



Tasmania
DEPARTMENT *of*
HEALTH *and*
HUMAN SERVICES

**Council of Obstetric & Paediatric
Mortality & Morbidity**

Tasmania

**Annual Report for
2002**

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Introduction

The members of the Council of Obstetric & Paediatric Mortality & Morbidity are pleased to be able to present the Annual Report for 2002. Considerable efforts have been made over the past two years to bring the Perinatal data collection and reporting process up to date. In presenting the report for 2002, I would particularly like to commend the efforts of all hospitals offering maternity services.

The Perinatal Registry Act, 1994, mandates the collection and reporting of perinatal data in Tasmania for the purposes of:

- Studying, researching and interpreting information relating to maternal and perinatal deaths;
- Studying, researching and interpreting information relating to births in Tasmania;
- Identifying and monitoring trends in respect of perinatal health (including congenital abnormalities);
- Providing information to the Secretary for Health & Human Services on the requirements for and the planning of obstetric and neonatal care; and
- Providing information to persons employed in health care and to researchers;

The benefits of these activities are realised by everyone involved in providing and/or managing obstetric and paediatric services, however none of them would be possible without the co-operation of staff working in the maternity units. It is very well recognised that the administrative burden associated with data collection is not insignificant. In the late 1990's the quality of perinatal data supplied to the central database had fallen. This was most likely as a response to no return for the effort expended (i.e. the central collection was years behind and annual reports were not being produced). As a result of this, considerable effort had to be made to collect missing or incomplete data from births that had occurred years ago.

Over the last three years this situation has turned around tremendously. Some hospitals have instituted quality assurance processes that ensure that incomplete forms are not submitted to the central collection. The rate of incomplete forms being returned to hospitals has fallen from 50% to, in most cases, 0%. The obvious benefit is that forms are now being processed in a timely manner and consequently aggregate data can also be reported within a more useful timeframe. For hospitals the benefit has been a decrease in the amount of time spent pulling medical records to chase old information, as well as access to more timely information.

I therefore extend a thank you to each and every person who has contributed to the improved perinatal data collection and reporting process. The Council looks forward to an even more timely reporting of perinatal data for 2003.

Chairperson
Council of Obstetric and Paediatric Mortality and Morbidity.

Disclaimer:

During the production of this report several issues of data accuracy and problems of database integrity were encountered. While not downgrading the value of the information contained within this report, the possibility that some inaccuracies exist in the data as presented should be noted.

Acknowledgements

The production of this Report relies on the assistance, willing co-operation and on-going support of numerous individuals and professional groups, which include:

- Members of the Council of Obstetric and Paediatric Mortality and Morbidity, and its sub-committees (Paediatric Morbidity & Mortality, Maternal Morbidity & Mortality, Perinatal Morbidity & Mortality and Data Management);
- Obstetricians, Paediatricians and Midwives working in all parts of Tasmania;
- The state Coroner's Office and staff;
- The Australian Bureau of Statistics;
- Births, Deaths and Marriages;
- The Tasmanian Department of Health & Human Services;
- Launceston General Hospital;
- Northwest Private Hospital;
- Mersey Community Hospital;
- Queenstown District Hospital;
- North Eastern Soldiers Memorial Hospital (Scottsdale);
- Smithton District Hospital;
- Calvary Private Hospital;
- Royal Hobart Hospital; and
- The Hobart Private Hospital.

Perinatal Registry Act 1994

The Perinatal Registry Act was given Royal Assent on the 10th May, 1994. Under this the Act the Council of Obstetric and Paediatric Mortality and Morbidity was established, and given the following functions:

1. To investigate the circumstances surrounding, and the conditions that may have caused:
 - Maternal and perinatal deaths in Tasmania;
 - Deaths of children in Tasmania in the age group from 29 days to 14 years;
 - Congenital abnormalities in children born in Tasmania; and
 - Injuries, illness or defects suffered by pregnant women or viable foetuses in Tasmania at any time before or during childbirth.
2. To maintain a perinatal data collection for the purposes of:
 - Collecting, studying, researching and interpreting information relating to maternal and perinatal deaths;
 - Collecting, studying, researching and interpreting information relating to births in Tasmania;
 - Identifying and monitoring trends in respect of perinatal health (including congenital abnormalities);
 - Providing information to the Secretary for Health & Human Services on the requirements for and the planning of obstetric and neonatal care;
 - Providing information to persons employed in health care and to researchers; and
 - Maintaining a register of congenital abnormalities.
3. To provide information for the education and instruction in medical theory and practice in obstetrics and paediatrics for legally qualified medical practitioners and nurses.
4. To investigate and report on any other matters relating to obstetric and paediatric mortality and morbidity referred to the Council by the Minister or the Secretary for Health & Human Services.
5. To perform any other functions imposed by the Perinatal Registry Act or any other Act or the regulations.

Definitions Prescribed under the Perinatal Registry Act

Abortion / Miscarriage: Spontaneous or medically induced termination of pregnancy before the foetus is viable (before 20 weeks gestation)

Low birth weight: An infant born weighing less than 2500 grams

Very low birth weight: An infant born weighing less than 1500 grams

Extremely low birth weight: An infant born weighing less than 1000 grams

Infant death: A death, occurring within 1 year of birth in a liveborn infant whose birthweight was at least 400 grams, or at least of 20 weeks gestation if the birthweight was not known.

Maternal death: means:

- (a) the death of a woman caused by, or that may have been caused by, her pregnancy or in which her pregnancy was, or may have been, a contributing factor; or
- (b) the death of a woman that occurs before the twenty-ninth day after the day on which the woman gave birth to a child; or
- (c) the death of a woman caused by, or that may have been caused by, her giving birth to a child, or in which her giving birth to a child was, or may have been, a contributing factor.

Neonatal death: A death occurring within 28 days of birth in an infant whose birthweight was at least 400 grams, or if the weight was not known, an infant born after at least 20 weeks of gestation.

Preterm: An infant with a gestational age of less than 37 completed weeks.

Sudden Infant Death Syndrome (SIDS): Sudden death of an infant under 1 year of age, which remains unexplained after a thorough case investigation including performance of a complete autopsy, examination of the death scene, and a review of the clinical history.¹

Stillbirth: A foetal 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 400 grams or more birthweight; the death is indicated by the fact that after such separation the foetus does not breathe or show any other evidence of life, such as beating of the heart, pulsation of the umbilical cord, or definite movement of voluntary muscles.²

¹ Willinger, M., James, L.S. & Catz, C. Defining the Sudden Infant death Syndrome (SIDS): Deliberations of an Expert Panel convened by the National Institute of Child Health & Human Development. *Paediatric Pathology* 11:667-684, 1991

² National Health Data Dictionary V10.0

Members of the Council of Obstetric & Paediatric Mortality & Morbidity

Nominees of the University of Tasmania (2 nominees):

Professor Allan Carmichael (Chair until June) (2002)
Professor Clement Chan (Chair from June 2002) (July – December 2002)

Person nominated by the Secretary employed in the delivery of Neonatal Services:

Associate Professor Graham Bury (2002)

Person nominated by the Secretary employed in the Department of Health & Human Services:

Ms Mary Blackwood (2002)

Nominee of the Tasmanian Branch of the Royal Australian and New Zealand College of Obstetricians and Gynaecologists:

Dr Jan Batt (January- June 2002)
Dr Melwyn D'Mello (July – December 2002)

Nominee of the Tasmanian Branch of the Paediatric and Child Health Division of the Royal Australian College of Physicians:

Dr Elizabeth Hallam (2002)

Nominee of the Tasmanian Branch of the Royal Australian College of General Practitioners:

Dr Thomas (Geoff) Shannon (2002)

Nominee of the Tasmanian Branch of the Australian College of Midwives Inc.:

Ms Ruth Forrest (2002)

Additional Member Nominated by Council to represent community interests:

Ms Ros Escott (2002)

Members of Sub-Committees & Support Services

Maternal Mortality & Morbidity Sub-Committee:

Dr Jan Batt (Chair) (January – June 2002)
Dr Shelby Jarrell (Chair) (July – December 2002)
Dr Melwyn D’Mello (July – December 2002)
Ms Ruth Forrest (2002)

Paediatric Mortality & Morbidity Sub-Committee:

Dr Elizabeth Hallam (Chair) (2002)
Dr Geoff Shannon (2002)
Dr Chris Lawrence (2002)
Dr Alfhild Larson (2002)

Perinatal Mortality & Morbidity Sub-Committee:

Associate Professor Graham Bury (Chair) (2002)
Dr David Challis (2002)
Dr. Chris Bailey (2002)

Data Management Sub-Committee

Dr Rupert Sherwood (Chair) (2002)
Dr Melwyn D’Mello (2002)
Dr Michelle Williams (2002)
Ms Elizabeth Hunn (2002)

National Perinatal Collection Committee -Tasmanian Representative:

Ms Karen Wheeler (2002)

National Perinatal Data Development Committee – Tasmanian Representative:

Ms Karen Wheeler (2002)

Support Staff:

Ms Diane Hickie (2002)

Council Summary

Perinatal Statistics at a Glance

- The birth rate in Tasmania continues to decline and is currently 12.0 per 1000 head of population (Table 1). The decrease in birth rate from 2001 to 2000 is not as sharp as in previous years.
- The gap between the percentage of public and private maternity patients (Figure 2) is closing. The percentage of private patients has increased from 34.6% in 2001 to 36.6% in 2002.
- The percentage of female infants increased from 46% to 49% (Table 5).
- The proportion of low birth weight infants remains steady at 5.7% (Table 6).
- The resuscitation rate remains low, with 5.9% of all births reported as requiring some resuscitative intervention (Table 14). Tasmania's reported resuscitation rate is significantly lower than all other States and Territories. It is not possible to determine if this is a reflection of actual practice, or if resuscitation is under reported.
- The Perinatal Mortality Rate (Table 17) continues to increase with a rate of 11.9 per 1000 births in 2002. Tasmania's rate remains higher than the Australian average (Figure 7). Spontaneous pre-term births and unexplained intrauterine deaths remain the highest cause of mortality (Table 18).
- The neonatal mortality rate remains at 1.1 per 1000 births (Table 21).
- The rate of autopsy is the lowest for ten years, with a marked decline from 66% in 1996 to 7.4% in 2002 (Table 23).
- The teenage pregnancy rate remains steady at 8% (Table 24), but is higher than the national average (Figure 9). The proportion of mothers aged 40 years or more has increased to 3 %.
- The caesarean section rate has decreased from 23% in 2001 to 22% in 2002 (Table 31). However, the elective caesarean section rate has increased from 48.9% to 51.8% (Table 36).
- The induction rate has increased to 25% of all deliveries (Table 42), while the percentage of caesarean sections following induction of labour has decreased from 17% to 13%.
- Augmentation of labour has increased from 25% in 2001 to 29.9% in 2002 (Table 45).

Recommendations

The following recommendations have been made:

From the Perinatal Mortality & Morbidity Sub-Committee:

1. That improvements should be made in the process for follow up imaging if a risk of intra uterine growth restriction is identified.
2. That in-service training on malpresenting births should be provided for ambulance officers.
3. That a protocol for the management of extremely low birthweight infants, including introduction of high frequency ventilation should be developed.

From the Paediatric Mortality & Morbidity Sub-Committee:

1. That the public in general is educated on the risks of infants bed-sharing with parents. Infant vulnerability is especially an issue with a history of premature birth, in situations where parents smoke, drink alcohol and/or use recreational drugs
2. That Clinicians are reminded of the importance of pneumococcal vaccination for both children and adults with hyposplenism.
3. That Clinicians continue to receive education in the management of Pertussis, even though the diseases is no longer frequently encountered.

Committee Reports

Maternal Mortality & Morbidity Sub-Committee

Maternal Deaths for 2002

One maternal death occurred in Tasmania in 2002. In this case a young woman presented to hospital with vomiting, severe headache and history of a seizure at home. The pregnancy was in its 25th week of gestation at the time and the woman (P1G2) had no history of obstetric complications or pre-existing maternal conditions. The woman was commenced on treatment for both viral and bacterial meningitis while a definite diagnosis was investigated. A diagnosis of herpetic encephalitis was subsequently confirmed.

Three days later the woman's condition deteriorated and she was transferred to the Intensive Care Unit. Here she was intubated and ventilated. A further four days later spontaneous premature labour commenced and a stillborn infant was delivered via emergency LUSC. Placental abruption was determined as cause of death for the infant.

A CT Scan provided evidence of a right temporal lobe haemorrhage. Daily CT Scans showed a worsening in the woman's condition over the next two days. A prognosis of nil functional recovery, or serious incapacitation and dementia at best, was made and with the consent of the woman's family active treatment was withdrawn.

The Maternal Mortality & Morbidity Committee has classified this death as an incidental death, unrelated to the pregnancy. The survival rate from herpetic encephalitis is extremely low, and the Sub-Committee is satisfied that the pregnancy in no way contributed to the onset of the disease or the selection of treatment options. There were no avoidable factors, and consequently no recommendations to be made.

Maternal Deaths for 1999

Until recently the Council believed that no maternal deaths occurred in the years 1997 to 1999. However the occurrence of one maternal death in 1999 has since been identified. This death is discussed in this report for completeness, but it does not have any bearing on any of the statistical material provided later.

In this case the woman, a 24 year old G2P2 had a spontaneous rupture of membranes at 41 weeks gestation. She experienced some pain at the time, which it is reported she assumed to be associated with the commencement of labour. Shortly after this the woman collapsed and an ambulance was called. Upon arrival of the ambulance it was noted that the woman was conscious, but restless and experiencing difficulty breathing. She rapidly became unconscious and suffered a cardiac arrest in transit to hospital.

Cardio pulmonary resuscitation was commenced and atropine administered. The woman became asystolic with ventricular fibrillation. She was defibrillated six times, and six doses of adrenaline were administered, all with no effect. She was intubated and CPR attempts continued on route to hospital. Once in the Department of Emergency Medicine she was noted to still be asystolic, with pupils fixed and dilated. A foetal ultrasound was performed and no foetal heart beat noted. Resuscitation efforts were ceased.

The post mortem revealed the cause of death to be Hypovolaemic shock, secondary to acute blood loss, secondary to a ruptured splenic artery aneurysm. In his report, the Forensic Pathologist stated his certainty that the woman had a pre-existent aneurysm or a weakness of the vessel wall with aneurysmal dilatation in pregnancy. Detection of such a condition is not possible and the occurrence of sudden death due to splenic aneurysm rupture is well documented.

The Maternal Mortality & Morbidity Committee has classified this death as an indirect death. There is no way of determining if the rupture of the aneurysm was directly related to the pregnancy. The Sub-Committee is satisfied that the pregnancy was well managed and that there were no avoidable factors, and consequently no recommendations to be made.

Perinatal Mortality & Morbidity Sub-Committee

Perinatal Deaths for 2002

There were 73 perinatal deaths in Tasmania for 2002. This includes all infants (both live and stillborn) who were greater than 20 weeks gestation, or weighed 400 grams or more at birth. Twenty-four of these deaths were neonatal deaths (liveborn infants who did not live beyond 28 days of age) with 49 stillbirths. The overall perinatal mortality was 12.8 per 1000 births. The neonatal mortality rate was 4.2 per 1000 births, with a stillbirth rate of 8.5 per 100 births. The Australia and New Zealand Perinatal Mortality Classification was used to classify the Perinatal Deaths.

Cause of Death	Number of deaths		
	2000	2001	2002
Congenital Abnormality	9	16	12
Perinatal Infection	1	1	0
Hypertension	1	2	2
Antepartum Haemorrhage	5	5	6
Maternal Conditions	2	3	2
Specific Perinatal Conditions	7	5	7
Hypoxic Peripartum Death	3	0	5
Foetal Growth Restriction	1	1	1
Spontaneous Pre-Term	15	8	19
Unexplained Antepartum Deaths	16	16	16
No Obstetric Antecedent	1	0	2
Birth Trauma	0	0	1
	61	57	73

1. Congenital Abnormalities

There were 12 deaths attributed to severe congenital malformation, 7 of which were neonatal deaths. The congenital malformations amongst the stillborn infants included one case of renal agenesis, one infant with a fusion defect of the face, and 3 infants with multiple malformations. In terms of neonatal deaths: 3 infants died from pulmonary hypoplasia secondary to oligohydramnios or renal agenesis; 1 infant of 29 weeks gestation died from tricuspid atresia; 1 death was due to exomphalos; 1 from Trisomy 13; and 1 anencephalic infant.

2. Perinatal Infections

There were no perinatal deaths due to perinatal infections in 2002.

3. Hypertension

Two infants were stillborn as a result of hypertensive disorders in the mother. In one case the mother suffered an eclamptic fit at 32 weeks gestation. In the second case the infant died at 26 weeks just prior to delivery by emergency caesarean section.

4. Antepartum Haemorrhage

There were six stillbirths resulting from antepartum haemorrhage. In five cases the mother suffered placental abruption. The cause of the haemorrhage was unspecified in the sixth case.

5. Maternal Conditions

There were two stillborn infants as a result of maternal conditions complicating the pregnancy. In one case the mother suffered from Lupus Obstetric Syndrome, with the infant dying at 22 weeks gestation. In the second case the mother suffered from herpetic encephalitis and also died shortly after the birth of the infant (see Maternal Mortality Report Section).

6. Specific Perinatal Conditions

There were 7 stillbirths attributed to this category. One infant suffered from Megakaryoblastic leukaemoid reaction. This condition is rare outside of Downs Syndrome, however Downs Syndrome was not confirmed in this case. Another infant suffered a fetomaternal haemorrhage; there was 1 case of twin to twin transfusion; and 1 of hydrops fetalis. Three infants died as a result of cord accidents: 1 due to antepartum cord compression; 1 from cord entanglement; and 1 suffered a true knot in the cord.

7. Hypoxic Peripartum Death

There were 5 stillborn infants as a result of intrapartum asphyxia. One infant was a footling breech delivery at 36 weeks gestation. Another infant had the umbilical cord wrapped several times around the neck.

8. Foetal Growth Restrictions

There was 1 death as a result of intrauterine growth restriction at 32 weeks gestation with the infant weighing 1190 grams at birth. In this case the IUGR was noted earlier on ultra sonic scan, but the process for follow-up monitoring appeared to be inadequate.

9. Spontaneous Pre-Term

There were 19 deaths associated with extreme prematurity: 14 neonatal deaths and 5 stillbirths. Of the 14 neonatal deaths, 7 infants were of 23 weeks or less gestation with the other 7 having a gestational age range of 24 – 26 weeks. The stillborn infants had a gestational age range of 20 – 24 weeks. In one case there was premature rupture of membranes at 15 weeks, with the infant remaining in utero until 23 weeks gestation. The birth weights for the stillborn infants ranged from 290 grams to 596 grams. One infant was born at home, while another infant was born in the emergency department.

10. Unexplained Antepartum Deaths

There were 16 stillbirths where a cause of death has not been established. In three cases a post-mortem was conducted and could find no explanation for the FDIU. There were 4 cases where some degree of placental insufficiency was detected, and in one case a retroplacental clot was present. The gestational age of these infants ranged from 24 weeks (4 infants) through to full term (1 infant). One infant from a twin pregnancy had a gestational age of 37 weeks, although the FDIU had been detected at 33 weeks.

11. No Obstetric Antecedent

Two infants died a sudden infant death at home. Both were aged less than 28 days at the time of their death. Both infants were healthy and there was no history of obstetric complications throughout the pregnancy.

12. Birth Trauma

There was one neonatal death as the result of severe hypoxic ischaemic encephalopathy in a term infant.

The 2001 data from Victoria provides the following figures:

Stillbirth Rate	7.1 per 1000 births	444 / 62149
Neonatal Death Rate	3.3 per 1000 births	204 / 62149
Perinatal Mortality Rate	10.4 per 1000 births	648 / 62149

This indicates that Tasmania appears to have a higher neonatal death rate, although it is not statistically significantly different from the 2001 Victorian rate (Probability of significance = 0.26¹.)

In Victoria, 37 % of neonatal deaths were due to congenital abnormality (29% in Tasmania), 33% due to extreme prematurity (58% in Tasmania), and 7% due to Hypoxic Ischaemic Encephalopathy (compared to 4% in Tasmania). Thus Tasmania's higher death rate, if real, appears to be due to extreme prematurity.

Comparing data from the Australian New Zealand Neonatal Network (ANZNN) data collection and the Royal Hobart Hospital (RHH) Neonatal Intensive Care Unit survival rates and rates of IVH for infants with a gestational age of 24 –26 weeks (100 infants), RHH had a survival rate average of 60% (60/100) from 1995-2002, while the national survival rate in 2002 was 72%. RHH's survival without significant IVH (none, grade I, or grade II) was 50/100, or 50%. ANZNN average was 67% in 2002. These differences are likely to be statistically significant, but should be interpreted cautiously as overall very low birth weight survival has been slowly increasing nationally.

RECOMMENDATIONS:

4. Improve process for follow up imaging if IUGR risk identified.
5. Provide in-service training for ambulance officers on malpresenting births.
6. Development of a protocol for the management of extremely low birthweight infants, including introduction of high frequency ventilation.

¹ Determined using the statistical test “midp” or “mid-p” to compensate for the discreteness of a distribution. Results with a P value ≤ 0.05, 0.01 or 0.001 are labelled as statistically significant.

Paediatric Mortality & Morbidity Sub-Committee

Paediatric Deaths for 2002

The Council's Terms of Reference, as specified under the Perinatal Registry Act, 1994 in respect of paediatric mortality are to:

To investigate the circumstances surrounding, and the conditions that may have caused: deaths of children in Tasmania in the age group from 29 days to 14 years.

Given the small number of deaths each year, paediatric mortality is classified using a broad 4 category classifications system. This classification system was first used in 2001, therefore minimal data is available to enable comparison over years, and trend analysis is not possible at this stage.

2001 Cases still under investigation.

There was one paediatric death occurring in 2001 that was still under investigation at the time of printing the 2000-2001 report. In this case the suspected cause of death for the 7 month old infant was respiratory arrest with cerebral atrophy from a hypoxic injury. Further investigations have revealed that a possible cause of death may be pyruvate carboxylase deficiency. Genetic counselling has been recommended.

Paediatric deaths for 2002 have been classified as follows:

Cause of Death	Number of Deaths	
	2001	2002
Conditions determined at birth	4	3
Acquired conditions	8	8
Sudden Infant Death	8	2
Injuries	4	11*
Cases still under investigation	0	1
Unknown/Indeterminate	2	1
TOTAL	26	26

* One infant died interstate, however the injury leading to the infant's death was sustained in Tasmania.

1. CONDITIONS DETERMINED AT BIRTH

There were three paediatric deaths in this category, with the children aged from 11 months to 14 years of age. The children were born with a variety of congenital conditions, including Trisomy 13, cerebellar arteriovenous malformation and mucopolipidosis.

2. ACQUIRED CONDITIONS

Eight deaths were classified to this category. The age of the children ranged from 6 weeks of age (prolonged neonatal death) to 14 years. Three deaths were associated with respiratory conditions, these being bronchopneumonia, aspiration pneumonia and pertussis. Medical assistance was not sought for the child who died from bronchopneumonia and it is, therefore, possible that this death could have been avoided with appropriate care and treatment.

The infant with pertussis was too young to have received routine immunisation against this disease. In reviewing this case there was some concern that the consequences of hypoxia, due to the significance of the pulmonary infection, may have been mistaken for cerebral oedema. It was felt that a lack of exposure to such cases, due to the decreased incidence of pertussis within the community, was also a contributing factor. With early recognition of the severity of the child's illness the final outcome could have possibly been prevented.

Leukaemia was the cause of death for two children, with one other child dying from Ewings sarcoma. The remaining two children died from the infectious diseases of salmonella septicaemia and streptococcus pneumoniae septicaemia. In this last case the child was later diagnosed with hyposplenism. It is, therefore possible that the death could have been prevented if the hyposplenism had been identified and a pneumococcal vaccine administered.

3. SUDDEN INFANT DEATH

There were two infants over the age of 29 days (one at 3 months and the other at 6 months of age) who died from sudden infant death. There were a further two infants, aged less than 29 days of age who also died a sudden infant death. Due to their age at the time of death, these infants are included in the calculation of the perinatal mortality rate, however their death as a result of Sudden Infant Death also warrants a mention in this section of the report.

Of these four infants, three were bed sharing with their parents at the time of their death. The fourth infant was placed to sleep in a prone position. It was uncertain whether or not the parents of these infants had been provided with education on SIDS prevention and safe sleeping practices.

Other risk factors involved in these cases include: premature births with low birthweights for two infants; parents smoking around the infant in 1 case; and evidence of drug and/or alcohol use in two cases.

4. INJURY

There were 11 paediatric deaths attributable to injury that occurred in 2002. These children ranged in age from 2 months to 14 years. Three children, two aged less than 3 years, died as a result of drowning. Three children were killed in motor vehicle accidents; two of these were on motorbikes, while the other child was unrestrained in a car. One infant died from strangulation after becoming entangled in the cord of a window blind. Another infant died from serious head injuries, sustained when a piece of furniture toppled over crushing the child beneath. There was one case of child suicide, and two children died as the result of child abuse and assault.

5. CASES STILL UNDER INVESTIGATION

There is one case where the cause of death for the infant is still under investigation.

6. UNKNOWN/INDETERMINATE

There is one death where the cause of death remains undetermined.

Recommendations:

4. Once again the Sub-Committee recommends that the public in general is educated on the risks of infants bed-sharing with parents. Infant vulnerability is especially an issue with a history of premature birth, in situations where parents smoke, drink alcohol and/or use recreational drugs
5. That Clinicians are reminded of the importance of pneumococcal vaccination for both children and adults with hyposplenism.
6. That Clinicians continue to receive education in the management of Pertussis, even though the disease is no longer frequently encountered.

Data Management Sub-Committee

The functioning of the Data Management Sub-Committee is governed by the following Terms of Reference:

Purpose:

To oversight all aspects of the data collection processes of the Council of Obstetric and Paediatric Mortality & Morbidity

Functions:

1. To advise the Council on the presentation and content of reports based on current data;
2. To advise the Council on issues of collection and reporting, in particular
 - Improvement in and monitoring of compliance
 - The development of the capacity for electronic collection and transfer
 - The need to review data, based on assessment every two years
 - Other issues affecting reporting compliance; and
3. To advise the Council on the process for data access for research and audit purposes.

Report for 2002

The Data Management Sub-Committee was re-established in 2002 with the intention of ensuring that that the perinatal data collection provided a statewide, uniform collection of meaningful and useful data to help guide and monitor clinical practice.

To achieve this objective the following list of actions was proposed:

1. Re-design the data collection form;
2. Re-design the database;
3. Establish a process whereby clinicians and midwives can have access to the data for ad-hoc and routine reports;
4. Update the Data Collection Guidelines and provide education to sites; and
5. Review the structure of the Annual Report.

1. Re-design the data collection form;

The Sub-Committee reviewed each section of the current Perinatal Data Collection Form and made two drafts, both of which were circulated to hospitals providing maternity services for comment. Some additional questions were added to the form, and many existing items removed. Some existing items were modified to remove ambiguity and ensure response categories were mutually exclusive. Hospitals and individual clinicians provided excellent feedback, which assisted with the review process. The Sub-Committee also ensured that the form re-design process would enable all national mandatory reporting requirements to be met.

2. Re-design the database;

One of the underlying principles of the form re-design process was to ensure that the revised form could be easily translated to an electronic data capture system. Functional specifications to support the electronic capture of data were also developed. In June 2002, the Department of Health & Human Services submitted a request for funding, under the whole of Government Microsoft Licence Agreement, for \$40 000 to assist in the development of a Microsoft Access Database for the Perinatal Data Collection. Due to personnel changes within both Microsoft and Treasury, submissions made under the Agreement were not considered until the following year.

3. Establish a process whereby clinicians and midwives can have access to the data for ad-hoc and routine reports

The move towards on-site electronic data capture is the major strategy to ensure that this objective is met. In the interim the Sub-Committee has proposed the preparation of individual site reports with comparison to state figures. Hospital Reports covering the years 2000 and 2001 were prepared and distributed. Sites/clinicians are reminded that ad-hoc requests for information can be made at any time.

4. Update the Data Collection Guidelines and provide education to sites.

In conjunction with the review of the Data Collection Form, the Sub-Committee also developed numerous definitions and help messages to support data capture. These were circulated with the second draft of the proposed new forms for comment. Prior to the introduction of the new forms, and the on-site electronic data capture system, data collection guidelines will be fully developed. On-site education sessions will also be provided.

5. Review the structure of the Annual Report

The Sub-Committee proposed the following structure for future editions of the Annual Report:

- Report births by region;
- Separate obstetric and neonatal sections
- Report should have a standard format with consistent statistical tables plus a special focus section that differs every year
- Invite midwifery commentary through programs such as KYM, and from lactation consultants;
- Invite commentary from GPs on shared care arrangements;
- The back page should be a comments page to enable audience to provide comments; and
- Individual hospital reports with site-specific data compared to state data.

The Sub-Committee will continue to meet in 2003 to progress all of the above activities. Comments on the structure of the Annual Report, and/or the topics for special focus sections are welcome.

Perinatal Statistics

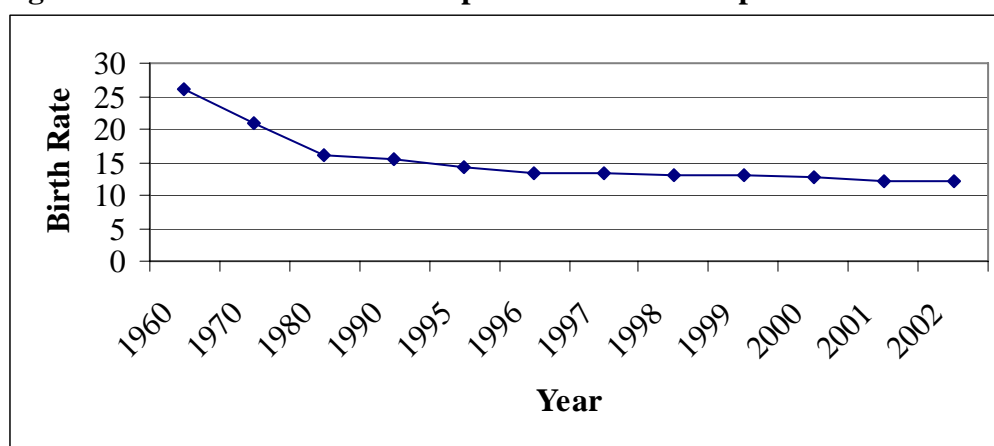
Births and Birth Rates

Table 1: Births and Birth Rates for Tasmania 1992-2002

Year	No. Births	Birth rate per 1000 population
1992	7025	14.9
1993	6861	14.5
1994	6845	14.5
1995	6817	14.4
1996	6331	13.4
1997	6309	13.4
1998	6171	13.1
1999	6145	13.1
2000	5975	12.7
2001	5726	12.1
2002	5714	12.0

NB: Australian Bureau of Statistics estimates Tasmania's population as 474 305 in 2002. Please note this estimation of population is a preliminary figure only and is subject to change.

Figure 1: Birthrate for Tasmania per 1000 Head of Population 1960 - 2002



The data for 2002 demonstrates that Tasmania's birthrate continues to slowly decline. The decline since 1992 has been just under 3 births per 1000 head of population. The proportion of infants born in the north of the state remains reasonably consistent at 28%. The proportion born in the south has increased from 48.9% in 1997 to 50.8% in 2002, but has decreased over the same time period in the northwest from 23.8% to 21.5% (see Table 2).

Table 2: Births by Region 1997 – 2002

Year	South	North	Northwest
1997	3087	1705	1505
1998	3028	1699	1509
1999	2993	1769	1411
2000	2922	1692	1357
2001	2904	1573	1238
2002	2873	1600	1230

Table 3: Births By Hospital 1997 - 2002

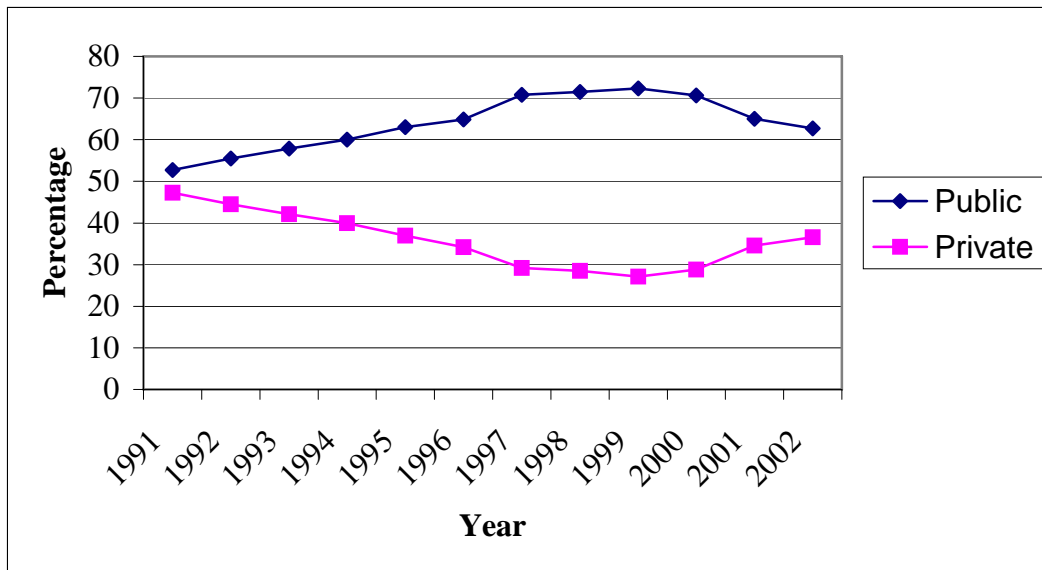
Hospital	1997 No.	1998 No.	1999 No.	2000 No.	2001 No.	2002 No.
Royal Hobart Hospital (QAH)	2049	2050	2084	2007	1823	1831
Launceston General Hospital (QVH)	1626	1564	1641	1587	1512	1493
District Hospitals	180	151	159	119	101	78
Private Sector	2401	2349	2195	2216	2250	2230
Others (includes homebirths)	53	57	66	46	40	82
TOTAL	6309	6171	6145	5975	5726	5714

The proportion of mothers electing to be treated as private patients continued to increase in 2002, although it is still far short of the level in 1992.

Table 4: Proportion of Public and Private Patients 1992 - 2002

Year	Public %	Private %
1992	55.5	44.5
1993	57.9	42.1
1994	60.0	40.0
1995	63.0	37.0
1996	64.8	34.2
1997	70.8	29.2
1998	71.5	28.5
1999	72.3	27.1
2000	70.6	28.8
2001	65.0	34.6
2002	62.7	36.6

Figure 2: Proportion of Public and Private Patients 1992 - 2002



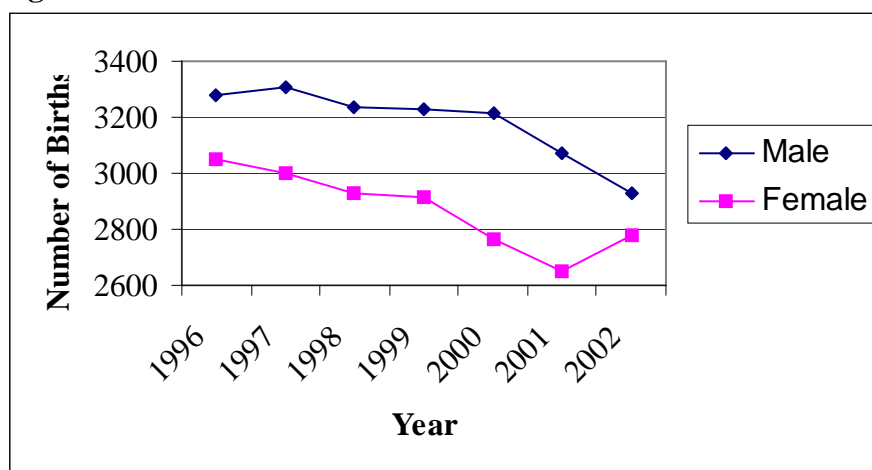
Sex of Infants

Table 5: Sex of all Infants born in Tasmania 1997 – 2002

Year	Male		Female		Indeterminate		Total No.
	No.	%	No.	%	No.	%	
1997	3307	52	3001	48	1	^	6309
1998	3237	52	2932	48	2	^	6171
1999	3232	53	2912	47	1	^	6145
2000	3211	54	2762	46	2	^	5975
2001	3073	54	2650	46	3	^	5726
2002	2930	51	2782	49	2	^	5714

^ Less than 0.1%

Figure 3: Sex of all Infants 1996 - 2002

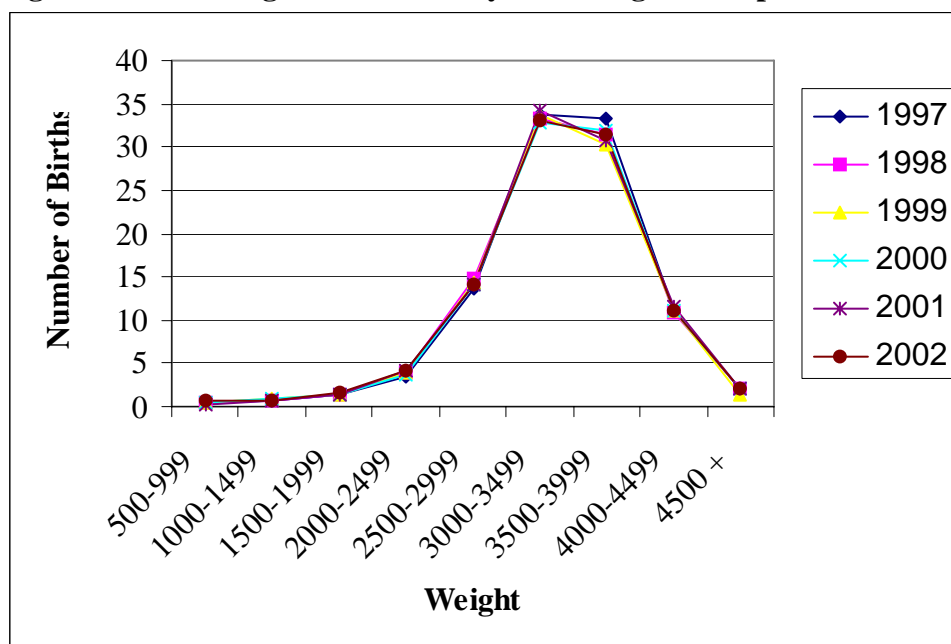


There were less males born as a percentage of all births for 2002 than has been the case over the last 5 years. In 2000, Tasmania had the highest percentage of male babies born (54%), with NSW the next highest at 52%. The national average for that year was 51.4% of all infants born being male¹.

¹ Australia's Mothers & Babies 2000 Australian Institute of Health & Welfare

Birthweight

Figure 4: Percentage of all Births by Birthweight Groups 1997 - 2002



The percentage of infants born in each birth weight group has remained largely unchanged since 1997. The only birthweight group that has seen any change is 3500-3999 grams, where the percentage of infants in that group fluctuates from 30.3% to 31.9%, with a high of 33.2% in 1997.

Low Birthweight

Low birthweight is defined as less than 2500 grams and will include babies that are small for gestational age as well as those which are premature. Very low birthweight is defined as less than 1500 grams.

Table 6: Incidence of Low and Very Low Birthweight 1992 - 2002

Year	Number – Very Low Birthweight	% Proportion of all births	Number - Low Birthweight	% Proportion of all births
1992	114	1.6	325	4.6
1993	86	1.3	300	4.4
1994	83	1.2	306	4.5
1995	111	1.6	321	4.7
1996	66	1.1	345	5.5
1997	90	1.4	303	4.8
1998	89	1.4	335	5.4
1999	98	1.6	320	5.2
2000	104	1.7	309	5.2
2001	74	1.3	325	5.7
2002	102	1.8	328	5.7

Apgar Scores

The Apgar score is routinely recorded shortly after birth, (usually at one minute and again at five minutes after birth) for all infants and is a general measure of an infant's condition immediately after birth. An Apgar score at five minutes is a good indication of the infant's overall health and wellbeing. An Apgar Score of less than 6 at five minutes is indicative of an unwell infant.

In 2002 there were 50 infants (0.87%) with an Apgar score less than 6 at five minutes. This compares with 122 (1.9%) in 1997, 85 (1.3%) in 1998, 87 (1.4%) in 1999, 50 (0.8%) in 2000, and 33 (0.6%) in 2001.

Table 7: Apgar Score for all Births at five minute 1997 - 2002

Apgar Score	1997 %	1998 %	1999 %	2000 %	2001 %	2002 %
1	0.1	^	0.2	0.1	^	0.1
2	0.1	0.1	0.1	0.0	0.0	0.1
3	0.1	0.1	0.2	0.2	0.1	0.1
4	0.1	0.2	0.3	0.2	0.2	0.2
5	0.4	0.4	0.3	0.3	0.2	0.5
6	0.7	0.9	0.9	0.5	0.7	0.8
7	1.8	1.8	2.0	1.8	1.8	2.0
8	4.5	4.2	4.2	5.0	4.2	4.4
9	53.2	56.8	58.9	60.0	60.0	58.7
10	37.7	33.8	31.3	30.7	31.0	31.9

^ Less than 0.1%

Figure 5: Number of Births with a Low Apgar Score at five minutes 1997 – 2002

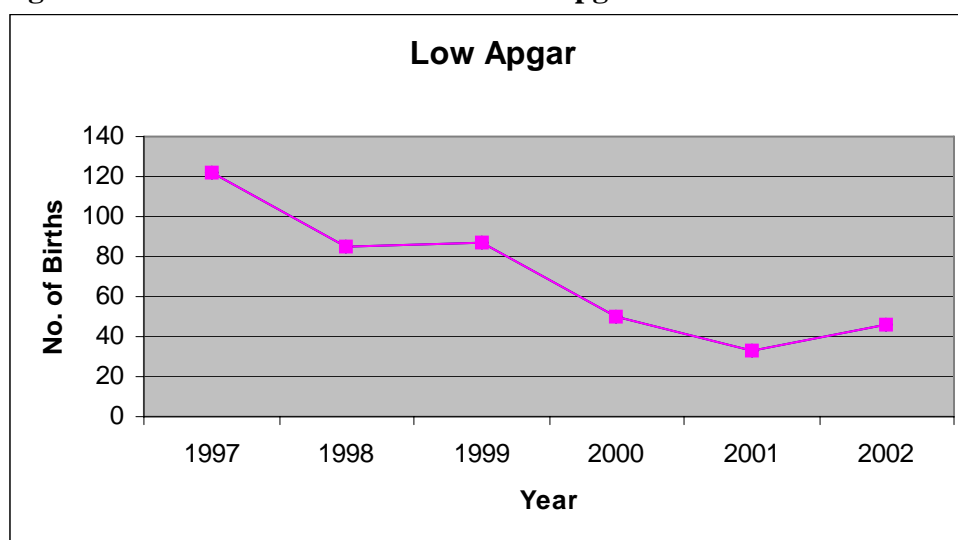


Table 8: Proportion of Liveborn Infants by Type of Anaesthetic with an Apgar Score of less than 6 at five minutes 1997 - 2002

Year	No Anaesthetic %	General Anaesthetic only %	Epidural only %	Other Anaesthetic %
1997	0.8	0.2	0.1	^
1998	0.5	0.1	0.1	0.1
1999	0.7	0.1	0.1	0.1
2000	0.4	0.1	0.1	0.1
2001	0.3	0.1	^	^
2002	0.4	0.1	0.1	0.2

^ Less than 0.1%

Table 9: Proportion of all Liveborn Infants by Sex with an Apgar Scores less than 6 at five minutes 1997 - 2002

Year	Male %	Female %
1997	1.0	1.2
1998	0.1	0.6
1999	1.1	0.9
2000	0.8	0.5
2001	0.6	0.3
2002	0.4	0.4

Table 10: Proportion of all Liveborn Infants by Mode of Delivery with an Apgar Score less than 6 at five minutes 1997 - 2002

Year	Vaginal Delivery %	Caesarean Section %
1997	1.8	2.3
1998	1.2	1.9
1999	1.5	1.3
2000	0.8	0.9
2001	0.6	0.5
2002	0.6	0.3

Table 11: Proportion of Liveborn Infants by Gestation with an Apgar Score less than 6 at five minutes 1997 - 2002

Year	Gestation in Weeks				
	20 – 24 %	25 – 29 %	30 – 34 %	35 – 39 %	40 + %
1997	50.0	17.1	0	1.3	0.8
1998	25.0	8.1	1.4	0.8	0.7
1999	73.3	8.3	2.7	0.7	0.8
2000	0	7.3	1.4	0.7	0.5
2001	50.0	5	2.2	0.5	0.3
2002	0	3.1	2.3	0.9	0.6

Table 12: Proportion of Liveborn Infants by Birthweight with an Apgar Score less than 6 at five minutes 1997 - 2002

Year	Birthweight in Grams					
	500 – 999 %	1000 – 1499 %	1500 – 2499 %	2500 – 3499 %	3500 – 4499 %	4500 + %
1997	44.0	23.4	4.6	1.4	1.0	0.8
1998	44.0	10.3	4.1	1.0	0.6	0
1999	44.0	8.2	2.4	0.9	0.7	0
2000	21.7	4.4	0.3	0.8	0.6	0
2001	11.1	3.6	0.6	0.5	0.3	2.0
2002	13.6	0	2.5	0.9	0.5	0.8

Resuscitation

The following table shows all intubations, including those done in conjunction with other methods of resuscitation.

Table 13: Intubation Rate 1992 - 2002

Year	Number of Intubations	Number of Births	Percentage of all Births requiring Intubation
1992	40	6392	0.6
1993	50	6795	0.7
1994	36	6787	0.5
1995	44	6748	0.6
1996	50	6331	0.8
1997	58	6309	0.9
1998	38	6171	0.6
1999	42	6145	0.7
2000	42	5975	0.7
2001	19	5726	0.3
2002	30	5714	0.5

Table 14: Resuscitation Rate 1997 – 2002

Year	Number of Resuscitations	Number of Births	Percentage of all Births requiring Resuscitations
1997	884	6309	14.0
1998	799	6171	12.9
1999	794	6145	12.9
2000	662	5975	11.0
2001	568	5726	9.9
2002	339	5714	5.9

In the year 2000, Tasmania had the lowest reported resuscitation rate (10.6%) of any State or Territory in Australia. The state with the second lowest rate was Victoria with 42.6% of all live births requiring resuscitation. The highest was the Northern Territory with 64.9%, while the National average was 52.9%. Nationally the most common method of resuscitation was suction followed by oxygen therapy¹. Tasmania does not collect suction as a means of resuscitation.

A different story is told in 1998 where all states, with the exception of Western Australia, had a resuscitation rate of 9 – 18%. In this year suctioning and oxygen therapy were not included as resuscitative actions².

¹ Australia's Mothers & Babies 2000 Australian Institute of Health & Welfare

² Australia's Mothers & Babies 1998 Australian Institute of Health & Welfare

Presentation at Delivery

Table 15: Presentation at Delivery for all Births 1997 –2002

Year	Vertex n (%)	Face & Brow n (%)	Breech n (%)	Other n (%)	Not Stated n (%)
1997	5881 (93)	17 (^)	286 (5)	34 (1)	91 (1)
1998	5635 (90)	26 (^)	221 (4)	65 (1)	314 (5)
1999	5516 (89)	25 (^)	250 (4)	87 (1)	317 (5)
2000	5388 (90)	21 (^)	256 (4)	66 (1)	243 (4)
2001	5340 (93)	22 (^)	225 (4)	78 (1)	67 (1)
2002	5374 (94)	23 (^)	250 (4)	61 (1)	8 (^)

^ Less than 0.1%

As the rate of cases where the presentation was not stated decrease, the rate of vertex presentations increases, therefore it reasonable to assume that the majority of missing cases were vertex presentations. Nationally the rate of vertex presentations is around 95%.¹

¹ Australia's Mothers & Babies 2000 Australian Institute of Health & Welfare

Perinatal Mortality

Table 16: Perinatal Outcome 1997 - 2002

Outcome	1997	1998	1999	2000	2001	2002
Livebirth	6249	6115	6082	5914	5666	5641
Stillbirth (antepartum)	21	31	22	27	29	0
Stillbirth (intrapartum)	0	3	3	7	5	0
Stillbirth (time unknown)	31	3	19	5	10	49
Neonatal death	8	14	17	18	14	24
Unknown	0	5	2	4	2	0
TOTAL	6309	6171	6145	5975	5726	5714

Figure 6: Stillbirths & Neonatal Deaths 1997 - 2002

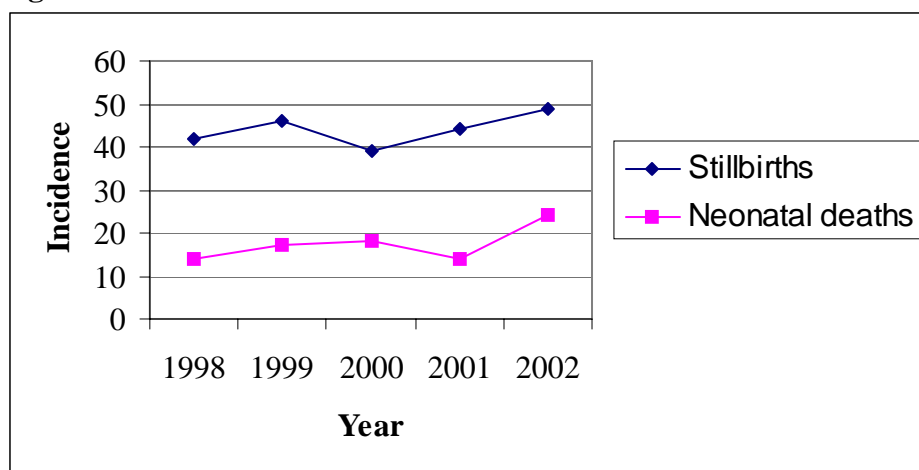


Table 17: Perinatal Mortality Rates 1992 - 2002

Year	Number of Perinatal deaths	Number of Births	Rate of Perinatal Mortality per 1000 births
1992	93	7025	13.2
1993	66	6861	9.6
1994	58	6845	8.5
1995	69	6817	10.1
1996	53	6331	8.4
1997	60	6309	9.5
1998	56	6171	9.1
1999	63	6145	10.2
2000	61	5975	10.2
2001	57	5726	10.0
2002	68	5714	11.9

Figure 7: Perinatal Mortality Rate per 1000 Births in Tasmania 1991 - 2002 and Australia 1993 - 1999

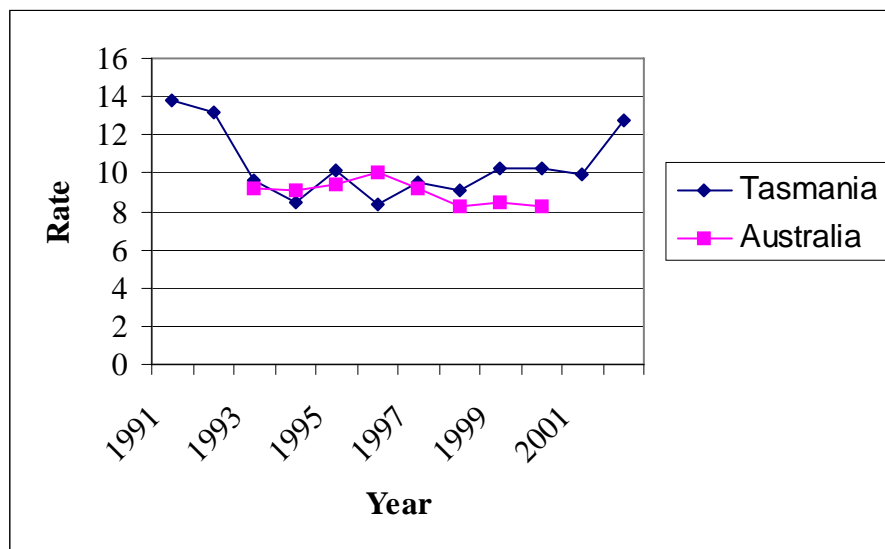


Table 18: Causes of Perinatal Mortality 1996 - 2002

Cause	1996	1997	1999	2000	2001	2002
Spontaneous Pre-term	6	7	12	15	8	19
Intrauterine growth retardation	4	3	2	1	1	1
Unexplained Intrauterine death	21	14	16	16	16	16
Birth Trauma	0	0	0	0	0	1
Intrapartum asphyxia	5	6	1	3	0	5
Hypertension	0	0	1	1	2	2
Maternal Disease	0	0	1	2	3	2
Antepartum Haemorrhage	3	6	3	5	5	6
Foetal abnormality	5	11	19	9	16	12
Haemolytic disease	0	0	0	0	0	0
Infection	3	3	3	1	1	0
Other	6	8	5	8	5	9
Total	53	60	63	61	57	73

Note: A comprehensive review of Perinatal Mortality was not undertaken in 1998.

Table 19: Incidence of Perinatal Deaths with Antepartum Haemorrhage (APH) 1992 - 2002

Year	APH of Unknown Origin		Placenta Previa		Abruptio Placentae	
	Deaths	Cases	Deaths	Cases	Deaths	Cases
1992	5	59	0	25	1	24
1993	7	82	1	19	7	21
1994	2	32	1	21	6	14
1995	3	33	1	18	2	14
1996	3	171	0	21	1	27
1997	0	139	0	16	8	21
1998	5	155	0	11	2	6
1999	2	88	1	24	1	10
2000	1	3	0	22	4	37
2001	0	2	0	26	6	36
2002	1*	0	0	21	5	28

* On the Perinatal Data Collection Form this death was reported in conjunction with a “probable abruption”. However, the independent review of perinatal mortality conducted by the Perinatal Mortality & Morbidity Sub-Committee was unable to confirm the origin of the haemorrhage. Therefore there are two pieces of conflicting information from two different sources.

Neonatal Mortality

Neonatal mortality includes all deaths of liveborn babies born after 20 weeks gestation or with a birthweight greater than 400 grams, and the rate is expressed as deaths per 1000 births.

Table 20: Neonatal Mortality 1992- 2002

Year	Number of Neonatal Deaths	Neonatal Mortality Rate
1992	42	6.0
1993	19	3.0
1994	10	1.5
1995	20	3.0
1996	12	2.0
1997	8	1.3
1998	14	2.3
1999	17	2.8
2000	16	2.7
2001	14	2.4
2002	24	4.2

Table 21: Neonatal Mortality, per 1000 births, in Infants over 28 weeks Gestation 1992 - 2002

Year	Number	Neonatal Mortality Rate
1992	21	3.0
1993	9	1.3
1994	5	0.7
1995	14	2.0
1996	3	0.5
1997	3	0.5
1998	5	0.8
1999	7	1.2
2000	6	1.0
2001	6	1.1
2002	6	1.1

Nationally, the neonatal mortality rate per 1000 births in infants over 28 weeks gestation was 1.8 in 1998, 1.7 in 1999 and 1.6 in 2000. For infants greater than 1000 grams at birth the national neonatal mortality rate was 1.7 in 1998, 1.8 in 1999 and 1.6 in 2000¹.

Table 22: Neonatal Mortality, per 1000 births, in Infants over 1000 grams Birthweight 1992 - 2002

Year	Number	Neonatal Mortality Rate
1992	22	3.1
1993	13	1.9
1994	7	0.8
1995	6	0.8
1996	3	0.5
1997	2	0.3
1998	3	0.5
1999	2	^
2000	7	1.2
2001	6	1.1
2002	3	0.5

^ Less than 0.1%

¹ Australia's Mothers & Babies 2000 Australian Institute of Health & Welfare

Autopsy Rates

Despite repeated recommendation from the Council of Obstetric & Paediatric Mortality & Morbidity on the value of autopsy as an investigation tool in cases of perinatal death, especially in cases of unexplained intrauterine death, the rate of autopsy has continued to decline markedly.

Table 23: Rate of Autopsies on Perinatal Deaths 1992 - 2002

Year	Autopsy Rate %
1992	43.0
1993	47.0
1994	48.0
1995	47.5
1996	66.0
1997	35.0
1998	Unknown
1999	37.0
2000	46.0
2001	23.0
2002	7.4

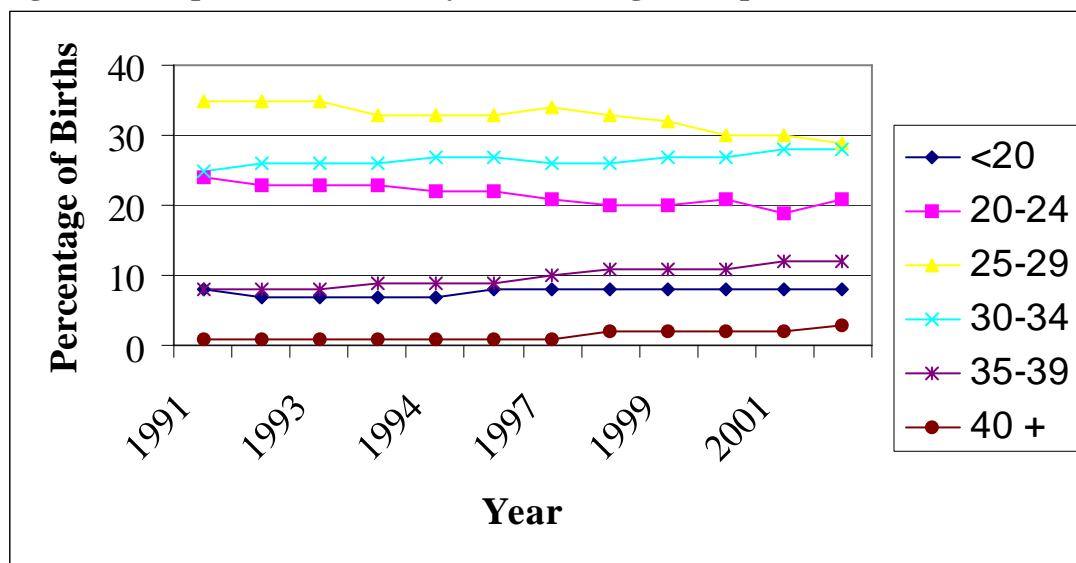
Mothers

Age of Mothers

Table 24: Age of Mothers 1992 - 2002

Year	Under 20 years of age %	20 – 24 years of age %	25 – 29 years of age %	30 – 34 years of age %	35 – 39 years of age %	Over 40 years of age %
1992	7	23	35	26	8	1
1993	7	23	35	26	8	1
1994	7	23	33	26	9	1
1995	7	22	33	27	9	1
1996	8	22	33	27	9	1
1997	8	21	34	26	10	1
1998	8	20	33	26	11	2
1999	8	20	32	27	11	2
2000	8	21	30	27	11	2
2001	8	19	30	28	12	2
2002	8	21	29	28	12	3

Figure 8: Proportion of Births by Maternal Age Groups 1992 - 2002

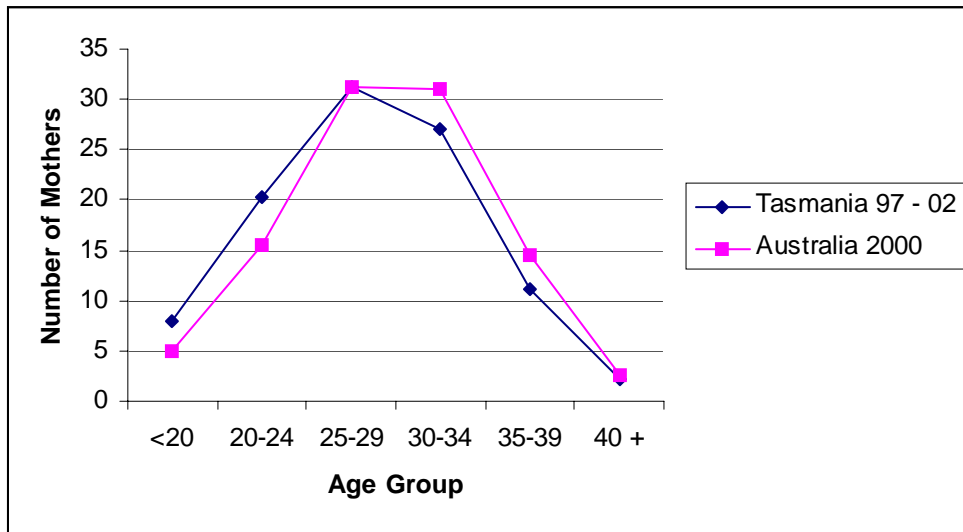


The number of women giving birth in their twenties continues to decline in contrast to the increasing rate of mothers in their thirties. The teenage pregnancy rate remains stable at 8%, while the proportion of mothers in their forties has increased from 2% to 3% in 2002.

Figure 9 shows that the average age of mothers in Tasmania from 1997 – 2002 is higher for the teenage age group and those in their early twenties than the national

average for Australia in 2000. From age 30 onwards Tasmania falls below the national average.¹

Figure 9: Average Maternal Age in Tasmania 1997 – 2002 and Australia 2000



¹ Australia's Mothers & Babies Australian Institute of Health & Welfare

Table 25: Rates of Birth per 1000 Female Population by Maternal Age 1996 - 2002

Maternal age In years	Year	Estimated Tasmanian Female Population *	Rate of Births per 1000
15 – 19	1997	16633	31.3
	1998	16804	29.6
	1999	16951	30.6
	2000	17112	29.3
	2001	16626	28.7
	2002	16591	27.9
20 – 24	1997	15359	86.3
	1998	15037	82.6
	1999	14750	83.5
	2000	14484	86.0
	2001	14022	78.2
	2002	14175	84.1
25 – 29	1997	16493	129.5
	1998	16466	125.9
	1999	16005	124.3
	2000	15619	114.2
	2001	14712	115.9
	2002	14028	116.2
30 – 34	1997	17239	94.2
	1998	16601	97.8
	1999	16123	102.7
	2000	16058	99.6
	2001	16390	98.4
	2002	16304	96.9
35 – 39	1997	19143	31.6
	1998	18924	36.2
	1999	18625	36.7
	2000	18059	37.6
	2001	17620	38.9
	2002	16987	40.1
40 – 44	1997	17846	5.0
	1998	17901	6.3
	1999	17940	5.3
	2000	18108	6.9
	2001	18511	7.0
	2002	18589	9.1
45 -49	1997	16375	0.2
	1998	16475	0.3
	1999	16750	0.2
	2000	16915	0.3
	2001	17135	0.1
	2002	17282	0.3

*Australian Bureau of Statistics Demography – Tasmania 3311.6 1997, 1998, 1999, 2000, 2001 & Census Edition 3201.0 March 2003

Parity

Parity refers to the condition of having given birth to an infant or infants, alive or dead. A multiple birth is considered as a single parous experience.

Table 26: Percentage of Births by Parity 1992 - 2002

Year	Para 1 %	Para 2 %	Para 3 %	Para 4 %	Para 5 and over %
1992	39	33	18	7	3
1993	39	33	16	7	4
1994	39	34	20	6	3
1995	40	33	17	6	4
1996	40	34	16	6	4
1997	41	34	15	6	3
1998	39	34	16	6	4
1999	40	34	16	6	4
2000	39	33	17	6	4
2001	39	33	17	6	4
2002	40	33	17	6	4

Indigenous Status

Reporting of Indigenous Status is by self-identification. Upon admission to hospital, patients are asked if they are of Aboriginal or Torres Strait Island origin. Low community acceptance of the need to ask the question, and a lack of confidence in how an affirmative response will be treated has possibly resulted in some under reporting of Indigenous Status.

Table 27: Mother's Indigenous Status 1997 - 2002

Status	1997	1998	1999	2000	2001	2002
Aboriginal	6	62	13	11	15	12
Torres Strait Islander	3	15	4	1	3	3
Aboriginal & Torres Strait Islander	198	54	47	46	30	25
Neither	5640	4311	1450	1444	1081	756
Not Stated	462	1729	4631	4473	4597	4918

Breastfeeding

Table 28: All births by Breastfeeding at Discharge 1997 - 2002

Year	Yes	No	% Yes
1997	4908	1401	77.8
1998	4715	1546	75.3
1999	4607	1590	74.3
2000	4430	1545	74.1
2001	4281	1445	74.8
2002	4346	1368	76.1

The rate of women choosing to breastfeed has remained stable at around 75% over the last 6 years. However this figure only represents the number of women who were breastfeeding at discharge and does not provide any measure of the number of women who were able to continue breastfeeding once they were home. Table 29 indicates that the number of primiparae women breastfeeding at discharge is increasing.

Table 29: Breastfeeding at Discharge by Public/Private Hospital 2000 - 2002

Year	Public % Yes	Private % Yes
2000	71	78
2001	68	84
2002	71	73

Table 30: Breastfeeding at Discharge by Parity 2000 – 2002

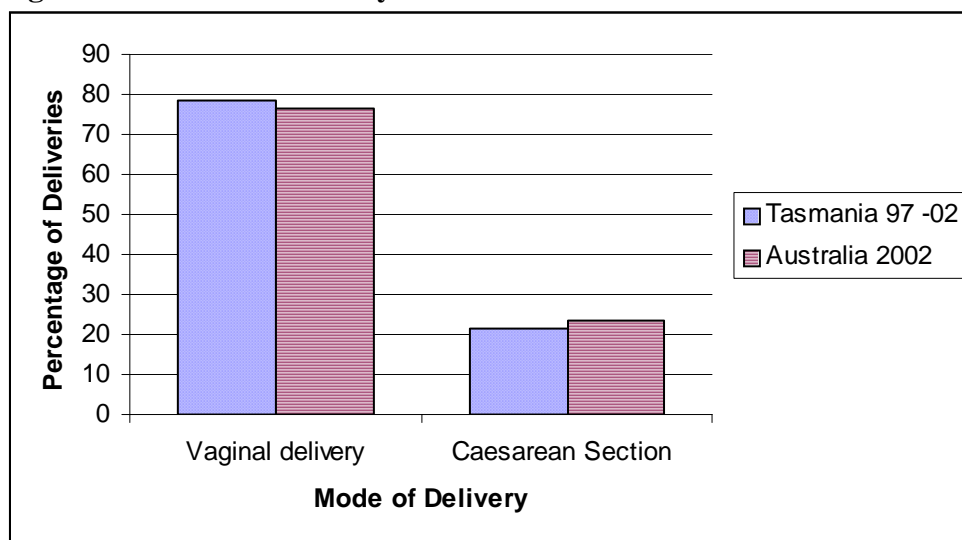
Year	Primiparae % Yes	Multiparae % Yes
2000	76	73
2001	78	73
2002	79	74

Mode of Delivery

Table 31: Mode of Delivery 1992 - 2002

Year	Vaginal Delivery Number	Vaginal Delivery %	Caesarean Sections Number	Caesarean Sections %
1992	5881	84	1144	16
1993	5704	83	1157	17
1994	5688	83	1157	17
1995	5504	81	1313	19
1996	5140	81	1191	19
1997	5046	80	1263	20
1998	4856	78	1315	22
1999	4838	79	1252	20
2000	4640	78	1324	22
2001	4380	77	1334	23
2002	4465	78	1246	22

Figure 10: Mode of Delivery in Tasmania 1997 – 2002 and Australia 2000



Tasmania's caesarean section rate remains above 20%, but is still lower than the Australian rate of 23.3 in 2000 (also refer to Caesarean Section segment later in this report)¹.

¹ Australia's Mothers & Babies 2000 Australian Institute of Health & Welfare

Table 32: Mode of Delivery for Vaginal Births 2000 – 2002

Mode of Delivery	2000		2001		2002	
	No.	%	No.	%	No.	%
Unassisted Vaginal	4041	87	3789	86	3823	86
Forceps	277	6	249	6	234	5
Forceps Rotation	35	1	16	^	17	^
Vacuum Extraction	252	5	306	7	331	7
Vaginal Breech	35	1	20	^	35	1
Total	4640		4380		4465	

^ Less than 0.1%

Table 33: Mode of Delivery by Gestation 1997 - 2002

Gestation in weeks	Year	Vaginal Delivery	Caesarean Section	Total
		No. (%)	No. (%)	Number
20 - 24	1997	24 (96)	1 (4)	25
	1998	15 (94)	1 (6)	16
	1999	26 (96)	1 (4)	27
	2000	25 (89)	3 (11)	28
	2001	23 (100)	0	23
	2002	20 (87)	3 (13)	23
25 - 29	1997	23 (48)	25 (52)	48
	1998	16 (38)	26 (62)	42
	1999	19 (51)	18 (49)	37
	2000	20 (43)	27 (57)	47
	2001	13 (48)	14 (52)	27
	2002	25 (53)	22 (47)	47
30 - 34	1997	70 (53)	62 (47)	132
	1998	85 (75)	28 (25)	113
	1999	100 (54)	86 (46)	186
	2000	88 (57)	66 (43)	154
	2001	81 (54)	70 (46)	151
	2002	72 (48)	77 (52)	149
35 - 39	1997	1775 (72)	690 (28)	2465
	1998	1850 (71)	763 (29)	2613
	1999	1955 (72)	754 (28)	2709
	2000	1898 (70)	794 (30)	2629
	2001	1819 (68)	853 (32)	2672
	2002	1816 (70)	767 (30)	2583
40 and over	1997	3130 (87)	473 (13)	3603
	1998	2839 (86)	459 (14)	3298
	1999	2673 (88)	379 (12)	3052
	2000	2590 (86)	429 (14)	3019
	2001	2426 (86)	389 (14)	2815
	2002	2521 (87)	376 (13)	2897

Given the small number of infants born a young gestational age, it is not possible to make any meaningful analysis of the likelihood of a caesarean section birth instead of

a vaginal birth at less than 25 weeks. However, Table 32 does demonstrate that the greater the gestational age the less variation in there is in the probability of a vaginal or caesarean birth.

Table 34: Mode of Delivery by Maternal Age 1997 - 2002

Maternal age in years	Year	Vaginal Delivery No. (%)	Caesarean Section No. (%)	Total Number
Less than 14	1997	4 (100)	0	4
	1998	6 (100)	0	6
	1999	1 (100)	0	1
	2000	4 (100)	0	4
	2001	0	0	0
	2002	2 (100)	0	2
15 - 19	1997	450 (87)	68 (13)	518
	1998	427 (87)	62 (13)	489
	1999	440 (87)	68 (13)	508
	2000	439 (88)	61 (12)	500
	2001	399 (84)	77 (16)	476
	2002	389 (84)	73 (16)	462
20 - 24	1997	1097 (83)	223 (17)	1320
	1998	987 (81)	227 (19)	1214
	1999	1006 (84)	198 (16)	1204
	2000	1004 (81)	239 (19)	1243
	2001	921 (84)	174 (16)	1095
	2002	1010 (85)	181 (15)	1191
25 - 29	1997	1707 (80)	418 (20)	2125
	1998	1596 (78)	443 (22)	2039
	1999	1563 (80)	397 (20)	1960
	2000	1431 (80)	360(20)	1791
	2001	1322 (78)	382 (22)	1704
	2002	1291 (79)	337 (21)	1628
30 - 34	1997	1230 (79)	389 (21)	1619
	1998	1235 (77)	363 (23)	1598
	1999	1252 (77)	378 (23)	1630
	2000	1184 (74)	412 (26)	1596
	2001	1180 (73)	427 (27)	1607
	2002	1166 (74)	413 (26)	1579
35 - 39	1997	461 (77)	141 (23)	602
	1998	490 (73)	181 (27)	671
	1999	482 (72)	186 (28)	668
	2000	467 (69)	210 (31)	677
	2001	456 (67)	226 (33)	682
	2002	492 (72)	188 (28)	680
40+	1997	69 (74)	24 (26)	93
	1998	82 (66)	41 (34)	123
	1999	74 (75)	24 (25)	98
	2000	94 (72)	36 (28)	130
	2001	87 (67)	43 (33)	130
	2002	98 (66)	50 (34)	148

Table 35: Percentage of all births by Parity by Mode of Delivery 1997-2002

Parity	Year	Vaginal No. (%)	Caesarean Section No. (%)	Total
1	1997	1981 (78)	567 (22)	2548
	1998	1815 (75)	606 (25)	2421
	1999	1887 (78)	545 (22)	2432
	2000	1787 (76)	560(24)	2347
	2001	1693 (75)	558 (25)	2251
	2002	1788 (78)	517 (22)	2305
2	1997	1718 (80)	410 (20)	2128
	1998	1705 (80)	426 (20)	2131
	1999	1658 (79)	426 (21)	2084
	2000	1543 (78)	445 (22)	1988
	2001	1442 (76)	454 (24)	1896
	2002	1463 (78)	423 (22)	1886
3	1997	797 (82)	172 (18)	969
	1998	798 (80)	193 (20)	991
	1999	815 (82)	184 (18)	999
	2000	820 (81)	186 (19)	1006
	2001	752 (79)	197 (21)	949
	2002	769 (80)	196 (20)	965
4	1997	330 (83)	68 (17)	398
	1998	331 (85)	59 (15)	390
	1999	298 (81)	68 (19)	366
	2000	291 (78)	80 (22)	371
	2001	281 (77)	86 (23)	367
	2002	269 (82)	59 (18)	328
5+	1997	174 (80)	41 (20)	215
	1998	205 (83)	43 (17)	248
	1999	197 (84)	37 (16)	234
	2000	182 (79)	48 (21)	230
	2001	191 (84)	37 (16)	228
	2002	176 (78)	51 (22)	227

Caesarean Section

Table 36: Emergency/Elective Caesarean Section Proportion 1997 - 2002

Year	Emergency Number	Emergency %	Elective Number	Elective %
1997	659	52.5	597	47.5
1998	561	54.0	478	46.0
1999	637	53.3	559	46.7
2000	649	50.3	642	49.7
2001	675	51.1	645	48.9
2002	600	48.2	646	51.8

Table 37: Emergency/Elective Caesarean Section Proportion by Public/Private Hospitals 2000 - 2002

Year	Emergency %		Elective %	
	Public	Private	Public	Private
2000	56	41	44	59
2001	57	45	43	55
2002	54	41	46	59

Table 38: Primary/Repeat Caesarean Section Proportion 1998 - 2002

Year	Primary Number	Primary %	Repeat Number	Repeat %
1998	772	57.7	565	42.3
1999	764	60.5	499	39.5
2000	832	62.8	492	37.2
2001	811	60.8	523	39.2
2002	754	60.5	492	39.5

Of the emergency caesareans performed in 2000, 107 (16.5%) were repeat sections. In 2001 this increased to 116 (17.2%) and fell in 2002 to 103 (17.16%).

Table 39: Primary/Repeat Caesarean Section Proportion by Public/Private Hospitals 2000 - 2002

Year	Primary %		Repeat %	
	Public	Private	Public	Private
2000	66	59	34	41
2001	64	57	36	43
2002	61	60	39	40

The propensity for more caesarean section to be performed in the private sector than in the public sector continues (25% of deliveries for 2002, compared with 20% in the public sector). While a higher percentage of the caesarean sections performed in the public sector are emergency procedures, the rate of primary caesarean sections is consistent in both sectors.

Figure 11: Caesarean Section Rates 1980 - 2002

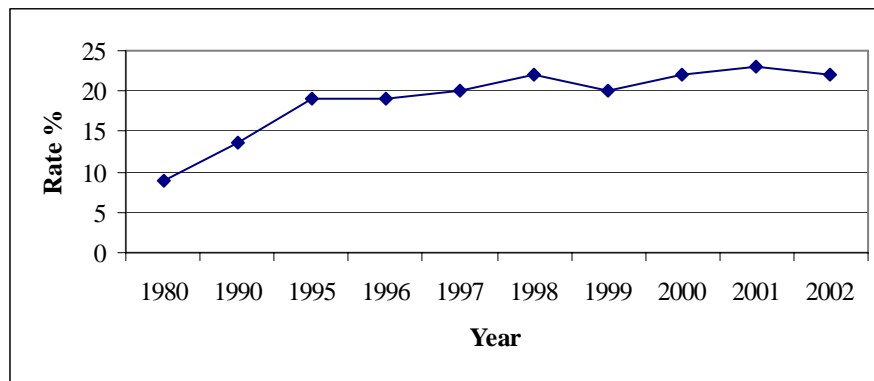


Table 40: All births by Caesarean Section following Augmentation of Labour 1998 – 2002

Type of Augmentation	Year	Primary	Repeat	% of all Augmentations
ARM* only	1998	15	7	5.2
	1999	15	3	3.7
	2000	25	5	5.4
	2001	35	2	6.5
	2002	34	5	5.8
Oxytocin only	1998	24	6	16.3
	1999	12	4	9.7
	2000	34	3	19.1
	2001	35	0	17.6
	2002	38	1	18.5
Oxytocin & ARM*	1998	14	2	16.7
	1999	23	0	17.0
	2000	18	1	16.2
	2001	22	3	17.1
	2002	19	2	16.0
Other	1998	3	0	27.3
	1999	2	2	36.4
	2000	0	0	0
	2001	0	0	0
	2002	1	0	25.0

* ARM = Artificial Rupture of Membranes

Induction and Augmentation

Induction

Table 41: Percentage of Births by Mode of Delivery by Method of Induction 1998 - 2002

Induction	Year	Vaginal Delivery %	Caesarean Section %	Total Number
Artificial Rupture of Membranes only	1998	95	5	130
	1999	94	6	115
	2000	93	7	134
	2001	98	2	123
	2002	90	10	145
Prostaglandin only	1998	81	19	553
	1999	84	16	533
	2000	83	17	570
	2001	81	19	451
	2002	88	12	421
Artificial Rupture of Membranes & Prostaglandin	1998	86	14	142
	1999	86	14	140
	2000	91	9	146
	2001	88	12	153
	2002	91	9	201
Oxytocin only	1998	86	14	139
	1999	83	17	121
	2000	82	18	98
	2001	79	21	114
	2002	84	16	83
Oxytocin & Artificial Rupture of Membranes	1998	84	16	369
	1999	91	9	356
	2000	85	15	253
	2001	87	13	327
	2002	92	8	360
Oxytocin & Prostaglandin	1998	72	28	47
	1999	94	6	52
	2000	60	40	42
	2001	73	27	44
	2002	57	43	42
Oxytocin, Artificial Rupture of Membranes & Prostaglandin	1998	79	21	117
	1999	80	20	151
	2000	82	18	120
	2001	74	26	136
	2002	80	20	157
Other	1998	0	100	1
	1999	79	21	14
	2000	100	0	7
	2001	64	36	44
	2002	77	23	47

Table 42: Induction Rate 1996 – 2002

Year	Deliveries following Induction of Labour			Induction Rate %
	Vaginal deliveries Number (%)	Caesarean Section deliveries Number (%)	Total Number	
1996	1120 (85)	202 (15)	1322	21
1997	1113 (86)	181 (14)	1294	21
1998	1253 (84)	245 (16)	1498	24
1999	1282 (86)	210 (14)	1492	24
2000	1159 (85)	211 (15)	1370	23
2001	1157 (83)	235 (17)	1392	24
2002	1267 (87)	189 (13)	1456	25

Table 43: Induction Rate by Public/Private Hospitals 2000 – 2002

Year	Deliveries following Induction of Labour				Induction Rate %	
	Vaginal deliveries Number (%)		Caesarean Section Number (%)		Public	Private
	Public	Private	Public	Private		
2000	593 (81)	503 (88)	139 (19)	66 (12)	20.4	25.7
2001	608 (83)	502 (83)	127 (17)	103 (17)	22.0	26.9
2002	669 (87)	563 (86)	99 (13)	90 (14)	23.9	29.3

The induction rate tends to be higher in the private sector than the public sector, however the mode of delivery following induction varies little between the two.

Table 44: Percentage of Caesarean Sections following Induction of Labour 1996 - 2002

Year	Total number of Caesarean Sections	Number of Inductions of Labour with Caesarean Section Delivery	Percentage of Caesarean Sections following Induction of Labour %
1996	1191	202	17
1997	1263	181	14
1998	1315	245	19
1999	1252	210	17
2000	1324	211	16
2001	1334	235	18
2002	1246	189	15

Augmentation

Table 45: Augmentation of Labour 1997 – 2002

Year	Artificial Rupture of Membranes	Oxytocin	Other	None	Augmentation Rate
1997	373	116	106	3415	14.8
1998	406	180	98	3155	17.8
1999	441	150	130	3026	19.2
2000	498	165	64	2958	20.4
2001	541	179	133	2559	25.0
2002	667	210	136	2377	29.9

Augmentation refers to the various methods used to increase or hasten labour. The augmentation rate has increased markedly from 14.83% in 1997 to 29.88% in 2002. Nationally the augmentation rate was 53.82% in 2000.¹

¹ Australia's Mothers & Babies 2000 Australian Institute of Health & Welfare

Multiple Pregnancy

Table 46: All Births by Multiple Pregnancy 1997 - 2002

Year	Number of infants born from a Twin pregnancy	Number of infants born from a Multiple* pregnancy
1997	152	0
1998	185	3
1999	162	3
2000	180	3
2001	180	3
2002	164	3

*Multiple equal 3 babies or more.

Please note that infants who do not survive beyond 20 weeks of gestation, or who do not weigh more than 400 grams are not recorded as a birth, hence some odd numbers in the figures above.

Table 47: Perinatal Mortality in Multiple Pregnancy 1997 – 2002

Year	Twin Deaths		Triplet Deaths	
	No.	%	No.	%
1997	5	3.3	0	0
1998	7	3.8	0	0
1999	6	3.7	0	0
2000	10	5.5	1	33.3
2001	4	2.2	0	0
2002	9	5.5	0*	0

* One triplet died aged 51 days from complications associated with prematurity and has, therefore, been included in the paediatric mortality statistics. However, this death could equally be considered a prolonged neonatal death.

Table 48: Incidence of Maternal Hypertension in Multiple Pregnancy 1996 - 2002

Hypertension Category	Year	Number
Pre-existing	1996	4
	1997	0
	1998	6
	1999	4
	2000	10
	2001	8
	2002	0
Pregnancy Induced Hypertension	1996	20
	1997	17
	1998	21
	1999	22
	2000	25
	2001	16
	2002	22
Eclampsia	1996	0
	1997	2
	1998	0
	1999	0
	2000	0
	2001	0
	2002	0

Table 49: Incidence of Antepartum Haemorrhage in Multiple Pregnancy 1996 - 2002

	Year	Incidence
Antepartum Haemorrhage of unknown origin	1996	0
	1997	7
	1998	0
	1999	0
	2000	0
	2001	0
	2002	0
Placenta Previa	1996	2
	1997	0
	1998	0
	1999	2
	2000	2
	2001	1
	2002	2
Abruptio Placentae	1996	4
	1997	0
	1998	0
	1999	0
	2000	2
	2001	2
	2002	0

Maternal Hypertension

Table 50: Prevalence (Number) of cases of Maternal Hypertension for all Births 1996 - 2002

Type of Hypertension	1996	1997	1998	1999	2000	2001	2002
Pre-Existing	82	36	69	66	122	101	103
Hypertension in Pregnancy *	301	293	317	342	315	283	252
Eclampsia	2	6	2	0	0	0	0
Nil	5946	5974	5783	5737	5538	5342	5359
Total	6331	6309	6171	6145	5975	5726	5714

*Due to data accuracy concerns in relation to the recording of pregnancy induced hypertension and Pre-Eclampsia, these figures have been combined as Hypertension in Pregnancy.

Table 50a: Prevalence (Percentage) of cases of Maternal Hypertension for all births 1996 - 2002

Type of Hypertension	1996 %	1997 %	1998 %	1999 %	2000 %	2001 %	2002 %
Pre-Existing	1.3	0.6	1.1	1.1	2.0	1.8	1.8
Hypertension in Pregnancy *	4.8	4.6	5.1	5.6	5.3	4.9	4.4
Eclampsia	^	0.1	^	0	0	0	0
Nil	93.9	94.7	93.7	93.4	92.7	93.3	93.8

^ Less than 0.1%

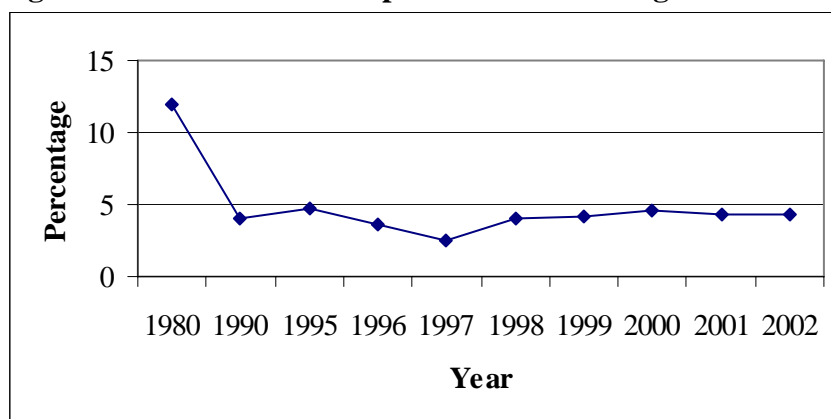
Haemorrhage

Postpartum Haemorrhage

Table 51: Incidence of Postpartum Haemorrhage 1992 - 2002

Year	Number	Incidence %
1992	316	4.5
1993	295	4.3
1994	239	3.5
1995	320	4.7
1996	228	3.6
1997	160	2.5
1998	251	4.1
1999	252	4.1
2000	245	4.5
2001	244	4.3
2002	246	4.3

Figure 12: Incidence of Postpartum Haemorrhage 1980 – 2002



The rate of post partum haemorrhage has remained largely unchanged in the last twenty years, following a significant drop between 1980 and 1990.

Antepartum Haemorrhage

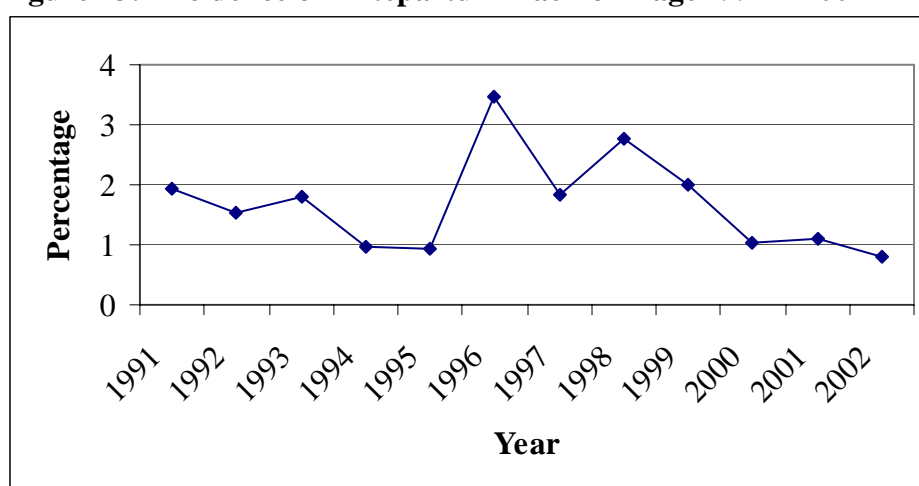
Table 52: Incidence of Antepartum Haemorrhage 1992 - 2002

Year	Number	Incidence %
1992	105	1.5
1993	123	1.8
1994	68	1.0
1995	68	1.0
1996	221	3.5
1997	113	1.8
1998	173	2.8
1999	123	2.0
2000	59	1.0
2001	63	1.1
2002	49	0.8

Table 53: Type of Antepartum Haemorrhage 1997 - 2002

Type	1997	1998	1999	2000	2001	2002
Placenta Previa	16	11	24	22	26	21
Abruptio Placenta	21	6	10	37	36	28
Antepartum Haemorrhage (unclassified)	139	154	88	3	2	0
Total	176	171	122	62	64	49

Figure 13: Incidence of Antepartum Haemorrhage 1991 – 2002



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