



Tasmania
DEPARTMENT *of*
HEALTH *and*
HUMAN SERVICES

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

Tasmania

**Combined Annual Reports for
2000 – 2001**

Published September 2003

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Introduction

It has been a great tradition that Tasmania maintains a Perinatal Register. It is important that this is done and that the information is used to produce this report for several reasons.

1. To enable Tasmania to contribute to the National Perinatal Database at the Australian Institute of Health & Welfare. From this National Collection the annual *Mothers and Babies* report is produced, detailing the health and wellbeing of obstetric care across the country. Australia enjoys a low maternal, perinatal and paediatric mortality and morbidity rate but there are many countries in the world, including the Asia-Pacific regions, which suffer from significantly higher rates. The *Mothers and Babies* Report serves as important references to the healthcare workers in these countries.
2. The Registry and Report serve us as a means of monitoring our medical care and provide a comparison of our performance with regards to the performance in other states and other countries.
3. To enable review of the individual cases of mortality to help the State identify areas where improvements can be directed and focussed.
4. To enable review of obstetric practices within the state to provide healthcare workers with a practical learning model to continue medical education and quality improvement of clinical care.

In order to fulfil these goals, it is of utmost importance that the accuracy of this Registry, and punctuality of the publication of these Reports, is maintained, constantly monitored and upgraded. To achieve these goals, the Data Management Committee of the Council is working hard towards the improvement of data collection forms, electronic collection of data and auditing of data.

It is most important for this momentum of enthusiasm to be continued. On behalf of the Council, I would sincerely like to thank all the healthcare workers who provide support to the Council and to the publication of this Report. These include many clinicians, midwives and administrative staff of the Hospitals and others as listed in the Acknowledgement.

Professor Clement Chan
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.
- Karen Hinton

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) (2000-2001)
Vacant (2000-2001)

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

Associate Professor Graham Bury (2000-2001)

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

Ms Mary Blackwood (2000-2001)

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

Dr Jan Batt (2000-2001)

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

Dr Elizabeth Hallam (2000-2001)

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

Dr Thomas (Geoff) Shannon (2000-2001)

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

Ms Ruth Forrest (2000-2001)

Additional Member Nominated by Council to represent community interests:

Ms Ros Escott (2000-2001)

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Maternal Mortality & Morbidity Sub-Committee:

Dr Jan Batt (Chair) (2000-2001)
Dr Rob Kelsall (2000-2001)
Ms Ruth Forrest (2000-2001)

Paediatric Mortality & Morbidity Sub-Committee:

Dr Elizabeth Hallam (Chair) (2000-2001)
Dr Geoff Shannon (2000-2001)
Dr Rob Kelsall (2000-2001)
Dr Alfhild Larson (2000-2001)

Perinatal Mortality & Morbidity Sub-Committee:

Associate Professor Graham Bury (Chair) (2000-2001)
Dr David Challis (2000 – 2001)
Dr. Chris Bailey (2000-2001)

Data Management Sub-Committee

Dr Rupert Sherwood (Chair) (2000-2001)
Ms Mary Blackwood (2000-2001)
Professor Allan Carmichael (2000-2001)

National Perinatal Collection Committee -Tasmanian Representative:

Ms Christine Douglas (2000)
Ms Maria Grandovec (2000 – 2001)

National Perinatal Data Development Committee – Tasmanian Representative:

Ms Christine Douglas (2000)
Ms Maria Grandovec (2000 – 2001)

Support Staff:

Ms Christine Douglas, Executive Officer (2000)
Ms Maria Grandovec (2000 – 2001)

Council Summary

Introduction

The following account summarises the apparent observation of trend demonstrated by the data in this Report. It should be noted that these data have not been subjected to strict statistical analysis and some of the apparent trends may not be statistically significant. This summary serves as a document to assist readers in gaining a general overview. When apparent trends are noted and elicit concern, then in-depth and focussed study or research should be conducted to confirm that validity of the concern. Following this process, improvements in care and/or monitoring of obstetric and paediatric health may be proposed.

Notwithstanding the lack of statistical analysis, the Council has opted to include discussion of trends and to make recommendations in this Annual Report to ensure that the work from 2000 and 2001 is constructively used. The discussion and recommendation should be seen as stimulants of thought and catalysts for more in-depth studies. They should not be seen as legal or policy implementing comments. From the body of this Report there are several points worth noting.

1. Deliveries

In Table 1, on Birth and Birth Rates, a continuous decline in births in Tasmania is evident (15.36 per 1000 head of population in 1991 to 12.1 in 2001). This represents a decline of 21% over 10 years. There is also an absolute decline in births from 6957 to 5726 (a decrease of 1231 births or 17.7%). The decline in births is more evident in the Northwest (18%) compared to the South (6%) or North (8%) from 1997 to 2001 (Table 2).

Throughout the years the data does not show any trend of change for the following: sex of infants (Table 5 and Figure 3); birthweight groups (Figure 4); and low or very low birthweight (Table 6).

2. Perinatal Statistics

One encouraging trend is the decrease in babies born with an Apgar score less than 6 at five minutes from 1.9 % in 1997 to 0.6% in 2001 (Table 7). This decrease is observed for both vaginal and caesarean section deliveries (Table 10), all birthweight groups (Table 12) and gestational ages (Table 11).

Another encouraging trend is the decrease of babies requiring intubation from 0.5 – 0.9% between 1997 – 2000, down to 0.3% in 2001 (Table 13). Resuscitation steadily decreased from 14% in 1997 to 9.9% in 2001 (Table 14).

3. Perinatal Mortality

The perinatal mortality rate hovered around the 10/1000 births from 1993 to 2001. This figure is less than the 13/1000 births in 1991 and 1992 (Table 16). The difference between the Tasmanian and the national perinatal mortality rate between 1993 and 1999 is small, if in fact any difference exists (Figure 6). However it is noted that the 3 main causes of perinatal mortality (unexplained intrauterine death, foetal abnormality and spontaneous pre term delivery) did not show any decreasing trend.

More in-depth research may be required to prevent or minimise their occurrence. Mortality due to other causes are too few to suggest any trend (Table 17).

4. Neonatal Mortality

Both the actual numbers of neonatal mortality and the neonatal mortality rates between 1993 and 2001 appear similar, but lower than those in 1991 and 1992 (Table 19). The neonatal mortality rate in infants over 28 weeks gestation and 1000 grams birthweight showed a decrease after 1993 (from around 3 to less than 2) (Table 20 and 21). It is uncertain if the apparently slight increase in both figures for 2000 and 2001 represent a fluctuation or a genuine increase.

5. Maternal Factors

Between 1991 and 2001 the percentage of mothers aged less than 20 years remains similar (7 – 8%), while the percentage of mothers aged between 20-29 years has steadily decreased by about 5%. Conversely, the percentage of mothers aged greater than 40 years has also remained stable (1 –2%), while those aged between 30 – 39 has increased by 3 –4% (Table 23 and Figure 7).

The tendency to have more mothers aged 30 and above is supported by the rates of birth per 1000 female population (Table 24). The percentage of births by parity remains stable between 1991 and 2001 (Table 25).

The data on mother's indigenous status is largely 'not stated' which makes interpretation impossible (Table 26). The percentage of mother's breastfeeding on discharge shows hardly any change between 1997 and 2001 (Table 27).

6. Mode of delivery

From 1991 to 2001 there appears to be a steadily increasing caesarean section rate from 17% to 23% of all deliveries (Table 30). The increased caesarean section rate occurred for the 35 – 39 week gestation group (Table 32) and in the mothers aged 30 years or more (Table 33).

The proportion of emergency and elective caesarean sections remains similar between 1997 to 2001 (Table 35). In the public sector more emergency and primary caesarean sections are performed than in the private sector (Tables 36 and 38). There did not appear to be any trend in the percentages of primary or repeat caesarean sections (Table 37) and caesarean section rates following augmentation of labour (Table 39).

7. Induction of Labour

From 1997 to 2001 there was no apparent trend of change in the total number of inductions or mode of delivery after induction irrespective of the different forms of induction (Table 40). While the induction rate has increased from 21 % in 1996 to 24% in 2001, it is difficult to suggest that this is an increasing trend (Table 41), however there is a slightly higher induction rate in private compared to public hospitals (Table 42).

8. General

There are no apparent trends of change in multiple pregnancies or incidence of hypertension or haemorrhage.

Questions for thought:

1. Are some of the causes of perinatal death (e.g. foetal abnormality) related to the increasing maternal age?
2. Are some of the causes of perinatal death associated with other maternal factors (e.g. spontaneous pre term, placental abruption) associated with tobacco smoking?
3. What is the acceptable caesarean section rate? It is not uncommon to find the rate is increasing in many well developed countries and medico legal issues could be a contributing factor.

Recommendations

1. That further in-depth study into socio-economic factors in relation to perinatal mortality is undertaken (e.g. effects on increased maternal age, and tobacco smoking). A study on the effects of folate supplements may also be interesting.
2. An independent and academic study on the 'acceptable' caesarean section rate for Tasmania would be of benefit.
3. Some active measures should be taken to secure improved data collection for indigenous status.

Professor Clement Chan
Chairperson
Council of Obstetric and Paediatric Mortality and Morbidity.

Committee Reports

Maternal Mortality & Morbidity Sub-Committee

Maternal Deaths for 2000

There were no maternal deaths in the year 2000.

Maternal Deaths for 2001

One maternal death occurred in the year 2001. In this case the woman had a normal delivery of a liveborn infant in a hospital on the west coast of the State. The pregnancy was normal and there were no complications during delivery. During the immediate postpartum period, the woman suffered a severe uncontrollable post partum haemorrhage. Surgical intervention could not be undertaken on site, and a decision was made to transport the patient to the Northwest Regional Hospital.

Problems arose at this stage due to the weather conditions. The delivery occurred during the winter months and the road was impassable due to snow and ice. The option of air ambulance retrieval was investigated, but weather conditions were so bad that the plane would have been unable to land. Evacuation by road was therefore attempted, however the haemorrhage was so severe that the patient suffered a cardiac arrest and died in transit.

In reviewing this case the Maternal Mortality and Morbidity Sub-Committee addressed both the appropriateness of the delivery occurring in a reasonably isolated location, and the timeliness of the emergency evacuation. In relation to the first issue, the Sub-Committee is satisfied that there was no evidence antenatally to suggest that this was a high-risk pregnancy. The woman had no history of post partum haemorrhage, the pregnancy was completely normal, and there were no indications that post partum haemorrhage was a predictable risk. The Sub-Committee was also satisfied that everything possible was done to staunch the bleeding, and to maintain adequate fluid balance.

In reviewing the timeliness of the evacuation procedure, the Sub-Committee concluded that because the plane would have to first travel from Hobart to Queenstown, even if weather had permitted the plane to land, only fifteen minutes would have been gained over a road evacuation. The efforts of all involved in attempting the road evacuation in treacherous conditions were commended.

In conclusion the Sub-Committee is of the opinion that there were no preventable factors in relation to this maternal death. Everything that could have been done was done, and the major issue in this case was the appalling weather conditions.

Perinatal Mortality & Morbidity Sub-Committee

Perinatal Deaths for 2000

There were 61 perinatal deaths investigated in Tasmania in the year 2000. Of these 45 were stillbirths with 16 neonatal deaths. Of the 61 deaths only 28 (46%) underwent autopsy. The overall perinatal mortality was 10.2 per 1000 births. The Australia and New Zealand Perinatal Mortality Classification was used to classify the Perinatal Deaths.

Cause of Death	Number of deaths
Congenital Abnormality	9
Perinatal Infection	1
Hypertension	1
Antepartum Haemorrhage	5
Maternal Conditions	2
Specific Perinatal Conditions	7
Hypoxic Peripartum Death	3
Foetal Growth Restriction	1
Spontaneous Pre-Term	15
Unexplained Antepartum Deaths	16
No Obstetric Antecedent	1
	61

Further analysis of the neonatal deaths has been done using the ANZNDC (Australia and New Zealand Neonatal Death Classification).

Cause of Death	Number of deaths
Nosocomial infection	1
Extreme Prematurity	3
Cardio-respiratory disorders	3
Gastrointestinal	1
Congenital abnormality	3
Neurological	4
Other	1
	16

1. CARDIO-RESPIRATORY DISORDERS

The three infants dying of cardio-respiratory diseases suffered pulmonary haemorrhage when in the recovery phase from hyaline membrane disease.

2. GASTROINTESTINAL

One pre-term infant died of gastro-intestinal problems with an intestinal perforation.

3. CONGENITAL ABNORMALITIES

Two of the congenital abnormality related deaths were due to cardiac anomalies, with the third death caused by metabolic disorders.

4. NEUROLOGICAL

Four infants died of neurological problems, one from a severe intra-cranial haemorrhage and the others from either perinatal asphyxia or hypoxic ischaemic encephalopathy. One of the infants with hypoxic ischaemic encephalopathy also had a disseminated herpes infection.

5. OTHER

The infant dying from other causes was a baby born at term who died abruptly on day 3. Findings at autopsy revealed possible pneumonia, but otherwise the death was consistent with Sudden Infant Death Syndrome.

Perinatal Deaths for 2001

In 2001 there were 57 perinatal deaths (neonatal deaths and still births) of at least 400 grams birth weight or 20 weeks gestation. Of these 43 were stillbirths. Of the total live births, 14 died within 28 days of birth (neonatal deaths).

THE PERINATAL MORTALITY RATE

The perinatal mortality rate for Tasmania (rate per 1,000 births for births of infants born dead of at least 400 grams birth weight or greater than 20 weeks gestation (stillbirth rate) together with infants born alive who died within the first 28 days of life (neonatal death rate) was 9.96.

CAUSES OF PERINATAL DEATHS 2001

The Perinatal Sub-Committee has classified each of the 57 perinatal deaths occurring in 2001 according to the amended Whitfield Classification. This classifies perinatal deaths into 12 groups.

The causes of perinatal deaths in 2001 were as follows:

Cause of Death	Number of Deaths
Spontaneous pre-term	8
Intra-uterine growth restriction	1
Unexplained intra-uterine death	16
Birth Trauma	nil
Intra-partum asphyxia	nil
Hypertension	2
Maternal disease	3
Ante-partum haemorrhage	5
Fetal abnormality	16
Haemolytic disease	nil
Infection	1
Other	5

A brief description of the twelve groups is as follows:

1. SPONTANEOUS PRE-TERM

This group of eight deaths was attributed to prematurity (or its complications) of normally formed appropriately grown infants born before 37 weeks gestation. All of these infants were of 26 weeks gestation or less, with one being associated with multiple pregnancies. Three of these infants were born by emergency caesarian section on account of severe maternal pre-eclampsia. One infant was a poorly grown Twin with a birthweight of 345 grams. In the remaining four neonatal deaths labour started spontaneously and proceeded inevitably to delivery.

2. INTRAUTERINE GROWTH RESTRICTION (IUGR)

There was only one infant with isolated intrauterine growth restriction. This was an infant born on account of maternal pre-eclampsia at 27 weeks gestation. This stillborn infant had a birthweight less than 10 percentile for gestational age with no congenital abnormalities. One other infant classified as dying from the primary cause of complications from extreme prematurity was one of Twins and also showed evidence of intrauterine growth restriction.

3. UNEXPLAINED INTRA-UTERINE DEATH

In this group fetal death preceded labour in the absence of any other major primary complication. Seven of these infants died in utero before 37 weeks gestation with the remaining nine being near full term with one infant being 8 days after the expected date of delivery. Another infant was at 41 weeks gestation. Autopsy was performed on only six infants (1 case was reported to the Coroner) out of sixteen such infants in this group. Thorough investigation of these infants dying before birth is recommended. (*see recommendations*)

4. BIRTH TRAUMA

This group includes only normally formed babies of at least 1500 grams birth weight with evidence of lethal trauma at autopsy, even when labour and delivery are not complicated by mechanical difficulties. There were no deaths in this group.

5. INTRAPARTUM ASPHYXIA

This group is restricted to normally formed babies of at least 1500 grams birth weight with evidence of intrapartum hypoxia and confirmed by hypoxic changes at autopsy. There were no deaths in this group.

6. HYPERTENSION

There were two deaths in this group. One mother had severe pre-eclampsia and the fetal death of one Twin in utero at 29 weeks gestation. The second Twin was delivered promptly and survived. The second mother has essential hypertension, which decreased foetal growth with no foetal movement felt at 28 weeks gestation.

7. MATERNAL DISEASE

Three deaths were attributed to mother's maternal disorders or their complications. Two mothers were involved in significant motor vehicle accidents, one at 31 weeks and the second at 32 weeks. Both these incidents lead to fetal death in utero within 24 hours of the accident. One of the accidents was said to be associated with alcohol and drug ingestion. The third infant died just two days before full term, mother having Type 1 diabetes mellitus treated with insulin.

8. ANTEPARTUM HAEMORRHAGE

There were five deaths in this group. Two occurred at 38 weeks, which were attributed to placental abruption. The other deaths occurred at 21, 22 and 23 weeks gestation in pregnancies where there had been repeated episodes of antepartum haemorrhage over the previous weeks.

9. FETAL ABNORMALITY

There were sixteen deaths in this group. Ten of these sixteen infants were born following termination of pregnancy, which occurred beyond the 20th week of gestation. The types of abnormalities were as follows:

Central nervous system	6
Cardiovascular system	2
Urinary Tract	2
Chromosomal	3
Multiple	3

- ◇ The central nervous system cases consisted of holoprosencephaly, two infants with meningomyelocele, one with anencephaly and one with the lethal form of spinal muscular atrophy.
- ◇ In the cardiovascular cases, there was one case of Tetralogy of Fallot where the infant died suddenly in utero, and another with hypoplastic left heart syndrome.
- ◇ There were two cases involving the renal tract, both of these being renal agenesis.

-
- ◇ Three infants had chromosomal abnormalities, two with trisomy 21 and the third with trisomy 13.
 - ◇ There were also three infants with multiple anomalies.

10. HAEMOLYTIC DISEASE

There were no deaths from haemolytic disease.

11. INFECTION

One infant died of infection, this being at 21 weeks gestation. Mother had had a previous termination of pregnancy and on this occasion a cervical suture had been placed early in the pregnancy. However at 21 weeks gestation mother developed obvious chorioamnionitis leading to the birth of a stillborn infant.

12. OTHER

This miscellaneous group was comprised of five infants. There was one infant transferred from another hospital with a spontaneous bowel perforation on Day 3, which failed all attempts at resuscitation. Two infants succumbed to the effects of Twin to Twin transfusion. Another infant died following the onset of labour within 24 hours after an amniocentesis at 20 weeks gestation. A further death occurred in a mother who had been taking Cyclosporin for psoriasis, was unaware of her pregnancy, which finished with the delivery of a still born infant at 22 weeks gestation.

The amended Whitfield classification can also be used to clarify cause of death in the Preterm and Term group of infants. In the Preterm group the commonest cause of death was congenital anomalies, this being followed by spontaneous preterm labour and then unexplained intrauterine death. In the Term group of infants unexplained intrauterine death was the most common cause.

RECOMMENDATIONS:

1. Documentation in the patient clinical history was satisfactory with the only area requiring attention being where patients' antenatal care had been conducted in private consulting rooms. In these circumstances it was unusual to find any record of antenatal events in the clinical history. This deficiency would be rapidly resolved if the proposal for a patient held record, which has been discussed for several years, were to be adopted. The resolution of safety and quality concerns surrounding the continuation of the current practice would also be resolved.
2. A standard form for reporting and recording perinatal deaths at individual hospitals has been prepared and distributed. The routine forwarding of these forms once the case has been reviewed at perinatal meetings would facilitate the work of the perinatal Sub-Committee.
3. Autopsy rate:
The rate for 2001 was 23%. This is substantially the lowest rate since detailed records have been kept. The rate was slightly higher 5/18 (28%), in the group "Unexplained Intrauterine" death. In this group, autopsy is considered to be an important part of the process of eliminating possible cause. Whilst such a substantial fall off in autopsy rate is understandable, a request for a limited

autopsy is sometimes more acceptable. A number of the records indicated that a request for autopsy had been declined. As pointed out in the 1999 Perinatal report from South Australia, "a good quality autopsy is invaluable in confirming the antenatal diagnosis, eliciting other findings of clinical significance, particularly negative ones, and determining the time course of events leading to death. It may thus be invaluable in relieving parental guilt, helping with the grieving process and parental counseling, and gaining understanding of the patterns and evaluation of fetal and neonatal disease. Parental permission should therefore be sought as often as possible."

The current autopsy rate and the importance of such an investigation, particularly in cases of unexplained intrauterine death should be noted.

Paediatric Mortality & Morbidity Sub-Committee

Paediatric Deaths for 2000

The Paediatric Mortality & Morbidity Sub-Committee reviewed four paediatric deaths for the year 2000. All cases were referred by the Coroner. In three of the cases the cause of death was determined as Sudden Infant Death Syndrome. The age of these infants ranged from 6 weeks to 7 months. In one case, concern was expressed over the excessive bed covering (3 doonas) used to cover the infant.

The fourth case was that of a one year old infant where the cause of death was found to be asphyxia due to entanglement in bed clothing.

Members of the Sub-Committee expressed some concern that only cases of possible Sudden Infant Death Syndrome were being reviewed by the Sub-Committee. Dr Hallam highlighted the need to review all paediatric mortality, including adolescents up to 18 years of age. Under the current definitions in the Perinatal Registry Act 1994, only deaths of children up to 14 years of age fall within the remit of the Council.

Recommendations:

1. A process for a more comprehensive investigation of all paediatric deaths in Tasmania is established.
2. The definition of 'paediatric death' as specified in the Perinatal Registry Act 1994, be revisited to include children up to 18 years of age.

Paediatric Deaths for 2001

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.

Following the recommendation made in 2000, a more comprehensive review was undertaken of paediatric deaths occurring in 2001. Given the small number of deaths each year, the Paediatric Mortality & Morbidity Sub-Committee opted for a broad, 4 category classifications system. The paediatric deaths for 2001, have therefore been classified as follows:

Cause of Death	Number of Deaths
Conditions determined at birth	3
Acquired conditions	8
Sudden Infant Death Syndrome	8
Injuries	4
Cases still under investigation	1
Unknown	2
TOTAL	26

1. CONDITIONS DETERMINED AT BIRTH

Three paediatric deaths were assigned to this category. Two children were born prematurely, and succumbed to conditions associated with their prematurity at 4 and 6 months of age respectively. The third child died from Molybdenum co-factor deficiency at 3 months of age.

2. ACQUIRED CONDITIONS

There were eight deaths assigned to this category. Three children died from brain stem tumours, one pontine tumour and two gliomas. One child died from epilepsy, another from septicaemia associated with bacterial pharyngitis, while another child died from Leukaemia. Two children died as a result of meningococcal infection.

3. SUDDEN INFANT DEATH SYNDROME

There were eight deaths in this category in children ranging from age 29 days to 8 months of age. Two infants died while bed sharing with sleeping parents, which makes it possible that overlaying might be the cause of death rather than SIDS. Another child had a mild case of bronchopneumonia, not severe enough to be the cause of death by itself. This infant was also bed sharing with its parents at the time the death occurred.

The cause of death for one child has been assigned as 'unascertained ?SIDS'. No autopsy was performed on this infant, therefore SIDS cannot be given as the definitive cause of death. Members of the Sub-Committee were particularly concerned that the mother was taking psychotropic drugs and breastfeeding the infant. Without an autopsy it is not possible to exclude other factors as a contributing cause in the child's death.

4. INJURY

Four children died as a result of injuries in 2001. There was one case of drowning, and three deaths caused by road traffic accidents. Two of the accidents involved cars, while the third was a motor cycle accident. In one of the car accidents the child was unrestrained.

5. CASES STILL UNDER INVESTIGATION

Only one case remains in this category and involves the death of a 7 month old infant from respiratory arrest with cerebral atrophy from a hypoxic injury.

6. UNKNOWN

There were two paediatric deaths were no information on the nature of the deaths was available for the Sub-Committee to review.

Recommendations:

1. The Sub-Committee acknowledges that consideration of an autopsy in a child is very distressing to parents and family members. However, it should be noted that ‘unascertained’ is the only possible cause of death finding that can be handed down where an autopsy is not performed. Such a finding can, especially over the long term, be even more distressing and may prevent parents from ever coming to terms with the death of their child. An ‘unascertained’ cause of death also impedes future preventative measures being taken to safeguard the lives of other children, both within individual families and with the community at large.

The Sub-Committee would therefore recommend that every effort be taken to assist parents in understanding the crucial importance of consenting to the autopsy. The Sub-Committee also further recommends that in the interests of the public, Magistrates should exercise their authority to require an autopsy be undertaken if parental consent is not granted.

2. 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 or use recreational drugs.

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.

During both 2000 and 2001 the Sub-Committee had a period of low activity while the Council considered the strategic directions for the Perinatal data collection. During 2001 the opportunities for moving to a clinical obstetric information system were investigated. The benefit of such a system was seen as the capacity to collect more detailed clinical information, thus giving direct benefit to clinicians and midwives, while also improving patient outcomes. Such a system would enable the Perinatal data collection requirements to be met as a sub-set of the whole data collection capacity.

The major system under investigation was a product called OBICARE, which was being developed by Queensland Health in conjunction with a software development company. The software development company was unable to complete the development of the OBICARE product and, therefore by the close of 2001 the product was no longer seen as an option worth pursuing.

Perinatal Statistics

Births and Birth Rates

Table 1: Births and Birth Rates for Tasmania 1991-2001

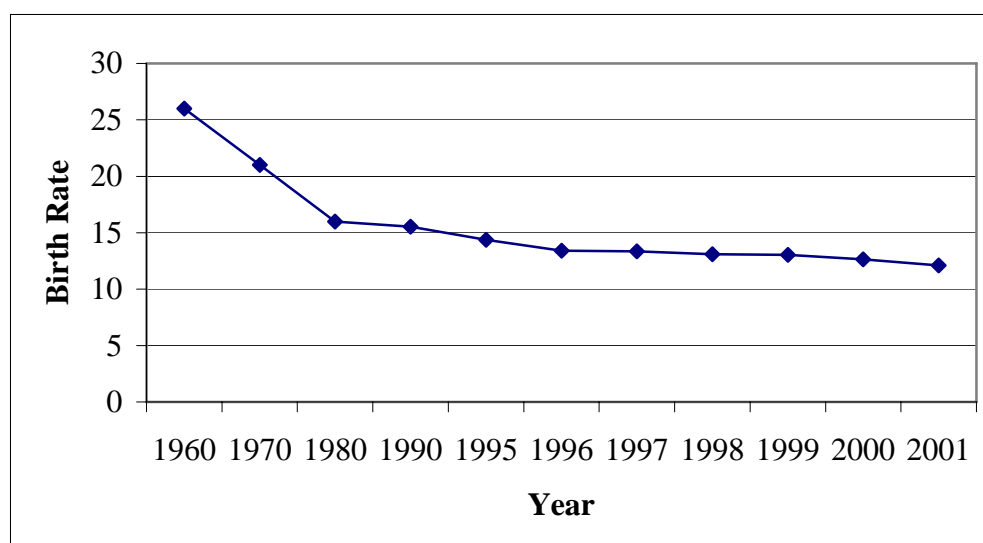
Year	No. Births	Birth rate per 1000 population
1991	6957	15.36
1992	7025	14.95
1993	6861	14.54
1994	6845	14.47
1995	6817	14.38
1996	6331	13.40
1997	6309	13.35
1998	6171	13.09
1999	6145	13.05
2000	5975	12.65
2001	5726	12.10

NB: Australian Bureau of Statistics estimates Tasmania's population as 472 083 in 2000 and 472 931 in 2001. Please note the 2001 estimation of population is a preliminary figure only and is subject to change.

Table 2: Births by Region 1997 – 2001

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

Figure 1: Birthrate for Tasmania per 1000 head of population 1960 - 2001



In 1960, there were 26 births for every 1000 head of population. In the next two decades this figured dropped by five births per year for each 10 year period (21 births in 1970 and 16 in 1980). Between 1980 and 1990 the decreasing birth rate was almost arrested, with a drop of only 0.5 over that 10 year period (i.e. a birth rate of 15.5 in 1990). In the last decade the birth rate has again decreased, but not at the rate of the 1960's and '70's. In the year 2000 the birth rate for Tasmania was 12.6 per 1000 head of population. In 2001 the decreasing rate is still evident with a birth rate of 12.1.

Table 3: Births By Hospital 1996 - 2001

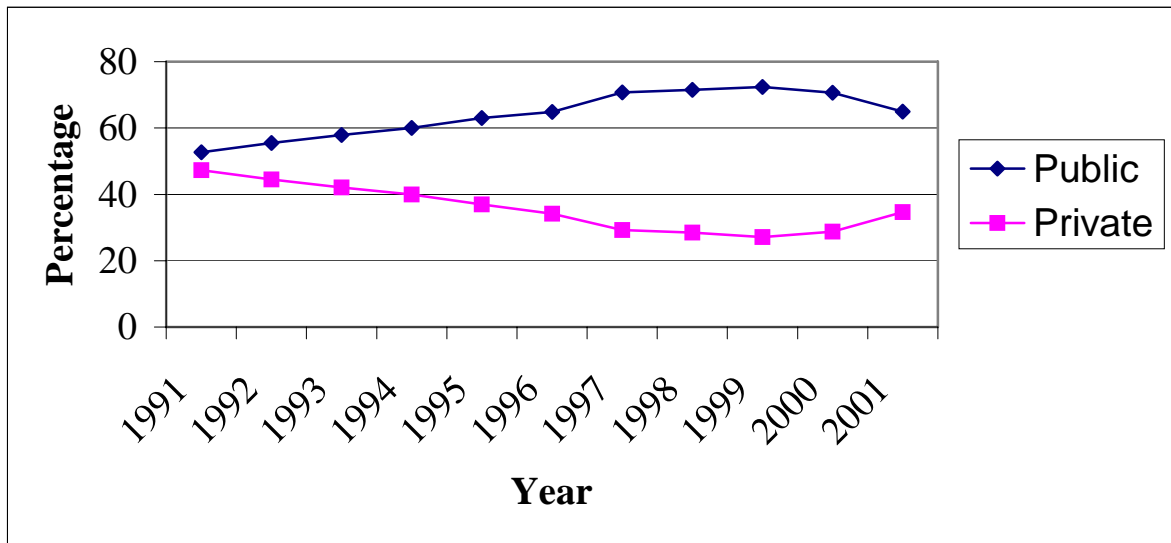
Hospital	1996 No.	1997 No.	1998 No.	1999 No.	2000 No.	2001 No.
Royal Hobart Hospital (QAH)	1781	2049	2050	2084	2007	1823
Launceston General Hospital (QVH)	1834	1626	1564	1641	1587	1512
District Hospitals	187	180	151	159	119	101
Private Sector	2464	2401	2349	2195	2216	2250
Others (includes homebirths)	65	53	57	66	46	40
TOTAL	6331	6309	6171	6145	5975	5726

While the birth rate in Tasmania is on the decline, the percentage of births occurring in each of the hospitals, or health sectors, remains reasonably stable. The rate of births at District hospitals has fallen from 3% of the state total in 1996 to 2% in 2001. The rate for 'other (including home births)' has also fallen to less than 1% in the last two years.

Table 4: Proportion of Public and Private Patients 1991 - 2001

Year	Public %	Private %
1991	52.7	47.3
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	70.78	29.22
1998	71.5	28.5
1999	72.33	27.11
2000	70.61	28.8
2001	64.98	34.61

Figure 2: Proportion of Public and Private Patients 1991 - 2001

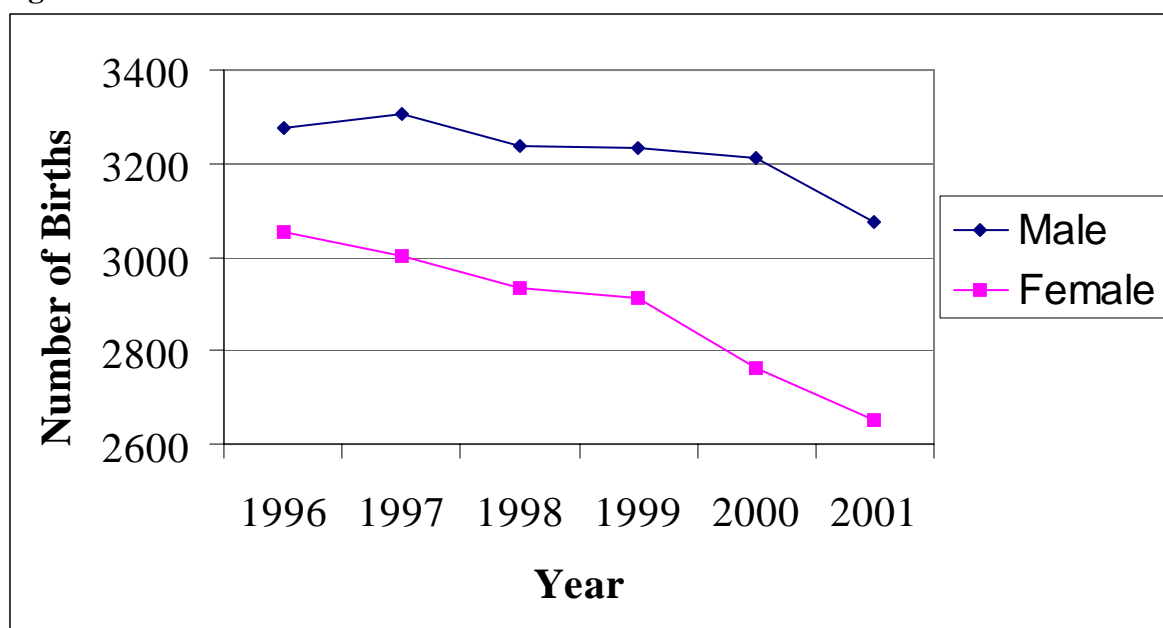


Sex of Infants

Table 5: Sex of all infants born in Tasmania 1997 - 2001

Sex	1997		1998		1999		2000		2001	
	No.	%	No.	%	No.	%	No.	%	No.	%
Male	3307	52	3237	52	3232	53	3211	54	3073	54
Female	3001	48	2932	48	2912	47	2762	46	2650	46
Indeterminate	1	0	2	0	1	0	2	0	3	0
Total	6309		6171		6145		5975		5726	

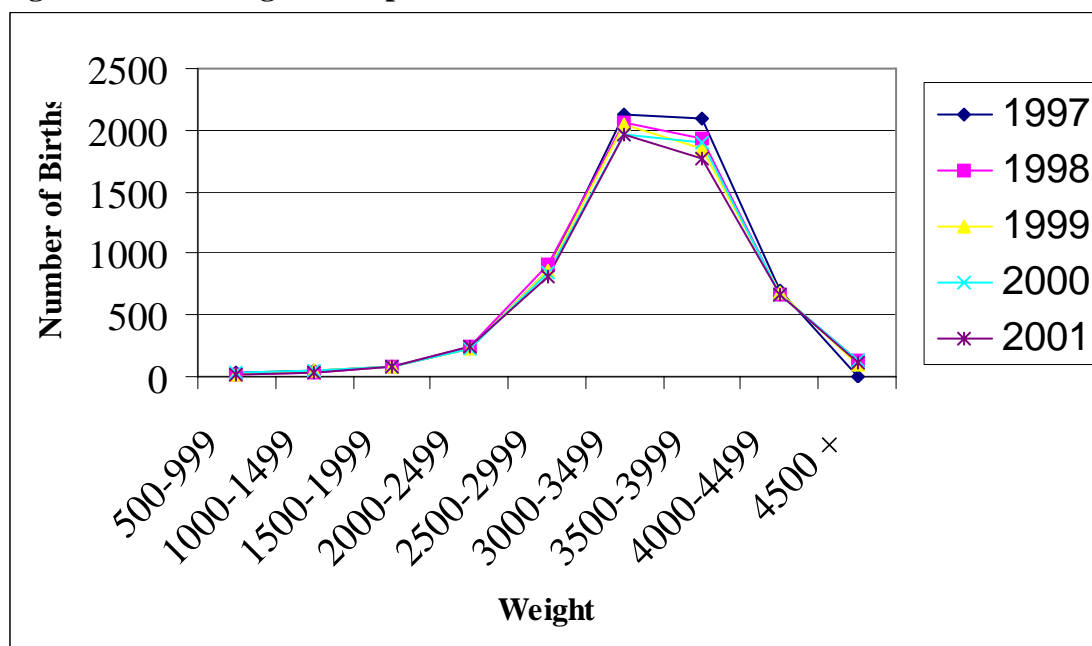
Figure 3: Sex of all Infants 1996 - 2001



The ratio of males to females is increasing slightly in favour of male infants. This is consistent with national trends where it is reported that in 1999 there were 105 males to ever 100 females born.

Birthweight

Figure 4: Birthweight Groups for all Births 1997 - 2001



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 1991 - 2001

Year	Number – Very Low Birthweight	% Proportion of all births	Number - Low Birthweight	% Proportion of all births
1991	84	1.2	360	5.2
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

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.

Table 7: Apgar Score for all Births at five minute 1997 - 2001

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

The total number of infants with an Apgar score of less than six at five minutes was 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 8: Proportion of Liveborn Infants by Type of Anaesthetic with an Apgar Score of less than 6 at five minutes 1997 - 2001

Year	No Anaesthetic %	General Anaesthetic only %	Epidural only %	Other Anaesthetic %
1997	0.75	0.22	0.09	0.04
1998	0.45	0.14	0.11	0.09
1999	0.68	0.14	0.06	0.13
2000	0.42	0.11	0.05	0.06
2001	0.3	0.08	0.03	0.03

Table 9: Proportion of all Liveborn Infants by Sex with an Apgar Scores less than 6 at five minutes 1997 - 2001

Year	Male %	Female %
1997	1.01	1.24
1998	0.95	0.64
1999	1.14	0.89
2000	0.81	0.47
2001	0.55	0.34

Table 10: Proportion of all Liveborn Infants by Mode of Delivery with an Apgar Score less than 6 at five minutes 1997 - 2001

Year	Vaginal Delivery %	Caesarean Section %
1997	1.89	2.29
1998	1.2	1.94
1999	1.45	1.26
2000	0.8	0.9
2001	0.6	0.5

Table 11: Proportion of Liveborn Infants by Gestation with an Apgar Score less than 6 at five minutes 1997 - 2001

Year	Gestation in Weeks				
	20 – 24 %	25 – 29 %	30 – 34 %	35 – 39 %	40 + %
1997	50.0	17.1	0	1.25	0.77
1998	25.0	8.1	1.35	0.75	0.71
1999	73.3	8.3	2.74	0.72	0.77
2000	0	7.3	1.4	0.7	0.5
2001	50.0	5	2.2	0.45	0.3

Table 12: Proportion of Liveborn Infants by Birthweight with an Apgar Score less than 6 at five minutes 1997 - 2001

Year	Birthweight in Grams					
	500 – 999 %	1000 – 1499 %	1500 – 2499 %	2500 – 3499 %	3500 – 4499 %	4500 + %
1997	44.0	23.4	4.63	1.44	0.96	0.78
1998	44.0	10.25	4.14	0.96	0.57	0
1999	44.0	8.16	2.42	0.91	0.67	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

Resuscitation

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

Table 13: Intubation Rate 1991 - 2001

Year	Number of Intubations	Number of Births	Percentage of all Births requiring Intubation
1991	59	6861	0.9
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

Table 14: Resuscitation Rate 1997 – 2001

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

Perinatal Mortality

Table 15: Perinatal Outcome 1997 - 2001

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

Figure 5: Stillbirths & Neonatal Deaths 1997 - 2001

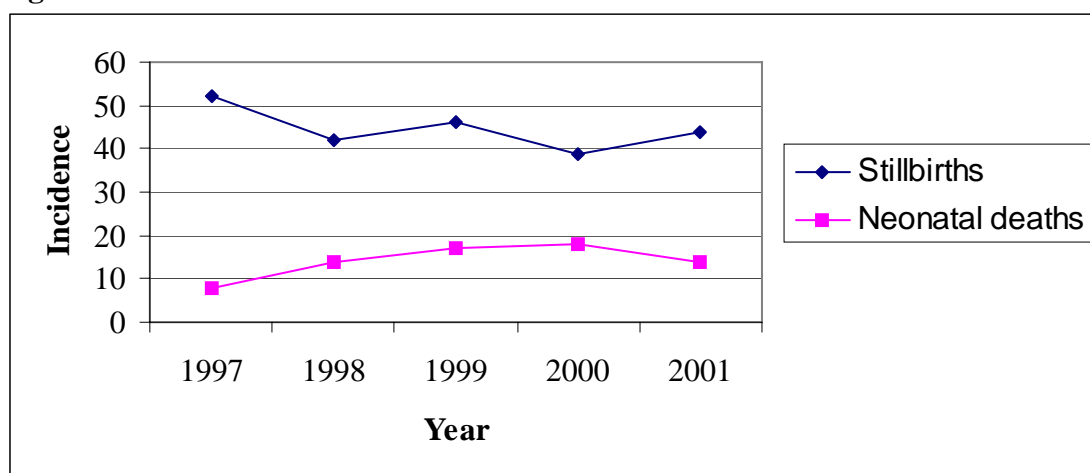


Table 16: Perinatal Mortality Rates 1991 - 2001

Year	Number of Perinatal deaths	Number of Births	Rate of Perinatal Mortality per 1000 births
1991	96	6957	13.8
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	9.96

Figure 6: Perinatal Mortality Rate per 1000 Births in Tasmania 1991 - 2001 and Australia 1993 - 1999

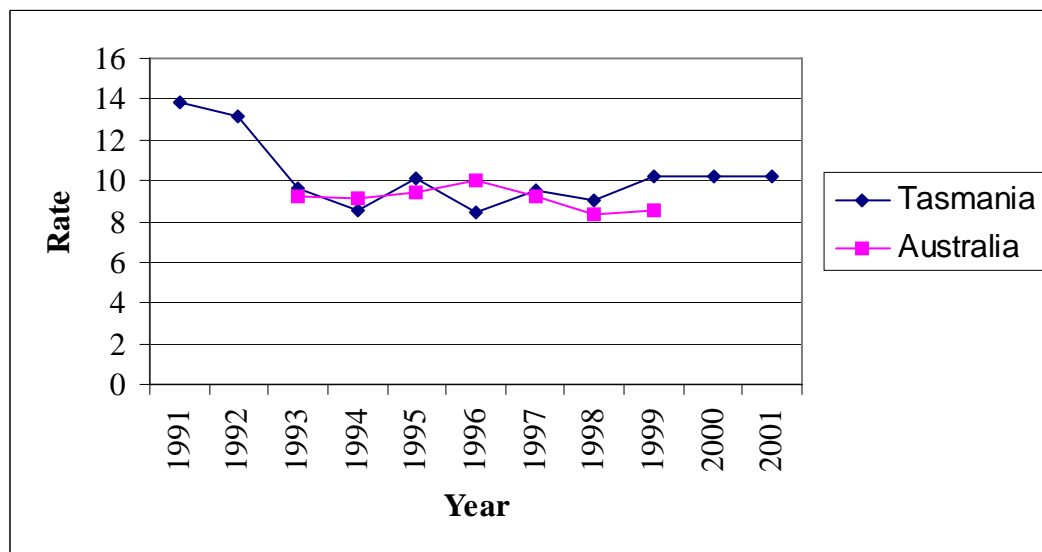


Table 17: Causes of Perinatal Mortality 1996 - 2001

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

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

Table 18: Incidence of Perinatal Deaths with Antepartum Haemorrhage (APH) 1991 - 2001

Year	APH of Unknown Origin		Placenta Previa		Abruptio Placentae	
	Deaths	Cases	Deaths	Cases	Deaths	Cases
1991	11	89	0	28	8	18
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

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 19: Neonatal Mortality 1991- 2001

Year	Number of Neonatal Deaths	Neonatal Mortality Rate
1991	41	6
1992	42	6
1993	19	3
1994	10	1.5
1995	20	3
1996	12	2
1997	8	1.3
1998	14	2.3
1999	17	2.8
2000	16	2.7
2001	14	2.4

Table 20: Neonatal Mortality in Infants over 28 weeks Gestation 1991 - 2001

Year	Number	Neonatal Mortality Rate
1991	18	2.6
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	1.15
2000	6	1.01
2001	6	1.06

Table 21: Neonatal Mortality in Infants over 1000 grams Birthweight 1991 - 2001

Year	Number	Neonatal Mortality Rate
1991	21	3.0
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	0.03
2000	7	1.19
2001	6	1.06

Autopsy Rates

Autopsy is a very valuable investigation tool in cases of Perinatal Death, especially in cases of unexplained intrauterine death (see Council Summary).

Table 22: Rate of Autopsies on Perinatal deaths 1991 - 2001

Year	Autopsy Rate %
1991	38.5
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

Mothers

Age of Mothers

Table 23: Age of Mothers 1991 - 2001

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 %
1991	8	24	35	25	8	1
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

The rate of teenage pregnancy has remained constant at 8% of all pregnancies over the past five years. During 1997 - 2001, 31- 33%* of these pregnancies occurred in women aged less than 18 and 2.3 to 5 % occurred in women aged less than 16 at the time of delivery. (* In 1998 this figure actually increased to 38%, but for all other years it has been within the range as stated)

Figure 7: Proportion of Births by Maternal Age Groups 1991 - 2001

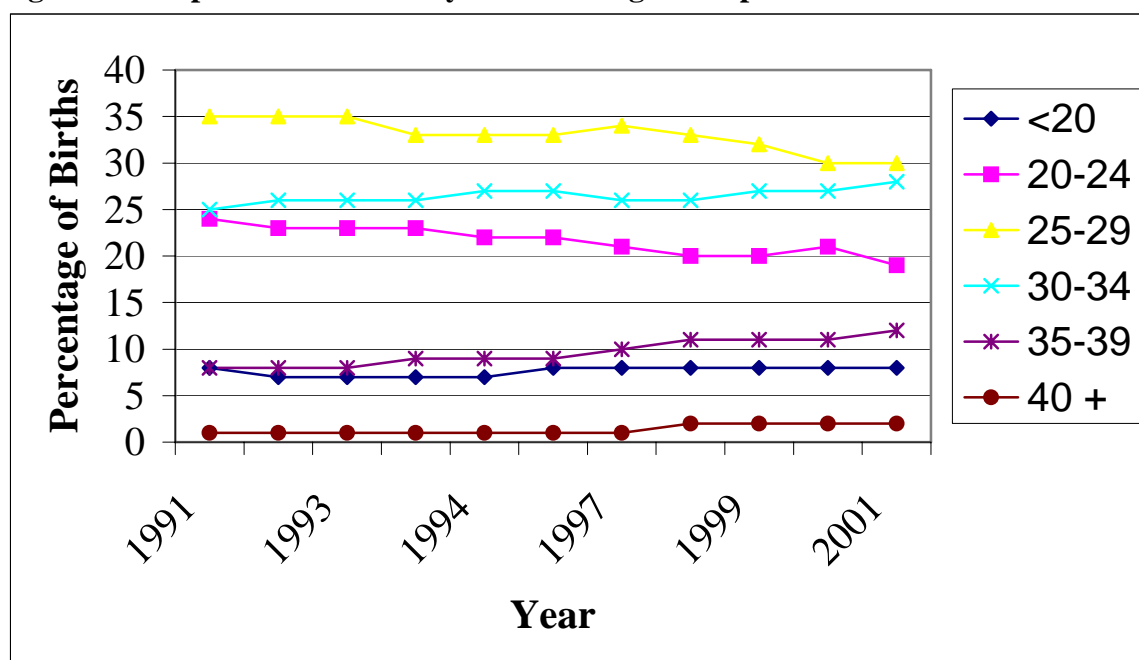


Table 24: Rates of Birth per 1000 Female Population by Maternal Age 1996 - 2001

Maternal age In years	Year	Estimated Tasmanian Female Population *	Rate of Births per 1000
15 – 19	1997	16633	31.26
	1998	16804	29.64
	1999	16951	30.61
	2000	17112	29.28
	2001	16626	28.70
20 – 24	1997	15359	86.31
	1998	15037	82.63
	1999	14750	83.45
	2000	14484	85.98
	2001	14022	78.17
25 – 29	1997	16493	129.47
	1998	16466	125.94
	1999	16005	124.25
	2000	15619	114.92
	2001	14712	115.90
30 – 34	1997	17239	94.19
	1998	16601	97.77
	1999	16123	102.66
	2000	16058	99.62
	2001	16390	98.41
35 – 39	1997	19143	31.60
	1998	18924	36.20
	1999	18625	36.73
	2000	18059	37.56
	2001	17620	38.87
40 – 44	1997	17846	5.04
	1998	17901	6.25
	1999	17940	5.29
	2000	18108	6.90
	2001	18511	6.96
45 -49	1997	16375	0.18
	1998	16475	0.30
	1999	16750	0.17
	2000	16915	0.29
	2001	17135	0.05

*Australian Bureau of Statistics Demography – Tasmania 3311.6 1997, 1998, 1999, 2000, 2001

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 25: Percentage of Births by Parity 1991 - 2001

Year	Para 1 %	Para 2 %	Para 3 %	Para 4 %	Para 5 and over %
1991	39	33	18	7	4
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

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 26: Mother's Indigenous Status 1997 - 2001

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

Breastfeeding

Table 27: All births by Breastfeeding at Discharge 1997 - 2001

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

Table 28: Breastfeeding at Discharge by Public/Private hospital 2000 - 2001

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

Table 29: Breastfeeding at Discharge by Parity 2000 – 2001

Year	Primiparae % Yes	Multiparae % Yes
2000	76	73
2001	78	73

Mode of Delivery

Table 30: Mode of Delivery 1991 - 2001

Year	Vaginal Delivery Number	Vaginal Delivery %	Caesarean Sections Number	Caesarean Sections %
1991	5780	83	1179	17
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

Table 31: Mode of Delivery for Vaginal Births 2000 – 2001

Mode of Delivery	2000		2001	
	No.	%	No.	%
Unassisted Vaginal	4041	87	3789	86
Forceps	277	6	249	6
Forceps Rotation	35	1	16	0
Vacuum Extraction	252	5	306	7
Vaginal Breech	35	1	20	0
Total	4640		4380	

Table 32: Mode of Delivery by Gestation 1997 - 2001

Gestation in weeks	Year	Vaginal Delivery No. (%)	Caesarean Section No. (%)	Total 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
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
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
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
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

Table 33: Mode of Delivery by Maternal Age 1997 - 2001

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
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
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
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
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
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
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

Table 34: Percentage of all births by Parity by Mode of Delivery 1997-2001

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
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
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
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
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

Caesarean Section

Table 35: Emergency/Elective Caesarean Section Rate 1997 - 2001

Year	Emergency Number	Emergency %	Elective Number	Elective %
1997	659	52.46	597	47.53
1998	561	54.0	478	46.0
1999	637	53.26	559	46.73
2000	649	50.27	642	49.72
2001	675	51.13	645	48.86

Table 36: Emergency/Elective Caesarean Section Rate by Public/Private Hospitals 2000 - 2001

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

Table 37: Primary/Repeat Caesarean Section Rate 1998 - 2001

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

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

Table 38: Primary/Repeat Caesarean Section Rate by Public/Private Hospitals 2000 - 2001

Year	Primary %		Repeat %	
	Public	Private	Public	Private
2000	66	59	34	41
2001	64	57	36	43

Figure 8: Caesarean Section Rates 1980 - 2001

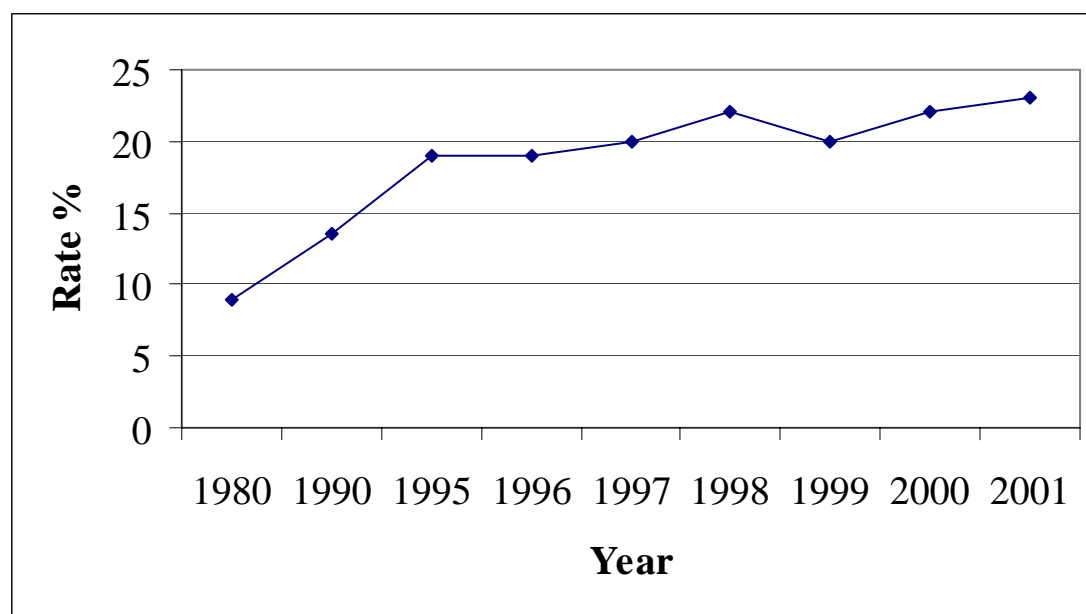


Table 39: All births by Caesarean Section following augmentation of labour 1998 – 2001

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
Oxytocin only	1998	24	6	16.3
	1999	12	4	9.7
	2000	34	3	19.1
	2001	35	0	17.6
Oxytocin & ARM*	1998	14	2	16.7
	1999	23	0	17.0
	2000	18	1	16.2
	2001	22	3	17.1
Other	1998	3	0	27.3
	1999	2	2	36.4
	2000	0	0	0
	2001	0	0	0

* ARM = Artificial Rupture of Membranes

Induction

Table 40: Induction of Labour for all Births by Mode of Delivery 1997 - 2001

Induction	Year	Vaginal Delivery %	Caesarean Section %	Total Number
ARM* only	1997	88	12	164
	1998	95	5	130
	1999	94	6	115
	2000	93	7	134
	2001	98	2	123
Prostaglandin only	1997	84	16	647
	1998	81	19	553
	1999	84	16	533
	2000	83	17	570
	2001	81	19	451
ARM* & Prostaglandin	1997	93	7	99
	1998	86	14	142
	1999	86	14	140
	2000	91	9	146
	2001	88	12	153
Oxytocin only	1997	82	18	96
	1998	86	14	139
	1999	83	17	121
	2000	82	18	98
	2001	79	21	114
Oxytocin & ARM*	1997	89	11	314
	1998	84	16	369
	1999	91	9	356
	2000	85	15	253
	2001	87	13	327
Oxytocin & Prostaglandin	1997	86	14	36
	1998	72	28	47
	1999	94	6	52
	2000	60	40	42
	2001	73	27	44
Oxytocin, ARM* & Prostaglandin	1997	80	20	118
	1998	79	21	117
	1999	80	20	151
	2000	82	18	120
	2001	74	26	136
Other	1997	0	0	0
	1998	0	100	1
	1999	79	21	14
	2000	100	0	7
	2001	64	36	44

* ARM = Artificial Rupture of the Membranes

Table 41: Induction Rate 1996 – 2001

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

Table 42: Induction Rate by Public/Private Hospitals 2000 – 2001

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

Table 43: Percentage of Caesarean Sections following Induction of Labour 1996 - 2001

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

Multiple Pregnancy

Table 44: All Births by Multiple Pregnancy 1997 - 2001

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

*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 45: Perinatal Mortality in Multiple Pregnancy 1997 – 2001

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

Table 46: Incidence of Maternal Hypertension in Multiple Pregnancy 1996 - 2001

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

Table 47: Incidence of Antepartum Haemorrhage in Multiple Pregnancy 1996 - 2001

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

Maternal Hypertension

Table 48: Prevalence (Number) of Maternal Hypertension for all births 1996 - 2001

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

*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 48a: Prevalence (Percentage) of Maternal Hypertension for all births 1996 - 2001

Type of Hypertension	1996 %	1997 %	1998 %	1999 %	2000 %	2001 %
Pre-Existing	1.29	0.57	1.11	1.07	2.04	1.76
Hypertension in Pregnancy *	4.75	4.64	5.13	5.56	5.27	4.94
Eclampsia	0.03	0.09	0.03	0	0	0
Nil	93.91	94.69	93.71	93.36	92.68	93.29

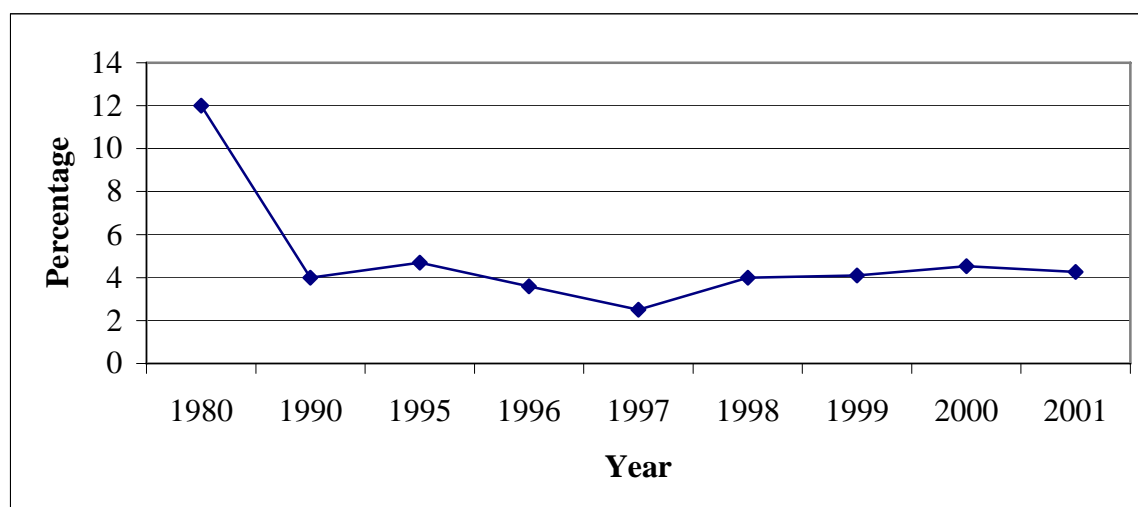
Haemorrhage

Postpartum Haemorrhage

Table 49: Incidence of Postpartum Haemorrhage 1991 - 2001

Year	Number	Incidence %
1991	243	3.5
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

Figure 11: Incidence of Postpartum Haemorrhage 1980 – 2001



Antepartum Haemorrhage

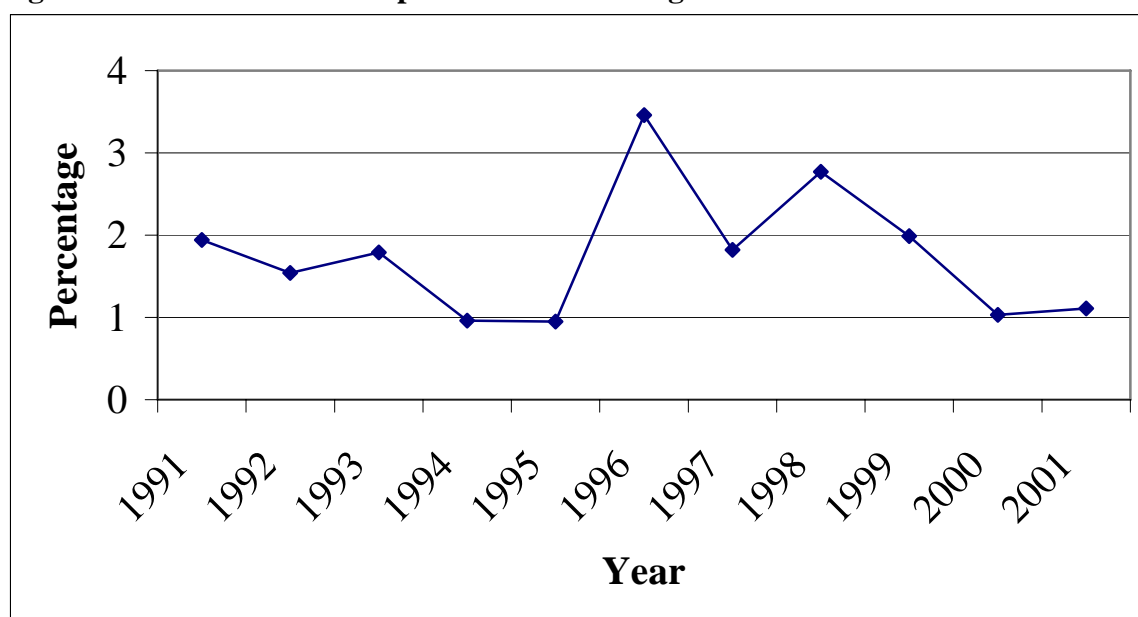
Table 50: Incidence of Antepartum Haemorrhage 1991 - 2001

Year	Number	Incidence %
1991	132	1.9
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

Table 51: Type of Antepartum Haemorrhage 1997 - 2001

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

Figure 12: Incidence of Antepartum Haemorrhage 1991 – 2001



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