

Australia's mothers and babies 2002

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The AIHW National Perinatal Statistics Unit (NPSU) is a collaborative unit of the AIHW, and was established in 1979. The NPSU is a formally affiliated institution of the University of New South Wales and is linked to the Faculty of Medicine, School of Women's and Children's Health. The NPSU is located at the Sydney Children's Hospital. The NPSU aims to improve the health of Australian mothers and babies by monitoring reproductive and perinatal health. The NPSU is also involved in perinatal data development activities and epidemiological research. The NPSU maintains national data collections on perinatal health, maternal deaths, birth anomalies and assisted conception.

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Paula J Laws

Elizabeth A Sullivan

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Director

Dr Richard Madden

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Preface

Australia's Mothers and Babies 2002 is the twelfth report in the annual series prepared by the Australian Institute of Health and Welfare's National Perinatal Statistics Unit (NPSU). It is a collaborative effort of the NPSU and states and territories in providing national information on the pregnancy and childbirth of mothers and their babies. As in past years, readers will find an accessible report drawn from the National Perinatal Data Collection, a data collection that provides reliable health statistics on mothers and their babies.

This report updates the information presented in *Australia's Mothers and Babies 2001*, maintaining comparability with previous reports while incorporating improvements. Two special features are also included in this year's report: a chapter on homebirths and birth centre births, and a chapter on births from assisted reproductive technology (ART). The latter reports on all ART births for the year 2002 and shows the continual increase in the proportion of all births that arise from ART.

In addition, an appendix containing information on state and territory pre-existing and pregnancy-related medical conditions and labour complications data has been included. These data are not complete, but this is the first step in gaining national consistency and promoting discussion about these important pregnancy-related conditions and complications.

This report covers several areas where historically there have been data gaps by reporting available national or state and territory data. The number of mothers with a history of previous caesarean section and their current method of birth is reported, as is type of anaesthetic for operative deliveries. These new data are filling the gaps in the perinatal collection and answering the challenge of providing comprehensive and reliable information.

The *Australia's Mothers and Babies* reports provide a snapshot of the quarter of a million women who give birth annually, summarising selected characteristics of the mothers and their babies. With the continuing trend in delaying childbearing and declining birth rates, it is important that the community has a reliable report to which it can refer.

Richard Madden

Director

Australian Institute of Health and Welfare

Acknowledgments

The Australian Institute of Health and Welfare National Perinatal Statistics Unit (NPSU) is a formally affiliated institution of the University of New South Wales (UNSW) and is linked to the School of Women's and Children's Health. We would like to acknowledge the support of NPSU by the School of Women's and Children's Health, UNSW and the Sydney Children's Hospital.

The NPSU highly values the time, effort and expertise contributed by all states and territories in the collection and provision of the data used in this report. We would like to acknowledge the staff members of the state and territory health authorities who provided data and reviewed the tables for this report:

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Cherie Shepherd, Sonya McNellee and Margaret Stewart, Department of Health and Community Services, Northern Territory.

Deborah Donoghue, Coordinator at the Australian and New Zealand Neonatal Network, provided data for the chapter on babies in neonatal intensive care units.

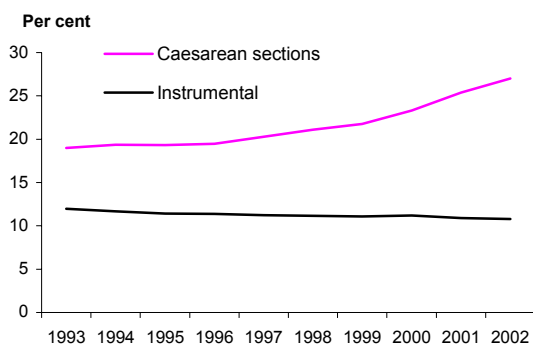
The following NPSU staff members made valuable contributions: Narelle Grayson reviewed the report and provided assistance with preparing Appendix A; Jishan Dean provided data and assistance with Chapter 6.

Highlights

Australia's Mothers and Babies 2002 is the twelfth annual report on pregnancy and childbirth of women in Australia. This section provides an overview of the main findings of the report.

Mothers

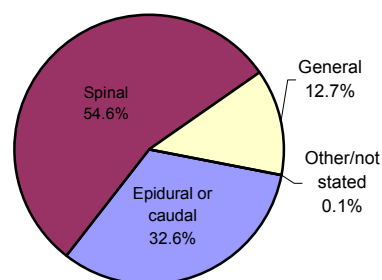
- In 2002, 255,095 babies born to 250,758 mothers were notified to perinatal data collections in the states and territories.
- The average age of all mothers in 2002 was 29.4 years, and 27.6 years for those having their first baby, continuing the upward trend seen in maternal age in recent years.
- In 2002, 27.0% of deliveries were by caesarean section. State and territory caesarean section rates ranged from 21.4% to 29.5%. Over the last 10 years, instrumental deliveries have decreased and caesarean sections have increased. Caesarean section rates were higher among older mothers and those admitted to private hospitals.



Proportion of caesarean section and instrumental deliveries, 1993–2002

- Of all mothers giving birth in 2002, 12.8% had previously had a caesarean section. Mothers with a history of caesarean section were likely to have another caesarean section in 2002 (79.4%), while 16.6% had a spontaneous vaginal delivery, and 3.7% had an assisted vaginal delivery.

- Of mothers having an operative delivery (caesarean section, forceps or vacuum extraction) in 2002, at least 38.6% had an epidural or caudal anaesthetic administered, and at least 40.0% had a spinal anaesthetic. A general anaesthetic was administered for 9.3% of operative deliveries. Proportions of mothers having spinal and general anaesthetics were higher for caesarean section deliveries than for assisted vaginal deliveries.



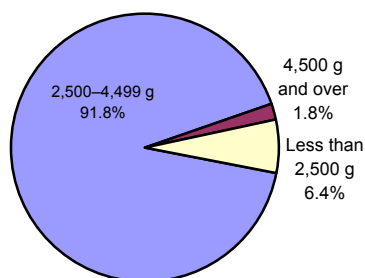
Type of anaesthetic for caesarean section deliveries, 2002

- There were 8,822 Aboriginal or Torres Strait Islander mothers, representing 3.6% of all mothers in Australia in 2002. Over one-third (38.4%) of births in the Northern Territory were to Aboriginal or Torres Strait Islander mothers.
- Caesarean section deliveries occurred in 21.9% of Aboriginal or Torres Strait Islander mothers in 2002, compared with 27.4% of other mothers. The proportion of Aboriginal or Torres Strait Islander mothers who had previously had a caesarean section was 14.4%, compared with 12.8% for other mothers.

- The proportion of mothers who were born in a country other than Australia was 22.1% in 2002.
- Multiple pregnancies accounted for 1.7% of all confinements and included 4,178 twin pregnancies and 81 triplet or higher order pregnancies.

Babies

- Of all births in Australia in 2002, 20,071 (7.9%) were preterm (less than 37 weeks gestation).
- Low birthweight (less than 2,500 grams) occurred in 16,230 (6.4%) liveborn babies in 2002. The proportion of liveborn babies of Aboriginal or Torres Strait Islander mothers that were low birthweight was 12.9% compared with 6.2% of babies of other mothers.



Birthweight, live births, 2002

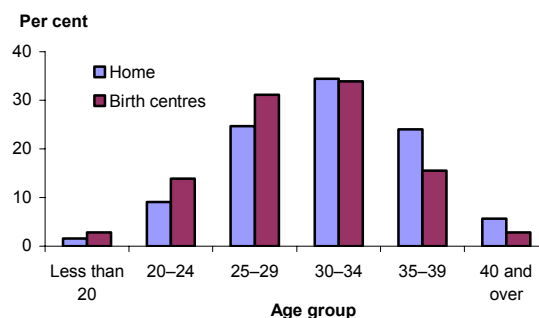
- The median length of stay in hospital for babies born in hospital was 4.0 days in 2002. Two-thirds of babies stayed in hospital for less than 5 days.

Special topics

- In 2002, there were 637 planned homebirths reported, representing 0.3% of all confinements. The mean age of mothers giving birth at home was 31.4 years. Liveborn babies born at home had a mean birthweight of 3,631 grams.
- There were 5,379 confinements in birth centres in 2002, representing 2.1% of all

confinements. The mean age of mothers giving birth in birth centres was 29.7 years. Liveborn babies born in birth centres had a mean birthweight of 3,564 grams.

- Of mothers giving birth at home, 29.7% were aged 35 years or older, compared with 18.3% of mothers giving birth in birth centres.



Age distribution of mothers giving birth at home and in birth centres, 2002

- Of babies born in 2002, 2.3% were following the use of assisted reproductive technology (ART). These babies had a lower average birthweight compared with all Australian babies, with 20.9% of pregnancies being preterm. Almost half of the ART confinements were delivered by caesarean section (49.4%). Mothers of babies born following ART were, on average, 4.3 years older than all Australian mothers, with a mean age of 33.7 years.
- In 2002, 5,383 babies were admitted to level III neonatal intensive care units in Australia. Of these babies, 49.0% had a gestational age of less than 32 weeks and 41.2% had a birthweight of less than 1,500 grams.
- In 2002, using state and territory perinatal data, the fetal death rate was 6.7 per 1,000 births; the neonatal death rate was 3.1 per 1,000 live births; and the perinatal death rate was 9.8 per 1,000 births.

1 Introduction

Australia's Mothers and Babies 2002 is the twelfth report by the Australian Institute of Health and Welfare's (AIHW) National Perinatal Statistics Unit (NPSU), providing national information on the pregnancy and childbirth of mothers, and the characteristics and outcomes of their babies. This edition contains special chapters on homebirths and birth centre births, and births following assisted reproductive technology in Australia in 2002.

Purpose of this report

The purpose of *Australia's Mothers and Babies* is to provide Australia with annual health statistics on the pregnancy and childbirth characteristics of mothers who gave birth to liveborn or stillborn babies in 2002, and their babies' characteristics and perinatal outcomes.

This is achieved through the following objectives:

- to report against the Perinatal National Minimum Data Set
- to provide national information on the pregnancy and childbirth of mothers, and the characteristics and outcomes of their babies
- to provide information for state and territory, national and international comparison.

Structure of this report

This chapter provides background information, describes the major data sources and briefly discusses their overall limitations.

The remainder of this report is divided into the following chapters:

- Chapter 2: Summary measures of perinatal health
This chapter contains summary information on key perinatal health measures derived from the National Perinatal Data Collection (NPDC).
- Chapter 3: Mothers
This chapter contains information on confinements in 2002, including smoking during pregnancy, previous births by caesarean section, and information on childbirth and maternal characteristics.
- Chapter 4: Babies
This chapter contains information on the characteristics and outcomes of babies born in 2002, including birth status, birthweight, gestation and sex ratios.
- Chapter 5: Special topic: Homebirths and birth centre births
This chapter focuses on selected characteristics of mothers giving birth at home and in birth centres in 2002, and characteristics of their babies.
- Chapter 6: Special topic: Assisted reproductive technology births
This chapter reports characteristics of mothers and their babies who were born in 2002 in Australia following the use of ART.

- Chapter 7: Babies in level III neonatal intensive care units
This chapter contains information from the Australian and New Zealand Neonatal Network on babies admitted to neonatal intensive care units in Australia in 2002.
- Chapter 8: Perinatal mortality
This chapter includes perinatal data from the Australian Bureau of Statistics (ABS) and NPDC on fetal, neonatal and perinatal deaths. It also presents deaths from five states classified using the Perinatal Society of Australia and New Zealand Perinatal Death Classification (PSANZ-PDC).

Appendix A contains information on pre-existing and pregnancy-related medical conditions and labour complications data. This Appendix includes state and territory data on selected conditions, such as essential hypertension and diabetes mellitus.

The Perinatal National Minimum Data Set

A National Minimum Data Set (NMDS) is a core set of data elements agreed to by the Statistical Information Management Committee (SIMC) and endorsed by the National Health Information Group (NHIG) for mandatory collection and reporting at a national level. An NMDS depends on a national agreement to collect uniform data and to supply it as part of the national collection (NHDC 2003). The standards make data collection activities more efficient by reducing duplication of effort by standardising core data items; more effective by ensuring that information to be collected is relevant and appropriate to its purpose; and more comparable and consistent for reporting purposes.

An NMDS includes agreement on specified data elements (discrete items of information or variables) and supporting data element concepts as well as the scope of the application of those data elements and the statistical units for collection. Definitions of all data elements that are included in NMDS collections in the health sector are included in the *National Health Data Dictionary* (NHDD).

The Perinatal NMDS is a specification for data collected on all births in Australia in hospitals, birth centres and the community. Data are collected from patient administrative and clinical record systems and forwarded regularly to the relevant state or territory health authority. Data for the year ending 31 December are then provided annually to the NPSU for national collation.

The Perinatal NMDS was first specified in 1997. It includes data items on the demographic characteristics of the mother, including the current pregnancy, labour and delivery, and the baby, including birth status, sex and birthweight.

Current definitions are included in the *National Health Data Dictionary* Version 12 (NHDC 2003) and Version 12 Supplement (AIHW 2004); however, Versions 10 and 11 of the NHDD were current at the time of collection of the 2002 data (AIHW 2001; AIHW 2002). A list of the current Perinatal NMDS items can be found in Appendix B, and the items are available in full online at www.aihw.gov.au/knowledgebase.

In 2003, an evaluation of the Perinatal NMDS was conducted in consultation with the National Perinatal Data Development Committee (NPDDC), which as a result of the evaluation recommended changes to the Perinatal NMDS. A report was submitted to the AIHW and SIMC for endorsement, and was subsequently published. The findings and recommendations of the evaluation can be found in the *Report on the Evaluation of the Perinatal National Minimum Data Set* (Laws & Sullivan 2004b).

Some changes to the Perinatal NMDS which have been endorsed for implementation from 1 January 2005 are the addition of three NHDD items – Apgar score at 5 minutes, Length of stay (antenatal), and Presentation at birth – and the removal of two items – Establishment identifier and Region code.

The National Perinatal Data Development Committee

The NPDDC comprises representatives from each state and territory health authority and the NPSU. A primary role of the Committee is to undertake perinatal data development, with the Committee recommending changes to definitions for perinatal data items and submitting new perinatal data items to the Health Data Standards Committee (HDSC) for inclusion in the NHDD, and to SIMC for inclusion in the Perinatal NMDS.

Since completion of the Perinatal NMDS evaluation report, a program of perinatal data development has been implemented. The NPDDC met three times in 2004, and will continue with regular meetings and out-of-session work. The program of data development involves revision of existing Perinatal NMDS items, data development work on existing perinatal NHDD items, and development of new perinatal items for the NHDD.

Several new items are currently being considered by the NPDDC for inclusion in the NHDD. Some of these include parity, smoking during pregnancy, previous births by caesarean section, estimated date of confinement, accoucheur (attendant at the birth) and antenatal care.

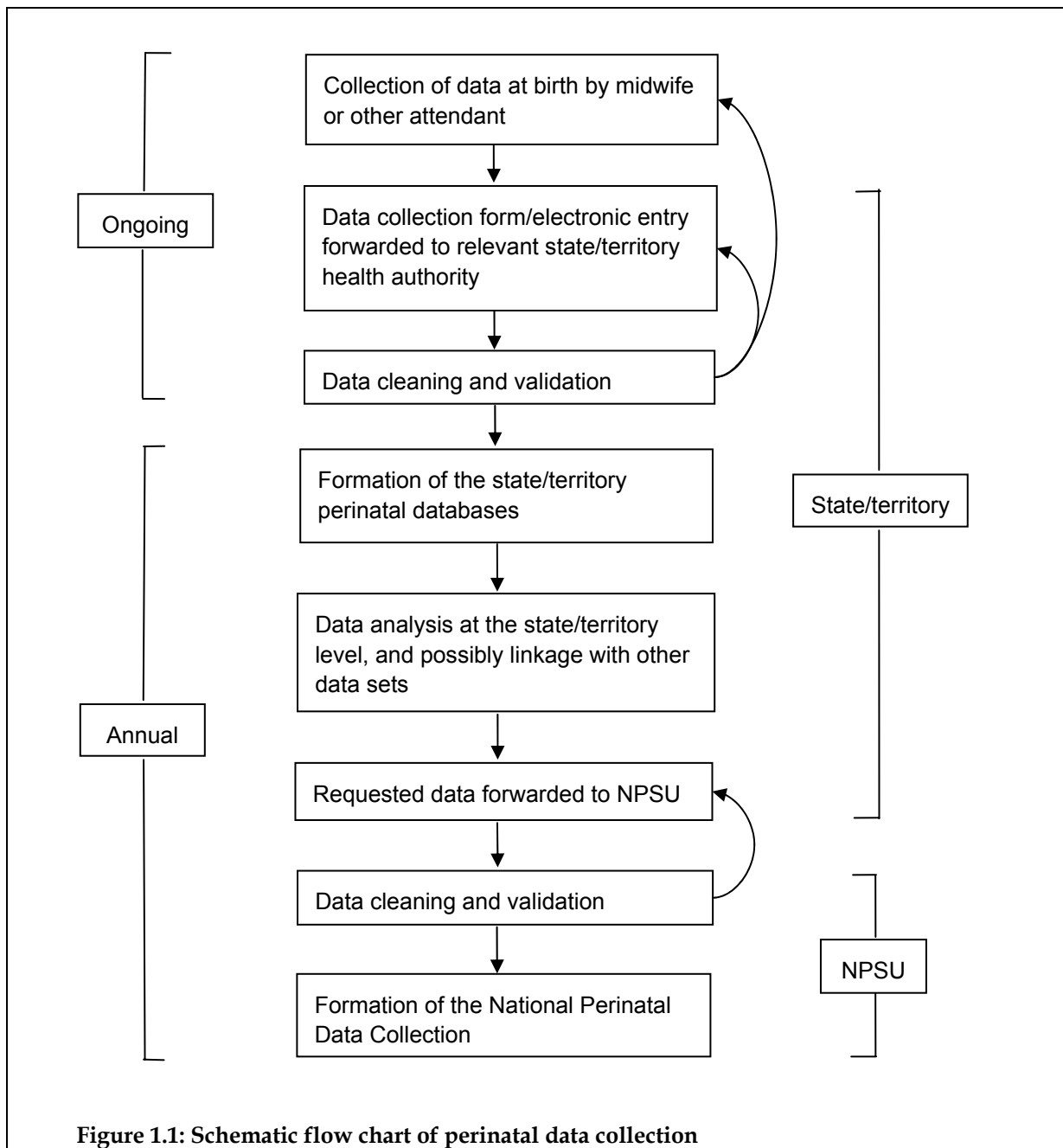
Data sources

National Perinatal Data Collection

The 2002 national data on births are based on notifications to the perinatal data collection in each state and territory. Midwives and other staff, using information obtained from mothers and from hospital or other records, complete notification forms for each birth in each jurisdiction. Figure 1.1 shows the pathway of perinatal data to the NPSU for national collation.

Each state and territory collects more information than is specified on the Perinatal NMDS, and the NPSU requests some of these additional items. The information includes characteristics of the mother, such as previous pregnancies, medical conditions and complications, and the puerperium, and the baby, such as Apgar scores, resuscitation and outcomes.

The state and territory health authorities undertake data processing, analysis and publication of reports. Each state and territory provided data in an electronic format to the NPSU. Due to data editing and subsequent updates of state and territory databases, the figures in this report may differ slightly from those in reports published by the states and territories. See Appendix C for a list of state and territory reports on the 2002 data.



Australian Bureau of Statistics

The ABS compiles statistics and publishes reports on registrations of live births and perinatal deaths from data made available by the Registrar of Births, Deaths and Marriages in each state and territory. These data are used to compile vital statistics. These are administrative data collections.

The ABS reports the perinatal deaths of babies of at least 400 grams birthweight, or 20 weeks gestation where birthweight is unknown. These inclusion criteria differ from the World Health Organization's (WHO) definition of 500 grams birthweight, or 22 weeks gestation where birthweight is unknown. Data obtained from ABS and its published reports (ABS 2003a; ABS 2003b) were used to analyse trends and variations in perinatal deaths using the

lower criteria of 400 grams or 20 weeks gestation where birthweight is unknown, in the period from 2000 to 2002.

ABS publishes the reports *Births Australia* (e.g. ABS 2003a) and *Causes of Death Australia* (e.g. ABS 2003b) annually.

Australian and New Zealand Neonatal Network

The Australian and New Zealand Neonatal Network (ANZNN) monitors the care of high-risk newborns registered to level III neonatal intensive care units (NICUs). Babies in the ANZNN data set are those who were admitted to a level III NICU at less than 28 days and who met at least one of the following criteria: less than 32 weeks gestation, less than 1,500 grams birthweight, required assisted ventilation for at least 4 hours, or underwent major surgery. ANZNN publishes an annual report on these babies and their mothers (e.g. Donoghue 2002). Further details on the ANZNN can be found in these reports, and Appendix D lists contact details for the ANZNN. Chapter 7 presents data on babies admitted to level III NICUs in Australia in 2002.

Assisted reproductive technology data

Assisted reproductive technology (ART) data are provided to the NPSU by fertility centres across Australia and New Zealand. The data are provided annually and are based on the treatment cycles in a nominated year, with their pregnancy outcomes to follow. Information on ART babies born in 2002 of Australian mothers is presented in Chapter 6 of this report. The data were selected using the same criteria as the Australian perinatal data in this report. All Australian babies born in 2002 of at least 20 weeks gestation or at least 400 grams birthweight are included. For ART multiple births, all babies are included if at least one baby fits the selection criteria.

In 2002, a new ART data collection system (Australia and New Zealand Assisted Reproduction Database, ANZARD) was implemented. This has enabled the NPSU to present results of treatment and their pregnancy outcomes in a single treatment year in the same annual report. The eighth annual report based on this new reporting format was released in October 2004 (Bryant et al. 2004), and included information on all treatment cycles that took place in 2002 and their resulting pregnancies and births.

The data presented are derived from both the Assisted Conception Data Collection (ACDC) and the new ANZARD for babies born in 2002 and have not been published previously.

Criteria for inclusion in the NPDC

Tabulated data in this report are based on births that occurred in each state and territory in 2002. Notification forms are completed for all births of at least 400 grams birthweight or 20 weeks or more gestation. Each state and territory has developed its own forms for collecting perinatal data, often to maintain compatibility with its other data collections.

Data are presented for all states and territories where available. Although the perinatal collections are based on an NMDS, in some jurisdictions the data are collected in different categories. Where data are not available from all states and territories in the required format, this is indicated in the footnotes of tables or figures.

The data in this report relate to the state or territory of occurrence of births in 2002 rather than to the area of usual residence of the mother. Because of differences in data items and varying practices for coding the mother's place of residence if she lived in a state or territory other than that in which the birth occurred, it is presently not possible to analyse the perinatal data according to region of residence.

All states and territories have a specific data item to record Indigenous status on their perinatal form. According to the *National Health Data Dictionary*, Indigenous status is a measure of whether a person identifies as being of Aboriginal or Torres Strait Islander origin (NHDC 2003). This separately identifies mothers as those of Aboriginal and Torres Strait Islander origin, and other mothers. No information is collected about the paternal or baby's Indigenous status. Because Indigenous status is the name of the data element being collected, this term has been used where necessary in this report.

The number of babies is marginally higher than the number of mothers because of multiple births. The term 'confinements' has been used in this report to indicate maternal characteristics, whereas 'births' refers to babies.

Data quality

The data received from states and territories are checked for format and coding consistencies and scanned for missing variables and missing values. Data structure is examined for each variable to identify outliers, logistic errors and irregularities owing to differing interpretations of the coding system across the states and territories. Tables are then provided to each state and territory to enable additional review of data quality. Hence, the data go through a process of intensive validation and improvement, including consultations with all state and territory perinatal data providers.

Australian Capital Territory data

For some 2002 data, minor differences may exist between Australian Capital Territory data published by the NPSU and by the Population Health Research Centre, ACT Health. The Australian Capital Territory data contain a high proportion of southern New South Wales residents who gave birth in the Australian Capital Territory. This proportion was 13.7% in 2001 (ACT Health 2004:16). When interpreting the data it is important to note that a proportion of the higher risk or multiple pregnancies and associated poorer perinatal outcomes occur in these residents. Therefore, figures on plurality, preterm birth and perinatal deaths can appear inflated in relation to the number of births in the Australian Capital Territory.

Quality of Indigenous status data

All jurisdictions are working towards improving the ascertainment of Indigenous status in their perinatal collections. Data on Indigenous status for Tasmania are not presented in this report as it was not compliant with the specifications used. In the extract provided to the NPSU, the 'Not stated' category for Indigenous status was not able to be distinguished from the category of mothers who were neither Aboriginal or Torres Strait Islander. In the Council of Obstetric and Paediatric Mortality and Morbidity (Tasmania) annual report, however, 86.1% of mothers were reported as having a 'Not stated' Indigenous status, 13.2% were

reported as being neither Aboriginal or Torres Strait Islander, and 0.7% as Aboriginal or Torres Strait Islander in 2002 (DHHS 2004:44). The Department of Health and Human Services in Tasmania is actively pursuing improvements in the collection and provision of Indigenous status data.

There are a small number of Aboriginal and Torres Strait Islander mothers in the Australian Capital Territory, and the proportion fluctuates from year to year, making this jurisdiction less comparable to other jurisdictions. In 2001, 20.7% of Aboriginal or Torres Strait Islander mothers who gave birth in the Australian Capital Territory were New South Wales residents (ACT Health 2004:54).

Data presentation

This report updates the information presented in *Australia's Mothers and Babies 2001* (Laws & Sullivan 2004a), largely maintaining comparability with previous reports while incorporating improvements.

A number of AIHW practices for data presentation have been adopted. Percentages in all tables have been calculated including the 'Not stated' categories. Cell sizes of three or less in state and territory tables have not been published, in accordance with the AIHW's policy on the reporting of small numbers. Exceptions to this are small numbers in 'Other' and 'Not stated' categories. The Australian Capital Territory is required to suppress numbers in cells of less than five, and this has been implemented throughout the report for this jurisdiction. Where n.p. (not published) has been used to protect confidentiality, the expressed numbers appear in the totals but the individual variables do not add up to these numbers.

For multiple pregnancies, mother items which may be different for each baby, such as gestational age and presentation at birth, are classified according to the features of the first born baby. Therefore, where these items are presented for babies, each baby of a multiple birth is assigned the value of the first born baby.

Tables that have been published for the first time in this report include Table 3.15 on anaesthetic for operative deliveries, Tables 3.20 and 3.21 on previous births by caesarean section, and Table 4.7, which presents the method of birth for each baby rather than each confinement. Other minor changes to data presentation, including where a jurisdiction has not provided a data item or data have not been published for other reasons, are detailed in the footnotes to the tables.

2 Summary measures of perinatal health

Table 2.1 presents summary perinatal health information for Australia derived from the 2002 National Perinatal Data Collection. Data include measures of pregnancy-related interventions, maternal risk factors and birth outcomes.

Table 2.1: Summary measures of perinatal health for Australia, NPDC, 2002

Variable	Description of measure	Value
Maternal age	Percentage of first-time mothers aged 35 years and older	11.2
Maternal age	Percentage of teenage mothers	4.9
Smoking	Percentage of women smoking while pregnant ^(a)	18.4
Indigenous status	Percentage of mothers who identified as Aboriginal or Torres Strait Islander ^(b)	3.6
Maternal country of birth	Percentage of mothers born in Australia	77.4
Hospital sector	Percentage of women giving birth in public hospitals ^(c)	68.9
Multiple pregnancy	Number of multiple pregnancies per 1,000 confinements	17.0
Spontaneous onset of labour	Rate of spontaneous onset of labour per 1,000 confinements	578.5
Induction of labour	Rate of induction per 1,000 confinements	265.7
Instrumental vaginal deliveries	Rate of instrumental (forceps or vacuum extraction) deliveries per 1,000 confinements	108.2
Caesarean section	Rate of caesarean section per 1,000 confinements	270.4
Previous caesarean section	Percentage of all mothers having had previous caesarean sections ^(d)	12.8
Mother's postnatal stay	Median length of stay in hospital of delivery (days), excluding those who were transferred or died ^(e)	4.0
Preterm birth	Percentage of all births that were less than 37 weeks gestation	7.9
Low birthweight	Percentage of liveborn babies weighing less than 2,500 grams at birth	6.4
Apgar scores	Percentage of liveborn babies with an Apgar score of less than 7 at 5 minutes	1.4
Perinatal death rate	Perinatal deaths per 1,000 births ^(f)	9.8

(a) Excludes Victoria, Queensland and Tasmania.

(b) Excludes Tasmania.

(c) Hospital sector cannot be compared with mother's accommodation status in previous reports. A small number of patients in public hospitals are private patients, and a small number of patients in private hospitals are public patients.

(d) Excludes Tasmania and ACT.

(e) Excludes WA.

(f) Excludes neonatal deaths for NT.

3 Mothers

Confinements and births

There were 250,758 confinements notified to state and territory perinatal data collections in Australia for 2002, resulting in a total of 255,095 live births and fetal deaths (Table 3.1).

Table 3.1: Confinements and births by state and territory, 2002

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Australia
Confinements	84,587	62,023	48,324	24,396	17,421	5,625	4,708	3,674	250,758
Fetal deaths	515	452	329	175	122	49	35	30	1,707
Live births	85,490	62,681	48,867	24,609	17,623	5,660	4,769	3,689	253,388
All births	86,005	63,133	49,196	24,784	17,745	5,709	4,804	3,719	255,095

To evaluate the completeness of notifications of births in the perinatal collections, these births can be compared with birth registrations published by the ABS in the *Births Australia, 2002* report (ABS 2003a). In the registration system, 250,988 live births were registered in Australia in 2002, 2,400 fewer than the 253,388 live births notified to the perinatal collections.

As the states and territories differ in the conventions used for coding the residence of mothers living interstate, it is not possible to compare the numbers in the two data systems by state and territory. These differences in the national figures on live births are likely to be because of delays in the registration of some live births. It is also likely that some homebirths are not notified to the perinatal collections but are still registered by the parents.

The total fertility rate was 1.75 births per woman in 2002 (ABS 2003a). In 2002, the national crude birth rate was 12.8 live births per 1,000 population. The birth rate has declined over recent years; the crude birth rate was 15.8 in 1982. In 2002, the crude birth rate varied among the states and territories, from 11.6 in South Australia to 18.8 in the Northern Territory (ABS 2003a).

Place of birth

Most births in Australia occur in hospitals, either in conventional labour-ward settings or in hospital birth centres. There were 243,728 confinements in hospitals (97.2%) and 5,379 confinements in birth centres (2.1%) in 2002 (Table 3.2). Planned homebirths and other births, such as those occurring unexpectedly before arrival in hospital or in other settings, are the two categories accounting for the smallest proportion of confinements (0.7%).

Chapter 5 contains summary data on characteristics of birth centre and homebirth confinements and births. Data on hospital births are presented throughout the report.

Table 3.2: Place of birth, all confinements, by state and territory, 2002

Place of birth	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Australia
Number									
Hospital	82,149	60,185	47,615	23,913	16,318	5,528	4,427	3,593	243,728
Birth centre	2,024	1,429	389	278	1,000	6	253	—	5,379
Home	99	163	154	121	48	4	14	34	637
Other	315	246	165	84	55	72	14	^(a) 47	998
Not stated	—	—	1	—	—	15	—	—	16
Total	84,587	62,023	48,324	24,396	17,421	5,625	4,708	3,674	250,758
Per cent									
Hospital	97.1	97.0	98.5	98.0	93.7	98.3	94.0	97.8	97.2
Birth centre	2.4	2.3	0.8	1.1	5.7	0.1	5.4	—	2.1
Home	0.1	0.3	0.3	0.5	0.3	0.1	0.3	0.9	0.3
Other	0.4	0.4	0.3	0.3	0.3	1.3	0.3	^(a) 1.3	0.4
Not stated	—	—	0.0	—	—	0.3	—	—	0.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

(a) The majority of these births occurred in remote community health centres.

Note: For multiple births, the place of birth of the first born was used.

Size of maternity unit

The size of maternity units is based on the volume of confinements for the year and varies from those with very few births each year to those with more than 2,000 births. The actual number of maternity units in a region depends on its geographical location, the population of the region, and policies regarding maternity services. In 2002, 40.5% of the maternity units in Australia had 100 or fewer confinements, and 6.9% had in excess of 2,000 confinements (Table 3.3).

Table 3.3: Maternity units by size and state and territory, 2002

Number of confinements annually	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Australia
	Number								
1–100	41	33	58	23	34	3	—	1	193
101–500	39	28	25	21	13	2	—	2	130
501–1,000	20	11	13	11	8	2	1	2	68
1,001–2,000	18	12	11	3	3	2	3	1	53
2,001 and over	12	10	5	2	4	—	—	—	33
Total	130	94	112	60	62	9	4	6	477
	Per cent								
1–100	31.5	35.1	51.8	38.3	54.8	33.3	—	16.7	40.5
101–500	30.0	29.8	22.3	35.0	21.0	22.2	—	33.3	27.3
501–1,000	15.4	11.7	11.6	18.3	12.9	22.2	25.0	33.3	14.3
1,001–2,000	13.8	12.8	9.8	5.0	4.8	22.2	75.0	16.7	11.1
2,001 and over	9.2	10.6	4.5	3.3	6.5	—	—	—	6.9
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Note: Includes hospitals and birth centres.

Maternal age

Maternal age is an important risk factor for perinatal outcome. Adverse outcomes are more likely to occur in younger and older mothers. The age of mothers ranged from 12 to 54 years in 2002. The average age of women giving birth in Australia has increased gradually in recent years. The mean age in 2002 was 29.4 years, compared with 28.2 years in 1993. The trend in delayed childbearing can be attributed to a number of factors including social, educational and economic factors, increased access to assisted reproductive technology and longer reproductive life expectancy (Carolan 2003; van Katwijk & Peeters 1998).

In 2002, mothers in Victoria were older (30.2 years) and those in the Northern Territory younger (26.9 years) than the national average (Table 3.4). The number of teenage confinements dropped from 13,622 in 1993 to 12,227 in 2002, a decline of 10.2% over the decade. The proportion of teenage confinements in 2002 was 4.9%, and ranged from a low of 3.1% in Victoria to 14.7% in the Northern Territory.

The proportion of mothers aged 20–24 years has fallen from 19.9% in 1993 to 15.2% in 2002 (38,055 mothers). Older mothers aged 35 years and over have continued to increase from 11.8% in 1993 to 18.1% in 2002.

Table 3.4: Maternal age by state and territory, 2002

Maternal age (years)	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Australia
Mean	29.5	30.2	28.7	29.0	29.2	28.1	30.1	26.9	29.4
	Number								
Less than 20	3,652	1,939	3,067	1,438	961	458	171	541	12,227
20–24	12,674	7,486	8,544	4,012	2,737	1,180	570	852	38,055
25–29	24,523	16,854	14,373	7,062	5,095	1,606	1,353	925	71,791
30–34	27,810	23,014	14,878	7,800	5,650	1,548	1,648	877	83,225
35–39	13,107	10,713	6,222	3,433	2,503	668	784	401	37,831
40 and over	2,765	2,015	1,240	651	475	145	182	78	7,551
Not stated	56	2	—	—	—	20	—	—	78
Total	84,587	62,023	48,324	24,396	17,421	5,625	4,708	3,674	250,758
	Per cent								
Less than 20	4.3	3.1	6.3	5.9	5.5	8.1	3.6	14.7	4.9
20–24	15.0	12.1	17.7	16.4	15.7	21.0	12.1	23.2	15.2
25–29	29.0	27.2	29.7	28.9	29.2	28.6	28.7	25.2	28.6
30–34	32.9	37.1	30.8	32.0	32.4	27.5	35.0	23.9	33.2
35–39	15.5	17.3	12.9	14.1	14.4	11.9	16.7	10.9	15.1
40 and over	3.3	3.2	2.6	2.7	2.7	2.6	3.9	2.1	3.0
Not stated	0.1	0.0	—	—	—	0.4	—	—	0.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Maternal parity

Parity is the number of previous pregnancies that resulted in live births or stillbirths. In 2002, 41.1% of mothers were having their first baby and 34.1% were having their second baby. One in six mothers (15.4%) had given birth twice previously and 9.2% had given birth three or more times (Table 3.5).

Mothers in the Northern Territory were more likely than mothers in the other states and the Australian Capital Territory to have a parity of three or more. In the Northern Territory, 8.2% of mothers had given birth three times previously and 7.2% four or more times, compared with 5.6% and 3.6% respectively for Australia.

Table 3.5: Mother's parity by state and territory, 2002

Parity	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Australia
Number									
None	35,035	25,982	19,205	9,904	7,224	2,244	2,130	1,404	103,128
One	28,723	21,792	16,108	8,233	6,196	1,837	1,602	1,110	85,601
Two	12,940	9,396	7,815	3,790	2,529	966	650	594	38,680
Three	4,747	3,076	3,055	1,475	913	343	214	302	14,125
Four or more	3,049	1,777	2,140	994	559	235	112	264	9,130
Not stated	93	—	1	—	—	—	—	—	94
Total	84,587	62,023	48,324	24,396	17,421	5,625	4,708	3,674	250,758
Per cent									
None	41.4	41.9	39.7	40.6	41.5	39.9	45.2	38.2	41.1
One	34.0	35.1	33.3	33.7	35.6	32.7	34.0	30.2	34.1
Two	15.3	15.1	16.2	15.5	14.5	17.2	13.8	16.2	15.4
Three	5.6	5.0	6.3	6.0	5.2	6.1	4.5	8.2	5.6
Four or more	3.6	2.9	4.4	4.1	3.2	4.2	2.4	7.2	3.6
Not stated	0.1	—	0.0	—	—	—	—	—	0.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

The average age of mothers having their first baby increased to 27.6 years in 2002. Nevertheless, the majority (60.8%) of these women were aged less than 30 years. Figure 3.1 shows the increase in the proportion of first-time mothers in the older age groups between 1993 and 2002. More than 1 in 9 (11.2%) of all primiparous women were aged 35 years or older in 2002. The proportion of mothers who had given birth at least twice previously increased with maternal age from 2.0% for teenagers to 44.9% for mothers aged 40 years and over (Table 3.6).

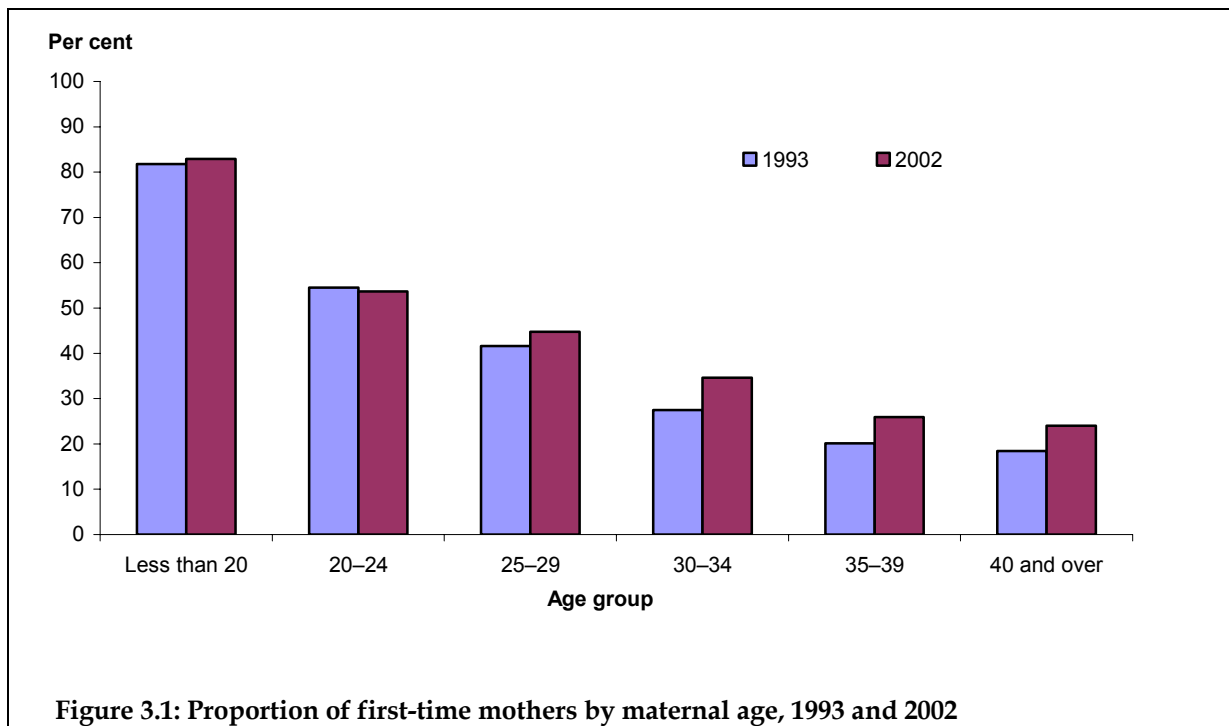


Table 3.6: Mother's parity by maternal age, 2002

Parity	Less than 20	20-24	25-29	30-34	35-39	40 and over	Not stated	Total
	Number							
None	10,099	20,448	32,149	28,794	9,790	1,811	37	103,128
One	1,881	12,244	24,190	31,503	13,416	2,342	25	85,601
Two	223	3,992	10,136	14,592	8,265	1,464	8	38,680
Three	18	1,021	3,470	5,160	3,551	901	4	14,125
Four or more	1	342	1,820	3,137	2,801	1,026	3	9,130
Not stated	5	8	26	39	8	7	1	94
Total	12,227	38,055	71,791	83,225	37,831	7,551	78	250,758
	Per cent							
None	82.6	53.7	44.8	34.6	25.9	24.0	47.4	41.1
One	15.4	32.2	33.7	37.9	35.5	31.0	32.1	34.1
Two	1.8	10.5	14.1	17.5	21.8	19.4	10.3	15.4
Three	0.1	2.7	4.8	6.2	9.4	11.9	5.1	5.6
Four or more	0.0	0.9	2.5	3.8	7.4	13.6	3.8	3.6
Not stated	0.0	0.0	0.0	0.0	0.0	0.1	1.3	0.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Smoking during pregnancy

Smoking is a risk factor for pregnancy, and is associated with low birthweight, preterm birth, congenital anomalies and perinatal death (Chan et al. 2001; Walsh et al. 2001). Smoking also increases the mother's risk of spontaneous abortion, ectopic pregnancy and other obstetric complications.

There is currently no national agreement on the collection of data on smoking during pregnancy. Data was available for five states and territories: New South Wales, Western Australia, South Australia, the Australian Capital Territory and the Northern Territory. The proportion of women who smoked while pregnant ranged from 14.9% in the Australian Capital Territory to 26.3% in the Northern Territory. Overall, 18.4% of women in the five states and territories smoked during pregnancy (Table 3.7).

Table 3.7: Mother's tobacco smoking status during pregnancy, by state and territory, 2002

Smoking status	NSW	Vic	Qld	WA	SA ^(a)	Tas	ACT	NT	Total
Number									
Smoked	13,829	n.a.	n.a.	4,932	4,393	n.a.	703	966	24,823
Did not smoke	70,745	n.a.	n.a.	19,464	12,722	n.a.	3,884	2,276	109,091
Not stated	13	n.a.	n.a.	—	306	n.a.	121	432	872
Total	84,587	n.a.	n.a.	24,396	17,421	n.a.	4,708	3,674	134,786
Per cent									
Smoked	16.3	n.a.	n.a.	20.2	25.2	n.a.	14.9	26.3	18.4
Did not smoke	83.6	n.a.	n.a.	79.8	73.0	n.a.	82.5	61.9	80.9
Not stated	0.0	n.a.	n.a.	—	1.8	n.a.	2.6	11.8	0.6
Total	100.0	n.a.	n.a.	100.0	100.0	n.a.	100.0	100.0	100.0

(a) For SA, 'Smoked' includes women who quit before the first antenatal visit.

n.a. Data not available for Victoria, Queensland and Tasmania.

The average age of mothers who smoked was 27.0 years compared with 29.9 years for those who did not smoke. Teenage mothers accounted for 11.6% of all mothers who reported smoking during pregnancy.¹

¹ These figures exclude Victoria, Queensland and Tasmania.

Aboriginal and Torres Strait Islander mothers and their babies

In 2002, 8,822 women who identified as being Aboriginal or Torres Strait Islander gave birth in Australia, representing 3.6% of all confinements.² Aboriginal or Torres Strait Islander mothers accounted for a much greater proportion of all confinements in the Northern Territory (38.4%) than in other jurisdictions. There were also high proportions of confinements to Aboriginal or Torres Strait Islander women in Western Australia (6.6%) and Queensland (5.6%). Because of their larger overall populations, there were more confinements of Aboriginal or Torres Strait Islander mothers in Queensland (2,721), New South Wales (2,155) and Western Australia (1,606) than in the Northern Territory (1,409) (Table 3.8).

Table 3.8: Indigenous status of mothers by state and territory, 2002

Indigenous status	NSW	Vic	Qld	WA	SA	Tas	ACT ^(a)	NT	Total
Number									
Aboriginal or Torres Strait Islander	2,155	416	2,721	1,606	443	n.a.	72	1,409	8,822
Other	82,383	61,607	45,593	22,790	16,978	n.a.	4,610	2,233	236,194
Not stated	49	—	10	—	—	n.a.	26	32	117
Total	84,587	62,023	48,324	24,396	17,421	n.a.	4,708	3,674	245,133
Per cent									
Aboriginal or Torres Strait Islander	2.5	0.7	5.6	6.6	2.5	n.a.	1.5	38.4	3.6
Other	97.4	99.3	94.3	93.4	97.5	n.a.	97.9	60.8	96.4
Not stated	0.1	—	0.0	—	—	n.a.	0.6	0.9	0.0
Total	100.0	100.0	100.0	100.0	100.0	n.a.	100.0	100.0	100.0

(a) Because of the small number of Aboriginal or Torres Strait Islander mothers in the ACT, the proportion fluctuates from year to year, making the ACT less comparable to other jurisdictions.

n.a. Data for Tasmania were not available because the 'Not stated' category for Indigenous status was not able to be distinguished from the category of mothers who were neither Aboriginal or Torres Strait Islander.

The confinements notified to the perinatal collections of mothers who identified as being of Aboriginal or Torres Strait Islander descent in 2002 resulted in 8,827 live births and 102 fetal deaths. There were 236,194 confinements to other mothers resulting in 238,781 live births and 1,556 fetal deaths (Table 3.9).

The perinatal collection by year of birth reported 8,827 live births to Aboriginal and Torres Strait Islander mothers. This was 6.5% more than the 8,292 live births reported by ABS registration data for Australia in 2002 (ABS 2003a).

² All figures in this section exclude Tasmania.

Table 3.9: Births by maternal Indigenous status and state and territory, 2002

Indigenous status	NSW	Vic	Qld	WA	SA	Tas	ACT^(a)	NT	Total
Aboriginal or Torres Strait Islander									
Fetal deaths	18	6	31	25	6	n.a.	—	16	102
Live births	2,165	415	2,719	1,603	444	n.a.	72	1,409	8,827
All births	2,183	421	2,750	1,628	450	n.a.	72	1,425	8,929
Other									
Fetal deaths	497	446	298	150	116	n.a.	35	14	1,556
Live births	83,276	62,266	46,136	23,006	17,179	n.a.	4,671	2,247	238,781
All births	83,773	62,712	46,434	23,156	17,295	n.a.	4,706	2,261	240,337

(a) Because of the small number of Aboriginal or Torres Strait Islander mothers in the ACT, the proportion fluctuates from year to year, making the ACT less comparable to other jurisdictions.

n.a. Data for Tasmania were not available because the 'Not stated' category for Indigenous status was not able to be distinguished from the category of mothers who were neither Aboriginal or Torres Strait Islander.

Aboriginal or Torres Strait Islander mothers are more likely to have their babies at a younger age compared with other mothers. In 2002, the average age of an Aboriginal or Torres Strait Islander mother at confinement was 24.8 years, compared with 29.6 years for other mothers. More than one in five (22.6%) Aboriginal or Torres Strait Islander mothers were teenagers. The proportion of teenagers among Aboriginal or Torres Strait Islander mothers was higher in the Northern Territory (29.8%) than in the other states and the Australian Capital Territory.

In 2002, 29.2% of Aboriginal or Torres Strait Islander mothers were having their first baby and 70.7% had given birth previously. Mothers who had given birth three or more times previously accounted for 28.5% of Aboriginal or Torres Strait Islander mothers.

Aboriginal or Torres Strait Islander mothers accounted for 11.4% of mothers who smoked during pregnancy in the five jurisdictions which provided smoking data. Caesarean section deliveries occurred in 21.9% of Aboriginal or Torres Strait Islander mothers in 2002, compared with 27.4% for other mothers. The proportion of Aboriginal or Torres Strait Islander mothers who had previously had a caesarean section was 14.4%, compared with 12.8% for other mothers.

Maternal country of birth

The country of birth of the mother may be an important risk factor for outcomes such as low birthweight and perinatal mortality. In 2002, five of the jurisdictions used the four-digit ABS Standard Australian Classification of Countries (SACC) (ABS 1998) to classify countries of birth, two jurisdictions used the ABS Australian Standard Classification of Countries for Social Statistics (ASCCSS), and one provided the countries of birth in 20 defined groupings.

A high proportion (22.1%) of women giving birth in Australia in 2002 were born in countries other than Australia. Because of the large number of countries, only those countries with more than 1,000 confinements are reported separately. Mothers born in the United Kingdom constituted 3.2% of all confinements and accounted for relatively higher proportions of all mothers in Western Australia (7.3%) and South Australia (4.2%). New Zealand-born mothers constituted 2.5% of all confinements. Mothers born in non-English-speaking countries were more likely to reside in the more populous states, New South Wales and Victoria (Table 3.10).

Table 3.10: Maternal country of birth by state and territory, 2002

Country of birth	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Australia
	Number								
Australia	61,631	47,512	40,555	17,300	14,784	5,279	3,880	3,217	194,158
New Zealand	1,998	1,062	2,031	790	199	51	66	53	6,250
United Kingdom	2,344	1,680	1,297	1,779	728	73	111	74	8,086
Former Yugoslavia	408	536	60	93	67	5	7	—	1,176
Other Europe and former USSR	1,904	1,656	697	733	342	49	132	50	5,563
Lebanon	1,663	522	25	29	25	—	n.p.	n.p.	2,278
Other Middle East and North Africa	1,623	1,192	132	205	96	n.p.	n.p.	n.p.	3,288
China and Hong Kong	2,137	886	224	130	89	6	53	12	3,537
India	747	528	105	116	63	8	26	4	1,597
Philippines	1,156	555	395	128	125	23	33	46	2,461
Vietnam	1,773	1,632	358	299	273	n.p.	52	n.p.	4,400
Other Asia	3,452	2,126	864	821	330	36	143	95	7,867
Northern America	540	357	251	132	76	23	49	27	1,455
South and Central America and the Caribbean	739	380	130	95	56	10	28	5	1,443
Africa (excluding North Africa)	935	856	330	443	116	16	37	17	2,750
Other countries	1,537	543	861	68	52	17	47	32	3,157
Not stated	—	—	9	1,235	—	10	9	29	1,292
Total	84,587	62,023	48,324	24,396	17,421	5,625	4,708	3,674	250,758

(continued)

Table 3.10 (continued): Maternal country of birth by state and territory, 2002

Country of birth	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Australia
	Per cent								
Australia	72.9	76.6	83.9	70.9	84.9	93.8	82.4	87.6	77.4
New Zealand	2.4	1.7	4.2	3.2	1.1	0.9	1.4	1.4	2.5
United Kingdom	2.8	2.7	2.7	7.3	4.2	1.3	2.4	2.0	3.2
Former Yugoslavia	0.5	0.9	0.1	0.4	0.4	0.1	0.1	—	0.5
Other Europe and former USSR	2.3	2.7	1.4	3.0	2.0	0.9	2.8	1.4	2.2
Lebanon	2.0	0.8	0.1	0.1	0.1	—	n.p.	n.p.	0.9
Other Middle East and North Africa	1.9	1.9	0.3	0.8	0.6	n.p.	n.p.	n.p.	1.3
China and Hong Kong	2.5	1.4	0.5	0.5	0.5	0.1	1.1	0.3	1.4
India	0.9	0.9	0.2	0.5	0.4	0.1	0.6	0.1	0.6
Philippines	1.4	0.9	0.8	0.5	0.7	0.4	0.7	1.3	1.0
Vietnam	2.1	2.6	0.7	1.2	1.6	n.p.	1.1	n.p.	1.8
Other Asia	4.1	3.4	1.8	3.4	1.9	0.6	3.0	2.6	3.1
Northern America	0.6	0.6	0.5	0.5	0.4	0.4	1.0	0.7	0.6
South and Central America and the Caribbean	0.9	0.6	0.3	0.4	0.3	0.2	0.6	0.1	0.6
Africa (excluding North Africa)	1.1	1.4	0.7	1.8	0.7	0.3	0.8	0.5	1.1
Other countries	1.8	0.9	1.8	0.3	0.3	0.3	1.0	0.9	1.3
Not stated	—	—	0.0	5.1	—	0.2	0.2	0.8	0.5
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

n.p. Data not published due to small numbers.

Hospital sector

'Hospital sector' indicates whether a patient was admitted to a public or a private hospital. In publications of data prior to 2001, data were presented on 'Admitted patient election status in hospital', which indicated whether a patient elected to be treated as either a public or private patient. The data presented here are not directly comparable to data presented in those earlier reports. This is because, although the majority of patients in public hospitals are public patients, a small number are private patients, and a small number of patients in private hospitals are public patients whose treatment has been contracted to the private sector. In 2002, the proportion of mothers in private hospitals was 31.1%, and ranged from 26.9% in New South Wales to 40.3% in Western Australia (Table 3.11).

Table 3.11: Hospital sector of mothers giving birth in hospitals, by state and territory, 2002

Hospital sector	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Australia
Number									
Public	60,052	40,708	32,335	14,268	11,453	3,354	2,735	2,905	167,810
Private	22,096	19,477	15,280	9,645	4,865	2,174	1,692	686	75,915
Not stated	1	—	—	—	—	—	—	2	3
Total	82,149	60,185	47,615	23,913	16,318	5,528	4,427	3,593	243,728
Per cent									
Public	73.1	67.6	67.9	59.7	70.2	60.7	61.8	80.9	68.9
Private	26.9	32.4	32.1	40.3	29.8	39.3	38.2	19.1	31.1
Not stated	0.0	—	—	—	—	—	—	0.1	0.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Note: This table cannot be compared with mother's accommodation status in previous reports.

Duration of pregnancy

Accurate population data on gestational age are difficult to obtain. Estimates based on the calculated interval between the first day of the last menstrual period (LMP) and the baby's date of birth may be imprecise for some women because of uncertainty about the date of LMP, irregular cycles, or delayed ovulation after use of oral contraceptives. Nevertheless, in the majority of pregnancies, the gestational age derived from the dates provides an appropriate estimate of the duration of pregnancy.

As most pregnant women have at least one ultrasound examination during pregnancy, this may provide useful information on gestational age. If more than one ultrasound examination is conducted, the earliest should be used to date the pregnancy. Preferably an ultrasound carried out between 6 and 10 weeks gestation, and not after 24 weeks gestation, should be used. The different practices for recording and estimating gestational age in the states and territories are likely to result in variable estimates of the distribution of gestational age. This should be kept in mind when comparing state and territory data on gestational age.

Preterm birth (less than 37 weeks gestation) occurred in 7.0% of all confinements. The average duration of pregnancy in Australia was 39.0 weeks. Mothers gave birth at 20–27 weeks in 0.7% of confinements, at 28–31 weeks in 0.7%, and at 32–36 weeks in 5.6% of confinements (Figure 3.2). There was a higher incidence of preterm birth in the Northern Territory (10.4%) than elsewhere (Table 3.12), which possibly reflects the demographic factors found in the Northern Territory. These figures are based on the duration of pregnancies of mothers, and so they differ from the figures on gestational age in the Chapter 4, which are based on babies. The numbers differ owing to multiple births.

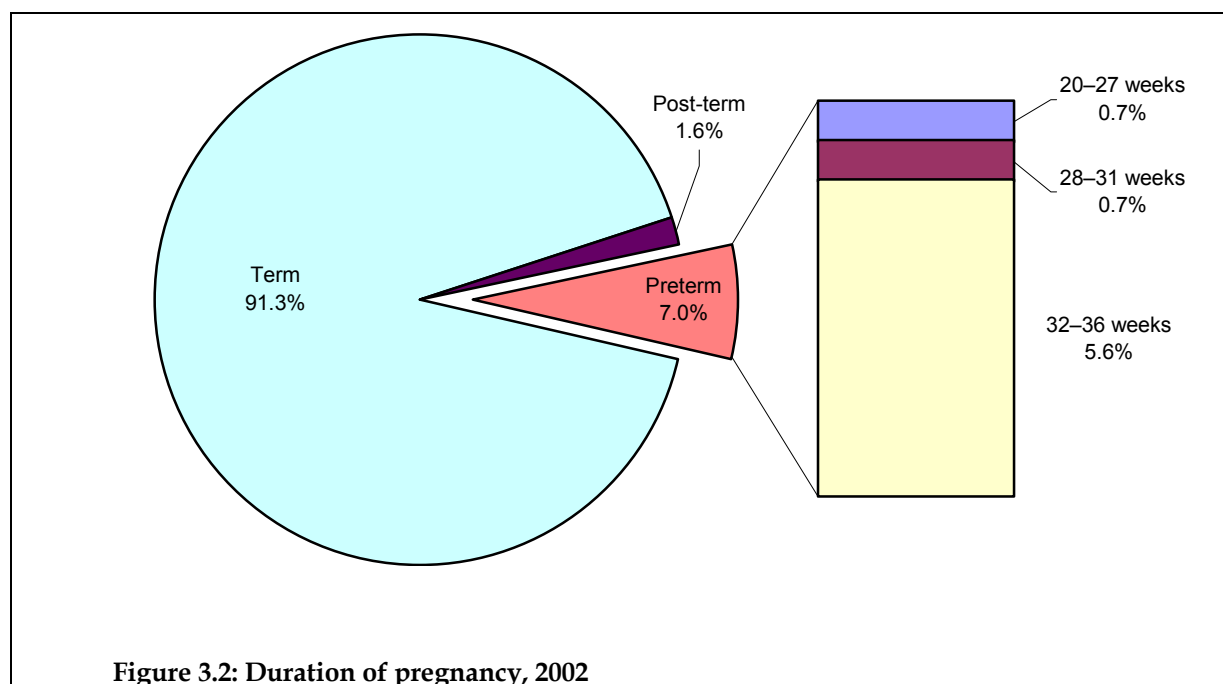
Births occurring at 37–41 weeks gestation (term) accounted for 91.3% of all confinements in 2002. Post-term births (at 42 or more completed weeks of gestation) accounted for 1.6% of confinements (Figure 3.2). Post-term births were least common in Western Australia (0.8%) and most common in the Australian Capital Territory (2.7%).

Table 3.12: Duration of pregnancy by state and territory, 2002

Duration of pregnancy (weeks)	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Australia
Mean	39.1	38.9	38.9	38.8	38.9	39.0	39.0	38.7	39.0
	Number								
20–27 ^(a)	537	520	360	173	137	42	40	39	1,848
28–31	530	427	401	153	143	50	50	41	1,795
32–36	4,311	3,427	2,915	1,466	1,020	346	271	301	14,057
37–41	77,141	56,879	44,026	22,413	15,954	5,118	4,218	3,215	228,964
42 and over	2,047	763	620	191	166	69	129	74	4,059
Not stated	21	7	2	—	1	—	—	4	35
Total	84,587	62,023	48,324	24,396	17,421	5,625	4,708	3,674	250,758
	Per cent								
20–27 ^(a)	0.6	0.8	0.7	0.7	0.8	0.7	0.8	1.1	0.7
28–31	0.6	0.7	0.8	0.6	0.8	0.9	1.1	1.1	0.7
32–36	5.1	5.5	6.0	6.0	5.9	6.2	5.8	8.2	5.6
37–41	91.2	91.7	91.1	91.9	91.6	91.0	89.6	87.5	91.3
42 and over	2.4	1.2	1.3	0.8	1.0	1.2	2.7	2.0	1.6
Not stated	0.0	0.0	0.0	—	0.0	—	—	0.1	0.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

(a) Includes 3 confinements of less than 20 weeks duration.

Note: For multiple births, the gestational age of the first born was used.



Multiple pregnancy

In the perinatal collections, multiple pregnancies are based on the number of fetuses that remain in utero at 20 weeks gestation and are subsequently delivered as separate births. This definition excludes fetuses aborted before 20 completed weeks or fetuses compressed in the placenta at 20 weeks or more. If gestational age is unknown, only fetuses weighing 400 grams or more are taken into account in determining whether it is a singleton or multiple pregnancy. As the perinatal collections include both live births and stillbirths, there are more multiple pregnancies in the perinatal collection than in the data on registrations of live births published by the ABS.

In 2002, there were 4,259 multiple pregnancies (1.7% of all confinements) (Table 3.13), consisting of 4,178 twin pregnancies and 81 triplet or higher order pregnancies. There were 17.0 multiple confinements per 1,000 confinements. The twinning rate was 16.7 per 1,000 confinements in 2002, which has increased substantially since the late 1970s. In 1993, there were 3,520 multiple pregnancies, accounting for 1.4% of confinements, with a twinning rate of 13.3 per 1,000 confinements.

Table 3.13: Plurality, all confinements, by state and territory, 2002

Plurality	NSW	Vic	Qld	WA	SA	Tas	ACT ^(a)	NT	Australia
Number									
Singleton	83,190	60,932	47,484	24,011	17,101	5,542	4,614	3,625	246,499
Multiple	1,397	1,091	840	385	320	83	94	49	4,259
Total	84,587	62,023	48,324	24,396	17,421	5,625	4,708	3,674	250,758
Per cent									
Singleton	98.3	98.2	98.3	98.4	98.2	98.5	98.0	98.7	98.3
Multiple	1.7	1.8	1.7	1.6	1.8	1.5	2.0	1.3	1.7
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

(a) ACT figures include non-ACT residents who gave birth in the ACT, thus the proportion of multiple pregnancies appears high when based on ACT births.

The increasing trend in multiple births in the last two decades can be attributed largely to increased use of fertility drugs and assisted conception, delay in childbearing, and the growing number of older mothers (Tough et al. 2000; Tough et al. 2002).

Onset of labour

Onset of labour is categorised as spontaneous, induced or no labour. In 2002, the onset of labour was spontaneous in 57.8% of all confinements, and there was no labour in 15.5% of confinements. Labour was induced in 26.6% and augmented in 19.2% of confinements³ (Table 3.14).

Figure 3.3 presents the type of onset of labour by state and territory. The proportion of spontaneous onset of labour was highest in the Northern Territory (66.1%) and lowest in Western Australia (51.4%). Western Australia reported the highest proportion of no labour (18.6%), and Tasmania reported the lowest (10.3%).

Induced labour was more likely in Western Australia (30.0%) than in the other states and territories. Combined medical and surgical induction of labour was more likely than either type alone. There was considerable variation among the states and territories in whether labour was augmented, ranging from 16.6% in New South Wales to 26.7% in the Australian Capital Territory (Table 3.14).

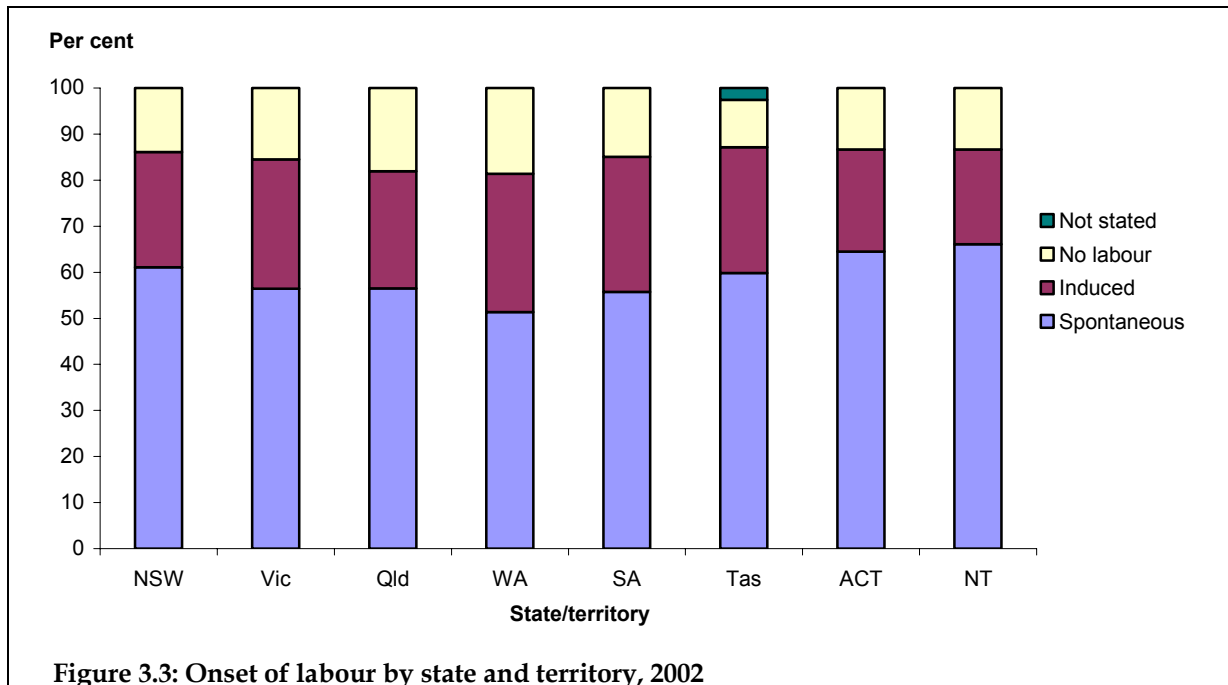


Figure 3.3: Onset of labour by state and territory, 2002

³ This national figure for augmentation excludes Tasmania.

Table 3.14: Onset of labour, all confinements, by state and territory, 2002

Onset of labour	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Australia
Number									
Spontaneous	51,681	34,984	27,315	12,535	9,712	3,367	3,035	2,428	145,057
no augmentation	37,556	23,345	15,446	7,339	6,149	n.a.	1,772	1,683	93,290
medical only ^(a)	4,655	3,643	2,603	1,463	943	n.a.	374	219	13,900
surgical only	6,417	5,833	8,061	2,672	2,086	n.a.	581	399	26,049
combined	2,994	2,163	1,192	1,055	534	n.a.	308	124	8,370
other/not stated	59	—	13	6	—	3,367	—	3	3,448
Induced	21,174	17,429	12,261	7,314	5,103	1,535	1,044	755	66,615
medical only ^(a)	6,599	5,166	4,990	1,418	1,724	n.a.	314	256	20,467
surgical only	1,193	1,158	1,688	496	598	n.a.	152	86	5,371
combined	13,077	11,105	5,516	5,370	2,781	n.a.	569	407	38,825
other/not stated	305	—	67	30	—	1,535	9	6	1,952
No labour	11,720	9,610	8,747	4,547	2,606	577	629	491	38,927
Not stated	12	—	1	—	—	146	—	—	159
Total	84,587	62,023	48,324	24,396	17,421	5,625	4,708	3,674	250,758
Per cent									
Spontaneous	61.1	56.4	56.5	51.4	55.7	59.9	64.5	66.1	57.8
no augmentation	44.4	37.6	32.0	30.1	35.3	n.a.	37.6	45.8	37.2
medical only ^(a)	5.5	5.9	5.4	6.0	5.4	n.a.	7.9	6.0	5.5
surgical only	7.6	9.4	16.7	11.0	12.0	n.a.	12.3	10.9	10.4
combined	3.5	3.5	2.5	4.3	3.1	n.a.	6.5	3.4	3.3
other/not stated	0.1	—	0.0	0.0	—	59.9	—	0.1	1.4
Induced	25.0	28.1	25.4	30.0	29.3	27.3	22.2	20.5	26.6
medical only ^(a)	7.8	8.3	10.3	5.8	9.9	n.a.	6.7	7.0	8.2
surgical only	1.4	1.9	3.5	2.0	3.4	n.a.	3.2	2.3	2.1
combined	15.5	17.9	11.4	22.0	16.0	n.a.	12.1	11.1	15.5
other/not stated	0.4	—	0.1	0.1	—	27.3	0.2	0.2	0.8
No labour	13.9	15.5	18.1	18.6	15.0	10.3	13.4	13.4	15.5
Not stated	0.0	—	0.0	—	—	2.6	—	—	0.1
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

(a) Includes use of oxytocin and/or prostaglandins.

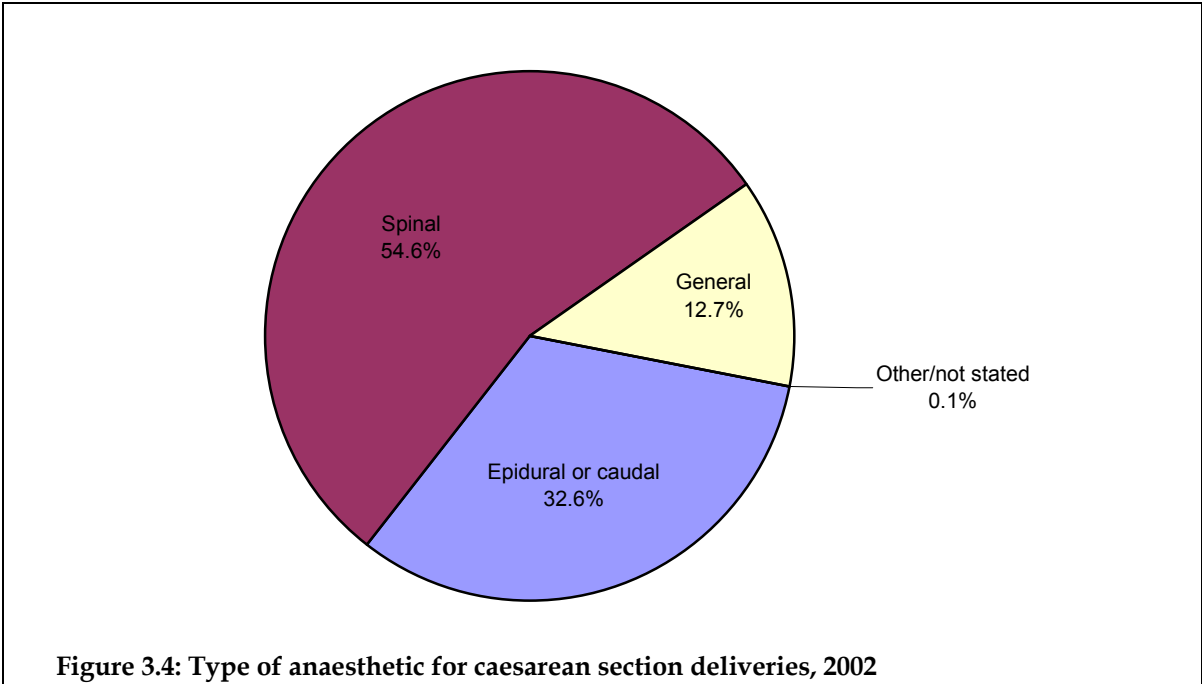
n.a. Data for Tasmania on augmentation and induction not available in the required format.

Anaesthetic for operative deliveries

This is the first time data on anaesthetics have been published in *Australia's Mothers and Babies*. Table 3.15 presents types of anaesthetic administered in 2002 for operative deliveries, including forceps, vacuum extraction and caesarean section deliveries. For this data, the type of anaesthetic administered is coded hierarchically, with local anaesthetic being the lowest order and general anaesthetic being the highest order. Although this data element should include only anaesthetics administered for delivery, some states and territories may include anaesthetics administered for labour under this item, and this may be reflected in the differences reported between the states and territories.

In 2002, 4.5% of women having an operative delivery had a local anaesthetic administered. At least 38.6% of women having operative deliveries had an epidural or caudal anaesthetic administered, and at least 40.0% had a spinal anaesthetic. A general anaesthetic was administered for 9.3% of operative deliveries.⁴

General anaesthetic was used in 12.7% of caesarean section deliveries in 2002 (Figure 3.4), compared with 0.6% of assisted vaginal deliveries. An epidural or caudal anaesthetic was administered for at least 32.6% of caesarean section deliveries and at least 53.6% of assisted vaginal deliveries. A spinal anaesthetic was administered in at least 54.6% of caesarean section deliveries, and in only 3.1% of assisted vaginal deliveries.



⁴ These figures exclude ACT.

Table 3.15: Type of anaesthetic administered, operative deliveries,^(a) by state and territory, 2002

Type of anaesthetic	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Total
Number									
None	795	1,822	1,385	245	211	347	n.a.	47	4,852
Local anaesthetic to perineum	2,052	791	651	380	259	n.p.	n.a.	n.p.	4,167
Pudendal	610	920	211	225	175	—	n.a.	14	2,155
Epidural or caudal	13,740	7,589	5,051	6,125	2,669	365	n.a.	386	35,925
Spinal	8,370	12,164	9,396	2,676	3,276	836	n.a.	503	37,221
General	4,337	1,621	1,358	502	532	154	n.a.	141	8,645
Other	40	14	4	12	4	n.p.	n.a.	n.p.	164
Not stated	—	3	—	—	—	—	n.a.	3	6
Total	29,944	24,924	18,056	10,165	7,126	1,781	n.a.	1,139	93,135
Per cent									
None	2.7	7.3	7.7	2.4	3.0	19.5	n.a.	4.1	5.2
Local anaesthetic to perineum	6.9	3.2	3.6	3.7	3.6	n.p.	n.a.	n.p.	4.5
Pudendal	2.0	3.7	1.2	2.2	2.5	—	n.a.	1.2	2.3
Epidural or caudal	45.9	30.4	28.0	60.3	37.5	20.5	n.a.	33.9	38.6
Spinal	28.0	48.8	52.0	26.3	46.0	46.9	n.a.	44.2	40.0
General	14.5	6.5	7.5	4.9	7.5	8.6	n.a.	12.4	9.3
Other	0.1	0.1	0.0	0.1	0.1	n.p.	n.a.	n.p.	0.2
Not stated	—	0.0	—	—	—	—	n.a.	0.3	0.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	n.a.	100.0	100.0

(a) Operative deliveries include forceps, vacuum extraction and caesarean section.

Note: A hierarchical coding system is used for this item, starting with a local anaesthetic, up to a systemic general anaesthetic. If more than one type of anaesthetic is administered, the highest type in the hierarchy is coded.

n.a. Data not available for ACT.

n.p. Data not published due to small numbers.

Presentation at birth

In 2002, the predominant presentation at birth was vertex, occurring in 94.5% of all confinements. Breech presentation occurred in approximately 1 in 22 confinements, ranging from 4.0% in Tasmania to 4.9% in the Northern Territory. Other presentations, such as face or brow presentation, occurred in 0.8% of confinements (Table 3.16).

Table 3.16: Presentation at birth, all confinements, by state and territory, 2002

Presentation	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Australia
Number									
Vertex	80,128	58,484	45,650	23,101	16,482	5,333	4,435	3,444	237,057
Breech	3,753	2,895	2,238	1,094	729	224	196	180	11,309
Other ^(a)	597	578	417	201	172	61	46	37	2,109
Not stated	109	66	19	—	38	7	31	13	283
Total	84,587	62,023	48,324	24,396	17,421	5,625	4,708	3,674	250,758
Per cent									
Vertex	94.7	94.3	94.5	94.7	94.6	94.8	94.2	93.7	94.5
Breech	4.4	4.7	4.6	4.5	4.2	4.0	4.2	4.9	4.5
Other ^(a)	0.7	0.9	0.9	0.8	1.0	1.1	1.0	1.0	0.8
Not stated	0.1	0.1	0.0	—	0.2	0.1	0.7	0.4	0.1
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

(a) Includes face or brow presentation.

Note: For multiple births, the presentation of the first born was used.

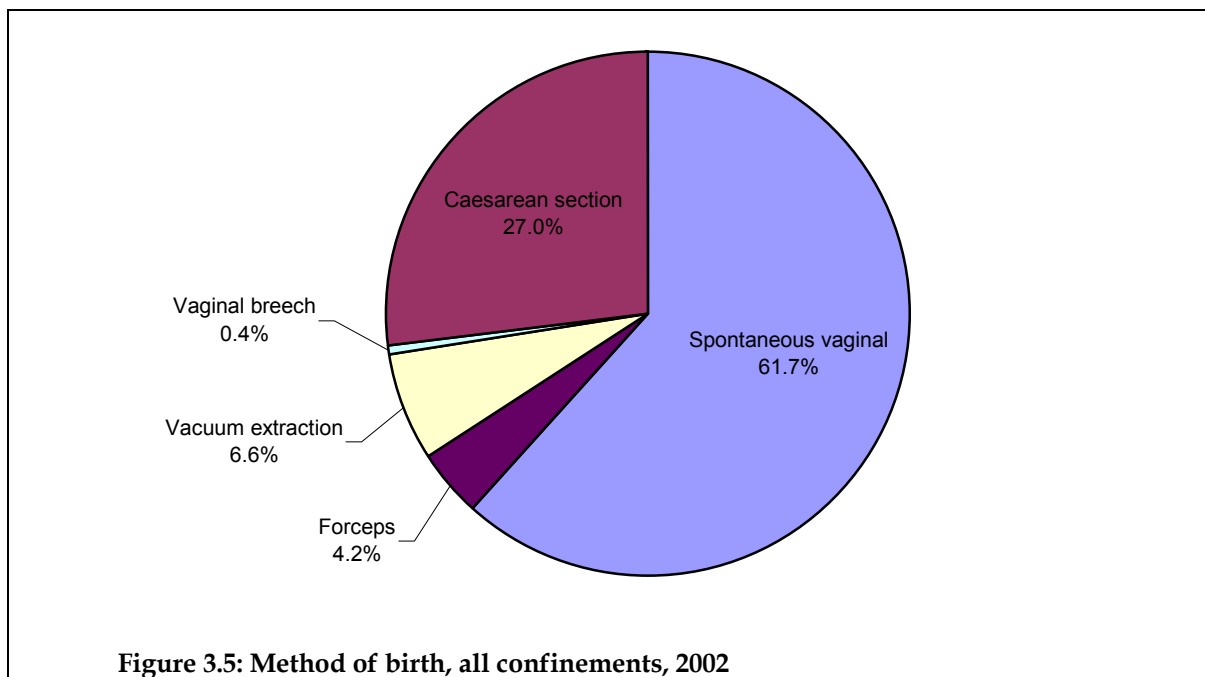
Method of birth

Data are presented in this section on the method of birth by confinement; for multiple births, the method of birth of the first born baby is presented. Table 4.7 presents method of birth data for each individual baby.

Vaginal deliveries

Of all confinements in 2002, 61.7% resulted in spontaneous vaginal deliveries. The proportion of spontaneous vaginal deliveries ranged from 57.9% in Western Australia to 68.6% in the Northern Territory. Vaginal breech delivery occurred in 0.4% of confinements in 2002 (Figure 3.5), decreasing over the past 10 years from 1.0% in 1993.

Approximately 1 in 9 mothers had an assisted vaginal delivery where either forceps or vacuum extraction was used. The proportion of these instrumental deliveries varied among the states and territories, from 5.7% in the Northern Territory to 14.0% in the Australian Capital Territory. Forceps delivery occurred in 4.2% of confinements and was most common in Victoria (6.5%). Deliveries by vacuum extraction accounted for 6.6% nationally, ranging from 2.8% in the Northern Territory to 9.6% in the Australian Capital Territory (Table 3.17).



Caesarean section deliveries

There were 67,806 caesarean sections performed in 2002, accounting for 27.0% of all confinements. This equalled a rate of 270.4 per 1,000 confinements. The proportion of caesarean deliveries varied by state and territory, from 21.4% in Tasmania to 29.5% in Queensland. Three states, Queensland, Western Australia and South Australia, recorded caesarean section rates (percentage) over 29% (Table 3.17). Of mothers giving birth in hospitals in Australia in 2002, 27.8% had a caesarean section delivery.

Caesarean section rates increase with age. In 2002, caesarean section rates ranged from 149.7 per 1,000 confinements in mothers aged less than 20 years to 417.2 per 1,000 confinements of mothers aged 40 and over (Figure 3.6).

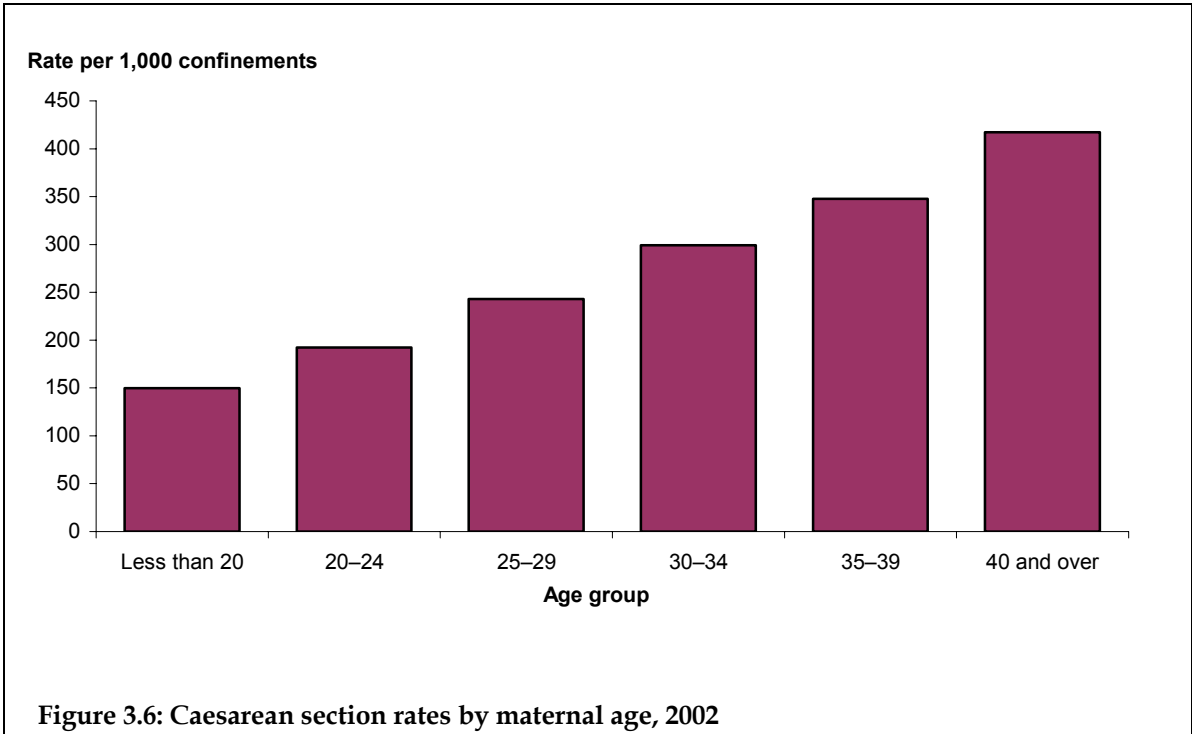


Table 3.17: Method of birth, all confinements, by state and territory, 2002

Method of birth	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Australia
Number									
Spontaneous vaginal	54,271	36,797	30,059	14,137	10,220	3,790	2,900	2,520	154,694
Forceps	3,034	4,016	1,237	756	1,020	251	206	106	10,626
Vacuum extraction	5,855	3,935	2,555	2,243	1,025	327	453	102	16,495
Vaginal breech	353	297	191	94	74	26	16	8	1,059
Caesarean section	21,055	16,973	14,264	7,166	5,081	1,203	1,133	931	67,806
labour	9,333	7,364	5,519	2,619	2,475	505	504	440	28,759
no labour	11,720	9,609	8,745	4,547	2,606	577	629	491	38,924
not stated	2	—	—	—	—	121	—	—	123
Other	—	—	18	—	—	25	—	—	43
Not stated	19	5	—	—	1	3	—	7	35
Total	84,587	62,023	48,324	24,396	17,421	5,625	4,708	3,674	250,758
Per cent									
Spontaneous vaginal	64.2	59.3	62.2	57.9	58.7	67.4	61.6	68.6	61.7
Forceps	3.6	6.5	2.6	3.1	5.9	4.5	4.4	2.9	4.2
Vacuum extraction	6.9	6.3	5.3	9.2	5.9	5.8	9.6	2.8	6.6
Vaginal breech	0.4	0.5	0.4	0.4	0.4	0.5	0.3	0.2	0.4
Caesarean section	24.9	27.4	29.5	29.4	29.2	21.4	24.1	25.3	27.0
labour	11.0	11.9	11.4	10.7	14.2	9.0	10.7	12.0	11.5
no labour	13.9	15.5	18.1	18.6	15.0	10.3	13.4	13.4	15.5
not stated	0.0	—	—	—	—	2.2	—	—	0.0
Other	—	—	0.0	—	—	0.4	—	—	0.0
Not stated	0.0	0.0	—	—	0.0	0.1	—	0.2	0.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Note: For multiple births, the method of birth of the first born was used.

The caesarean section rate has continued to show an overall upward trend over the last 10 years. The proportion of women having caesarean sections has increased from 19.0% in 1993 to 27.0% in 2002, and the proportion of instrumental deliveries has declined from 11.9% in 1993 to 10.8% in 2002 (Figure 3.7).

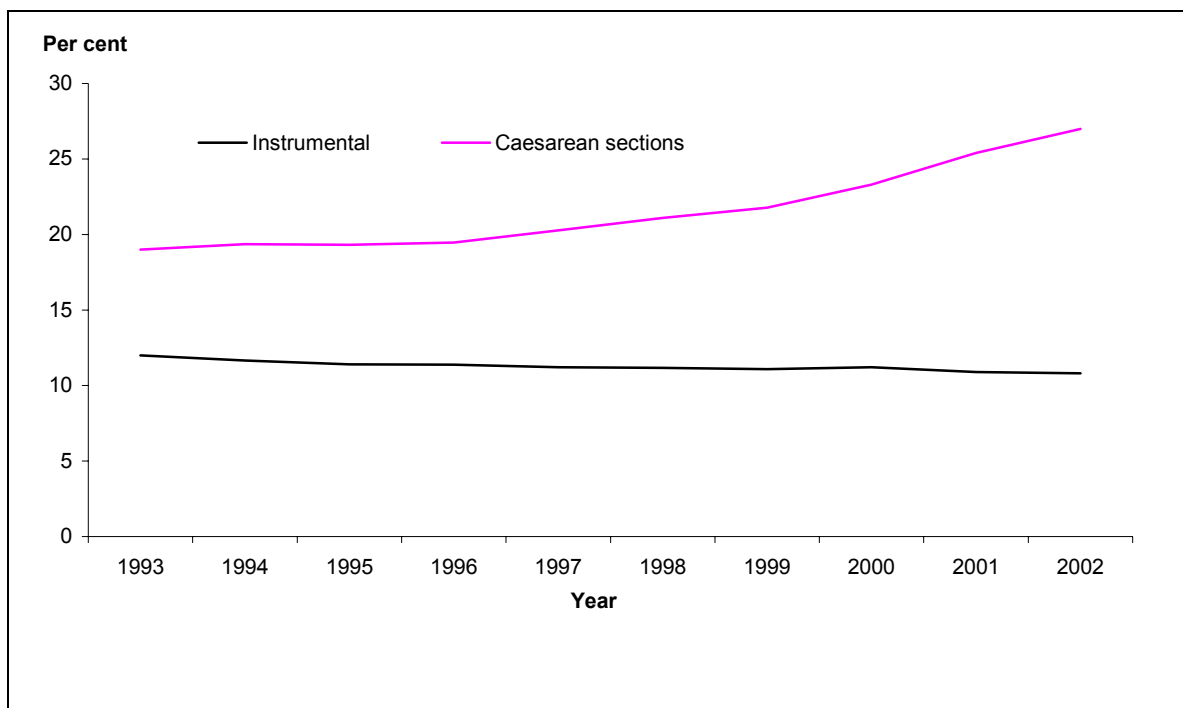


Figure 3.7: Proportion of caesarean section and instrumental deliveries, 1993–2002

Method of birth by hospital sector

Method of birth for each state and territory was compared by hospital sector (Table 3.18). Mothers giving birth in public hospitals reported higher levels of spontaneous vaginal deliveries than those in private hospitals (65.8% compared with 49.1%). Private hospital patients were more likely than public hospital patients to have vaginal deliveries requiring forceps (6.5% compared with 3.4%) or vacuum extraction (8.7% compared with 5.9%), and less likely to have vaginal breech deliveries (0.2% compared with 0.5%).

Of deliveries in public hospitals, the highest rate of forceps deliveries occurred in Victoria (5.0%) and South Australia (4.9%). Vacuum extraction was most common for both public and private hospitals in the Australian Capital Territory.

The caesarean section rate of 35.3% for women who were in private hospitals was higher than the rate of 24.4% for those in public hospitals. This difference was partly attributable to a higher proportion of older women among private hospital patients. More than 35% of mothers in private hospitals in Queensland (41.5%), South Australia (37.6%), Western Australia (37.4%), and the Northern Territory (36.2%) had their babies delivered by caesarean section (Table 3.18).

Table 3.18: Method of birth of mothers giving birth in hospitals by hospital sector and state and territory, 2002

Hospital sector/ method of birth	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Australia
Public									
	Number								
Spontaneous vaginal	40,478	25,429	22,358	9,136	6,834	2,336	1,799	2,072	110,442
Forceps	1,813	2,054	513	451	564	101	99	52	5,647
Vacuum extraction	3,673	2,444	1,380	1,036	736	241	229	85	9,824
Vaginal breech	301	214	145	82	65	14	13	8	842
Caesarean section	13,779	10,566	7,923	3,563	3,253	649	595	682	41,010
Other	—	—	16	—	—	13	—	—	29
Not stated	8	1	—	—	1	—	—	6	16
Total	60,052	40,708	32,335	14,268	11,453	3,354	2,735	2,905	167,810
	Per cent								
Spontaneous vaginal	67.4	62.5	69.1	64.0	59.7	69.6	65.8	71.3	65.8
Forceps	3.0	5.0	1.6	3.2	4.9	3.0	3.6	1.8	3.4
Vacuum extraction	6.1	6.0	4.3	7.3	6.4	7.2	8.4	2.9	5.9
Vaginal breech	0.5	0.5	0.4	0.6	0.6	0.4	0.5	0.3	0.5
Caesarean section	22.9	26.0	24.5	25.0	28.4	19.4	21.8	23.5	24.4
Other	—	—	0.0	—	—	0.4	—	—	0.0
Not stated	0.0	0.0	—	—	0.0	—	—	0.2	0.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Private									
	Number								
Spontaneous vaginal	11,385	9,563	7,002	4,520	2,285	1,365	820	367	37,307
Forceps	1,218	1,953	724	305	456	150	107	54	4,967
Vacuum extraction	2,166	1,477	1,175	1,207	289	n.p.	n.p.	17	6,640
Vaginal breech	40	74	37	10	7	n.p.	n.p.	—	180
Caesarean section	7,276	6,407	6,341	3,603	1,828	551	538	248	26,792
Other	—	—	1	—	—	12	—	—	13
Not stated	11	3	—	—	—	2	—	—	16
Total	22,096	19,477	15,280	9,645	4,865	2,174	1,692	686	75,915
	Per cent								
Spontaneous vaginal	51.5	49.1	45.8	46.9	47.0	62.8	48.5	53.5	49.1
Forceps	5.5	10.0	4.7	3.2	9.4	6.9	6.3	7.9	6.5
Vacuum extraction	9.8	7.6	7.7	12.5	5.9	n.p.	n.p.	2.5	8.7
Vaginal breech	0.2	0.4	0.2	0.1	0.1	n.p.	n.p.	—	0.2
Caesarean section	32.9	32.9	41.5	37.4	37.6	25.3	31.8	36.2	35.3
Other	—	—	0.0	—	—	0.6	—	—	0.0
Not stated	0.0	0.0	—	—	—	0.1	—	—	0.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Note: For multiple births, the method of birth of the first born was used.

n.p. Data not published due to small numbers.

Method of birth by Indigenous status

Mothers identified as being of Aboriginal or Torres Strait Islander origin were more likely than other mothers to have a spontaneous vaginal delivery (72.7% compared with 61.1%) and less likely to have assisted vaginal deliveries (forceps or vacuum extraction). Aboriginal or Torres Strait Islander mothers also had a higher rate of vaginal breech deliveries (0.8% compared with 0.4%). The caesarean section rate of 21.9% for mothers identified as Aboriginal or Torres Strait Islander was less than that for other mothers (27.4%) (Table 3.19).⁵

⁵ These figures exclude Tasmania.

Table 3.19: Method of birth by maternal Indigenous status and state and territory, 2002

Indigenous status/ method of birth	NSW	Vic	Qld	WA	SA	Tas	ACT ^(b)	NT	Total
Aboriginal or Torres Strait Islander									
	Number								
Spontaneous vaginal	1,598	288	2,019	1,182	275	n.a.	52	999	6,413
Assisted vaginal ^(a)	98	32	100	92	21	n.a.	n.p.	n.p.	401
Vaginal breech	14	6	23	10	9	n.a.	n.p.	n.p.	68
Caesarean section	445	90	579	322	138	n.a.	13	348	1,935
Other	—	—	—	—	—	n.a.	—	—	—
Not stated	—	—	—	—	—	n.a.	—	5	5
Total	2,155	416	2,721	1,606	443	n.a.	72	1,409	8,822
	Per cent								
Spontaneous vaginal	74.2	69.2	74.2	73.6	62.1	n.a.	72.2	70.9	72.7
Assisted vaginal ^(a)	4.5	7.7	3.7	5.7	4.7	n.a.	n.p.	n.p.	4.5
Vaginal breech	0.6	1.4	0.8	0.6	2.0	n.a.	n.p.	n.p.	0.8
Caesarean section	20.6	21.6	21.3	20.0	31.2	n.a.	18.1	24.7	21.9
Other	—	—	—	—	—	n.a.	—	—	—
Not stated	—	—	—	—	—	n.a.	—	0.4	0.1
Total	100.0	100.0	100.0	100.0	100.0	n.a.	100.0	100.0	100.0
Other									
	Number								
Spontaneous vaginal	52,645	36,509	28,032	12,955	9,945	n.a.	2,834	1,496	144,416
Assisted vaginal ^(a)	8,788	7,919	3,692	2,907	2,024	n.a.	n.p.	n.p.	26,133
Vaginal breech	339	291	168	84	65	n.a.	n.p.	n.p.	965
Caesarean section	20,594	16,883	13,683	6,844	4,943	n.a.	1,111	579	64,637
Other	—	—	18	—	—	n.a.	—	—	18
Not stated	17	5	—	—	1	n.a.	—	2	25
Total	82,383	61,607	45,593	22,790	16,978	n.a.	4,610	2,233	236,194
	Per cent								
Spontaneous vaginal	63.9	59.3	61.5	56.8	58.6	n.a.	61.5	67.0	61.1
Assisted vaginal ^(a)	10.7	12.9	8.1	12.8	11.9	n.a.	n.p.	n.p.	11.1
Vaginal breech	0.4	0.5	0.4	0.4	0.4	n.a.	n.p.	n.p.	0.4
Caesarean section	25.0	27.4	30.0	30.0	29.1	n.a.	24.1	25.9	27.4
Other	—	—	0.0	—	—	n.a.	—	—	0.0
Not stated	0.0	0.0	—	—	0.0	n.a.	—	0.1	0.0
Total	100.0	100.0	100.0	100.0	100.0	n.a.	100.0	100.0	100.0

(a) Assisted vaginal birth includes forceps and vacuum extraction.

(b) Because of the small number of Aboriginal or Torres Strait Islander mothers in the ACT, the proportion fluctuates from year to year, making the ACT less comparable to other jurisdictions.

Note: For multiple births, the method of birth of the first born was used.

n.a. Data for Tasmania were not available because the 'Not stated' category for Indigenous status was not able to be distinguished from the category of mothers who were neither Aboriginal or Torres Strait Islander.

n.p. Data not published due to small numbers.

Previous births by caesarean section

This is the first time that data on previous caesarean section births have been presented in *Australia's Mothers and Babies*. Data were available for six states and territories: New South Wales, Victoria, Queensland, Western Australia, South Australia and the Northern Territory. In 2002, 12.8% of all mothers giving birth in these jurisdictions had a history of previous caesarean section. Of these mothers, 9.2% had previously had one caesarean section and 2.2% had previously had two or more caesarean sections (Table 3.20). For multiparous mothers, 21.8% had a history of caesarean section.

Table 3.20: Number of mothers having had previous caesarean sections, by state and territory, 2002

Previous caesarean sections	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Total
Number									
None	39,479	54,012	40,748	21,157	14,903	n.a.	n.a.	3,173	173,472
At least one	9,971	8,011	6,626	3,239	2,518	n.a.	n.a.	501	30,866
one	8,042	6,441	5,255	n.a.	2,022	n.a.	n.a.	382	22,142
two	1,553	1,275	1,100	n.a.	388	n.a.	n.a.	89	4,405
three or more	376	295	271	n.a.	108	n.a.	n.a.	30	1,080
Not stated	35,137	—	950	—	—	n.a.	n.a.	—	36,087
Total	84,587	62,023	48,324	24,396	17,421	n.a.	n.a.	3,674	240,425
Per cent									
None	46.7	87.1	84.3	86.7	85.5	n.a.	n.a.	86.4	72.2
At least one	11.8	12.9	13.7	13.3	14.5	n.a.	n.a.	13.6	12.8
one	9.5	10.4	10.9	n.a.	11.6	n.a.	n.a.	10.4	9.2
two	1.8	2.1	2.3	n.a.	2.2	n.a.	n.a.	2.4	1.8
three or more	0.4	0.5	0.6	n.a.	0.6	n.a.	n.a.	0.8	0.4
Not stated	41.5	—	2.0	—	—	n.a.	n.a.	—	15.0
Total	100.0	100.0	100.0	100.0	100.0	n.a.	n.a.	100.0	100.0

n.a. Data not available.

In 2002, 16.6% of mothers with a history of caesarean section had a spontaneous vaginal delivery, and 3.7% had an assisted vaginal delivery. Repeat caesarean sections occurred in 79.4% of mothers⁶ (Table 3.21).

⁶ These figures exclude Tasmania and ACT.

Table 3.21: Current method of birth for mothers who have had a previous caesarean section, by state and territory, 2002

Method of birth	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Total
Number									
Spontaneous vaginal	1,944	1,104	1,172	351	426	n.a.	n.a.	137	5,134
Assisted vaginal ^(a)	420	328	159	101	135	n.a.	n.a.	11	1,154
Caesarean section	7,578	6,568	5,264	2,782	1,949	n.a.	n.a.	353	24,494
Other	28	11	31	5	8	n.a.	n.a.	—	83
Not stated	1	—	—	—	—	n.a.	n.a.	—	1
Total	9,971	8,011	6,626	3,239	2,518	n.a.	n.a.	501	30,866
Per cent									
Spontaneous vaginal	19.5	13.8	17.7	10.8	16.9	n.a.	n.a.	27.3	16.6
Assisted vaginal ^(a)	4.2	4.1	2.4	3.1	5.4	n.a.	n.a.	2.2	3.7
Caesarean section	76.0	82.0	79.4	85.9	77.4	n.a.	n.a.	70.5	79.4
Other	0.3	0.1	0.5	0.2	0.3	n.a.	n.a.	—	0.3
Not stated	0.0	—	—	—	—	n.a.	n.a.	—	0.0
Total	100.0	100.0	100.0	100.0	100.0	n.a.	n.a.	100.0	100.0

(a) Assisted vaginal birth includes forceps and vacuum extraction.

Note: For multiple births, the method of birth of the first born was used.

n.a. Data not available for Tasmania and ACT.

Perineal status after vaginal delivery

All states and territories collected information on the status of the perineum after delivery; however, data from Tasmania were in a different format and were not able to be published. In 2002, approximately 1 in 3 mothers (35.3%) had intact perineums following vaginal births. A first or second degree laceration or graze was reported in 42.8% of vaginal deliveries (Table 3.22).

One in 100 vaginal deliveries reported a third or fourth degree laceration of the perineum. This proportion varied slightly among the states and territories, from 0.8% in Victoria, to 1.5% in New South Wales and the Northern Territory. An episiotomy was performed for 16.2% of vaginal deliveries, with the highest rate being recorded in Victoria (20.9%). A combined laceration and episiotomy occurred in 1.8% of vaginal deliveries.

Table 3.22: Perineal status after vaginal delivery, by state and territory, 2002

Perineal status	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Total
	Number								
Episiotomy	9,284	9,425	4,032	3,181	2,227	n.a.	555	272	28,976
Intact	17,657	18,688	13,368	6,779	3,761	n.a.	1,248	1,455	62,956
1st degree laceration/ vaginal graze	17,923	6,993	6,955	2,808	1,924	n.a.	621	370	37,594
2nd degree laceration	14,404	8,718	6,855	3,350	3,950	n.a.	1,029	466	38,772
3rd/4th degree laceration	958	343	340	172	176	n.a.	34	42	2,065
Combined laceration and episiotomy	616	878	767	390	299	n.a.	88	94	3,132
Other	2,659	—	^(a) 1,724	550	2	n.a.	—	35	4,970
Not stated	12	—	1	—	—	n.a.	—	2	15
Total	63,513	45,045	34,042	17,230	12,339	n.a.	3,575	2,736	178,480
	Per cent								
Episiotomy	14.6	20.9	11.8	18.5	18.0	n.a.	15.5	9.9	16.2
Intact	27.8	41.5	39.3	39.3	30.5	n.a.	34.9	53.2	35.3
1st degree laceration/ vaginal graze	28.2	15.5	20.4	16.3	15.6	n.a.	17.4	13.5	21.1
2nd degree laceration	22.7	19.4	20.1	19.4	32.0	n.a.	28.8	17.0	21.7
3rd/4th degree laceration	1.5	0.8	1.0	1.0	1.4	n.a.	1.0	1.5	1.2
Combined laceration and episiotomy	1.0	1.9	2.3	2.3	2.4	n.a.	2.5	3.4	1.8
Other	4.2	—	^(a) 5.1	3.2	0.0	n.a.	—	1.3	2.8
Not stated	0.0	—	0.0	—	—	n.a.	—	0.1	0.0
Total	100.0	100.0	100.0	100.0	100.0	n.a.	100.0	100.0	100.0

(a) Includes cases where the perineum was intact but a graze was reported.

Note: For multiple births, the perineal status after delivery of the first born was used.

n.a. Data for Tasmania not available in the required format.

Length of stay in hospital

Antenatal length of stay

Most women (64.9%) gave birth within a day of admission to hospital, and this ranged from 57.7% in the Australian Capital Territory to 68.2% in Queensland (Table 3.23). The proportion of mothers giving birth within 2 days of admission was 93.0%. About 1.2% of mothers were hospitalised for 7 days or more immediately before delivery.

Table 3.23: Length of antenatal stay of mothers giving birth in hospitals, by state and territory, 2002

Length of stay	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Australia
Number									
Less than 1 day	51,399	41,005	32,495	14,796	10,174	3,598	2,556	2,249	158,272
1 day	23,642	16,166	12,618	7,041	5,037	1,557	1,493	1,003	68,557
2–6 days	4,366	2,418	2,045	957	846	255	290	284	11,461
7–13 days	608	330	269	165	133	19	51	37	1,612
14 or more days	484	266	188	105	128	15	37	17	1,240
Not stated	1,650	—	—	849	—	84	—	3	2,586
Total	82,149	60,185	47,615	23,913	16,318	5,528	4,427	3,593	243,728
Per cent									
Less than 1 day	62.6	68.1	68.2	61.9	62.3	65.1	57.7	62.6	64.9
1 day	28.8	26.9	26.5	29.4	30.9	28.2	33.7	27.9	28.1
2–6 days	5.3	4.0	4.3	4.0	5.2	4.6	6.6	7.9	4.7
7–13 days	0.7	0.5	0.6	0.7	0.8	0.3	1.2	1.0	0.7
14 or more days	0.6	0.4	0.4	0.4	0.8	0.3	0.8	0.5	0.5
Not stated	2.0	—	—	3.6	—	1.5	—	0.1	1.1
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Postnatal length of stay

The length of the mother's postnatal stay in hospital may be influenced by factors such as the type of delivery, maternal medical and obstetric complications, neonatal morbidity, and specific hospital policies of early discharge. In 2002, the median postnatal hospital stay for mothers was 4.0 days.⁷ Only Queensland reported a shorter median length of stay of 3.0 days (Table 3.24).

The trend towards shorter postnatal stays in hospital is reflected by the higher proportion of mothers who were discharged less than 5 days after giving birth. In 2002, 11.0% of

⁷ This national figure excludes Western Australia.

mothers were discharged less than 2 days after delivery, and 58.6% of mothers were discharged between 2 and 4 days after delivery. This compares with 5.2% and 42.7%, respectively, in 1993. Relatively more mothers in Queensland (75.2%) and Victoria (73.1%) had stays of less than 5 days in 2002. Longer lengths of stay of 5 or more days were relatively more common in South Australia (39.9%) and Tasmania (39.7%) (Figure 3.8).

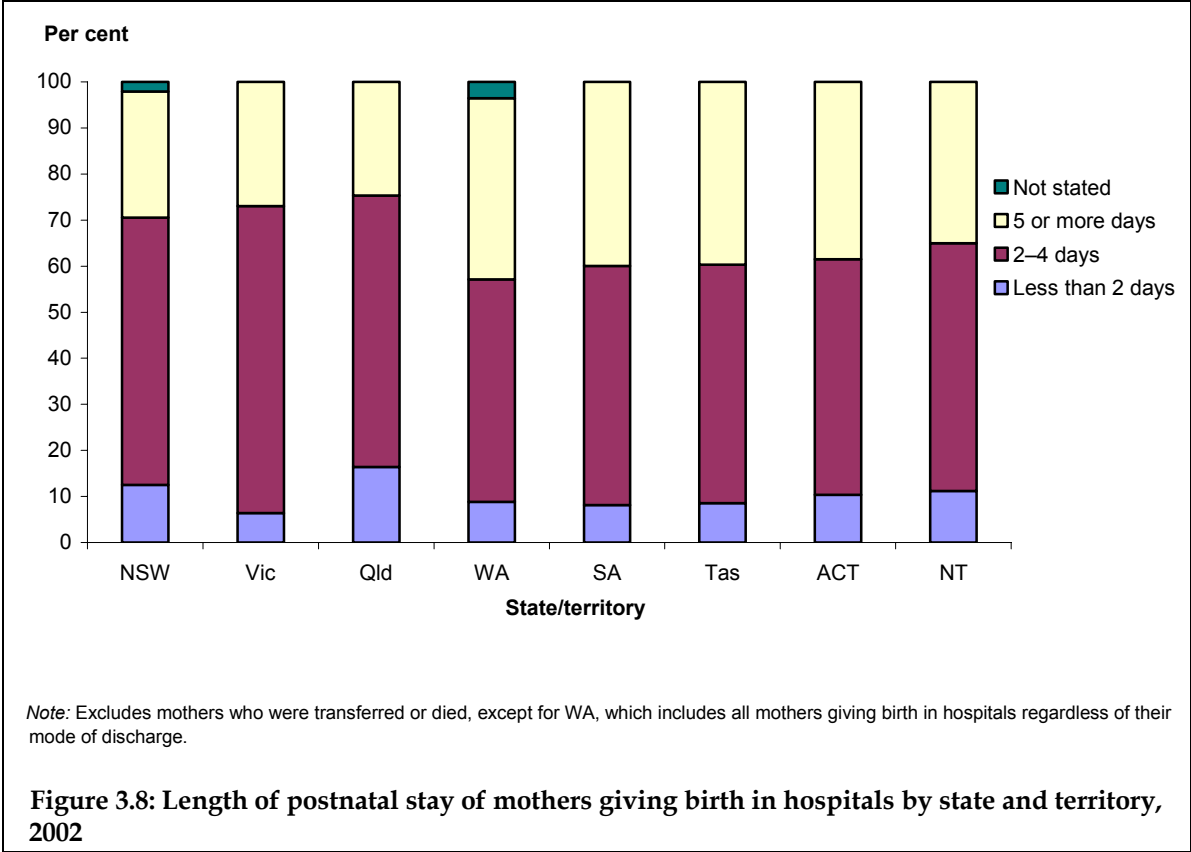


Table 3.24: Length of postnatal stay of mothers giving birth in hospitals^(a) by state and territory, 2002

Length of stay	NSW	Vic	Qld	WA ^(b)	SA	Tas	ACT	NT	Australia ^(c)
Median (days)	4.0	4.0	3.0	—	4.0	4.0	4.0	4.0	^(c) 4.0
Number									
Less than 1 day	1,878	697	1,269	430	241	77	102	64	4,758
1 day	8,029	3,074	6,373	1,685	1,044	385	343	312	21,245
2 days	12,882	9,507	9,186	3,214	2,253	788	612	568	39,010
3 days	15,628	12,784	8,894	3,995	3,118	1,031	799	647	46,896
4 days	17,373	16,851	9,324	4,343	2,862	991	791	597	53,132
5 days	11,645	9,631	6,880	4,075	3,327	932	800	549	37,839
6 days	6,230	4,192	2,885	2,481	1,338	530	469	241	18,366
7–13 days	3,663	1,943	1,693	2,791	1,648	658	383	359	13,138
14 or more days	146	54	39	50	20	33	7	29	378
Not stated	1,645	—	—	849	—	1	—	—	2,495
Total	79,119	58,733	46,543	23,913	15,851	5,426	4,306	3,366	237,257
Per cent									
Less than 1 day	2.4	1.2	2.7	1.8	1.5	1.4	2.4	1.9	2.0
1 day	10.1	5.2	13.7	7.0	6.6	7.1	8.0	9.3	9.0
2 days	16.3	16.2	19.7	13.4	14.2	14.5	14.2	16.9	16.4
3 days	19.8	21.8	19.1	16.7	19.7	19.0	18.6	19.2	19.8
4 days	22.0	28.7	20.0	18.2	18.1	18.3	18.4	17.7	22.4
5 days	14.7	16.4	14.8	17.0	21.0	17.2	18.6	16.3	15.9
6 days	7.9	7.1	6.2	10.4	8.4	9.8	10.9	7.2	7.7
7–13 days	4.6	3.3	3.6	11.7	10.4	12.1	8.9	10.7	5.5
14 or more days	0.2	0.1	0.1	0.2	0.1	0.6	0.2	0.9	0.2
Not stated	2.1	—	—	3.6	—	0.0	—	—	1.1
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

(a) Excludes mothers who were transferred or died.

(b) WA data includes all mothers giving birth in hospitals regardless of their mode of discharge.

(c) Excludes WA.

Mothers in private hospitals had a median postnatal length of stay of 5.0 days in 2002, compared with 3.0 days for those in public hospitals. The proportion of mothers giving birth in hospitals with a postnatal stay of less than 5 days was 48.6% for those in private hospitals, compared with 81.7% in public hospitals.

Mode of separation from hospital

Nearly all mothers who gave birth in hospitals were discharged to their homes (97.1%). Around 2.8% of mothers were transferred to another hospital (Table 3.25).⁸ This usually occurs for continuing care in a hospital located nearer to the mother's place of residence or sometimes for further treatment of complications. These transfers between hospitals were more likely to occur in the Northern Territory (4.0%) and New South Wales (3.7%) than in the other jurisdictions.

Table 3.25: Mode of separation of mothers giving birth in hospitals by state and territory, 2002

Mode of separation	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Total
Number									
Discharge home	79,119	58,733	46,543	n.a.	15,851	5,426	4,306	3,366	213,344
Transfer to another hospital	3,000	1,448	1,067	n.a.	466	13	120	142	6,256
Died	n.p.	n.p.	n.p.	n.a.	n.p.	n.p.	n.p.	n.p.	14
Other ^(a)	n.p.	n.p.	n.p.	n.a.	n.p.	n.p.	n.p.	n.p.	110
Not stated	28	—	—	n.a.	—	40	—	23	91
Total	82,149	60,185	47,615	n.a.	16,318	5,528	4,427	3,593	219,815
Per cent									
Discharge home	96.3	97.6	97.7	n.a.	97.1	98.2	97.3	93.7	97.1
Transfer to another hospital	3.7	2.4	2.2	n.a.	2.9	0.2	2.7	4.0	2.8
Died	n.p.	n.p.	n.p.	n.a.	n.p.	n.p.	n.p.	n.p.	0.0
Other ^(a)	n.p.	n.p.	n.p.	n.a.	n.p.	n.p.	n.p.	n.p.	0.1
Not stated	0.0	—	—	n.a.	—	0.7	—	0.6	0.0
Total	100.0	100.0	100.0	n.a.	100.0	100.0	100.0	100.0	100.0

(a) Other may include statistical discharges and transfers to health care accommodation other than acute hospitals.

n.a. Data not available for WA.

n.p. Data not published due to small numbers.

⁸ These national figures exclude Western Australia.

Terminations

At a national level, complete information on terminations of pregnancy is not available. There is no national agreement on the collection of terminations data. However, two national administrative data collections – the Health Insurance Commission (HIC) Medicare data and the National Hospital Morbidity Database (NHMD) – are sometimes used to extrapolate estimates for the number of terminations of pregnancy. Both the HIC Medicare data and NHMD data have limitations, lack sensitivity and specificity, have incomplete coverage, and have not been validated as data sources for enumerating terminations of pregnancy.

Only South Australia and Western Australia collect population-based data on terminations of pregnancy within their states. The South Australian data are often used to provide an estimate of national figures on terminations of pregnancy. In 2002, South Australia reported 5,417 terminations of pregnancy at a rate of 17.2 per 1,000 women aged 15–44 years (Chan et al. 2003:39); Western Australia reported 8,244 terminations of pregnancy at a rate of 19.4 per 1,000 women aged 15–44 years (preliminary unpublished data, Department of Health, Western Australia).

4 Babies

Birth status

Babies are recorded as liveborn or stillborn (fetal deaths) on perinatal notification forms. A live birth is the complete expulsion or extraction from the mother of a baby which, after such separation, breathes or shows any other evidence of life. A fetal death is defined as a death occurring prior to the complete expulsion or extraction from the mother of a product of conception of 20 or more completed weeks gestation or 400 grams or more birthweight (NHDC 2003).

There were 253,388 live births and 1,707 fetal deaths in Australia in 2002, giving a total of 255,095 births reported to the NPDC (Table 3.1). This equated to a natural stillbirth rate of 6.7 per 1,000 births.

Sex

Male births exceeded female births in all states and territories, and accounted for 51.3% of births nationally in 2002 (Table 4.1). This proportion was similar across the states and territories, and has changed very little over the past decade.

In 2002, the national sex ratio was 105.3 male births per 100 female births. For singleton births the sex ratio was 105.7 male births per 100 female births. The sex ratio for twins was 95.7 and for other multiple births, 82.8. The sex ratio for all births was highest in the Northern Territory, at 106.8 male births per 100 female births, and lowest in Western Australia, at 103.7.

Table 4.1: Babies' sex by state and territory, 2002

Sex	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Australia
Sex ratio (M:F)	105.3	105.7	105.4	103.7	106.4	105.1	106.1	106.8	105.3
	Number								
Males	44,058	32,427	25,237	12,617	9,148	2,925	2,473	1,921	130,806
Females	41,858	30,690	23,953	12,167	8,595	2,782	2,331	1,798	124,174
Indeterminate/ not stated	89	16	6	—	2	2	—	—	115
Total	86,005	63,133	49,196	24,784	17,745	5,709	4,804	3,719	255,095
	Per cent								
Males	51.2	51.4	51.3	50.9	51.6	51.2	51.5	51.7	51.3
Females	48.7	48.6	48.7	49.1	48.4	48.7	48.5	48.3	48.7
Indeterminate/ not stated	0.1	0.0	0.0	—	0.0	0.0	—	—	0.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Gestational age

In 2002, the mean gestational age for all babies was 38.9 weeks. The proportion of babies born at term (37–41 weeks gestation) was 90.5%.

Preterm birth before 37 weeks gestation is associated with many neonatal problems that cause significant morbidity and mortality in newborn babies and may sometimes be associated with long-term disabilities (NHMRC 1997). Preterm births were classified according to the criteria of the WHO into groups of 20–27 weeks, 28–31 weeks and 32–36 weeks. Of all births in 2002, 7.9% were preterm, with most of the preterm births at 32–36 weeks (Table 4.2).

The mean gestational age for all preterm births in 2002 was 33.2 weeks. Nationally, 0.8% of births were at gestation 20–27 weeks, 0.8% were at 28–31 weeks, and 6.2% were at 32–36 weeks. The Northern Territory showed the highest proportion of preterm births, at 11.0% of all births, and New South Wales reported the lowest, at 7.1% of all births.⁹

Table 4.2: Gestational age of preterm births by state and territory, 2002

Gestational age (weeks)	NSW	Vic ^(a)	Qld	WA	SA	Tas	ACT ^(b)	NT	Australia
Mean	33.3	33.1	33.2	33.4	33.3	33.3	32.8	33.1	33.2
	Number								
20–27 ^(c)	595	587	406	192	152	46	45	44	2,067
28–31	612	509	479	177	162	58	59	43	2,099
32–36	4,867	3,896	3,323	1,647	1,156	385	310	321	15,905
Total	6,074	4,992	4,208	2,016	1,470	489	414	408	20,071
	Per cent of total births								
20–27 ^(c)	0.7	0.9	0.8	0.8	0.9	0.8	0.9	1.2	0.8
28–31	0.7	0.8	1.0	0.7	0.9	1.0	1.2	1.2	0.8
32–36	5.7	6.2	6.8	6.6	6.5	6.7	6.5	8.6	6.2
Total	7.1	7.9	8.6	8.1	8.3	8.6	8.6	11.0	7.9

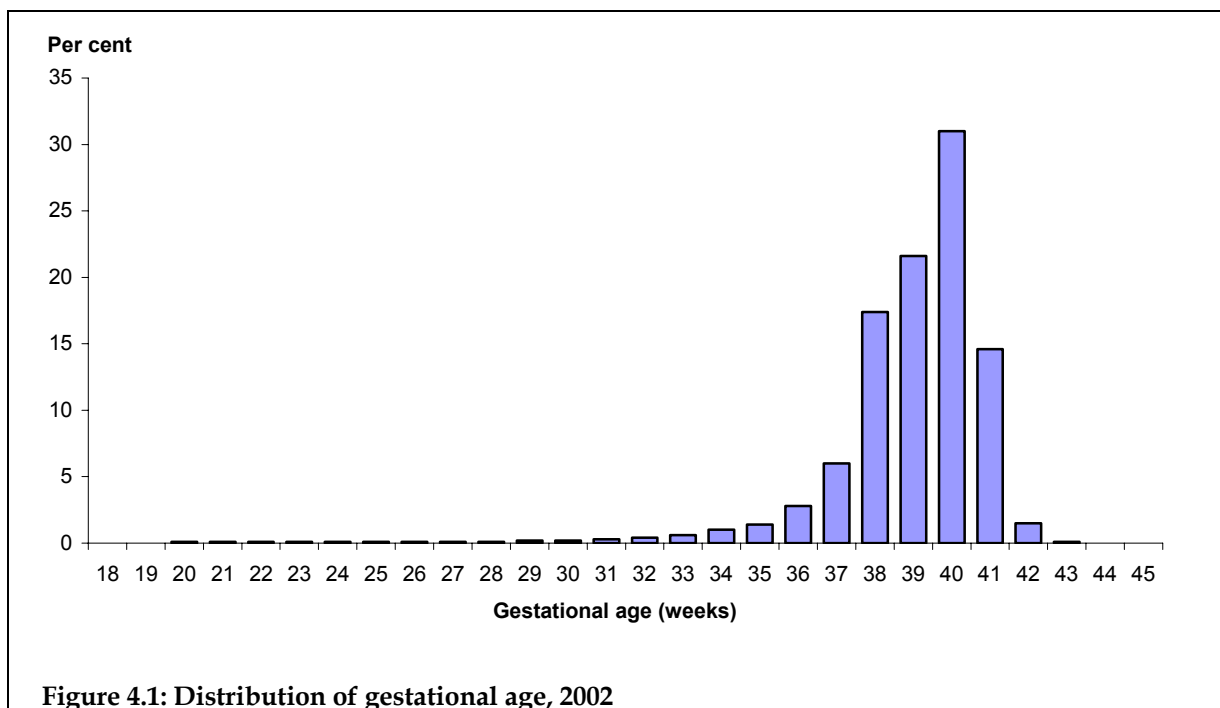
(a) These numbers may differ from those calculated by the Victorian Perinatal Data Collection Unit.

(b) ACT figures include non-ACT residents who gave birth in the ACT; thus the proportion of preterm births appears high when based on ACT births.

(c) Includes 3 babies of less than 20 weeks gestation.

Only 1.6% of babies were born post-term, at 42 weeks or more gestation (Figure 4.1). The duration of pregnancy by state and territory is detailed in Table 3.12.

⁹ Differences in the manner in which gestational age was estimated may have been a factor contributing to variations in preterm births among the states and territories.



For singletons, the mean gestational age was 39.0 weeks, compared with 35.3 weeks for twins and 32.3 weeks for triplets. Preterm birth occurred in 52.9% of twins and in almost all higher order births, which was much higher than the proportion of 6.3% found among singleton births (Table 4.3). The difference in gestational age distributions between singleton and multiple births is even more pronounced when babies of less than 32 weeks gestation are considered. In this high-risk group were 11.2% of twin births and 30.4% of triplet births, compared with approximately 1 in 100 (1.3%) for singleton births.

Table 4.3: Babies' gestational age by plurality, 2002

Gestational age (weeks)	Singletons		Twins		Triplets		Quadruplets		Total	
	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent
20–27 ^(a)	1,633	0.7	419	5.0	15	6.3	—	—	2,067	0.8
28–31	1,514	0.6	520	6.2	57	24.1	8	100.0	2,099	0.8
32–36	12,262	5.0	3,481	41.7	162	68.4	—	—	15,905	6.2
37–41	226,996	92.1	3,931	47.1	3	1.3	—	—	230,930	90.5
42 and over	4,059	1.6	—	—	—	—	—	—	4,059	1.6
Not stated	35	0.0	—	—	—	—	—	—	35	0.0
Total	246,499	100.0	8,351	100.0	237	100.0	8	100.0	255,095	100.0
20–36 ^(a)	15,409	6.3	4,420	52.9	234	98.7	8	100.0	20,071	7.9
Mean	39.0		35.3		32.3		29.0		38.9	

(a) Includes 3 babies of less than 20 weeks gestation.

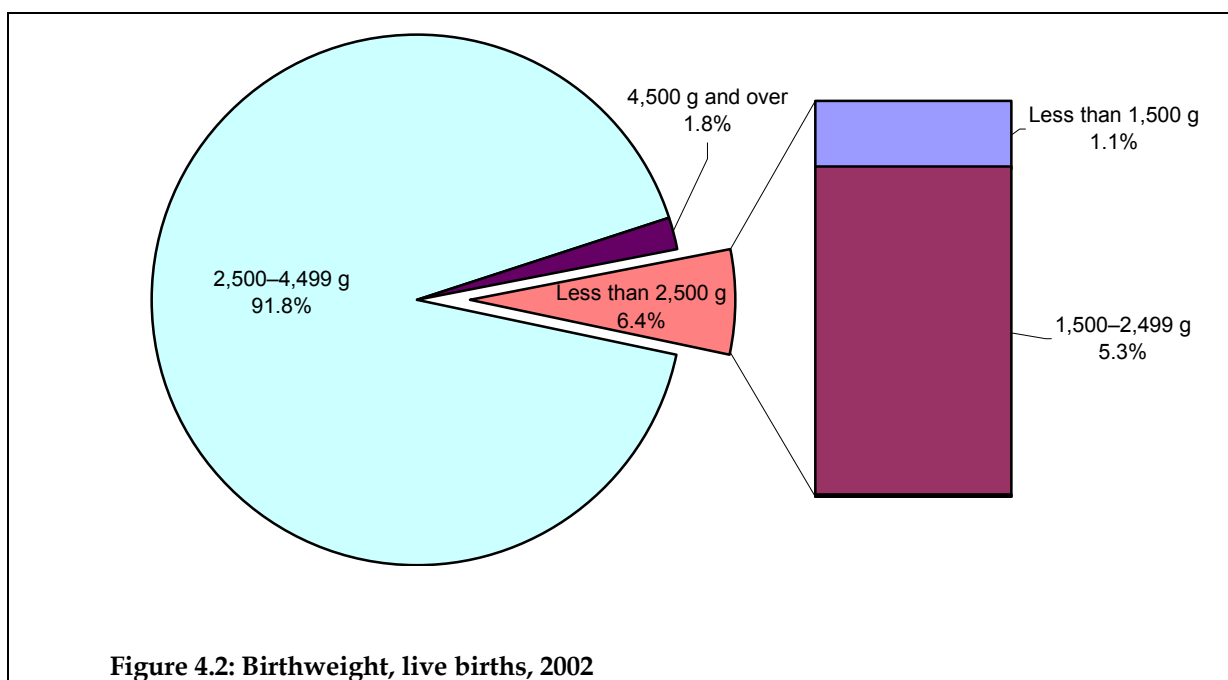
Birthweight

A baby's birthweight is a key indicator of health status. Babies are defined as low birthweight if their birthweight is less than 2,500 grams. Within this category, those weighing less than 1,500 grams are defined as very low birthweight and those less than 1,000 grams as extremely low birthweight.

Low birthweight babies have a greater risk of poor health and dying, require a longer period of hospitalisation after birth, and are more likely to develop significant disabilities (Mick et al. 2002; Leeson et al. 2001). A baby may be small due to being born early (preterm), or may be small for its gestational age (intrauterine growth retardation).¹⁰ The factors contributing to low birthweight include socioeconomic status, size of parents and age of mother, number of babies previously born, mother's nutritional status, smoking and alcohol intake and illness during pregnancy (Horter et al 1997; Kramer 1998).

In 2002, 91.8% of liveborn babies had a birthweight in the range 2,500–4,499 grams. The average birthweight of liveborn babies in Australia in 2002 was 3,371 grams and ranged from 3,286 grams in the Northern Territory to 3,400 grams in the Australian Capital Territory, reflecting little variation among the states and territories (Table 4.4).

In 2002, there were 16,230 (6.4%) liveborn babies of low birthweight (Figure 4.2). The 2,684 very low birthweight babies constituted 1.1% of all live births in 2002, and the 1,156 extremely low birthweight babies constituted 0.5%.



¹⁰ In 2002, there were 33 babies of 20 weeks or more gestation with a birthweight less than 200 grams. The majority of these babies were likely to have died earlier and were delivered at 20 weeks or more, thus meeting the criteria of the NPDC. All of these small babies were stillborn.

Table 4.4: Birthweight, live births, by state and territory, 2002

Birthweight (g)	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Australia
Mean	3,381	3,363	3,377	3,355	3,362	3,393	3,400	3,286	3,371
	Number								
Less than 1,000	337	337	222	88	88	28	31	25	1,156
1,000–1,499	435	416	323	139	118	41	34	22	1,528
1,500–1,999	1,046	762	721	296	236	83	75	57	3,276
2,000–2,499	3,308	2,562	2,046	1,004	721	236	193	200	10,270
2,500–2,999	12,788	9,670	7,086	3,897	2,674	802	633	710	38,260
3,000–3,499	30,471	22,467	16,976	9,145	6,361	1,891	1,588	1,289	90,188
3,500–3,999	26,650	19,024	15,305	7,367	5,313	1,801	1,520	1,026	78,006
4,000–4,499	8,917	6,343	5,272	2,294	1,788	637	590	314	26,155
4,500 and over	1,507	1,095	912	379	324	133	105	45	4,500
Not stated	31	5	4	—	—	8	—	1	49
Total	85,490	62,681	48,867	24,609	17,623	5,660	4,769	3,689	253,388
<i>Less than 1,500</i>	<i>772</i>	<i>753</i>	<i>545</i>	<i>227</i>	<i>206</i>	<i>69</i>	<i>65</i>	<i>47</i>	<i>2,684</i>
<i>Less than 2,500</i>	<i>5,126</i>	<i>4,077</i>	<i>3,312</i>	<i>1,527</i>	<i>1,163</i>	<i>388</i>	<i>333</i>	<i>304</i>	<i>16,230</i>
	Per cent								
Less than 1,000	0.4	0.5	0.5	0.4	0.5	0.5	0.7	0.7	0.5
1,000–1,499	0.5	0.7	0.7	0.6	0.7	0.7	0.7	0.6	0.6
1,500–1,999	1.2	1.2	1.5	1.2	1.3	1.5	1.6	1.5	1.3
2,000–2,499	3.9	4.1	4.2	4.1	4.1	4.2	4.0	5.4	4.1
2,500–2,999	15.0	15.4	14.5	15.8	15.2	14.2	13.3	19.2	15.1
3,000–3,499	35.6	35.8	34.7	37.2	36.1	33.4	33.3	34.9	35.6
3,500–3,999	31.2	30.4	31.3	29.9	30.1	31.8	31.9	27.8	30.8
4,000–4,499	10.4	10.1	10.8	9.3	10.1	11.3	12.4	8.5	10.3
4,500 and over	1.8	1.7	1.9	1.5	1.8	2.3	2.2	1.2	1.8
Not stated	0.0	0.0	0.0	—	—	0.1	—	0.0	0.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
<i>Less than 1,500</i>	<i>0.9</i>	<i>1.2</i>	<i>1.1</i>	<i>0.9</i>	<i>1.2</i>	<i>1.2</i>	<i>1.4</i>	<i>1.3</i>	<i>1.1</i>
<i>Less than 2,500</i>	<i>6.0</i>	<i>6.5</i>	<i>6.8</i>	<i>6.2</i>	<i>6.6</i>	<i>6.9</i>	<i>7.0</i>	<i>8.2</i>	<i>6.4</i>

Note: This table cannot be compared with birthweight for all births in previous reports.

The mean birthweight of stillborn babies was 1,306 grams in 2002 compared with 3,371 grams for liveborn babies. Low birthweight occurred in 77.6% of stillborn babies. More than half (57.4%) of the stillborn babies had a birthweight of less than 1,000 grams (Table 4.5).

Table 4.5: Birthweight by birth status, 2002

Birthweight (g)	Live births		Fetal deaths		Total	
	Number	Per cent	Number	Per cent	Number	Per cent
Less than 1,000	1,156	0.5	980	57.4	2,136	0.8
1,000–1,499	1,528	0.6	125	7.3	1,653	0.6
1,500–1,999	3,276	1.3	113	6.6	3,389	1.3
2,000–2,499	10,270	4.1	106	6.2	10,376	4.1
2,500–2,999	38,260	15.1	147	8.6	38,407	15.1
3,000–3,499	90,188	35.6	111	6.5	90,299	35.4
3,500–3,999	78,006	30.8	69	4.0	78,075	30.6
4,000–4,499	26,155	10.3	21	1.2	26,176	10.3
4,500 and over	4,500	1.8	7	0.4	4,507	1.8
Not stated	49	0.0	28	1.6	77	0.0
Total	253,388	100.0	1,707	100.0	255,095	100.0
<i>Less than 1,500</i>	<i>2,684</i>	<i>1.1</i>	<i>1,105</i>	<i>64.7</i>	<i>3,789</i>	<i>1.5</i>
<i>Less than 2,500</i>	<i>16,230</i>	<i>6.4</i>	<i>1,324</i>	<i>77.6</i>	<i>17,554</i>	<i>6.9</i>
Mean	3,371		1,306		3,358	

Male liveborn babies were proportionately less likely to be low birthweight (5.9%) than were female babies (6.9%). The average birthweight of liveborn male babies was 3,431 grams, 123 grams higher than that of females (3,308 grams).

In 2002, the average birthweight of liveborn babies of Aboriginal and Torres Strait Islander mothers was 3,165 grams. This was 213 grams lighter than the average of 3,378 grams for liveborn babies of other mothers.¹¹ The proportion of low birthweight in liveborn babies of Aboriginal and Torres Strait Islander mothers was 12.9% (Table 4.6), twice that of babies of other mothers (6.2%). The mean birthweight of liveborn babies of mothers identified as Aboriginal or Torres Strait Islander, and the proportion with low birthweight, varied markedly among the states and territories (Table 4.6).

¹¹ These figures exclude Tasmania.

Table 4.6: Birthweight of babies of Aboriginal or Torres Strait Islander mothers, live births, by state and territory, 2002

Birthweight (g)	NSW	Vic	Qld	WA	SA	Tas	ACT ^(a)	NT	Total
Mean	3,190	3,177	3,200	3,141	3,035	n.a.	3,132	3,122	^(b) 3,165
Number									
Less than 1,500	39	11	57	35	22	n.a.	n.p.	n.p.	193
1,500–2,499	228	45	266	183	62	n.a.	n.p.	n.p.	947
2,500–2,999	482	89	584	362	95	n.a.	18	372	2,002
3,000–3,499	719	137	895	569	156	n.a.	19	476	2,971
3,500–3,999	496	95	691	346	79	n.a.	19	292	2,018
4,000–4,499	170	32	179	91	23	n.a.	6	71	572
4,500 and over	29	6	47	17	7	n.a.	—	15	121
Not stated	2	—	—	—	—	n.a.	—	1	3
Total	2,165	415	2,719	1,603	444	n.a.	72	1,409	8,827
<i>Less than 2,500</i>	<i>267</i>	<i>56</i>	<i>323</i>	<i>218</i>	<i>84</i>	<i>n.a.</i>	<i>10</i>	<i>182</i>	<i>1,140</i>
Per cent									
Less than 1,500	1.8	2.7	2.1	2.2	5.0	n.a.	n.p.	n.p.	2.2
1,500–2,499	10.5	10.8	9.8	11.4	14.0	n.a.	n.p.	n.p.	10.7
2,500–2,999	22.3	21.4	21.5	22.6	21.4	n.a.	25.0	26.4	22.7
3,000–3,499	33.2	33.0	32.9	35.5	35.1	n.a.	26.4	33.8	33.7
3,500–3,999	22.9	22.9	25.4	21.6	17.8	n.a.	26.4	20.7	22.9
4,000–4,499	7.9	7.7	6.6	5.7	5.2	n.a.	8.3	5.0	6.5
4,500 and over	1.3	1.4	1.7	1.1	1.6	n.a.	—	1.1	1.4
Not stated	0.1	—	—	—	—	n.a.	—	0.1	0.0
Total	100.0	100.0	100.0	100.0	100.0	n.a.	100.0	100.0	100.0
<i>Less than 2,500</i>	<i>12.3</i>	<i>13.5</i>	<i>11.9</i>	<i>13.6</i>	<i>18.9</i>	<i>n.a.</i>	<i>13.9</i>	<i>12.9</i>	<i>12.9</i>

(a) Because of the small number of Aboriginal or Torres Strait Islander mothers in the ACT, the proportion fluctuates from year to year, making the ACT less comparable to other jurisdictions.

(b) Excludes Tasmania.

Note: This table cannot be compared with birthweight for all births to Aboriginal or Torres Strait Islander mothers in previous reports.

n.a. Data for Tasmania were not available because the 'Not stated' category for Indigenous status was not able to be distinguished from the category of mothers who were neither Aboriginal or Torres Strait Islander.

n.p. Data not published due to small numbers.

Mothers aged 30–34 years had the lowest proportion of low birthweight liveborn babies (5.9%). The proportion was higher among babies of younger and older mothers (8.0% for mothers aged less than 20 years, and 11.4% for mothers aged 45 years and older).

Of hospital births, the proportion of low birthweight liveborn babies was higher in babies of mothers who attended public hospitals (7.4%) than in babies of mothers who attended private hospitals (4.6%).

Method of birth

This is the first time that method of birth for babies has been presented in *Australia's Mothers and Babies*. It is important to note that Table 4.7 differs from Table 3.17, because the method of birth for each baby is presented, whereas Table 3.17 presents the method of birth by mother. The differences are due to multiple births.

Caesarean sections accounted for 27.8% of births, ranging from 24.6% in the Australian Capital Territory, to 30.2% in Queensland; 60.8% of babies had a spontaneous vaginal delivery. Approximately 1 in 10 babies had an assisted vaginal delivery.¹²

Table 4.7: Method of birth, all births, by state and territory, 2002

Method of birth	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Total
Number									
Spontaneous vaginal	54,544	36,935	30,209	14,190	10,272	n.a.	2,923	2,530	151,603
Forceps	3,072	4,062	1,262	765	1,032	n.a.	206	107	10,506
Vacuum extraction	5,918	3,964	2,577	2,262	1,030	n.a.	464	102	16,317
Vaginal breech	545	445	277	154	101	n.a.	28	15	1,565
Caesarean section	21,907	17,722	14,852	7,413	5,309	n.a.	1,183	958	69,344
Other	—	—	19	—	—	n.a.	—	—	19
Not stated	19	5	—	—	1	n.a.	—	7	32
Total	86,005	63,133	49,196	24,784	17,745	n.a.	4,804	3,719	249,386
Per cent									
Spontaneous vaginal	63.4	58.5	61.4	57.3	57.9	n.a.	60.8	68.0	60.8
Forceps	3.6	6.4	2.6	3.1	5.8	n.a.	4.3	2.9	4.2
Vacuum extraction	6.9	6.3	5.2	9.1	5.8	n.a.	9.7	2.7	6.5
Vaginal breech	0.6	0.7	0.6	0.6	0.6	n.a.	0.6	0.4	0.6
Caesarean section	25.5	28.1	30.2	29.9	29.9	n.a.	24.6	25.8	27.8
Other	—	—	0.0	—	—	n.a.	—	—	0.0
Not stated	0.0	0.0	—	—	0.0	n.a.	—	0.2	0.0
Total	100.0	100.0	100.0	100.0	100.0	n.a.	100.0	100.0	100.0

n.a. Data not available for Tasmania.

¹² These national figures exclude Tasmania.

Apgar scores

Apgar scores are clinical indicators of the baby's condition shortly after birth, based on assessment of the heart rate, breathing, colour, muscle tone and reflex irritability. Between 0 and 2 points are given for each of these five characteristics, and the total score is between 0 and 10. The Apgar score is routinely assessed at 1 and 5 minutes after birth, and subsequently at 5-minute intervals if it is still low at 5 minutes.

In 2002, 1.4% of liveborn babies had a low Apgar score (between 0 and 6), at 5 minutes. Scores of 0–3 were recorded at 5 minutes in 0.3% of all live births nationally, and scores of 4–6 were recorded in 1.1% of live births (Table 4.8). The distribution in each state and territory was compared for grouped 5-minute Apgar scores. In all states and territories, the distribution of 5-minute Apgar scores was similar for an Apgar score of 0–6, ranging from 1.1% of all live births in Western Australia to 2.9% in the Northern Territory.

Table 4.8: Apgar score at 5 minutes, live births, by state and territory, 2002

Apgar score	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Australia
	Number								
0–3	236	175	149	40	45	14	24	26	709
4–6	1,044	646	474	215	181	84	59	81	2,784
7–10	84,033	61,797	48,207	24,315	17,373	5,535	4,683	3,576	249,519
Not stated	177	63	37	39	24	27	3	6	376
Total	85,490	62,681	48,867	24,609	17,623	5,660	4,769	3,689	253,388
	Per cent								
0–3	0.3	0.3	0.3	0.2	0.3	0.2	0.5	0.7	0.3
4–6	1.2	1.0	1.0	0.9	1.0	1.5	1.2	2.2	1.1
7–10	98.3	98.6	98.6	98.8	98.6	97.8	98.2	96.9	98.5
Not stated	0.2	0.1	0.1	0.2	0.1	0.5	0.1	0.2	0.1
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Resuscitation at birth

The types of active resuscitation measures given to babies immediately after birth are presented in Table 4.9. For this data, the type of resuscitation used is coded hierarchically, with suction being the lowest order and external cardiac massage and ventilation being the highest order. Suction and oxygen therapy were the most common types of resuscitation used. Ventilatory assistance by intermittent positive pressure respiration (IPPR) through a bag and mask or after intubation was performed for at least 7.2% of all live births in 2002. External cardiac massage was provided for a small proportion of babies (0.2%).

Table 4.9: Active resuscitation measures at birth, live births, by state and territory, 2002

Resuscitation type	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Australia
	Number								
None	42,449	36,549	19,487	12,812	8,100	5,362	2,440	1,792	128,991
Suction	21,731	9,299	13,174	4,825	3,655	—	1,454	711	54,849
Oxygen therapy	15,025	11,748	11,742	4,539	4,423	—	579	658	48,714
IPPR through bag and mask	4,416	4,436	3,709	1,811	1,216	261	183	271	16,303
Endotracheal intubation and IPPR	625	422	423	252	175	37	50	47	2,031
External cardiac massage and ventilation	225	105	103	45	26	—	7	16	527
Other	951	59	212	325	28	—	—	—	1,575
Not stated	68	63	17	—	—	—	56	194	398
Total	85,490	62,681	48,867	24,609	17,623	5,660	4,769	3,689	253,388
	Per cent								
None	49.7	58.3	39.9	52.1	46.0	94.7	51.2	48.6	50.9
Suction	25.4	14.8	27.0	19.6	20.7	—	30.5	19.3	21.6
Oxygen therapy	17.6	18.7	24.0	18.4	25.1	—	12.1	17.8	19.2
IPPR through bag and mask	5.2	7.1	7.6	7.4	6.9	4.6	3.8	7.3	6.4
Endotracheal intubation and IPPR	0.7	0.7	0.9	1.0	1.0	0.7	1.0	1.3	0.8
External cardiac massage and ventilation	0.3	0.2	0.2	0.2	0.1	—	0.1	0.4	0.2
Other	1.1	0.1	0.4	1.3	0.2	—	—	—	0.6
Not stated	0.1	0.1	0.0	—	—	—	1.2	5.3	0.2
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Note: A hierarchical coding system is used for this item, starting with suction, up to external cardiac massage and ventilation. If more than one type of resuscitation is used, the highest measure in the hierarchy is coded.

Length of stay in hospital of birth

The majority of babies are discharged from hospital at the same time as their mothers; however, some babies experience morbidity and require hospitalisation. A baby's gestation and birthweight are two factors that influence the duration of hospitalisation. Twins and higher order multiple births usually have longer stays in hospital than singleton babies.

In 2002, the median length of stay in hospital for babies born in hospital was 4.0 days. This varied little among the states and territories. In 2002, the majority of babies remained in their hospital of birth for less than 6 days (83.1%), and almost half stayed in hospital for less than 4 days (45.3%). Relatively more babies born in Queensland had a length of stay of less than 4 days (53.0%), with a median length of stay of 3.0 days (Table 4.10).

Over the 8-year period from 1995 to 2002, the proportion of hospital-born babies with a length of stay of less than 5 days has increased, from 53.4% to 67.4%. During the same period, the proportion of babies with a length of stay in hospital of 5 days or more has decreased, from 46.6% in 1995 to 32.6% in 2002 (Figure 4.3).

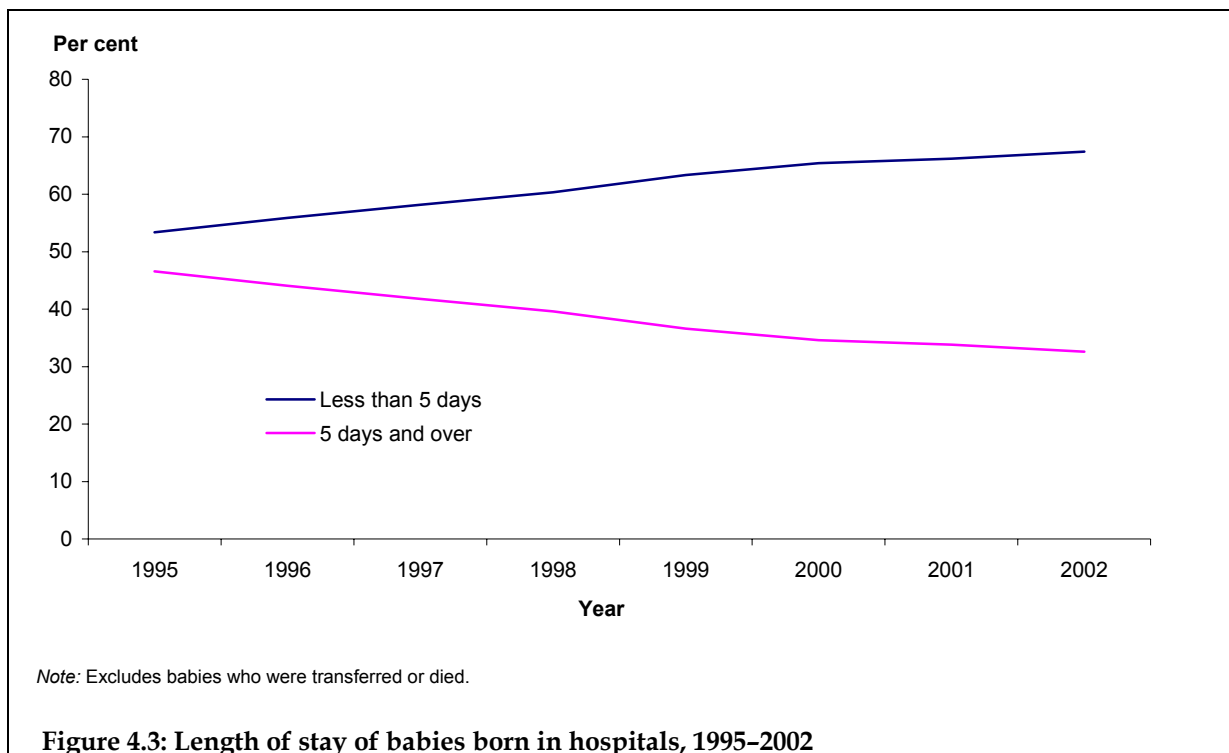


Table 4.10: Length of stay of babies born in hospitals^(a) by state and territory, 2002

Length of stay (days)	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Australia
Median	4.0	4.0	3.0	4.0	4.0	4.0	4.0	4.0	4.0
	Number								
Less than 1 day	1,553	470	1,109	345	199	73	93	54	3,896
1 day	7,209	2,826	6,044	1,494	940	359	314	291	19,477
2 days	12,204	9,084	8,827	3,089	2,164	763	586	527	37,244
3 days	15,367	12,268	8,482	3,931	2,973	996	763	602	45,382
4 days	17,520	16,145	8,967	4,280	2,730	958	729	528	51,857
5 days	11,648	9,246	6,578	4,094	3,182	897	742	482	36,869
6 days	6,333	4,096	2,757	2,475	1,284	512	426	203	18,086
7–13 days	4,639	2,724	2,131	2,932	1,756	677	376	329	15,564
14–20 days	782	666	541	191	196	76	42	87	2,581
21–27 days	381	331	310	86	102	51	22	32	1,315
28 or more days	626	402	398	192	218	90	25	69	2,020
Not stated	85	—	—	—	—	38	—	—	123
Total	78,347	58,258	46,144	23,109	15,744	5,490	4,118	3,204	234,414
	Per cent								
Less than 1 day	2.0	0.8	2.4	1.5	1.3	1.3	2.3	1.7	1.7
1 day	9.2	4.9	13.1	6.5	6.0	6.5	7.6	9.1	8.3
2 days	15.6	15.6	19.1	13.4	13.7	13.9	14.2	16.4	15.9
3 days	19.6	21.1	18.4	17.0	18.9	18.1	18.5	18.8	19.4
4 days	22.4	27.7	19.4	18.5	17.3	17.4	17.7	16.5	22.1
5 days	14.9	15.9	14.3	17.7	20.2	16.3	18.0	15.0	15.7
6 days	8.1	7.0	6.0	10.7	8.2	9.3	10.3	6.3	7.7
7–13 days	5.9	4.7	4.6	12.7	11.2	12.3	9.1	10.3	6.6
14–20 days	1.0	1.1	1.2	0.8	1.2	1.4	1.0	2.7	1.1
21–27 days	0.5	0.6	0.7	0.4	0.6	0.9	0.5	1.0	0.6
28 or more days	0.8	0.7	0.9	0.8	1.4	1.6	0.6	2.2	0.9
Not stated	0.1	—	—	—	—	0.7	—	—	0.1
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

(a) Excludes babies who were transferred or died.

Babies hospitalised for 28 or more days accounted for 0.9% in 2002. As the period of hospitalisation of babies transferred from their hospital of birth to another hospital is not included here, these figures underestimate the proportion of babies staying in hospital for long periods.

Mode of separation from hospital

In 2002, 94.5% of babies born in hospital were discharged home, varying from 88.1% in the Northern Territory to 97.9% in Tasmania (Table 4.11). A total of 4.4% of babies were transferred to another hospital from their hospital of birth.¹³ Babies dying at their hospital of birth accounted for 0.9% of separations; however, data on mode of separation of the baby from hospital are an incomplete source of information on neonatal deaths and cannot be used to determine national neonatal death rates.

Table 4.11: Mode of separation of babies born in hospitals, by state and territory, 2002

Mode of separation	NSW	Vic ^(a)	Qld	WA	SA	Tas	ACT	NT	Australia
	Number								
Discharge home	78,347	58,258	46,144	23,109	15,744	5,490	4,118	3,204	234,414
Transfer to another hospital ^(b)	4,438	2,349	1,886	962	727	27	349	74	10,812
Fetal or neonatal death	745	615	449	214	170	60	56	46	2,355
Other ^(c)	—	^(d) 69	^(e) 7	14	—	22	—	291	403
Not stated	34	—	—	—	—	11	—	23	68
Total	83,564	61,291	48,486	24,299	16,641	5,610	4,523	3,638	248,052
	Per cent								
Discharge home	93.8	95.1	95.2	95.1	94.6	97.9	91.0	88.1	94.5
Transfer to another hospital ^(b)	5.3	3.8	3.9	4.0	4.4	0.5	7.7	2.0	4.4
Fetal or neonatal death	0.9	1.0	0.9	0.9	1.0	1.1	1.2	1.3	0.9
Other ^(c)	—	^(d) 0.1	^(e) 0.0	0.1	—	0.4	—	8.0	0.2
Not stated	0.0	—	—	—	—	0.2	—	0.6	0.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

(a) These numbers may differ from those calculated by the Victorian Perinatal Data Collection Unit.

(b) Includes babies who were transferred to another hospital and died.

(c) May include statistical discharges and transfers to health care accommodation other than acute hospitals.

(d) These cases refer to postneonatal deaths (at 28 days or more after birth), regardless of the mode of separation.

(e) These babies died during the birth episode at 28 days or more after birth.

¹³ Although the states and territories record the hospital to which the baby is transferred on their perinatal forms, the hospital is not presently included in the data provided for the national report. Therefore, it is not possible to compare the proportion of babies transferred for further treatment of neonatal conditions with other reasons for transfer.

5 Special topic: Homebirths and birth centre births

Homebirths

In 2002, 637 planned homebirths, representing 0.3% of all confinements, were notified nationally (Table 5.1). It is probable that not all homebirths are reported to the perinatal data collections.

The mean age of mothers giving birth at home was 31.4 years. The proportion of mothers aged less than 20 years was 1.6%, and the proportion aged 35 years and over was 29.7%. The proportion of mothers giving birth at home who identified as being of Aboriginal or Torres Strait Islander origin was 4.7%. The highest proportion of homebirths occurred in the Northern Territory (Table 3.2).

Of these mothers, 24.0% were having their first baby, and 38.3% were having their second baby. The average age of first-time mothers giving birth at home was 29.2 years. The method of birth was spontaneous vaginal in 98.3% of deliveries, and the presentation was vertex in 97.8% of deliveries.

Table 5.1: Selected characteristics of homebirth confinements and births, 2002

Characteristic	Number	Per cent
Confinements	637	—
Mean maternal age	31.4	—
Parity		
None	153	24.0
One	244	38.3
Two	125	19.6
Three	65	10.2
Four or more	47	7.4
Method of birth		
Spontaneous vaginal	626	98.3
Other	11	1.7
Births	639	—
Birth status		
Live births	630	98.6
Fetal deaths	9	1.4
Sex		
Males	300	46.9
Females	337	52.7
Not stated	2	0.3
Mean birthweight of live births (g)	3,631	—

Of babies born at home, 98.6% were liveborn. The mean birthweight of these liveborn babies was 3,631 grams (Table 5.1). The proportion of liveborn babies of low birthweight born at home was 2.7%, and the proportion of preterm births was 3.8%.

Birth centres

Approximately 1 in 50 births (2.1%) occurred in birth centres in 2002. Both South Australia and the Australian Capital Territory reported over 5% of all confinements occurring in birth centres (Table 3.2).

Selected characteristics of birth centre confinements and births are detailed in Table 5.2. The mean age of mothers giving birth in birth centres was 29.7 years. The proportion of mothers aged less than 20 years was 6.2%, and the proportion aged 35 years and over was 18.3%.

Table 5.2: Selected characteristics of birth centre confinements and births, 2002

Characteristic	Number	Per cent
Confinements	5,379	—
Mean maternal age	29.7	—
Parity		
None	1,862	34.6
One	2,188	40.7
Two	936	17.4
Three	294	5.5
Four or more	98	1.8
Method of birth		
Spontaneous vaginal	5,332	99.1
Other	47	0.9
Births	5,381	—
Birth status		
Live births	5,378	99.9
Fetal deaths	3	0.1
Sex		
Males	2,784	51.7
Females	2,597	48.3
Mode of separation of babies		
Discharge home	5,193	96.5
Transfer to another facility ^(a)	181	3.4
Fetal or neonatal death	5	0.1
Other/not stated	2	0.0
Mean birthweight of live births (g)	3,564	—
Babies' median length of stay (days)^(b)	2.0	—

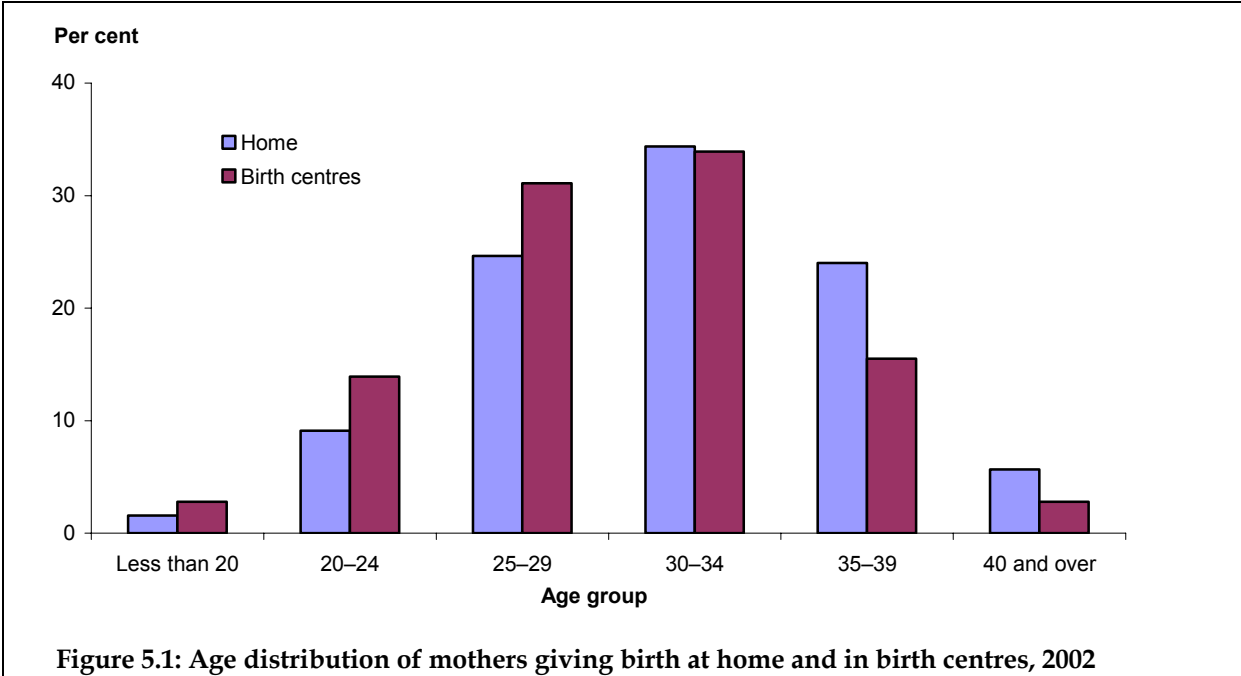
(a) Includes babies who were transferred to another facility and died.

(b) Excludes babies who were transferred or died.

Of mothers giving birth in birth centres, 34.6% were having their first baby, and 40.7% were having their second baby. The average age of first-time mothers giving birth in birth centres was 27.8 years. The proportion of mothers giving birth in birth centres who identified as being of Aboriginal or Torres Strait Islander origin was 0.9%. The method of birth was spontaneous vaginal in 99.1% of deliveries, and the presentation was vertex in 99.4% of deliveries.

Of babies born in birth centres, 99.9% were liveborn, and the mean birthweight of these liveborn babies was 3,564 grams. The proportion of liveborn babies of low birthweight born in birth centres was 0.8%, and the proportion of preterm births was 0.6%. Babies had a median length of stay in birth centres of 2.0 days, and 96.5% of babies were discharged home (Table 5.2).

Figure 5.1 shows the age distributions of mothers giving birth at home and in birth centres. Mothers giving birth at home were older, with 29.7% aged 35 years or older, compared with 18.3% of mothers giving birth in birth centres.



6 Special topic: Assisted reproductive technology births

Introduction

Since 1979, assisted reproductive technology (ART) has been used in Australia to help couples achieve pregnancy. The main procedures used in ART treatment cycles include in-vitro fertilisation (IVF), intra-cytoplasmic sperm injection and gamete intra-fallopian transfer (GIFT). Data on treatment cycles and outcomes of pregnancy are collected annually from all 25 ART centres in Australia and 4 in New Zealand and collated into an Australian and New Zealand assisted conception data collection. The data collection is funded by the Fertility Society of Australia and is maintained at the NPSU.

Results of treatments and outcomes of pregnancies in previous year's treatments were reported annually in the past, from the Assisted Conception Data Collection (ACDC). With the implementation of the new ANZARD collection in 2002, the results of the treatments and their pregnancy outcomes can be reported as a single cohort in the same year in the AIHW Assisted Conception series. However, 2002 was the changeover year from the ACDC to the new ANZARD collection. These data contain pregnancy outcome data from both 2001 and 2002 conception cohorts that crosses both collections. Therefore, pregnancy outcome data for 2002 have not been reported in the Assisted Conception series.

The data in this chapter report maternal characteristics and infant outcomes of women whose babies were born in 2002 in Australia following use of ART. All ART pregnancies included in this chapter were at least 20 weeks gestation or at least had one infant whose birthweight was greater than or equal to 400 grams. It is important to note the limitations of the pregnancy outcome data, which are not available in a small proportion of cases. The usual practice is for IVF and GIFT clinic centre staff to follow-up the outcome of the pregnancy with either the patient or her clinician, because often the ongoing care of patients is carried out by non-ART practitioners.

Births

There were 5,893 babies (4,859 confinements) born in 2002 following ART treatment between 2001 and 2002. Babies born following ART treatment accounted for 2.3% of all births in Australia in 2002. Of ART confinements, there were 3,845 singletons (79.1%), 988 sets of twins (20.3%) and 26 sets of triplets (0.5%). In total, 20.9% were multiple pregnancies.

Maternal age

In 2002, the average age of women giving birth after ART treatment was 33.7 years, 4.3 years older than the average age of all Australian mothers (29.4 years).

Duration of pregnancy

In 2002, the average duration of ART pregnancies was 37.6 weeks. Of all ART confinements, 20.9% were preterm (Table 6.1), reflecting a much larger proportion of preterm births compared with all Australian births (7.0% preterm). The proportion of ART singleton babies that were preterm was 10.9% compared with 58.2% for ART twins. For all Australian singletons, the proportion of preterm babies was 6.3% and for twins 52.9%.

Table 6.1: Duration of ART pregnancies, 2002

Gestational age (weeks)	Number	Per cent
20–27 ^(a)	116	2.4
28–31	128	2.6
32–36	775	15.9
37–41	3,794	78.1
42 and over	33	0.7
Not stated	13	0.3
Total	4,859	100.0

(a) Includes 2 pregnancies of less than 20 weeks gestation.

Method of birth

Mothers of ART babies had a higher incidence of caesarean section (49.4% of all ART deliveries) compared with all Australian deliveries (27.0%). Since 1997, the caesarean section rate has been steadily increasing, from 41.9% to 49.4%. The average caesarean section rate between 1993 and 2002 was 44.4%, twice that of all Australian pregnancies during the same period (21.6%).

Birthweight

In 2002, the average birthweight of all ART babies was 2,943 grams, 415 grams lower than the average birthweight of all Australian babies (3,358 grams). The proportion of ART babies of low birthweight (less than 2,500 grams) was 24.1%, and of very low birthweight (less than 1,500 grams), 5.3% (Table 6.2). The proportions for all Australian babies in 2002 were 6.9% and 1.5%, respectively (Table 4.5). The average birthweight for singleton ART babies was 3,263 grams, 130 grams lower than the average birthweight of all singleton Australian babies (3,393 grams).

Table 6.2: Birthweight of ART babies, 2002

Birthweight (g)	Number	Per cent
Less than 1,000	164	2.8
1,000–1,499	146	2.5
1,500–1,999	338	5.7
2,000–2,499	770	13.1
2,500–2,999	1,335	22.7
3,000–3,499	1,667	28.3
3,500–3,999	1,069	18.1
4,000 and over	348	5.9
Not stated	56	1.0
Total	5,893	100.0
<i>Less than 1,500</i>	<i>310</i>	<i>5.3</i>
<i>Less than 2,500</i>	<i>1,418</i>	<i>24.1</i>

Perinatal mortality derived from assisted conception data

The perinatal deaths reported in this chapter are based on IVF and GIFT clinic staff follow-up of pregnancy outcomes. These data may be incomplete and the numbers should be interpreted with caution. The perinatal death rate among ART babies was 20.0 deaths per 1,000 births (Table 6.3), which was slightly lower than reported in 2001 for ART babies (20.4 deaths per 1,000 births). The higher proportion of multiple birth confinements among ART mothers is a significant contributor to the higher proportion of perinatal deaths reported for ART babies.

Table 6.3: Perinatal outcomes for ART babies, 2002

Outcome	Number	Per cent	Deaths per 1,000 births^(a)
Live births	5,763	97.8	—
Fetal deaths	69	1.2	11.7
Neonatal deaths	49	0.8	8.5
Not stated	12	0.2	—
Total	5,893	100.0	20.0

(a) Fetal and perinatal death rates were calculated using all births (live births and stillbirths). The neonatal death rate was calculated using all live births.

7 Babies in level III neonatal intensive care units

Data in this chapter are provided by the Australian and New Zealand Neonatal Network (ANZNN), and describe babies admitted to level III NICUs at less than 28 days, meeting at least one of the following criteria: less than 32 weeks gestation, less than 1,500 grams birthweight, required assisted ventilation for at least 4 hours, or underwent major surgery.

In 2002, there were 5,383 babies admitted to level III NICUs in Australia who met ANZNN's audit criteria (Table 7.1), and 49.0% of these had a gestational age of less than 32 weeks. Babies with a birthweight of less than 1,500 grams accounted for 41.2% of all babies in NICUs. A further 31.8% of babies weighed between 1,500 and 2,500 grams.

Table 7.1: Babies in level III NICUs by birthweight group and gestational age group, 2002

Birthweight (g)	20–23 weeks	24–27 weeks	28–31 weeks	32–33 weeks	34–36 weeks	37–44 weeks	Total
Less than 500	8	19	1	—	—	—	28
500–749	53	237	40	2	—	1	333
750–999	3	351	135	8	2	—	499
1,000–1,249	—	165	391	31	10	—	597
1,250–1,499	—	23	533	150	54	—	760
1,500–1,999	—	—	623	326	81	4	1,034
2,000–2,499	—	—	47	258	297	77	679
2,500–2,999	—	—	7	36	261	221	525
3,000–3,499	—	—	1	5	88	376	470
3,500–3,999	—	—	—	2	24	306	332
4,000–7,000	—	—	—	—	9	117	126
Total	64	795	1,778	818	826	1,102	5,383

Of the babies in the ANZNN cohort, 71.5% were born in a hospital with a level III NICU, 27.7% were born in a hospital without a level III NICU and 0.7% were not born in a hospital. Babies in younger gestational age groups appeared more likely to be born in a hospital with a level III NICU (90.6% of babies at 20–23 weeks gestation).

As expected, there were higher proportions of multiple birth babies in the less mature gestational age groups than in the older gestational age groups (Table 7.2). Only 2.2% of babies with a gestational age of 37–44 weeks were twins, whereas in the 20–23 week group 25.0% were twins and 3.1% were triplets. The opposite effect was seen in singleton babies.

Similarly, the lower birthweight groups had higher proportions of multiple birth babies compared with the higher birthweight groups. For example, of babies weighing less than 500 grams, 75.0% were singletons, 21.4% were twins and 3.6% were triplets, whereas in the 4,000–7,000 gram group, 100.0% were singletons.

Table 7.2: Babies in level III NICUs by plurality and gestational age group, 2002

Plurality	20–23 weeks	24–27 weeks	28–31 weeks	32–33 weeks	34–36 weeks	37–44 weeks	Total
Number							
Singletons	46	567	1,228	603	697	1,078	4,219
Twins	16	219	481	198	119	24	1,057
Triplets	2	9	61	17	10	—	99
Quadruplets	—	—	8	—	—	—	8
Total	64	795	1,778	818	826	1,102	5,383
Per cent							
Singletons	71.9	71.3	69.1	73.7	84.4	97.8	78.4
Twins	25.0	27.5	27.1	24.2	14.4	2.2	19.6
Triplets	3.1	1.1	3.4	2.1	1.2	—	1.8
Quadruplets	—	—	0.4	—	—	—	0.1
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Babies of 20–23 weeks gestation appeared more likely to have younger mothers. For example, 10.9% of mothers of this gestational age group were aged less than 20 years, compared with 5.2% for all gestational age groups (Table 7.3). Caution must be taken here, however, because there were small numbers of babies in this gestational age group.

Table 7.3: Babies in level III NICUs by maternal age and gestational age group, 2002

Maternal age (years)	20–23 weeks	24–27 weeks	28–31 weeks	32–33 weeks	34–36 weeks	37–44 weeks	Total
Number							
Less than 20	7	40	100	38	30	67	282
20–24	12	124	267	124	110	182	819
25–29	18	194	505	217	232	312	1,478
30–34	15	266	531	271	247	301	1,631
35–39	9	141	275	128	145	153	851
40 and over	2	25	83	35	38	51	234
Not stated	1	5	17	5	24	36	88
Total	64	795	1,778	818	826	1,102	5,383
Per cent							
Less than 20	10.9	5.0	5.6	4.6	3.6	6.1	5.2
20–24	18.8	15.6	15.0	15.2	13.3	16.5	15.2
25–29	28.1	24.4	28.4	26.5	28.1	28.3	27.5
30–34	23.4	33.5	29.9	33.1	29.9	27.3	30.3
35–39	14.1	17.7	15.5	15.6	17.6	13.9	15.8
40 and over	3.1	3.1	4.7	4.3	4.6	4.6	4.3
Not stated	1.6	0.6	1.0	0.6	2.9	3.3	1.6
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Of babies in level III NICUs, 60.1% were born by caesarean section (36.2% with no labour and 23.9% with labour), and 39.8% were born by vaginal delivery (35.7% without the use of instruments and 4.1% with instruments). Babies in younger gestational age groups were more likely to be born vaginally than those in the older gestational age groups; however, babies in lower birthweight categories were more likely to be born by caesarean section (75.0% of babies less than 500 grams compared with 42.9% of babies 4,000–7,000 grams).

Not surprisingly, babies born at younger gestational ages had lower survival rates at discharge from level III NICUs (Figure 7.1). The proportion of babies surviving generally increased as gestational age increased. Of the 5,383 babies in level III NICUs in 2002, 94.8% were alive 7 days after admission, 92.2% were alive after 28 days, and 90.8% were alive at discharge. Two per cent of babies admitted were diagnosed with a lethal congenital malformation.

Around 56.0% of babies were transferred to another hospital. The majority of these babies were transferred to a hospital with a level I or II nursery (45.3%). Babies with younger gestational ages were less likely to be transferred (15.6% of babies at 20–23 weeks gestation).

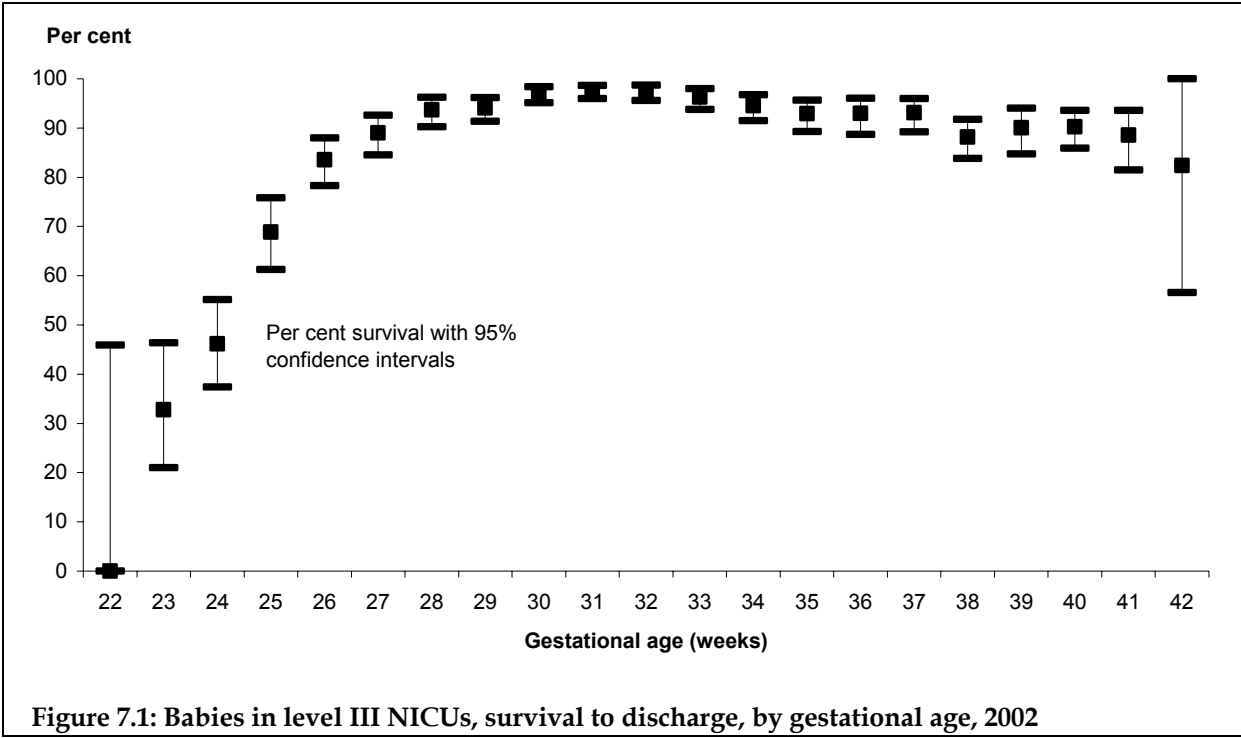


Figure 7.1: Babies in level III NICUs, survival to discharge, by gestational age, 2002

8 Perinatal mortality

Definitions

The *National Health Data Dictionary* specifies a definition of perinatal deaths to include all fetal and neonatal deaths of at least 400 grams birthweight or at least 20 weeks gestation (NHDC 2003). This definition is adopted by the NPDDC and extends up to 28 completed days after birth. Figure 8.1 shows the definitions of periods of perinatal and infant deaths used by the NPDDC and NPSU. Infant deaths are those occurring in live births at less than 1 year of age.

Figure 8.1: Perinatal and infant death periods

Labour		Birth	7 days	28 days	1 year
At least 20 weeks or 400 grams		0–<7 days	7–<28 days	28 days–<1 year	
Antepartum fetal deaths	Intrapartum fetal deaths	Early neonatal deaths	Late neonatal deaths	Postneonatal deaths	
Fetal deaths		Neonatal deaths			
Perinatal deaths					
Infant deaths					

There are different definitions in Australia for registering and reporting perinatal deaths (Figure 8.2). All fetal and neonatal deaths of at least 400 grams birthweight or, if birthweight is unavailable, a gestational age of at least 20 weeks are registered (ABS 2003b). The lower limit inclusion criterion has been adopted by the ABS because it recognises the availability of reliable 400 grams/20 week data from the state and territory Registrars of Births, Deaths and Marriages, and accepted the recommendations from major users that the ABS adopt this as the statistical standard.

The World Health Organization (WHO) definition of fetal death is the absence of evidence of life after birth of babies of at least 500 grams birthweight or, if birthweight is not available, whose gestational age is at least 22 weeks. WHO recommendations differ from the ABS standard and include only early neonatal deaths occurring in the first 7 days and not all neonatal deaths up to 28 days, as reported by the ABS. The WHO has also recommended that, for international comparisons, countries should report data based on lower limits of 1,000 grams or, when birthweight is not available, a gestational age of at least 28 weeks, excluding births and fetal and neonatal deaths that do not meet these criteria.

The perinatal death statistics based on registration are published by the ABS in its annual publication *Causes of Death Australia* (e.g. ABS 2003b). This publication has included perinatal deaths at the lower inclusion criteria of 400 grams or, when birthweight is not available, a gestational age of at least 20 weeks. Deaths are also included if both the birthweight and gestation are unknown. ABS data on neonatal deaths and liveborn babies dying within 28 days of birth are also summarised and published in *Causes of Death Australia*. Live births are

based on the same criteria as fetal deaths. Summary tables presented in this chapter include data from the ABS report (ABS 2003b) as well as from the ABS database as specified.

Figure 8.2: Definitions of perinatal mortality

Institution	Perinatal deaths		
	Fetal deaths		Neonatal deaths
	Birthweight	Gestational age	
WHO – International comparisons – National reporting	1,000 g	28 weeks (only if birthweight is unavailable)	< 7 days
	500 g	22 weeks (only if birthweight is unavailable)	< 7 days
ABS	400 g	20 weeks (only if birthweight is unavailable)	< 28 days
NPDDC & NPSU	400 g	20 weeks	< 28 days

Issues

The continuing decline in fetal, neonatal and perinatal death rates has been influenced by changes in the characteristics of pregnant women and their babies and by the quality of care during pregnancy, labour and the postnatal period. As the increased risk of perinatal death associated with maternal factors or complications during pregnancy is often mediated through higher rates of preterm birth and low birthweight, it is important to take into account these variables when analysing adverse perinatal outcomes such as fetal and neonatal death. It may be difficult to obtain sufficiently accurate information on gestational age for population-based analyses, so most studies have concentrated on birthweight-specific outcomes. Where birthweight is not recorded on birth registration forms, the information is obtained from the forms completed by midwives and other staff for the perinatal data collections.

There are more fetal deaths included in the perinatal collection than in the national births, deaths and marriages registration data, mainly because of the broader definition used in the perinatal collections. Unlike perinatal death registration data collected by the Registrars of Births, Deaths and Marriages and published by the ABS, information which may affect fetal death rates such as maternal parity, Indigenous status and hospital sector are collected for most births in the perinatal collections. However, the advantage of the perinatal death certificates is that they enable a more reliable distinction between fetal and neonatal deaths because the certifier is required to specify when the heartbeat ceased in relation to the onset of labour or to the birth.

Depending on when the fetal heart stopped beating, fetal deaths can be grouped as antepartum deaths, when the heartbeat ceased before labour commenced; intrapartum deaths, when the heartbeat ceased during labour; and unknown deaths, when it was not known whether the heartbeat ceased before or during labour. There is another small group of registered perinatal deaths for which it is not known whether the heartbeat ceased before or after birth. The ABS includes this group with the fetal deaths.

The perinatal data collections have more complete data on fetal deaths, but ascertainment of neonatal deaths within 28 days of birth is likely to be incomplete for deaths occurring among babies transferred to another hospital, readmitted to hospital or dying at home. This limitation can be overcome by linking the birth records in the perinatal data collections to the registered perinatal deaths of their respective Registries of Births, Deaths and Marriages. This linkage has been undertaken only by some of the states and territories and is not available at the national level. This has led to improved information about perinatal deaths in those states and territories and apparent reporting of higher numbers of neonatal deaths. Valid comparisons between the neonatal death data of states and territories are, therefore, not always possible in these circumstances. However, improved standardisation and linkage of perinatal deaths by all states and territories will allow more valid interpretation of perinatal mortality in the future.

The data on perinatal deaths published by the ABS are based on the year of registration rather than on the year of birth. When analysing perinatal death rates, it is preferable that both the deaths and the births should include only those babies born in a particular year so that the numerator and denominator have the same year of birth. By merging data files on perinatal death registrations for two successive years, it is possible to obtain near-complete perinatal deaths by year of birth for the first of those two years. The disadvantage of such analyses is that publication of reports based on year-of-birth cohorts is delayed and some late registrations of deaths are not included.

ABS data

As noted previously, the ABS definition of perinatal deaths includes birthweight of at least 400 grams or a gestational age of at least 20 weeks (where birthweight is unavailable). If both the birthweight and gestational age are unknown, the deaths are included.

Fetal deaths

During the period 2000–2002, there were 3,833 fetal deaths, giving a fetal death rate of 5.1 per 1,000 births (Table 8.1). Between 1993 and 2002, the national fetal death rate declined from 5.5 to 4.9 per 1,000 births (ABS 2001; ABS 2003b). This represents a decrease of 10.9%. Antepartum fetal deaths proportionately accounted for 64.8% of all fetal deaths in 2002 compared with 28.9% for intrapartum fetal deaths.

Table 8.1: Fetal, neonatal and perinatal deaths, 2000–2002

Deaths	2000	2001	2002	2000–2002
Number				
Fetal	1,303	1,290	1,240	3,833
Neonatal	773	802	779	2,354
Perinatal	2,076	2,092	2,019	6,187
Rate per 1,000 births^(a)				
Fetal	5.2	5.2	4.9	5.1
Neonatal	3.1	3.3	3.1	3.2
Perinatal	8.3	8.4	8.0	8.2

(a) Fetal and perinatal death rates were calculated using all births (live births and stillbirths). Neonatal death rates were calculated using all live births.

Note: Data based on year of registration and definition of 400 g birthweight (or 20 weeks gestation if birthweight is unknown).

Source: ABS 2003b.

Neonatal deaths

The Australian neonatal death rate declined more sharply than the fetal death rate, falling by 16.2% from 3.7 per 1,000 live births in 1993 to 3.1 per 1,000 live births in 2002 (ABS 2001; ABS 2003b). Initially, the early neonatal death rate for deaths within 7 days of birth fell more rapidly than the rate of late neonatal deaths that occurred in the second to fourth weeks after birth. However, all rates have remained consistent in recent years.

Perinatal deaths

In the period between 1993 and 2002, the national perinatal mortality rate declined from 9.2 per 1,000 births to 8.0 per 1,000 births (ABS 2001; ABS 2003b). Perinatal death rates were lowest in the Australian Capital Territory (5.6 per 1,000 births), and relatively higher in the Northern Territory (10.4 per 1,000 births) and Tasmania (12.9 per 1,000 births) (ABS 2003b).

Perinatal deaths by plurality

Perinatal death rates are higher for multiple births than for singleton births (Table 8.2). The absolute number of perinatal deaths among triplet and higher order multiple births are relatively small each year, so data were analysed for the 3-year period 2000–2002. The ABS data were analysed by year of registration of death, rather than year of birth.

There were 6,187 perinatal deaths during the period 2000–2002; 716 (11.6%) occurred in twins and 45 (0.7%) in other multiple births (Table 8.2). On average, for the 3-year period, multiple births accounted for 3.3% of all births and 12.3% of all perinatal deaths nationally. The perinatal death rate of twins for the period 2000–2002 was 4.0 times higher, and of other multiple births 7.3 times higher, than that of singleton births.

Table 8.2: Fetal, neonatal and perinatal deaths, singleton and multiple births, 2000–2002

Year	Singletons		Twins		Other multiple births		Total	
	Number	Rate ^(a)	Number	Rate ^(a)	Number	Rate ^(a)	Number	Rate ^(a)
Fetal deaths								
2000	1,208	5.0	92	11.9	3	11.8	1,303	5.2
2001	1,173	4.9	113	14.3	4	14.5	1,290	5.2
2002	1,137	4.7	96	11.8	7	27.5	1,240	4.9
<i>2000–2002</i>	<i>3,518</i>	<i>4.8</i>	<i>301</i>	<i>12.7</i>	<i>14</i>	<i>17.0</i>	<i>3,833</i>	<i>5.1</i>
Neonatal deaths								
2000	642	2.7	125	16.4	6	24.9	773	3.1
2001	639	2.7	144	18.4	19	70.1	802	3.3
2002	627	2.6	146	18.1	6	24.2	779	3.1
<i>2000–2002</i>	<i>1,908</i>	<i>2.6</i>	<i>415</i>	<i>17.7</i>	<i>31</i>	<i>38.2</i>	<i>2,354</i>	<i>3.2</i>
Perinatal deaths								
2000	1,850	7.6	217	28.0	9	35.3	2,076	8.3
2001	1,812	7.6	257	32.4	23	83.6	2,092	8.4
2002	1,764	7.2	242	29.6	13	51.0	2,019	8.0
2000–2002	5,426	7.5	716	30.2	45	54.5	6,187	8.2

(a) Fetal and perinatal death rates were calculated using all births (live births and stillbirths). Neonatal death rates were calculated using all live births.

Note: Data based on year of registration and definition of 400 g birthweight (or 20 weeks gestation if birthweight is unknown).

Sources: ABS perinatal deaths data 2000, 2001, 2002; ABS births data 2000, 2001, 2002.

National Perinatal Data Collection data

Fetal deaths

As noted previously, fetal deaths are included in the state and territory perinatal collections if the birthweight is at least 400 grams or the gestational age is 20 weeks and over.

In 2002, there were 1,707 fetal deaths notified to the perinatal collections, resulting in a fetal death rate of 6.7 per 1,000 births (Table 8.3), higher than the rate of 4.9 per 1,000 reported from the ABS mortality collection. This is partially explained by the use of different reporting practices and inclusion criteria of fetal deaths in the two collections. The following data should be interpreted with caution because fetal deaths are rare and rates may fluctuate from year to year.

Table 8.3: Fetal, neonatal and perinatal deaths, by state and territory, 2002

	NSW	Vic	Qld	WA	SA	Tas	ACT ^(a)	NT	Australia
Number									
Live births	85,490	62,681	48,867	24,609	17,623	5,660	4,769	3,689	253,388
Fetal deaths	515	452	329	175	122	49	35	30	1,707
Neonatal deaths ^(b)	233	226	177	53	54	18	25	n.a.	786
<i>Perinatal deaths</i>	<i>748</i>	<i>678</i>	<i>506</i>	<i>228</i>	<i>176</i>	<i>67</i>	<i>60</i>	<i>n.a.</i>	<i>2,493</i>
Total births	86,005	63,133	49,196	24,784	17,745	5,709	4,804	3,719	255,095
Rate per 1,000 births^(c)									
Fetal deaths	6.0	7.2	6.7	7.1	6.9	8.6	7.3	8.1	6.7
Neonatal deaths ^(b)	2.7	3.6	3.6	2.2	3.1	3.2	5.2	n.a.	3.1
<i>Perinatal deaths</i>	<i>8.7</i>	<i>10.7</i>	<i>10.3</i>	<i>9.2</i>	<i>9.9</i>	<i>11.7</i>	<i>12.5</i>	<i>n.a.</i>	<i>9.8</i>

(a) A significant proportion of mothers who gave birth in the ACT were NSW residents (13.7% in 2001; ACT Health 2004:16); therefore, rates appear high when based on ACT births.

(b) Except in WA, these may exclude neonatal deaths within 28 days of birth for babies transferred or readmitted to hospital and those dying at home.

(c) Fetal and perinatal death rates were calculated using all births (live births and stillbirths). Neonatal death rates were calculated using all live births.

n.a. Neonatal death data for NT were not available.

The variations in fetal death rates according to maternal age showed a pattern similar to that for perinatal deaths, with higher rates reported for teenage mothers and older mothers aged 35 years and over (Table 8.4). The age-group-specific fetal death rates ranged from 5.8 per 1,000 births for babies of mothers aged 30–34 years to 9.8 per 1,000 for babies of mothers aged less than 20 years.

The fetal death rate of babies born to Aboriginal or Torres Strait Islander mothers was 11.4 per 1,000 births. The rate was 6.5 per 1,000 in other mothers (Table 8.4).

Fetal death was more likely among first born babies (7.3 per 1,000 births) than among babies whose mothers already had one previous birth (6.3 per 1,000 births). However, for grand multiparous women (women who have had four or more previous pregnancies resulting in a live birth or stillbirth), the fetal death rate increased to 13.0 per 1,000 births.

The fetal death rate of twins (20.1 per 1,000 births) and of babies born in other multiple births (12.2 per 1,000 births) was higher than that of singleton babies (6.2 per 1,000 births).

Fetal death rates were higher for mothers who delivered in public hospitals (7.7 per 1,000 births) than for those who delivered in private hospitals (4.5 per 1,000 births).

Neonatal deaths

There were 786 neonatal deaths reported to the perinatal collection for 2002, giving a rate of 3.1 per 1,000 live births. This did not include neonatal deaths from the Northern Territory (Table 8.3). Neonatal death rates based on state and territory perinatal collection data varied between states and territories. The variation in rates may reflect differences in ascertainment practices of deaths by states and territories as well as absolute differences in mortality experienced in the state or territory. The neonatal death rates ranged from 2.2 per 1,000 live births in Western Australia to 5.2 per 1,000 live births in the Australian Capital Territory.

Note that a significant proportion of mothers who gave birth in the Australian Capital Territory were New South Wales residents (13.7% in 2001; ACT Health 2004:16). Many women from southern New South Wales with high-risk pregnancies chose to give birth in the Australian Capital Territory, so death rates are likely to appear higher when based on births in the Australian Capital Territory.

Table 8.4: Fetal, neonatal and perinatal deaths by selected maternal characteristics, 2002

Characteristic	Fetal deaths	Neonatal deaths ^(a,b)	Perinatal deaths ^(a,b)
	Rate per 1,000 births ^(c)		
Maternal age			
Less than 20	9.8	3.4	13.2
20–24	7.5	3.2	10.8
25–29	6.0	3.1	9.1
30–34	5.8	2.7	8.5
35 and over	7.8	3.6	11.4
Indigenous status^(d)			
Aboriginal or Torres Strait Islander	11.4	5.9	17.2
Other	6.5	3.0	9.5
Hospital sector for hospital births			
Public	7.7	3.9	11.6
Private	4.5	1.5	5.9
Parity			
Primipara	7.3	3.1	10.4
Multipara	6.3	3.1	9.3

(a) Excludes neonatal deaths in NT.

(b) Except in WA, these may exclude neonatal deaths within 28 days of birth for babies transferred or readmitted to hospital and those dying at home.

(c) Fetal and perinatal death rates were calculated using all births (live births and stillbirths). Neonatal death rates were calculated using all live births.

(d) Excludes Tasmania.

Higher neonatal death rates were reported for younger mothers and older mothers aged 35 years and over. The age-group-specific neonatal death rate was 3.4 per 1,000 live births for babies of teenage mothers and 3.6 per 1,000 live births for babies of mothers aged 35 years and over (Table 8.4).

The neonatal death rate of babies born to Aboriginal or Torres Strait Islander mothers was 5.9 per 1,000 live births, noting that the data do not include the Northern Territory or Tasmania and the number should be interpreted with caution – of all women identifying as Aboriginal or Torres Strait Islander, 16.0% were from the Northern Territory. This was twice the rate of 3.0 per 1,000 in babies born to other mothers.

Neonatal death rates were higher for mothers who delivered in public hospitals (3.9 per 1,000 live births) than for those who delivered in private hospitals (1.5 per 1,000 live births).

Perinatal deaths

The perinatal mortality data from state and territory perinatal collections are incomplete and cannot provide national data on perinatal mortality. In the perinatal data collection there were 2,493 perinatal deaths in 2002, resulting in a perinatal death rate of 9.8 deaths per 1,000 births (Table 8.3). Of these perinatal deaths, 68.5% were fetal deaths.

Perinatal death rates were highest in babies of teenage mothers (13.2 per 1,000 births), followed by babies of mothers aged 35 years and over (11.4 per 1,000 births). The perinatal death rate of babies born to Aboriginal or Torres Strait Islander mothers (excluding Tasmania and the Northern Territory for neonatal deaths) was 17.2 per 1,000 births. The rate was 9.5 per 1,000 in babies born to other mothers (Table 8.4).

Perinatal death was more likely among first-born babies (10.4 per 1,000 births) than among babies whose mothers already had one previous birth (9.3 per 1,000 births). Perinatal death rates were higher for mothers who delivered in public hospitals (11.6 per 1,000 births) than for those who delivered in private hospitals (5.9 per 1,000 births).

Perinatal death rates vary according to which definition is used. According to the ABS definition, there were 2,019 perinatal deaths registered in 2002, resulting in a perinatal death rate of 8.0 deaths per 1,000 births (ABS 2003b). Using the criteria of 400 grams or 20 weeks for the NPDC data, the 2002 perinatal death rate of 9.8 per 1,000 births was higher, even accounting for the non-inclusion of neonatal deaths from the Northern Territory.

Causes of perinatal deaths

It is recognised that the International Classification of Diseases (ICD-9 and ICD-10-AM) does not adequately emphasise those causes of perinatal death that may be preventable. As a result, other classifications that specify various antecedent maternal conditions, pregnancy complications and fetal abnormalities have been developed, with the Whitfield Classification (Whitfield et al. 1986) the most commonly used in Australia until recently. However, a number of states and territories now use the Perinatal Society of Australia and New Zealand Perinatal Death Classification (PSANZ-PDC) and the PSANZ Neonatal Death Classification (PSANZ-NDC) (Chan et al. 2004). Further details on these classifications can be found at http://128.250.188.72/psanz/SIG/sig_intro.htm.

For the 2002 data, five jurisdictions provided causes of death according to the PSANZ-PDC (Table 8.5). Data for New South Wales were not published as only deaths of at least 500 grams birthweight and/or at least 22 weeks gestation with confidential reports had been classified. This differed from the 400 grams and/or 20 weeks gestation criteria used by the other five states. Of perinatal deaths in Western Australia, 60.1% were not classified.

Overall, the main causes of perinatal deaths in these five states in 2002 were congenital abnormalities (20.4%), spontaneous preterm deaths (17.5%), and unexplained antepartum deaths (17.0%). These three groups of causes accounted for over half of all perinatal deaths in these states. There is considerable variability by jurisdiction in the leading causes of death, most likely the result of differences in the implementation of the classification at a jurisdictional level. Deaths from specific perinatal conditions (7.3%), maternal conditions (7.0%), and antepartum haemorrhage (6.9%) were also commonly reported causes of perinatal deaths.

Table 8.5: Causes of perinatal deaths, Perinatal Society of Australia and New Zealand Perinatal Death Classification, by state and territory, 2002

Cause of death	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Total
Number									
Congenital abnormality	n.p.	164	100	14	49	11	n.a.	n.a.	338
Perinatal infection	n.p.	12	10	8	15	—	n.a.	n.a.	45
Hypertension	n.p.	23	15	9	n.p.	n.p.	n.a.	n.a.	57
Antepartum haemorrhage (APH)	n.p.	44	47	6	12	6	n.a.	n.a.	115
Maternal conditions	n.p.	82	22	6	n.p.	n.p.	n.a.	n.a.	116
Specific perinatal conditions	n.p.	48	48	6	10	8	n.a.	n.a.	120
Hypoxic peripartum death	n.p.	18	15	10	8	5	n.a.	n.a.	56
Fetal growth restriction (FGR)	n.p.	36	n.p.	n.p.	17	n.p.	n.a.	n.a.	75
Spontaneous preterm	n.p.	135	111	5	23	16	n.a.	n.a.	290
Unexplained antepartum death	n.p.	104	113	19	30	16	n.a.	n.a.	282
No obstetric antecedent	n.p.	12	n.p.	n.p.	—	—	n.a.	n.a.	24
Not stated	n.p.	—	—	137	—	—	—	—	137
Total	n.p.	678	506	228	176	67	n.a.	n.a.	1,655
Per cent									
Congenital abnormality	n.p.	24.2	19.8	6.1	27.8	16.4	n.a.	n.a.	20.4
Perinatal infection	n.p.	1.8	2.0	3.5	8.5	0.0	n.a.	n.a.	2.7
Hypertension	n.p.	3.4	3.0	3.9	n.p.	n.p.	n.a.	n.a.	3.4
Antepartum haemorrhage (APH)	n.p.	6.5	9.3	2.6	6.8	9.0	n.a.	n.a.	6.9
Maternal conditions	n.p.	12.1	4.3	2.6	n.p.	n.p.	n.a.	n.a.	7.0
Specific perinatal conditions	n.p.	7.1	9.5	2.6	5.7	11.9	n.a.	n.a.	7.3
Hypoxic peripartum death	n.p.	2.7	3.0	4.4	4.5	7.5	n.a.	n.a.	3.4
Fetal growth restriction (FGR)	n.p.	5.3	n.p.	n.p.	9.7	n.p.	n.a.	n.a.	4.5
Spontaneous preterm	n.p.	19.9	21.9	2.2	13.1	23.9	n.a.	n.a.	17.5
Unexplained antepartum death	n.p.	15.3	22.3	8.3	17.0	23.9	n.a.	n.a.	17.0
No obstetric antecedent	n.p.	1.8	n.p.	n.p.	0.0	0.0	n.a.	n.a.	1.5
Not stated	n.p.	0.0	0.0	60.1	0.0	0.0	n.a.	n.a.	8.3
Total	n.p.	100.0	100.0	100.0	100.0	100.0	n.a.	n.a.	100.0

n.a. Data for ACT and NT were not available.

n.p. Data for NSW were not published as not all deaths were classified. The criteria for classification by the Perinatal Outcomes Working Party of the NSW Maternal and Perinatal Committee is at least 500g birthweight and/or at least 22 weeks gestation, and confidential reports must be received by the Committee. For further information see NSW Department of Health 2003.

n.p. Data not published due to small numbers.

Appendix A: State and territory pre-existing and pregnancy-related medical conditions and labour complications data

This Appendix presents state and territory data on a number of pre-existing conditions and complications arising in pregnancy and the puerperium. Data are presented on seven conditions and complications: essential hypertension, diabetes mellitus, pregnancy-induced hypertension, gestational diabetes, antepartum haemorrhage, cord prolapse and postpartum haemorrhage.

Comprehensive and reliable information on risk factors and complications arising in pregnancy continues to be a challenging area of data development, with no nationally consistent scope, collection methods or classifications of these conditions and complications.

The following data are presented as a first step in promoting discussion and developing consistency across jurisdictions, so that in the future more comprehensive information will be available on these and other conditions. This will be considered by the NPDDC as part of its perinatal data development work program.

Data

Tables A1–A7 provide information by state and territory. A number of states publish these data annually. Data are presented by individual state and territory, as the data are not directly comparable across jurisdictions. No national estimates or totals are provided in these preliminary data.

Data on these conditions and complications are generally collected using a tick box on the perinatal form of each state and territory. However, for some jurisdictions, for some of these conditions and complications a tick box is not available, so the condition or complication may be recorded using free text. The descriptions of these conditions and complications vary among the states and territories, and there are no nationally consistent guidelines for what they include.

It is important when interpreting the data that each state and territory is looked at independently. The scope of the selected conditions may vary – a higher rate may reflect a broader definition of the condition or a lower rate may reflect different practices in collection of the data or different inclusion criteria for the conditions.

New South Wales

Table A1: Selected maternal medical conditions and obstetric and labour complications, New South Wales, 2002

	Essential hypertension	Diabetes mellitus	Pregnancy-induced hypertension	Gestational diabetes	Antepartum haemorrhage	Cord prolapse	Postpartum haemorrhage
Number	940	462	4,839	3,693	n.a.	n.a.	n.a.
Rate per 1,000 confinements	11.1	5.5	57.2	43.7	n.a.	n.a.	n.a.

n.a. Data not available.

Victoria

Table A2: Selected maternal medical conditions and obstetric and labour complications, Victoria, 2002

	Essential hypertension	Diabetes mellitus	Pregnancy-induced hypertension	Gestational diabetes	Antepartum haemorrhage	Cord prolapse	Postpartum haemorrhage
Number	766	260	3,547	2,790	2,405	155	5,653
Rate per 1,000 confinements	12.4	4.2	57.2	45.0	38.8	2.5	91.1

Queensland

Table A3: Selected maternal medical conditions and obstetric and labour complications, Queensland, 2002

	Essential hypertension	Diabetes mellitus	Pregnancy-induced hypertension	Gestational diabetes	Antepartum haemorrhage	Cord prolapse	Postpartum haemorrhage
Number	376	180	3,405	2,127	1,659	80	1,538
Rate per 1,000 confinements	7.8	3.7	70.5	44.0	34.3	1.7	31.8

Western Australia

Table A4: Selected maternal medical conditions and obstetric and labour complications, Western Australia, 2002

	Essential hypertension	Diabetes mellitus	Pregnancy-induced hypertension	Gestational diabetes	Antepartum haemorrhage	Cord prolapse	Postpartum haemorrhage
Number	264	147	1,243	917	938	32	2,193
Rate per 1,000 confinements	10.8	6.0	51.0	37.6	38.4	1.3	89.9

South Australia

Table A5: Selected maternal medical conditions and obstetric and labour complications, South Australia, 2002

	Essential hypertension	Diabetes mellitus	Pregnancy-induced hypertension	Gestational diabetes	Antepartum haemorrhage	Cord prolapse	Postpartum haemorrhage
Number	191	82	1,387	615	642	24	993
Rate per 1,000 confinements	11.0	4.7	79.6	35.3	36.9	1.4	57.0

Tasmania

Table A6: Selected maternal medical conditions and obstetric and labour complications, Tasmania, 2002

	Essential hypertension	Diabetes mellitus	Pregnancy-induced hypertension	Gestational diabetes	Antepartum haemorrhage	Cord prolapse	Postpartum haemorrhage
Number	103	n.a.	252	n.a.	49	n.a.	246
Rate per 1,000 confinements	18.3	n.a.	44.8	n.a.	8.7	n.a.	43.7

n.a. Data not available.

Northern Territory

Table A7: Selected maternal medical conditions and obstetric and labour complications, Northern Territory, 2002

	Essential hypertension	Diabetes mellitus	Pregnancy-induced hypertension	Gestational diabetes	Antepartum haemorrhage	Cord prolapse	Postpartum haemorrhage
Number	42	53	128	128	51	7	n.a.
Rate per 1,000 confinements	11.4	14.4	34.8	34.8	13.9	1.9	n.a.

n.a. Data not available.

Appendix B: Perinatal National Minimum Data Set items

Current items

Data elements

Actual place of birth, version 2
Birth order, version 2
Birth plurality, version 1
Country of birth, version 4
Date of birth, version 5
Establishment identifier, version 4
Gestational age, version 1
Indigenous status, version 5
Infant weight, neonate, stillborn, version 3
Method of birth, version 1
Onset of labour, version 2
Person identifier, version 2
Separation date, version 5
Sex, version 4
State/territory of birth, version 1
Status of the baby, version 1

Supporting data elements and data element concepts

Australian state/territory identifier, version 4
Birthweight, version 1
Establishment number, version 4
Establishment sector, version 4
Gestational age, version 1
Live birth, version 1
Neonatal death, version 1
Neonate, version 1
Perinatal period, version 1

Region code, version 2

Stillbirth (fetal death), version 2

Endorsed changes from 1 January 2005

New data elements

Apgar score at 5 minutes, version 1

Length of stay (antenatal), version 1

Presentation at birth, version 1

Removed data elements

Establishment identifier, version 4

Region code, version 2

Appendix C: State and territory perinatal reports

Individual state and territory health authorities publish reports based on their state or territory perinatal collection either annually or periodically. For the 2002 data, the following state and territory reports have been published:

New South Wales

NSW Department of Health 2003. New South Wales mothers and babies 2002. NSW Public Health Bulletin Supplement, 14 (S-3).

Victoria

Riley M & King J 2003. Births in Victoria, 2001–2002. Melbourne: Victorian Government Department of Human Services.

The Consultative Council on Obstetric and Paediatric Mortality and Morbidity 2004. Annual report for the year 2002, incorporating the 41st survey of perinatal deaths in Victoria. Melbourne.

Queensland

Queensland Health 2004. Perinatal statistics Queensland 2002. Brisbane: Queensland Health.

Western Australia

Gee V & Green TJ 2004. Perinatal statistics in Western Australia, 2002. Perth: Department of Health, Western Australia.

South Australia

Chan A, Scott J, Nguyen A & Green P 2003. Pregnancy outcome in South Australia 2002. Adelaide: Department of Human Services.

Maternal, Perinatal and Infant Mortality Committee 2003. Maternal, perinatal and infant mortality in South Australia 2002, including South Australian protocol for investigation of stillbirths. Adelaide: Department of Human Services.

Tasmania

DHHS (Department of Health and Human Services) 2004. Council of Obstetric and Paediatric Mortality and Morbidity, Tasmania: annual report for 2002. Hobart: Department of Health and Human Services.

Northern Territory

Department of Health and Community Services (forthcoming). Northern Territory Midwives Collection: Mothers and babies 2000–2002. A report of the Northern Territory Perinatal Information Management Group. Darwin: Department of Health and Community Services.

Appendix D: Data collection contacts

State and territory perinatal data

New South Wales

Dr Lee Taylor
Manager, Surveillance Methods
Centre for Epidemiology and Research
NSW Department of Health
Locked Bag No. 961
North Sydney NSW 2059
Phone: 02 9391 9223
Fax: 02 9391 9232
Email: ltayl@doh.health.nsw.gov.au
Website: www.health.nsw.gov.au/public-health/epi/

Victoria

Ms Merylyn Riley
Senior Research Officer
Perinatal Data Collection Unit
Department of Human Services
7/589 Collins Street
Melbourne Vic 3000
Phone: 03 9616 2702
Fax: 03 9616 2700
Email: merilyn.riley@dhs.vic.gov.au
Website: www.health.vic.gov.au/perinatal/

Queensland

Ms Sue Cornes
Data Services Manager
Health Information Centre, Data Services Unit
Queensland Department of Health
GPO Box 48
Brisbane Qld 4001
Phone: 07 3234 0889
Fax: 07 3234 0564
Email: suzanne_cornes@health.qld.gov.au
Website: www.health.qld.gov.au/hic/

Western Australia

Ms Vivien Gee
Coordinator, Maternal and Child Health Unit
Health Data Collections, Health Information Centre
Department of Health, Western Australia
189 Royal Street
East Perth WA 6004
Phone: 08 9222 4262
Fax: 08 9222 4236
Email: vivien.gee@health.wa.gov.au
Website: www.population.health.wa.gov.au/HealthInfo/

South Australia

Dr Annabelle Chan
Senior Medical Consultant
Pregnancy Outcome Statistics Unit
Department of Health
PO Box 6, Rundle Mall
Adelaide SA 5000
Phone: 08 8226 6357
Fax: 08 8226 6291
Email: annabelle.chan@health.sa.gov.au
Website: www.dh.sa.gov.au/pehs/pregnancyoutcome.htm

Tasmania

Ms Karen Wheeler
Manager, Clinical Data Services
Hospitals and Ambulance Service
Department of Health and Human Services
Level 2, 10 Murray Street
Hobart Tas 7000
Phone: 03 6233 4016
Fax: 03 6233 3550
Email: karen.wheeler@dhhs.tas.gov.au
Website: www.dhhs.tas.gov.au/

Australian Capital Territory

Ms Maureen Bourne
Data Manager
Population Health Research Centre
Population Health, ACT Health
Building 5, Level 1
The Canberra Hospital
PO Box 11
Woden ACT 2606
Phone: 02 6244 4290
Fax: 02 6244 4138
Email: maureen.bourne@act.gov.au
Website: www.health.act.gov.au/healthinfo/

Northern Territory

Ms Sonya McNellee
Business analyst, Perinatal data
Department of Health and Community Services
Building 6, Royal Darwin Hospital
PO Box 41326
Casuarina NT 0810
Phone: 08 8922 7779
Fax: 08 8922 7787
Email: sonya.mcnellee@nt.gov.au
Website: www.health.nt.gov.au/

Australian and New Zealand Neonatal Network data

Coordinator

Australian and New Zealand Neonatal Network

Building DO2, Blackburn Circuit

University of Sydney NSW 2006

Phone: 02 9351 7745

Fax: 02 9351 7742

Email: ANZNN@perinatal.usyd.edu.au

Abbreviations

ABS	Australian Bureau of Statistics
ACDC	Assisted Conception Data Collection
ACT	Australian Capital Territory
AIHW	Australian Institute of Health and Welfare
ANZARD	Australia and New Zealand Assisted Reproduction Database
ANZNN	Australian and New Zealand Neonatal Network
ART	Assisted reproductive technology
ASCCSS	Australian Standard Classification of Countries for Social Statistics
g	gram
GIFT	Gamete intrafallopian transfer
HDSC	Health Data Standards Committee
HIC	Health Insurance Commission
ICD-9	International Classification of Diseases, 9th Revision
ICD-10-AM	International Statistical Classification of Diseases and Related Health Problems, 10th Revision, Australian modification
IVF	In-vitro fertilisation
LMP	First day of the last menstrual period
NHDD	<i>National Health Data Dictionary</i>
NHIG	National Health Information Group
NHMD	National Hospital Morbidity Database
NICU	Neonatal intensive care unit
NMDS	National Minimum Data Set
NPDC	National Perinatal Data Collection
NPDDC	National Perinatal Data Development Committee
NPSU	AIHW National Perinatal Statistics Unit
NSW	New South Wales
NT	Northern Territory
PSANZ-PDC	Perinatal Society of Australia and New Zealand Perinatal Death Classification
PSANZ-NDC	Perinatal Society of Australia and New Zealand Neonatal Death Classification
Qld	Queensland
SA	South Australia
SACC	Standard Australian Classification of Countries
SIMC	Statistical Information Management Committee
Tas	Tasmania

UNSW	University of New South Wales
Vic	Victoria
WA	Western Australia
WHO	World Health Organization
n.a.	Not available
n.p.	Not published

Glossary

Antepartum fetal death: fetal death occurring before the onset of labour.

Apgar score: numerical score used to indicate the baby's condition at 1 minute and 5 minutes after birth.

Assisted reproductive technology (ART): all treatments or procedures that include the in vitro handling of human oocytes and sperm or embryos for the purpose of establishing a pregnancy. This includes, but is not limited to, in-vitro fertilisation and trans-cervical embryo transfer, gamete intrafallopian transfer, zygote intrafallopian transfer, tubal embryo transfer, gamete and embryo cryopreservation, oocyte and embryo donation and gestational surrogacy.

Assisted vaginal/instrumental delivery: vaginal delivery using forceps or vacuum extraction.

Augmentation of labour: Intervention after the onset of labour to assist the progress of labour.

Baby's length of stay: number of days between date of birth and date of discharge from the hospital of birth (calculated by subtracting the date of birth from the date of discharge).

Birth status: status of the baby immediately after birth.

Birthweight: the first weight of the baby (stillborn or liveborn) obtained after birth (usually measured to the nearest 5 grams and obtained within 1 hour of birth).

Caesarean section: operative birth through an abdominal incision.

Complications of labour and delivery: medical and obstetric problems arising after the onset of labour and before the completed delivery of the baby and placenta.

Complications of puerperium: medical and obstetric problems of the mother occurring during the postnatal period (up to 6 weeks after giving birth).

Confinement: pregnancy resulting in at least one birth.

Early neonatal death: death of a liveborn baby within 7 days of birth.

Epidural: injection of anaesthetic agent into the epidural space of the spinal cord.

Episiotomy: an incision of the perineum and vagina to enlarge the vulval orifice.

Extremely low birthweight: birthweight of less than 1,000 grams.

Fetal death (stillbirth): death prior to the complete expulsion or extraction from its mother of a product of conception of 20 or more completed weeks of gestation or of 400 grams or more birthweight. The death is indicated by the fact that after such separation the fetus 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.

Forceps: assisted birth using a metallic obstetric instrument.

Gestational age: the duration of pregnancy in completed weeks calculated from the date of the first day of a woman's last menstrual period and her baby's date of birth, or via ultrasound, or derived from clinical assessment during pregnancy or from examination of the baby after birth.

Grand multipara: pregnant woman who has had four or more previous pregnancies resulting in a live birth or stillbirth.

Induction of labour: intervention to stimulate the onset of labour.

International Classification of Diseases: the WHO's internationally accepted classification of death and disease. The 9th Revision (ICD-9) and the 10th revision, Australian Modification (ICD-10-AM) are referred to in this report.

Intrapartum fetal death: fetal death occurring during labour.

Late neonatal death: death of a liveborn baby after 7 completed days and before 28 completed days.

Live birth: the complete expulsion or extraction from its mother of a product of conception, irrespective of the duration of the pregnancy, which, after such separation, breathes or shows any other evidence of life, such as beating of the heart, pulsation of the umbilical cord, or definite movement of voluntary muscles, whether or not the umbilical cord has been cut or the placenta is attached; each product of such a birth is considered liveborn (WHO definition).

Low birthweight: birthweight of less than 2,500 grams.

Maternal age: mother's age at delivery.

Maternal medical conditions: pre-existing maternal diseases and conditions, and other diseases, illnesses or conditions arising during pregnancy, that are not directly attributable to pregnancy but may significantly affect care during pregnancy and/or pregnancy outcome. Examples include essential hypertension, diabetes mellitus, epilepsy, cardiac disease and chronic renal disease.

Mode of separation: status at separation of patient (discharge/transfer/death) and place to which patient is released (where applicable).

Mother's length of stay: number of days between admission date (during the admission resulting in delivery) and discharge date (from the hospital where delivery occurred). The interval is calculated by subtracting the date of admission from the date of discharge.

Multipara: pregnant woman who has had at least one previous pregnancy resulting in a live birth or stillbirth.

Neonatal care levels: Level I care is for normal healthy term babies, some of whom may need short-term observation during the first few hours of life.

Level II refers to a nursery that generally has babies born at 32–36 weeks gestation weighing around 1,500 to 2,500 grams at birth. It includes care for babies who require intravenous therapy or antibiotics, and/or those who are convalescing after intensive care, and/or those who need their heart rate or breathing monitored, and/or those who need short-term oxygen therapy.

Level III or intensive care refers to the care of newborn infants who require more specialised care and treatment. It includes most babies born at less than 32 weeks gestation or less than 1,500 grams birthweight, and others who may require intravenous feeding, and/or surgery, and/or cardio-respiratory monitoring for management of apnoea or seizures, and/or require assisted ventilation, and/or supplemental oxygen over 40% or long-term oxygen (Donoghue 2002).

Neonatal death: death of a liveborn baby within 28 days of birth.

Neonatal morbidity: any condition or disease of the baby diagnosed after birth and before separation from care.

Obstetric complication: conditions arising during pregnancy that are directly attributable to pregnancy and may significantly affect care during pregnancy and/or pregnancy outcome. Examples include threatened abortion, antepartum haemorrhage, pregnancy-induced hypertension and gestational diabetes.

Parity: number of previous pregnancies resulting in live births or stillbirths.

Perinatal death: a fetal or neonatal death of at least 20 weeks gestation or at least 400 grams birthweight.

Perineal status: status of the perineum after delivery. May involve surgical suturing of perineal laceration or episiotomy incision.

Plurality: the number of births resulting from a pregnancy.

Post-term birth: birth at 42 or more completed weeks of gestation.

Presentation at birth: presenting part of the fetus (at lower segment of uterus) at delivery.

Preterm birth: birth before 37 completed weeks of gestation.

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

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

Spontaneous vaginal: birth without intervention in which the baby's head is the presenting part.

Stillbirth: see Fetal death.

Teenage mother: mother aged less than 20 years at delivery.

Vacuum extraction: assisted birth using a suction cap applied to the baby's head.

Vaginal breech: birth in which the baby's buttocks or lower limbs are the presenting parts.

Very low birthweight: birthweight of less than 1,500 grams.

Viable pregnancy: pregnancy of at least 20 weeks gestation.

Whitfield: a classification system for perinatal deaths.

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