatrician 6 Paediatric Registrar</p> <p>3 Obstetrician 7 Obstetric Registrar</p> <p>4 Neonatal Nurse 8 Midwife</p> <p>9 Other (specify).....</p> <p>Admission to SCN/NICU?</p> <p>1 YesLength of stay (days) _____</p> <p>2 No</p> <p>PostMortem</p> <p>0 Not stated 2 Refused</p> <p>1 Not requested 3 Done</p> <p>Histology of placenta?</p> <p>0 No</p> <p>1 Yes (If histology performed include report)</p> <p>2 Unknown</p> <p>Chorioamnionitis?</p> <p>0 Unknown</p> <p>1 None</p> <p>2 Clinically suspected</p> <p>3 Pathology proven</p> <p>4 Clinically & pathologically proven</p>	<p>Funisitis?</p> <p>0 Unknown</p> <p>1 None</p> <p>2 Pathologically proven</p> <p>Calcifications/Infarcts?</p> <p>0 No</p> <p>1 Yes</p> <p>APH?</p> <p>0 No</p> <p>1 Yes</p> <p>Bleeding during pregnancy?</p> <p>0 Not stated</p> <p>1 None</p> <p>2 Placental abruption</p> <p>3 Placenta praevia</p> <p>4 Vasa praevia</p> <p>5 Undetermined</p> <p>6 Other</p> <p>Was hypertension present?</p> <p>0 Not stated</p> <p>1 None</p> <p>2 Chronic hypertension – essential</p> <p>3 Chronic hypertension – renal disease</p> <p>4 Pregnancy induced</p> <p>5 Chronic superimposed PIH</p> <p>Was death an unexplained antepartum death?</p> <p>0 No</p> <p>1 Yes</p> <p>2 Unknown</p> <p>Was there fetal growth restriction?</p> <p>0 No</p> <p>1 Yes - idiopathic</p> <p>2 Yes - placental pathology</p> <p>3 Yes - Other</p> <p>4 Unknown</p> <p>Was there intrapartum asphyxia?</p> <p>0 No</p> <p>1 Yes</p> <p>2 Unknown</p> <p>Was there cord complications?</p> <p>0 No</p> <p>1 Yes (Specify)</p> <p>2 Unknown</p> <p>Was haematological disease present?</p> <p>0 No</p> <p>1 Yes - Resus incompatibility</p> <p>2 Yes - Other fetomaternal blood group incompatibility</p> <p>3 Yes – Haemoglobinopathy</p> <p>4 Unknown</p>
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<p>Was a major fetal anomaly present? 0 No 1 Yes (Specify) 2 Unknown</p> <p>Was there fetal/infant infection? 0 No 1 Yes 2 Unknown</p> <p>Infection documented 0 None 1 GBS 2 Listeria 3 CMV 4 Parvovirus 5 HSV 6 Rubella 7 Toxoplasmosis 8 Syphilis 9 E. coli 10 U histolytica 11 Other</p> <p>Other conditions present 0 None 1 Twin Twin Transfusion Syndrome (TTTS) 2 Idiopathic hydrops 3 Feto-maternal haemorrhage 4 Uterine abnormality 5 Drug dependence/abuse 6 Haemolytic disease 7 Birth trauma 8 Accident, poisoning or violence 9 Cervical incompetence 10 Other</p> <table style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th rowspan="2">Gestation</th> <th colspan="2">Weight (grams)</th> <th colspan="2">10th percentile</th> </tr> <tr> <th>Male</th> <th>Female</th> <th>Male</th> <th>Female</th> </tr> </thead> <tbody> <tr><td>22</td><td>400</td><td>400</td><td></td><td></td></tr> <tr><td>23</td><td>500</td><td>470</td><td></td><td></td></tr> <tr><td>24</td><td>520</td><td>540</td><td></td><td></td></tr> <tr><td>25</td><td>620</td><td>620</td><td></td><td></td></tr> <tr><td>26</td><td>720</td><td>680</td><td></td><td></td></tr> <tr><td>27</td><td>740</td><td>730</td><td></td><td></td></tr> <tr><td>28</td><td>850</td><td>760</td><td></td><td></td></tr> <tr><td>29</td><td>950</td><td>890</td><td></td><td></td></tr> <tr><td>30</td><td>1080</td><td>1045</td><td></td><td></td></tr> <tr><td>31</td><td>1310</td><td>1140</td><td></td><td></td></tr> <tr><td>32</td><td>1400</td><td>1340</td><td></td><td></td></tr> <tr><td>33</td><td>1640</td><td>1520</td><td></td><td></td></tr> <tr><td>34</td><td>1840</td><td>1760</td><td></td><td></td></tr> <tr><td>35</td><td>2110</td><td>2030</td><td></td><td></td></tr> <tr><td>36</td><td>2320</td><td>2220</td><td></td><td></td></tr> <tr><td>37</td><td>2550</td><td>2430</td><td></td><td></td></tr> <tr><td>38</td><td>2780</td><td>2660</td><td></td><td></td></tr> <tr><td>39</td><td>2940</td><td>2820</td><td></td><td></td></tr> <tr><td>40</td><td>3070</td><td>2950</td><td></td><td></td></tr> <tr><td>41</td><td>3180</td><td>3050</td><td></td><td></td></tr> <tr><td>42</td><td>3210</td><td>3080</td><td></td><td></td></tr> <tr><td>43</td><td>3080</td><td>2950</td><td></td><td></td></tr> <tr><td>44</td><td>3050</td><td>2930</td><td></td><td></td></tr> </tbody> </table> <p style="font-size: small; margin-top: 5px;">Reference: Roberts C, Lancaster P (1999) Australian national birthweight percentiles by gestational age. MJA Vol. 170: 114-118</p>	Gestation	Weight (grams)		10 th percentile		Male	Female	Male	Female	22	400	400			23	500	470			24	520	540			25	620	620			26	720	680			27	740	730			28	850	760			29	950	890			30	1080	1045			31	1310	1140			32	1400	1340			33	1640	1520			34	1840	1760			35	2110	2030			36	2320	2220			37	2550	2430			38	2780	2660			39	2940	2820			40	3070	2950			41	3180	3050			42	3210	3080			43	3080	2950			44	3050	2930			<p>Immediate Cause of Death: Clinical ICD-10-AM Code _____ Relevant factors: Antenatal: Intrapartum: Postpartum:</p> <p>Immediate Cause of Death: Post Mortem ICD-10-AM Code _____ </p> <p>Other Cause(s) of Death: Clinical ICD-10-AM Code _____ </p> <p>Other Cause(s) of Death: Post Mortem ICD-10-AM Code _____ </p> <p>Cause of Death Classifications Australia and New Zealand Antecedent Classification of Perinatal Mortality (ANZACPM) 1 Congenital abnormality 2 Perinatal infection 3 Hypertension 4 Antepartum haemorrhage 5 Maternal conditions 6 Specific perinatal conditions 7 Hypoxic peripartum death 8 Fetal growth restriction 9 Spontaneous preterm 10 Unexplained antepartum death 11 No obstetric antecedent</p> <p>Australia and New Zealand Neonatal Death Classification (ANZND) 1 Congenital abnormality 2 Extreme prematurity 3 Cardio-respiratory disorders 4 Infection 5 Neurological 6 Gastrointestinal 7 Other</p> <p>ANZACPM: _____ ANZND: _____</p> <p style="font-size: x-small; margin-top: 5px;">Note: Full Classification done by neonatologist, perinatal pathologist and midwife/clinical coder using the classification guideline from the National Perinatal Data Development Committee as of 1 November 2000.</p>
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9. APPENDIX C - PSANZ PERINATAL MORTALITY CLASSIFICATIONS

PSANZ Perinatal Death Classification (PSANZ-PDC)

1 Congenital abnormality (including terminations for congenital abnormalities)

- 1.1 Central nervous system
- 1.2 Cardiovascular system
- 1.3 Urinary system
- 1.4 Gastrointestinal system
- 1.5 Chromosomal
- 1.6 Metabolic
- 1.7 Multiple/non chromosomal syndromes
- 1.8 Other congenital abnormality
 - 1.81 Musculoskeletal
 - 1.82 Respiratory
 - 1.83 Diaphragmatic hernia
 - 1.84 Haematological
 - 1.85 Tumours
 - 1.88 Other specified congenital abnormality
- 1.9 Unspecified congenital abnormality

2 Perinatal infection

- 2.1 Bacterial
 - 2.11 Group B Streptococcus
 - 2.12 E coli
 - 2.13 Listeria monocytogenes
 - 2.14 Spirochaetal e.g. Syphilis
 - 2.18 Other bacterial
 - 2.19 Unspecified bacterial
- 2.2 Viral
 - 2.21 Cytomegalovirus
 - 2.22 Parvovirus
 - 2.23 Herpes simplex virus
 - 2.24 Rubella virus
 - 2.28 Other viral
 - 2.29 Unspecified viral
- 2.3 Protozoal e.g. Toxoplasma
- 2.5 Fungal
- 2.8 Other specified organism
- 2.9 Other unspecified organism

3 Hypertension

- 3.1 Chronic hypertension: essential
- 3.2 Chronic hypertension: secondary, e.g. renal disease
- 3.3 Chronic hypertension: unspecified
- 3.4 Gestational hypertension
- 3.5 Pre-eclampsia
 - 3.51 With laboratory evidence of thrombophilia
- 3.6 Pre-eclampsia superimposed on chronic hypertension
 - 3.61 With laboratory evidence of thrombophilia
- 3.9 Unspecified hypertension

4 Antepartum haemorrhage (APH)

- 4.1 Placental abruption
 - 4.11 With laboratory evidence of thrombophilia
- 4.2 Placenta praevia
- 4.3 Vasa praevia
- 4.8 Other APH
- 4.9 APH of undetermined origin

5 Maternal conditions

- 5.1 Termination of pregnancy for maternal psychosocial indications
- 5.2 Diabetes / Gestational diabetes
- 5.3 Maternal injury
 - 5.31 Accidental
 - 5.32 Non-accidental
- 5.4 Maternal sepsis
- 5.5 Lupus obstetric syndrome
- 5.6 Obstetric cholestasis
- 5.8 Other specified maternal conditions

6 Specific perinatal conditions

- 6.1 Twin-twin transfusion
- 6.2 Fetomaternal haemorrhage
- 6.3 Antepartum cord complications (e.g. cord haemorrhage; true knot with evidence of occlusion)
- 6.4 Uterine abnormalities, e.g. bicornuate uterus, cervical incompetence
- 6.5 Birth trauma (typically infants of >24 weeks gestation or >600g birthweight)
- 6.6 Alloimmune disease
 - 6.61 Rhesus
 - 6.62 ABO
 - 6.63 Kell
 - 6.64 Alloimmune thrombocytopenia
 - 6.68 Other
 - 6.69 Unspecified
- 6.7 Idiopathic hydrops
- 6.8 Other specific perinatal conditions (includes iatrogenic conditions such as rupture of membranes after amniocentesis, termination of pregnancy for suspected but unconfirmed congenital abnormality).

7 Hypoxic peripartum death (typically infants of >24 weeks gestation or >600g birthweight)

- 7.1 With intrapartum complications
 - 7.11 Uterine rupture
 - 7.12 Cord prolapse
 - 7.13 Shoulder dystocia
 - 7.18 Other
- 7.2 Evidence of non-reassuring fetal status in a normally grown infant (e.g. abnormal fetal heart rate, fetal scalp pH/lactate, fetal pulse oximetry without intrapartum complications)
- 7.3 No intrapartum complications and no evidence of non-reassuring fetal status.
- 7.9 Unspecified hypoxic peripartum death

8 Fetal Growth Restriction (FGR)

- 8.1 With evidence of reduced vascular perfusion on Doppler studies and /or placental histopathology (e.g. significant infarction, acute atherosclerosis, maternal and/or fetal vascular thrombosis or maternal floor infarction)
- 8.2 With chronic villitis
- 8.3 No placental pathology

- 8.4 No examination of placenta
- 8.8 Other specified placental pathology
- 8.9 Unspecified or not known whether placenta examined

9 Spontaneous preterm (<37 weeks gestation)

- 9.1 Spontaneous preterm with intact membranes, or membrane rupture <24 hours before delivery
 - 9.11 With chorioamnionitis on placental histopathology
 - 9.12 Without chorioamnionitis on placental histopathology
 - 9.13 With clinical evidence of chorioamnionitis, no examination of placenta
 - 9.17 No clinical signs of chorioamnionitis, no examination of placenta
 - 9.19 Unspecified or not known whether placenta examined
- 9.2 Spontaneous preterm with membrane rupture ≥24 hours before delivery
 - 9.21 With chorioamnionitis on placental histopathology
 - 9.22 Without chorioamnionitis on placental histopathology
 - 9.23 With clinical evidence of chorioamnionitis, no examination of placenta
 - 9.27 No clinical signs of chorioamnionitis, no examination of placenta
 - 9.29 Unspecified or not known whether placenta examined
- 9.3 Spontaneous preterm with membrane rupture of unknown duration before delivery
 - 9.31 With chorioamnionitis on placental histopathology
 - 9.32 Without chorioamnionitis on placental histopathology
 - 9.33 With clinical evidence of chorioamnionitis, no examination of placenta
 - 9.37 No clinical signs of chorioamnionitis, no examination of placenta
 - 9.39 Unspecified or not known whether placenta examined

10 Unexplained antepartum death

- 10.1 With evidence of reduced vascular perfusion on Doppler studies and /or placental histopathology (e.g. significant infarction, acute atherosclerosis, maternal and/or fetal vascular thrombosis or maternal floor infarction)
- 10.2 With chronic villitis
- 10.3 No placental pathology
- 10.4 No examination of placenta
- 10.8 Other specified placental pathology
- 10.9 Unspecified or not known whether placenta examined

11 No obstetric antecedent

- 11.1 Sudden Infant Death Syndrome (SIDS)
 - 11.11 SIDS Category IA: Classic features of SIDS present and completely documented.
 - 11.12 SIDS Category IB: Classic features of SIDS present but incompletely documented.
 - 11.13 SIDS Category II : Infant deaths that meet Category I except for one or more features.
- 11.2 Postnatally acquired infection
- 11.3 Accidental asphyxiation
- 11.4 Other accident, poisoning or violence (postnatal)
- 11.8 Other specified
- 11.9 Unknown/Undetermined
 - 11.91 Unclassified Sudden Infant Death
 - 11.92 Other Unknown/Undetermined

PSANZ Neonatal Death Classification (PSANZ-NDC)

- 1 Congenital abnormality (including terminations for congenital abnormalities)**
 - 1.1 Central nervous system
 - 1.2 Cardiovascular system
 - 1.3 Urinary system
 - 1.4 Gastrointestinal system
 - 1.5 Chromosomal
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 - 1.82 Respiratory
 - 1.83 Diaphragmatic hernia
 - 1.84 Haematological
 - 1.85 Tumours
 - 1.88 Other specified congenital abnormality
 - 1.9 Unspecified congenital abnormality

- 2 Extreme prematurity (typically infants of ≤ 24 weeks gestation or ≤ 600 g birthweight)**
 - 2.1 Not resuscitated
 - 2.2 Unsuccessful resuscitation
 - 2.9 Unspecified or not known whether resuscitation attempted

- 3 Cardio-respiratory disorders**
 - 3.1 Hyaline membrane disease / Respiratory distress syndrome (RDS)
 - 3.2 Meconium aspiration syndrome
 - 3.3 Primary persistent pulmonary hypertension
 - 3.4 Pulmonary hypoplasia
 - 3.5 Chronic neonatal lung disease (typically, bronchopulmonary dysplasia)
 - 3.8 Other

- 4 Infection**
 - 4.1 Bacterial
 - 4.11 Congenital bacterial
 - 4.12 Acquired bacterial
 - 4.2 Viral
 - 4.21 Congenital viral
 - 4.22 Acquired viral
 - 4.3 Protozoal, e.g. Toxoplasma
 - 4.4 Spirochaetal, e.g. Syphilis
 - 4.5 Fungal
 - 4.8 Other
 - 4.9 Unspecified organism

- 5 Neurological**
 - 5.1 Hypoxic ischaemic encephalopathy / Perinatal asphyxia (typically infants of >24 weeks gestation or >600 g birthweight)
 - 5.2 Intracranial haemorrhage
 - 5.8 Other

- 6 Gastrointestinal**
 - 6.1 Necrotising enterocolitis
 - 6.8 Other

7 Other

7.1 Sudden Infant Death Syndrome (SIDS)

7.11 SIDS Category 1A: Classic features of SIDS present and completely documented.

7.12 SIDS Category 1B: Classic features of SIDS present but incompletely documented.

7.13 SIDS Category II : Infant deaths that meet category 1 except for one or more features.

7.2 Multisystem failure-only if unknown primary cause or trigger event

7.3 Trauma

7.8 Other specified

7.9 Unknown/Undetermined

7.91 Unclassified Sudden Infant Death

7.92 Other Unknown/Undetermined

10. GLOSSARY

Aboriginal and Torres Strait Islander identification (status) refers to whether or not a person is of Aboriginal and/or Torres Strait Islander descent who self identifies as an Aboriginal and/or Torres Strait Islander and is accepted as such by the community in which he or she lives.

Abortion is a common term often used to mean termination of pregnancy or induced abortion.

Anomaly is a deviation from what is regarded as normal. An example would be a congenital malformation or congenital anomaly.

Antenatal refers to the time period of pregnancy before birth.

Birth refers to the birth or delivery of a child.

Birth status is the condition of the baby immediately after birth. The status may be a live birth or stillbirth (fetal death).

Birthweight is the first weight of the baby (stillborn or live born) obtained after birth. It is usually measured to the nearest five grams.

Confidence interval (95% CI) is a computed interval with a given probability (for example, 95%) that a true value of a variable, such as a rate, mean or proportion, is contained between the low and high values. When the confidence intervals of two estimated values do not overlap, the values are statistically significantly different.

Congenital anomalies are the structural or anatomical abnormalities that are present at or existing from the time of birth, usually resulting from abnormal development in the first trimester of pregnancy. Previously reported as birth defects, congenital anomalies or malformations.

Crude death rate is the number of deaths per 1,000 population (unless otherwise stipulated) in a given year (ABS definition).

Fetal death refers to death prior to the complete expulsion or extraction from its mother of a product of conception of 20 or more completed weeks of gestation or of 400g or more of birthweight; the death is indicated by the fact that after separation the fetus does not breathe or show any other evidence of life, such as the beating of the heart, pulsation of the umbilical cord, or definite movement of voluntary muscles (WHO definition).

Gestation is the period of development of a baby from the time of conception (fertilisation of the ovum) to birth.

Gestational age is the duration of the pregnancy in completed weeks from the first day of the last normal menstrual period. This is estimated from clinical assessment (including estimates from ultrasound examinations) when accurate information on the last menstrual period is not available or not consistent with the clinical assessment of gestational age.

Gravidity refers to a pregnancy; the state of being pregnant, it is unrelated to the outcome.

ICD 9 (or ICD-9-CM) refers to the International Classification of Diseases Ninth Revision as developed by the World Health Organisation. The CM stands for Country Modification.

ICD 10 (or ICD-10-AM) refers to the International Classification of Diseases Tenth Revision as developed by the World Health Organisation. The AM stands for Australian Modification. In the

ACT and most other states in Australia, ICD-10-AM codes were introduced in July 1998 to code hospital (morbidity) inpatient data.

Live birth refers, in this publication, to the complete expulsion or extraction from its mother a baby of 20 completed weeks gestation or more or at least 400 grams in birthweight or who after being born breathes or shows any other evidence of life, such as a heartbeat. The WHO defines live birth differently, as the complete expulsion or extraction from its mother of a product of conception, irrespective of the duration of the pregnancy, which, after such separation, breathes or shows any other evidence of life, such as beating of heart, pulsation of the umbilical cord, or definite movement of voluntary muscles, whether or not the umbilical cord has been cut or the placenta attached, each product of such a birth is considered live born.

Miscarriage is a common term used to mean spontaneous abortion. See the definition for 'Spontaneous abortion'.

Morbidity is a diseased state or the ratio of sick to well in the community.¹²

Mortality is a fatal outcome or the relative number of deaths (death rate) in a given population at a given time.

Multigravida refers to a woman who has been pregnant more than once.

Multipara refers to pregnant women who have had at least one previous pregnancy resulting in a live birth or stillbirth.

Multiple birth refers to a pregnancy resulting in more than one birth. For example twins, triplets etc.

Neonatal death is the death of a live born baby within 28 days of birth.

Neonatal morbidity refers to any condition or disease of the baby diagnosed within 28 days of birth.

Parity refers to the total number of previous pregnancies experienced by the woman that have resulted in a live birth or a stillbirth. The definition of parity has been changed since the last publication to align with the revised National Perinatal Data Development Committee's accepted definition.

Perinatal refers to the period from 20 weeks gestation to within 28 days after birth.

Perinatal death refers to a stillbirth or a neonatal death.

Plurality refers to the number of fetuses or babies from a pregnancy. On this basis a pregnancy may be classified as single or multiple.¹³

Post neonatal death refers to the death of a baby after 28 completed days and before 365 completed days.

Preterm birth refers to a birth before 36 completed weeks of gestation. Extremely preterm refers to births between 20 and 27 weeks gestation; moderately preterm refers to births between 28 and 31 weeks gestation; and mildly preterm refers to births between 32 and 37 weeks gestation.

Primigravida refers to a woman pregnant for the first time.

Primipara refers to a pregnant woman who has had no previous pregnancy resulting in a live birth or stillbirth.

Prolonged rupture of membranes refers to the spontaneous rupture of membranes for at least 18 hours prior to the onset of regular contractions with cervical dilation.

Resuscitation of a baby refers to active measures taken shortly after birth to assist the baby's ventilation and heartbeat, or to treat depressed respiratory effort and to correct metabolic disturbances.

Separation (from hospital) refers to when a patient is discharged from hospital, transferred to another hospital or other health care accommodation, or dies in hospital following formal admission (ABS definition).

Singleton birth refers to a pregnancy resulting in one birth.

Spontaneous abortion refers to the premature expulsion from the uterus of the products of conception, of the embryo, or of a nonviable fetus (a fetus of less than 400 grams birthweight or less than 20 weeks gestation). These may be classified as complete or incomplete.

Statistically significant infers that it can be concluded on the basis of statistical analysis that it is highly probable.

Stillbirth see 'Fetal death'.

11. LIST OF PUBLICATIONS

The Population Health Research Centre (PHRC) of ACT Health maintains and adds to an ongoing health series of publications to inform health professionals, policy developers and the community on health status in the Territory. Information contained therein will assist in the development of appropriate policy and service delivery models, the evaluation of programs, and an understanding of how the ACT compares with Australia as a whole with regard to health status.

- Number 1: ACT's Health: A report on the health status of ACT residents, Carol Gilbert, Ursula White, October 1995
- Number 2: The Epidemiology of Injury in the ACT, Carol Gilbert, Chris Gordon, February 1996
- Number 3: Cancer in the Australian Capital Territory 1983 - 1992, Norma Briscoe, April 1996
- Number 4: The Epidemiology of Asthma in the ACT, Carol Gilbert, April 1996
- Number 5: The Epidemiology of Diabetes Mellitus in the ACT, Carol Gilbert, Chris Gordon, July 1996
- Number 6: Developing a Strategic Plan for Cancer Services in the ACT, Kate Burns, June 1996
- Number 7: The First Year of The Care Continuum and Health Outcomes Project, Bruce Shadbolt, June 1996
- Number 8: The Epidemiology of Cardiovascular Disease in the ACT, C Gilbert, U White, January 1997
- Number 9: Health Related Quality of Life in the ACT: 1994 - 95, D Gannon, C Gordon, B Egloff, B Shadbolt, February 1997
- Number 10: Disability and Ageing in the ACT: An Epidemiological Review, C Gilbert, April 1997
- Number 11: Mental Health in the ACT, Ursula White, C Gilbert, May 1997
- Number 12: Aboriginal and Torres Strait Islander Health in the ACT, N Briscoe, J McConnell, M Petersen, July 1997
- Number 13: Health Indicators in the ACT: Measures of health status and health services in the ACT, C Kee (Gilbert), G Johansen, U White, J McConnell, January 1998
- Number 14: Health status of the ACT by statistical sub divisions, C Kee, G Bodilson (Johansen), April 1998
- Number 15: Results from the 1996 ACT Secondary School Students' Survey, H Phung, A Webb, N Briscoe, June 1998
- Number 16: Childhood immunisation & preventable diseases in the ACT 1993 - 1997, H Phung, M Petersen, June 1998
- Number 17: Health Related Quality of Life in the ACT 1994 - 97, H Phung, U White, B Egloff, June 1998
- Number 18: Maternal and Perinatal Status, ACT, 1994 - 96, M Bourne, C Kee, September 1998
- Number 19: Health risk factors in the ACT, C Kee, M Petersen, K Rockpool, October 1998
- Number 20: Communicable diseases in the ACT, L Halliday, M Petersen, November 1998
- Number 21: Illicit drug samples seized in the ACT, 1980 - 97, D Pianca, November 1998
- Number 22: Health Status of Young People in the A.C.T, L Halliday, J McConnell, October 1998
- Number 23: Health Status of Older People in the A.C.T, C Kee, G Bodilsen, October 1999

- Number 24: Drug related health in the ACT, J Barac (McConnell), P Luke, O Phongkham, December 1999
- Number 25: ACT Maternal and Perinatal 1997 Tables, M Bourne, March 2000
- Number 26: ACT Maternal and Perinatal 1998 Tables, M Bourne, March 2001
- Number 27: Cancer in the Australian Capital Territory 1994 – 1999, PHRC, February 2002
- Number 28: Health of older people in the ACT, 1999, PHRC, May 2002
- Number 29: Physical activity patterns of adults in the ACT, 2000, PHRC, November 2003
- Number 30: Perinatal Deaths in the ACT 1991 – 2000, PHRC, June 2003
- Number 31: Breast Cancer in the ACT, PHRC, June 2003
- Number 32: Maternal and Perinatal Health in the ACT, 1999, PHRC, June 2003
- Number 33: Alcohol and Tobacco Use by ACT Secondary School Students 1996-2002, PHRC, Sep 2003
- Number 34: Cancer in the ACT 1996-2000, PHRC, November 2003
- Number 35: Preventing injury in older people: fear of falling and physical activity ACT 2003, PHRC, November 2003
- Number 36: Maternal and Perinatal Health in the ACT, 1997 - 2001, PHRC, September 2004
- Number 37: Substance use & other health related behaviours among ACT Secondary Students, PHRC, December 2004
- Number 38: Review of ACT child deaths, PHRC, June 2006
- Number 39: The results of the 2005 ACT secondary student drug and health risk survey, PHRC, February 2007
- Number 40: The Health of Aboriginal and Torres Strait Islander People in the ACT, 2000 – 2004, May 2007
- Number 41: Sustainable Healthy Development – the ACT way, June 2007
- Number 42: Cancer in the ACT 1998-2004, August 2007
- Number 43: Report on the 2006 ACT Year 6 Physical Activity and Nutrition Survey, August 2007
- Number 44: Maternal and Perinatal Health in the ACT 200-2004, December 2007

12. REFERENCES

- ¹ Perinatal Society of Australia and New Zealand (2004). *Clinical Practice Guideline for Perinatal Mortality Audit, Section 7*. PSANZ.
- ² Laws PJ, Grayson N & Sullivan EA (2006). *Australia's mothers and babies 2004*. Perinatal statistics series no. 18. AIHW cat. no. PER 34. Sydney: AIHW National Perinatal Statistics Unit.
- ³ Government of South Australia, Department of Health (2006). *Maternal, Perinatal and Infant Mortality in South Australia*. Available at: <http://www.dh.sa.gov.au/pehs/PDF-files/2005-mortality-report-dec06.pdf>.
- ⁴ Centre for Epidemiology and Research, NSW Department of Health (2007). New South Wales Mothers and Babies, 2005. *NSW Public Health Bulletin, 2005, 16 (S-4)*.
- ⁵ The Consultative Council on Obstetric and Paediatric Mortality and Morbidity (2006). *Annual Report for the Year 2005, incorporating the 44th Survey of Perinatal Deaths in Victoria*. CCOPMM; Melbourne.
- ⁶ Queensland Health. *Health Information Centre, Perinatal Statistics 2005*. Available at: <http://www.health.qld.gov.au/hic/peri2005/Deaths.pdf>.
- ⁷ Australian Bureau of Statistics (2007). *Causes of Death 2005* (Cat. No. 3303.0).
- ⁸ Maternal, Perinatal and Infant Mortality Committee. *Maternal, Perinatal and Infant Mortality in South Australia 2003*. Adelaide: South Australian Department of Health, 2004.
- ⁹ The Consultative Council on Obstetric and Paediatric Mortality and Morbidity. *Annual Report for the year 2004, incorporating the 43rd Survey of Perinatal Deaths in Victoria*. Melbourne, October 2005.
- ¹⁰ Maternal, Perinatal and Infant Mortality Committee. *Maternal, Perinatal and Infant Mortality in South Australia 2005*. Adelaide: South Australian Department of Health, 2006.
- ¹¹ Queensland Health (2005). *Perinatal Statistics, Queensland 2004*. Available at: http://www.health.qld.gov.au/hic/peri2004/peri2004_final.pdf.
- ¹² Stedmans Medical Dictionary 26th Edition, (1995). Williams and Wilkins, Hagerstown, US.
- ¹³ Taylor L and Pym M (1995). *New South Wales Data Collection, Vol 7/No. S-1*.