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**NEW SOUTH WALES  
MOTHERS AND BABIES  
1999**

**NSW HEALTH DEPARTMENT**

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# NEW SOUTH WALES MOTHERS AND BABIES 1999

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## INTRODUCTION

This is the third report on mothers and babies in NSW to combine the annual reports of the NSW Midwives Data Collection (MDC), the Neonatal Intensive Care Units' Data Collection and the NSW Birth Defects Register. Information on causes of maternal deaths in NSW was obtained through the work of the NSW Maternal and Perinatal Committee and is also included.

From 1 January 1998, the MDC includes data elements necessary for most of the Australian Council on Healthcare Standards–Royal Australian and New Zealand College of Obstetricians and Gynaecologists (ACHS–RANZCOG) clinical indicators for obstetrics. A summary of the indicators for all NSW hospitals combined, and comparative information for participating Australian hospitals, is included in Part 7 of this report.

A study of the quality of reporting of Aboriginality to the MDC is described in Part 8.

## SUMMARY

### Trends in NSW

There were 87,289 babies born to 85,967 mothers in 1999. The number of births in NSW remained stable at about 86,000 to 88,000 between 1995 and 1999. The number of teenage mothers decreased from 4,349 (5.0 per cent of all mothers) in 1994 to 4,099 (4.8 per cent) in 1999; while the number of mothers aged 35 years and over increased from 11,906 in 1995 to 14,668 in 1999, an increase from 13.8 to 17.1 per cent of all confinements.

The reported number of Aboriginal and Torres Strait Islander mothers giving birth increased from 1,739 in 1995 (2.0 per cent of all mothers) to 2,059 in 1999 (2.4 per cent of all mothers). Part of this increase is likely to be due to an increased willingness of mothers to be identified as Aboriginal or Torres Strait Islander.

Patterns of maternal country of birth have remained fairly stable over the five year period with about one in four mothers born overseas in 1999, most commonly in the United Kingdom (3.1 per cent), China and New Zealand (both 2.3 per cent), and Vietnam (2.1 per cent).

The proportion of mothers planning to give birth in a birth centre reached a peak in 1996 (4.2 per cent) and subsequently fell slightly to 3.9 per cent in 1999, while the reported number of mothers planning a home birth decreased from 269 to 182 over the five year period.

The rate of normal vaginal birth fell slightly from 71.0 per cent in 1995 to 68.6 per cent in 1999. Over the five years, the caesarean section rate increased from 17.4 to 19.7 per cent and the rate of instrumental delivery remained steady at about 10.5 per cent.

Since 1995, the rate of low birthweight (less than 2,500 grams) was steady at about 6 per cent. The rate was 6.3 per cent in 1999.

There was a slight increase in the percentage of babies born prematurely at 32–36 weeks gestation, and a decrease in the percentage born at 42 weeks or more. The overall rate of premature births (less than 37 weeks gestation) rose from 6.3 per cent in 1995 to 7.1 per cent in 1999. There was no change in the proportion of babies who were very premature (less than 32 weeks) or extremely premature (less than 28 weeks).

The perinatal mortality rate varied from 8.8 to 9.6 per 1,000. About two-thirds of all perinatal deaths were stillbirths and one third were neonatal deaths.

In the period 1990–1997, 95 deaths were reported among pregnant women or women who gave birth less than six weeks previously. Sixty-two of these were classified as directly or indirectly associated with the pregnant state.

### Area Health Services

In 1999, the largest numbers of births occurred among mothers resident in the Western Sydney and South Western Sydney Health Areas. These two areas contributed about one quarter of the state's births.

In 1999, as in previous years, there were large variations between health areas in the age distribution of women giving birth. The proportion of women giving birth at less than 20 years of age varied from 0.8 per cent in the Northern Sydney Health Area to 14.3 per cent in the Far West Health Area, while the proportion of mothers giving birth at 35 years of age or more ranged from 8.0 per cent in the Far West Health Area to 28.6 per cent in the Northern Sydney Health Area.

The proportion of Aboriginal or Torres Strait Islander mothers varied from 0.1 per cent in the Northern Sydney Health Area to 30.4 per cent in the Far West Health Area.

The highest proportions of mothers born in non-English speaking countries were in the Central Sydney and South Western Sydney Health Areas. In Central Sydney, the majority of mothers born in non-English speaking countries were born in North East Asia and South East Asia (11.3 and 10.4 per cent of all confinements respectively). In South Western Sydney, the majority of mothers born in non-English speaking countries were born in South East Asia (15.5 per cent of all confinements).

The highest rate of normal vaginal birth was among residents of Far West Health Area (77.9 per cent), while the highest rate of instrumental delivery was among residents of Northern Sydney Health Area (15.5 per cent). The caesarean section rate varied from 15.2 per cent among mothers resident in the South Western Sydney Health Area to 25.0 per cent in the Northern Sydney Health Area.

The highest rates of low birthweight occurred in the Far West Health Area (8.9 per cent) and the lowest rate occurred in the Southern Health Area (4.8 per cent). The highest rate of preterm birth was in the Central Coast Health Area (9.5 per cent). The lowest rate was 4.5 per cent in the Southern Health Area, which may result from referral of high risk pregnancies to the ACT.

The perinatal mortality rate in 1999 was 9.2 per 1,000 births. The rate varied from 5.8 per 1,000 in the Illawarra Health Area to 13.6 per 1,000 in the Macquarie Health Area.

### **Aboriginal and Torres Strait Islander mothers and babies**

In 1999, there were 2,078 babies reported to be born to Aboriginal and Torres Strait Islander mothers, 2.4 per cent of all babies born in NSW. About two thirds of Aboriginal and Torres Strait Islander mothers who gave birth in 1999 lived in rural areas. One quarter lived in the New England or Macquarie Health Areas. About one in five Aboriginal and Torres Strait Islander mothers were teenagers. In 1999, 86.4 per cent of Aboriginal and Torres Strait Islander mothers were booked into the hospital of birth. This is lower than the 98.3 per cent of non-Aboriginal or Torres Strait Islander mothers who were booked into the hospital of birth in 1999.

In 1999, 69.2 per cent of Aboriginal and Torres Strait Islander mothers commenced antenatal care before 20 weeks gestation compared with 87.5 per cent of non-Aboriginal and Torres Strait Islander mothers.

Following statewide trends, the rate of induction of labour among Aboriginal or Torres Strait Islander mothers increased from 15.2 to 18.2 per cent between 1995 and 1999, while the rate of spontaneous onset of labour decreased from 77.3 to 73.4 per cent. However, the rate of induction of labour among Aboriginal and Torres Strait Islander mothers (18.2 per cent) continued to be lower than the statewide rate (24.1 per cent) in 1999. Also following statewide trends, the caesarean section rate among Aboriginal and Torres Strait Islander mothers was stable at about 16 per cent between 1995 and 1999.

Since 1995, the rates of low birthweight (less than 2,500 grams) and prematurity (less than 37 weeks gestation) in Aboriginal and Torres Strait Islander babies has been over 10 per cent. These rates are one and a half times to two times higher than the rates for NSW overall. The perinatal mortality rate in babies born to Aboriginal and Torres Strait Islander mothers was 14.0 per 1,000 in 1999, about one and half times the rate of 9.2 per 1,000 for NSW overall.

### **Maternal country of birth**

Between 1995 and 1999, about 20 per cent of mothers were born in non-English speaking countries. The proportion of mothers from Asian countries increased slightly from 9.9 to 10.8 per cent, while the proportion of mothers from Southern European countries decreased slightly from 1.9 to 1.6 per cent.

In 1999, the proportion of mothers born in non-English speaking countries was highest in the Central Sydney Health Area (43.4 per cent), followed by the South Western Sydney and Western Sydney Areas (38.0 and 36.1 per cent respectively).

Births to teenage mothers were less common among mothers born in non-English speaking countries than among mothers born in English speaking countries, as was smoking in pregnancy.

In 1999, 86.2 per cent of all mothers commenced antenatal care before 20 weeks gestation. There was some variation between country of birth groups, with 88.1 per cent of mothers born in English speaking countries commencing antenatal care before 20 weeks gestation, compared with 55.0 per cent of mothers born in Melanesia, Micronesia and Polynesia and 70.8 per cent of mothers born in the Middle East and Africa.

Mothers born in non-English speaking countries were more likely to have a spontaneous onset of labour than mothers born in English speaking countries and less likely to be induced.

Mothers born in the Middle East and Africa were more likely to have a normal vaginal delivery than mothers in other country of birth groups. The highest caesarean section rates were in mothers born in Central and South America (21.1 per cent).

The highest rate of low birthweight was in babies of mothers born in Southern Asian countries (9.1 per cent). Babies of mothers born in North East Asia and Southern Europe were least likely to be low birthweight.

The highest rate of prematurity was in babies of mothers born in Southern Asian countries (7.5 per cent). Babies of mothers born in North East Asia or the Middle East and Africa were least likely to be premature.

Perinatal mortality rates varied substantially between country of birth groups, from 6.6 per 1,000 among babies of mothers born in Southern Europe to 13.4 per 1,000 in babies of mothers born in Southern Asia.

### **Neonatal Intensive Care**

There were 1,991 infants registered in the Neonatal Intensive Care Units' Data Collection in 1999 representing a registration rate of 21.8 per 1,000 live births. Sixty one (3.1 per cent) infants registered in 1999 were born to Aboriginal and/or Torres Strait Islander mothers.

The 1,991 infants were born to 1,828 mothers, nearly 80 per cent of whom were residents of the Sydney, Central Coast, Hunter and Illawarra Health Areas. The age of mothers ranged from 15 to 48 years with a mean age of 29.4 years. Antenatal complications were reported for 89.8 per cent of mothers. The proportion of women receiving antenatal corticosteroids for lung maturation has increased each year since 1992, with 72.5 per cent of mothers receiving steroids in 1999.

Thirty six per cent of infants registered in 1999 were born following a booked tertiary centre birth and 33.2 per cent were born following maternal transfer. Thirty one per cent were transferred to a tertiary centre following birth and 11 per cent were transferred from one tertiary centre to another immediately after birth.

Nearly three quarters (74.2 per cent) of the infants registered in 1999 were born in a tertiary centre. There is an inverse relationship between gestational age and birth in a tertiary centre.

Boys comprised 56.0 per cent of the 1999 cohort and girls 44.0 per cent. Most infants (80.2 per cent) were from a singleton pregnancy, 17.2 per cent were from a twin pregnancy, 2.6 per cent were from a triplet pregnancy.

Seventy four per cent of infants registered during 1999 were preterm (less than 37 weeks gestation), 42.2 per cent were very preterm (less than 32 weeks gestation) and 14.5 per cent were extremely preterm (less than 28 weeks gestation). Nearly one in five (22.0 per cent) infants had a major or minor congenital anomaly.

Infants with major congenital anomalies were excluded from the analysis of mortality and morbidity. The majority of infants registered in 1999 (87.9 per cent) received assisted ventilation (intermittent mandatory ventilation or continuous positive airways pressure ventilation). The main indication for assisted ventilation varied with gestational age: respiratory distress syndrome, immature lung and transient tachypnoea were more common among preterm groups, whereas meconium aspiration and perinatal asphyxia were more common in term infants.

Proven systemic infection was present in 15.8 per cent of infants, necrotising enterocolitis in 3.2 per cent, and intraventricular haemorrhage in 17.1 per cent; 13.6 per cent of infants were treated for patent ductus arteriosus, and 3.7 per cent had major surgery. Severe grades (Grade 3 or 4) of retinopathy of prematurity were present in 3.8 per cent of infants less than 32 weeks gestation, of whom 67.4 per cent had either cryo or laser therapy to prevent retinal detachment. Surfactant was given to 46.2 per cent of infants; the majority (70.1 per cent) of ventilated infants with a diagnosis of Respiratory Distress Syndrome received surfactant.

Overall, 92.0 per cent of infants without a major congenital anomaly survived to six-months of age. Survival improved with gestational age up to 34 weeks after which it decreased slightly. Of the infants who died, most (67.9 per cent) died at less than one week of age and a further 22.1 per cent died at less than 29 days of age. The six-month survival rate for infants born at 22 to 27 weeks gestation was higher for those born in a tertiary centre (72.4 per cent) compared with those born in a non-tertiary centre (35.0 per cent). Among infants born at higher gestational ages the proportion surviving to six-months of age was similar for those born in a tertiary centre and those born in a non-tertiary centre.

## **Birth defects**

About 2,000 infants are born with birth defects each year in NSW, and for about half of these infants the malformation is detected after birth. In 1993–1999, defects of the cardiovascular system were most commonly reported, followed by defects of the musculoskeletal system and defects of the genito-urinary system. This is a similar pattern to previous years. In 1998, the overall rate of defects was slightly lower than the previous five years combined (42.1 versus 55.4 per 1,000), due to a decrease in the number of babies with multiple malformations. The proportion of reported cases with three or more malformations fell from 22.3 to 19.0 per cent between 1993 and 1998.

In the period 1993–1997, about 130 terminations of pregnancy per year were reported to the NSW Birth Defects Register. Following the introduction of a requirement to notify birth defects under the NSW Public Health Act 1991 from 1 January 1998, the number of terminations reported rose to 250 in 1998 and 236 in 1999.

Of the total 1,150 terminations of pregnancy reported in 1993–99, 644 (56.0 per cent) were associated with a chromosomal abnormality, the most common of which was Down syndrome, and 277 (24.1 per cent) were associated with a neural tube defect.

Birth defects were more common among premature infants compared to full term infants, and among male infants compared to female infants. The rate of birth defects increases with increasing maternal age, especially after age 35. However, as most babies are born to mothers aged less than 35 years, the majority of babies with birth defects were born to younger mothers.

## **DATA SOURCES**

### **The New South Wales Midwives Data Collection**

The New South Wales Midwives Data Collection (MDC) is a population-based surveillance system covering all births in NSW public and private hospitals, as well as home births. It encompasses all livebirths and stillbirths of at least 20 weeks gestation or at least 400 grams birth weight.

The MDC relies on the attending midwife or doctor to complete a notification form when a birth occurs. The form, a copy of which is shown at Appendix 4, includes demographic items and items on maternal health, the pregnancy, labour, delivery and perinatal outcomes. Completed forms are sent to the Patient Data Management Unit of the Information Management and Clinical Systems Branch of the NSW Health Department, where they are compiled into the MDC database.

The MDC receives notifications of women whose usual place of residence is outside NSW but who give birth in NSW. However, the MDC does not receive notifications of births outside NSW to women usually resident in NSW.

### **The Neonatal Intensive Care Units' Data Collection**

The Neonatal Intensive Care Units' (NICUS) Data Collection is a statewide audit of infants admitted to neonatal intensive care units in New South Wales (NSW) and the Australian Capital Territory (ACT) during the neonatal period for one of the following reasons:

- gestational age less than 29 weeks;
- gestational age less than 32 weeks (since 1/1/94);
- birth weight less than 1,000 grams;
- birth weight less than or equal to 1,500 grams (since 1/1/94);
- mechanical ventilation for four hours or more;
- continuous positive airways pressure (CPAP) for four hours or more;
- major surgery (opening of a body cavity).

In 1999 the 10 neonatal intensive care units in NSW and ACT were situated at the following perinatal centres: John Hunter Children's Hospital—Newcastle, King George V Hospital, Liverpool Health Service (joined 12/10/94), Nepean Hospital, Royal Hospital for Women, Royal North Shore Hospital, The Canberra Hospital—Woden Valley (joined 1/1/95), Westmead Hospital, and at the two paediatric hospitals: Sydney Children's Hospital and Royal Alexandra Hospital for Children (The Children's Hospital at Westmead).

The neonatal, maternal and perinatal data which comprise the NICUS Data Collection are collected and collated within each neonatal intensive care unit by a designated Clinical Audit Officer. The data are compiled into a central database located at the NSW Centre for Perinatal Health Services Research.

### **The New South Wales Birth Defects Register**

The NSW Birth Defects Register (BDR) is a population-based surveillance system established to monitor birth defects detected during pregnancy or at birth, or diagnosed in infants up to one year of age. The BDR was established in 1990 and under NSW Public Health Act 1991 from 1 January 1998 doctors, hospitals and laboratories have been required to notify birth defects detected during pregnancy, at birth, or up to one year of life. The BDR is administered by the Epidemiology and Surveillance Branch of the NSW Health Department.

The activities of the BDR include: annual publication of information on birth defects in NSW; provision of information to area health services to assist in service planning and monitoring of child health, and investigation of specific issues; provision of information in response to specific requests from the public, health professionals, and other government departments; and provision of data to the AIHW National Perinatal Statistics Unit (NPSU) for monitoring of birth defects at a national level. The NPSU is also responsible for providing Australian information on birth defects to the International Clearinghouse for

Birth Defects Monitoring Systems, a non-governmental organisation of the World Health Organization.

Sources of notifications to the BDR include: the NSW Midwives Data Collection (MDC), specialist paediatric hospitals, cytogenetic laboratories, and individual health care providers. The BDR is supported by an advisory committee, comprising a panel of clinical experts representing the following specialities: genetics, dysmorphology, neonatology, obstetrics and gynaecology, midwifery, bioethics and epidemiology; and a community representative from the Association of Genetic Support of Australasia.

Data for research purposes may be provided in two formats: aggregate information similar to that contained in this report, and data concerning individuals with identifying information removed. All requests for data should be submitted in writing to the Director, Epidemiology and Surveillance Branch. Requests for data concerning individuals for sufficiently important research purposes will be referred to the Statewide Health Confidentiality and Ethics Committee. Procedures for release of personal information are described in the Department's *Information Privacy Code of Practice*, copies of which are available through the NSW Health Department's World Wide Web site at [www.health.nsw.gov.au](http://www.health.nsw.gov.au).

### **The NSW Inpatient Statistics Collection**

For this report data from the NSW Inpatient Statistics Collection (ISC) was linked to MDC data to produce information on postnatal length of stay in NSW hospitals. These linked data are also used to provide information on health insurance status and type of delivery from 1998.

The ISC covers demographic and episode related data in respect of every inpatient who is separated from any public, private, and repatriation hospital, private day procedure centre or public nursing home in NSW. Separation can result from discharge, transfer, death, or change in service category. The ISC is maintained by the NSW Health Department's Information Management and Clinical Systems Branch.

### **Maternal deaths**

Maternal and perinatal deaths are reported by hospitals to the NSW Health Department's Epidemiology and Surveillance Branch. The NSW Maternal and Perinatal Committee, an advisory committee appointed by the Minister for Health, reviews each death to identify any possible avoidable factors and to determine whether the death was related to pregnancy (or its management) or whether it was incidental.

The information obtained from these reviews assists in the development of policies aimed at improving the health of mothers and newborns in NSW. Information considered by the Committee is confidential.

## DEFINITIONS

### Aboriginal and/or Torres Strait Islander

Women who identify themselves to be of Australian Aboriginal and/or Torres Strait Islander heritage.

### Amniocentesis

The sampling of the amniotic fluid to help determine fetal maturity or disease, by aspiration of the fluid through the mother's abdomen.

### Apgar score

A numerical scoring system routinely administered one and five minutes after birth to evaluate the condition of the baby. The score ranges from 0–10 (10 being perfect).

It takes account of five physical signs, each of which is assigned a component score of 0, 1 or 2: heart rate, respiration, muscle tone, reflexes and colour.

### Augmentation

Artificial rupture of the membranes or use of oxytocic drugs after spontaneous onset of labour.

### Birth defect

Any structural defect or chromosomal abnormality detected during pregnancy, at birth, or in the first year of life, excluding birth injuries and minor anomalies such as skin tags, talipes, birthmarks or clefty hips.

A list of common exclusions used by the NSW Birth Defects Register is shown in Appendix 1, and descriptions of some of the birth defects included in this report are shown in Appendix 2. From 1994, the following additional conditions were included in the NSW Birth Defects Register: congenital hypothyroidism, cystic fibrosis, phenylketonuria and thalassaemia major.

### Birth weight

The newborn infant's first bare weight in grams, obtained soon after birth.

Low birth weight: birth weight less than 2,500 grams.

Very low birth weight: birth weight less than 1,500 grams.

Extremely low birth weight: birth weight less than 1,000 grams.

### Caesarean section

Delivery of the fetus through an abdominal incision.

Elective caesarean section: a caesarean section (planned or unplanned) performed before the onset of labour.

Emergency caesarean section: a caesarean section performed after the onset of labour, whether or not the onset of labour was spontaneous.

### Confinement

Refers to a woman having given birth. Note: with a multiple pregnancy, one confinement will result in more than one birth.

### Country of birth

The mother's country of birth.

### CVS

Chorionic villus sampling (CVS) is the aspiration of a sample of chorionic tissue for biochemical and chromosome analysis.

### Epidural

Injection of analgesic agent outside the dura mater which covers the spinal canal; includes lumbar, spinal and epidural anaesthetics.

### Episiotomy

An incision of the perineum and vagina to enlarge the vulval orifice.

### Gestational age

The duration of pregnancy in completed weeks from the first day of the last normal menstrual period. Where accurate information on the date of the last menstrual period is not available, a clinical estimate of gestational age may be obtained from ultrasound during the first half of pregnancy or by examination of the newborn infant. The 'best estimate' is used here.

### Induction of labour

*Oxytocics–prostaglandins*: the initiation of labour by the use of drugs (oral, intravaginal or intravenous) such as oxytocic agents, prostaglandins, or their derivatives (medical induction).

*ARM only*: the initiation of labour by artificial rupture of membranes (surgical induction).

*Oxytocics–prostaglandins and ARM*: both medical and surgical induction as defined above (combined medical and surgical induction).

### Intraventricular haemorrhage (IVH)

Worst level of intraventricular haemorrhage (IVH) seen on either right or left side by either ultrasound or post-mortem examination.

None:	ultrasound–post-mortem shows no haemorrhage
Grade 1:	subependymal germinal matrix haemorrhage.
Grade 2:	intraventricular haemorrhage with no ventricular dilatation
Grade 3:	intraventricular haemorrhage with ventricle distended with blood.
Grade 4:	intraparenchymal haemorrhage.
Not examined:	No ultrasound or post-mortem examination.

**Live birth**

The complete expulsion or extraction from its mother of a baby of at least 400 grams or 20 weeks gestation who, after being born, breathes or shows any evidence of life such as a heartbeat.

**Major surgery**

Any surgery that requires opening of a body cavity.

**Mechanical ventilation**

Use of a mechanical ventilator to provide intermittent positive pressure respiration for a baby for four hours or more.

**Necrotising enterocolitis (NEC)**

*Clinically diagnosed:* received treatment for NEC (includes suspending feeds, blood cultures and treatment with antibiotics such as clindamycin/gentamycin).

*Proven radiologically or at operation:* radiological signs include intra-mural or intra-hepatic air, perforation or a 'fixed loop'.

**Neonatal death**

The death of a live born infant within 28 days of birth.

**Neonatal period**

The first 28 completed days of life.

**Neonatal mortality rate**

The number of neonatal deaths per 1,000 live births.

**Patent ductus arteriosus (PDA)**

Clinical signs of PDA such as typical murmur, active precordium, bounding pulses, cardiomegaly, or pulmonary vascular congestion on X-ray. May be confirmed on ultrasound examination.

**Parity**

The total number of livebirths and stillbirths of the mother before the pregnancy or birth under consideration.

**Perinatal death**

A stillbirth or neonatal death.

**Perinatal mortality rate**

The number of perinatal deaths (stillbirths and neonatal deaths) per 1,000 total births in a year (livebirths and stillbirths combined).

**Perineal status**

- 1st degree tear: a perineal graze-laceration-tear involving: the fourchette, hymen, labia, skin, vagina or vulva.
- 2nd degree tear: a perineal laceration or tear involving the pelvic floor or perineal muscles or vaginal muscles.
- 3rd degree tear: a perineal laceration-tear involving the anal sphincter or rectovaginal septum.

4th degree tear: a third degree perineal laceration or tear which also involves the anal mucosa or rectal mucosa.

**Plurality**

The number of fetuses or babies from the pregnancy. On this basis pregnancy may be classified as single or multiple.

**Premature infant**

An infant born before 37 completed weeks gestation.

**Premature labour**

The spontaneous onset of labour (regular painful contractions with progressive cervical changes) before 37 completed weeks of gestation.

**Prolonged rupture of membranes**

The spontaneous rupture of membranes for at least 24 hours before the onset of regular contractions with cervical dilatation.

**Retinopathy of prematurity**

Worst stage of retinopathy of prematurity (ROP) in either eye during the initial hospital admission.

- None seen: no changes seen
- Stage I: demarcation line present
- Stage II: ridge present
- Stage III: ridge with extra-retinal fibrovascular proliferation
- Stage IV: retinal detachment

**Systemic infection in the infant**

Clinical or radiological signs of infection together with growth of a known pathogen from a systemic site—does not include tracheal aspirate.

**Transfer (NICUS only)**

Maternal transfer before birth (prenatal): the transfer of a pregnant woman to a tertiary obstetric hospital.

Neonatal transfer after birth (postnatal): the transfer of an infant from the hospital of birth to a tertiary NICU.

**Spontaneous abortion**

The spontaneous expulsion of a fetus less than 20 weeks gestation and less than 400 grams birth weight.

**Stillbirth**

The complete expulsion or extraction from its mother of a product of conception of at least 20 weeks gestation or 400 grams birthweight who did not, at any time after delivery, breathe or show any evidence of life such as a heartbeat.

**Termination of pregnancy**

A procedure intentionally performed to terminate a pregnancy before 20 completed weeks gestation.

## EXPLANATORY NOTES

### Antenatal complications (NICUS)

These specifically include antepartum haemorrhage, placenta praevia, placenta abruptio, prolonged rupture of membranes, gestational diabetes, threatened preterm labour, hypertensive disease of pregnancy and rhesus isoimmunisation. There is also an open-ended 'other antenatal complications' option. The most common problems specified in this option are cervical incompetence, polyhydramnios, oligohydramnios, chorioamnionitis, threatened miscarriage and problems secondary to multiple pregnancy.

### Rates of birth defects

The BDR collects data pertaining to birth defects regardless of the outcome of pregnancy. This includes notifications of livebirths, stillbirths, terminations of pregnancy and spontaneous abortions. Birth defect rates are calculated using births (that is, livebirths and stillbirths) as the denominator, because denominator populations for pregnancies less than 20 weeks gestation are unknown. The numerators are described in the relevant sections.

The source of denominator population data on births is the MDC. The MDC was selected because its definitions are consistent with those applied by the BDR.

Denominator populations compatible with the BDR were derived from the MDC by including only those births that occurred to NSW residents.

Caution should be exercised when comparing the birth defect rates tabled in this document with those reported within the NPSU's Congenital Malformations Australia Report. This report covers birth defects detected during pregnancy and up to one year of age while the Congenital Malformations Australia Report covers birth defects detected during pregnancy and up to 28 days of life.

Variations in data published by the BDR and interstate birth defects registers may be due to differences in coding practices, in categories of birth defects included in each Register and differences in the upper age limit for notification of cases.

### Place of residence of mother

The mother's usual residence was the basis for coding to statistical local areas and NSW health areas.

### Labour

The category 'labour—spontaneous with oxytocics—prostaglandins' was used where labour was augmented with artificial rupture of membranes as well as oxytocics or prostaglandins.

### Levels of neonatal care

#### *Tertiary*

*Level 3:* Neonatal Intensive Care Unit (NICU)—a unit that provides high-dependency specialist nursing and medical care for all newborn infants including sustained 'life

support' such as mechanical ventilation and has staff neonatologists and neonatal registrars.

#### *Non-tertiary*

*Level 2a:* Neonatal Care—a unit which can give high-level oxygen, can start mechanical ventilation if necessary and has paediatric house staff.

*Level 2b:* Neonatal Care—a unit which can give low-level oxygen and has a paediatrician on call.

### Level of obstetric hospitals

*Level 1:* local hospitals (no births), postnatal only.

*Level 2:* small isolated hospitals, low-risk births only. Staffed by general practitioners and midwives.

*Level 3:* country district and smaller metropolitan hospitals, care for mothers and infants at low-moderate risk. Full resuscitation and theatre facilities available. Rostered obstetricians, resident medical staff and midwives. Accredited general practitioners—specialist anaesthetist on call. Has Level 2b neonatal care.

*Level 4:* country base—metropolitan district hospitals. Delivery and care for mothers and/or babies with moderate risk factors. Obstetricians and paediatrician available 24 hours a day, seven days a week. Rostered resident medical staff, specialist anaesthetist on call. Has Level 2b neonatal care.

*Level 5:* country base—metropolitan district hospitals, care for mothers and infants known to be at high risk. Able to cope with complications arising from these risk factors. Has Level 2a neonatal care.

*Level 6:* (tertiary)—specialist obstetric hospitals (supra regional). All functions—low, moderate and high-risk births. Has Level 3 neonatal intensive care.

### Type of delivery

The 'vaginal breech' category covers all forms of vaginal breech delivery, including forceps to the after-coming head.

### Perinatal mortality rate

Perinatal deaths include deaths reported to the MDC only. As the MDC form is completed at discharge or transfer of the baby, deaths occurring after this time may not be reported to the MDC. Birth and perinatal death registration data held by the Australian Bureau of Statistics (ABS) give the most complete ascertainment of perinatal deaths for calculation of rates.

## ACKNOWLEDGEMENTS

The NSW Midwives Data Collection, depends entirely on the state's midwives who provide information on each birth. We gratefully acknowledge their contribution.

The production of the NICUS chapter of this report was accomplished by the teamwork of a vast number of individuals and institutions. Their capacity to collect and exchange information, to discuss and reach consensus on a wide range of medical and epidemiological issues, has made this report possible. We thank the directors and clinical audit officers of the 10 neonatal intensive care units and the liaison officers representing all of the obstetric hospitals in NSW and ACT who have provided maternal and neonatal data. Finally, and not least, the families who participated in the audit are acknowledged and thanked for their continued patience and support.

We would like to thank all those who have contributed to the NSW Birth Defects Register since its establishment in 1990. The Register is dependent on families, health care institutions, and individual health care providers, for the supply of information about birth defects. We gratefully acknowledge their support. We thank health information managers in hospitals throughout NSW for their cooperation and assistance. The staff of the medical record departments at The Children's Hospital at Westmead, The Sydney Children's Hospital and The John Hunter Hospital have also provided much assistance to the NSW Birth Defects Register.

We would also like to express our appreciation to members of the NSW Maternal and Perinatal Committee and the NSW Birth Defects Register Advisory Committee for their advice and support.

## FURTHER INFORMATION

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# PART 1: TRENDS IN NEW SOUTH WALES

## 1.1 CONFINEMENTS AND BIRTHS BY PLURALITY

The number of births per year has remained fairly stable over the past five years (Table 1). There were 87,289 births to 85,967 women reported to the MDC for 1999. Of the 85,967 confinements reported in 1999, 1,261 (1.5 per cent) were for twins and 30 for triplets.

**TABLE 1**

**BIRTHS AND CONFINEMENTS BY PLURALITY, NSW 1995–1999**

Plurality	1995		1996		Year 1997		1998		1999	
	No.	%	No.	%	No.	%	No.	%	No.	%
<b>Confinements</b>										
Singleton	85155	98.7	84201	98.7	85740	98.6	83869	98.6	84676	98.5
Twins	1088	1.3	1076	1.3	1147	1.3	1174	1.4	1261	1.5
Triplets	20	0.0	24	0.0	32	0.0	28	0.0	30	0.0
Quadruplets	0	0.0	1	0.0	1	0.0	1	0.0	0	0.0
Total	86263	100.0	85302	100.0	86920	100.0	85072	100.0	85967	100.0
<b>Births</b>										
Singleton	85155	97.4	84201	97.4	85740	97.3	83869	97.2	84676	97.0
Twins	2176	2.5	2152	2.5	2293	2.6	2348	2.7	2523	2.9
Triplets	60	0.1	72	0.1	96	0.1	84	0.1	90	0.1
Quadruplets	0	0.0	4	0.0	4	0.0	4	0.0	0	0.0
TOTAL	87391	100.0	86429	100.0	88133	100.0	86305	100.0	87289	100.0

Source: NSW Midwives Data Collection (HOIST). Epidemiology and Surveillance Branch, NSW Health Department.

## 1.2 HEALTH AREA OF RESIDENCE

The number of mothers giving birth in most health areas remained fairly stable over the last five years (Table 2). The number of mothers giving birth tended to increase in the Sydney metropolitan health areas and to decrease elsewhere. There was a decrease in births reported in the

Greater Murray Health Area in 1998 due to the closure of the obstetric unit at the Mercy Care Centre Albury, in June 1998 and referral of women to Wodonga Hospital in Victoria.

**TABLE 2**

**CONFINEMENTS BY HEALTH AREA OF RESIDENCE, NSW 1995–1999**

Health Area	1995		1996		Year 1997		1998		1999	
	No.	%	No.	%	No.	%	No.	%	No.	%
Central Sydney	6553	7.6	6839	8.0	6657	7.7	6574	7.7	6625	7.7
Northern Sydney	8634	10.0	8552	10.0	8985	10.3	8824	10.4	9242	10.8
Western Sydney	10225	11.9	10250	12.0	10559	12.1	10541	12.4	10712	12.5
Wentworth	4811	5.6	4836	5.7	4827	5.6	4825	5.7	4851	5.6
South Western Sydney	12198	14.1	12034	14.1	12511	14.4	12050	14.2	12219	14.2
Central Coast	3795	4.4	3677	4.3	3792	4.4	3736	4.4	3665	4.3
Hunter	7105	8.2	6997	8.2	7034	8.1	6875	8.1	6965	8.1
Illawarra	4522	5.2	4320	5.1	4434	5.1	4350	5.1	4414	5.1
South Eastern Sydney	8861	10.3	8706	10.2	9148	10.5	9135	10.7	9427	11.0
Northern Rivers	2994	3.5	2956	3.5	2963	3.4	2941	3.5	2903	3.4
Mid North Coast	3028	3.5	3038	3.6	3073	3.5	2954	3.5	2906	3.4
New England	2536	2.9	2472	2.9	2463	2.8	2381	2.8	2348	2.7
Macquarie	1688	2.0	1734	2.0	1595	1.8	1589	1.9	1596	1.9
Mid Western	2425	2.8	2355	2.8	2437	2.8	2339	2.7	2297	2.7
Far West	602	0.7	568	0.7	600	0.7	556	0.7	533	0.6
Greater Murray	3524	4.1	3440	4.0	3357	3.9	2946	3.5	2603	3.0
Southern	2023	2.3	1812	2.1	1776	2.0	1782	2.1	1845	2.1
Other–Not stated	739	0.9	716	0.8	709	0.8	674	0.8	816	0.9
TOTAL	86263	100.0	85302	100.0	86920	100.0	85072	100.0	85967	100.0

Source: NSW Midwives Data (HOIST). Collection Epidemiology and Surveillance Branch, NSW Health Department.

### 1.3 MATERNAL AGE

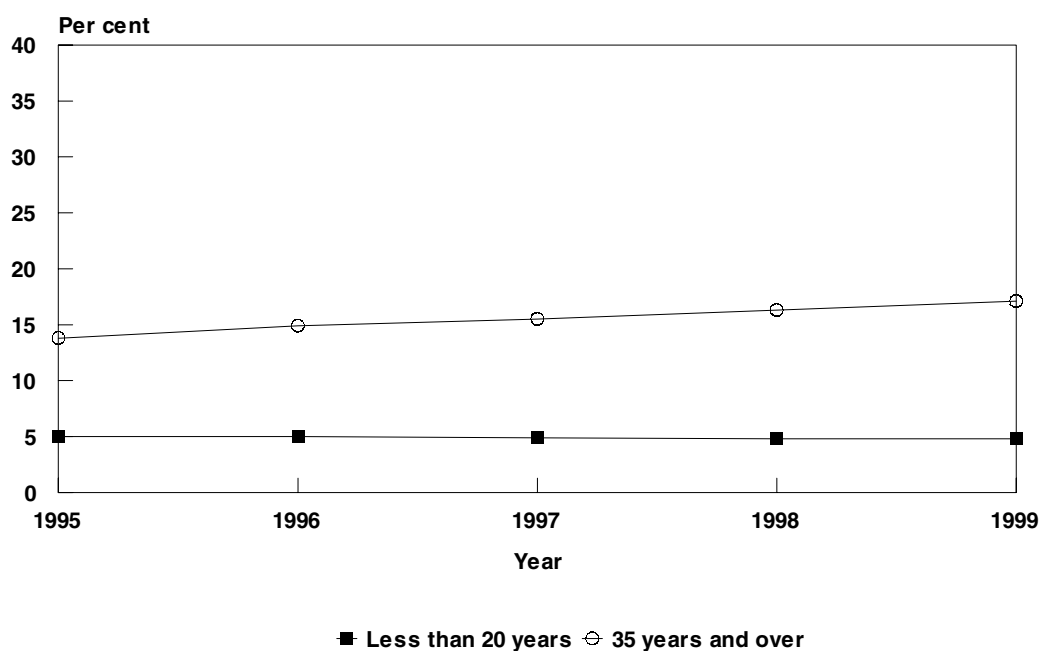
The number of teenage mothers decreased from 4,349 in 1995 to 4,099 in 1999 (Figure 1, Table 3). The mean maternal age rose slightly from 29.1 to 29.6 years over the same period.

The number of mothers 35 years of age or over giving birth increased from 11,906 in 1995 to 14,668 in 1999, an increase from 13.8 to 17.1 per cent of all confinements.

The trend towards later childbirth is evident among both primiparous and multiparous mothers: the proportion of mothers aged 35 years or more who gave birth for the first time increased from 7.5 to 10.4 per cent over the five year period, and the proportion of multiparous mothers increased from 18.0 to 21.7 per cent.

**FIGURE 1**

CONFINEMENTS AMONG MOTHERS AGED LESS THAN 20 YEARS AND 35 YEARS AND OVER, NSW 1995–1999



Source: NSW Midwives Data Collection Epidemiology and Surveillance Branch, NSW Health Department.

**TABLE 3**

CONFINEMENTS BY MATERNAL AGE, NSW 1995–1999

Maternal age (years)	1995		1996		Year 1997		1998		1999	
	No.	%	No.	%	No.	%	No.	%	No.	%
12–19	4349	5.0	4295	5.0	4291	4.9	4118	4.8	4099	4.8
20–34	69976	81.1	68239	80.0	69114	79.5	67034	78.8	67171	78.1
35+	11906	13.8	12712	14.9	13465	15.5	13839	16.3	14668	17.1
Not stated	32	0.0	56	0.1	50	0.1	81	0.1	29	0.0
TOTAL	86263	100.0	85302	100.0	86920	100.0	85072	100.0	85967	100.0

Source: NSW Midwives Data Collection (HOIST). Epidemiology and Surveillance Branch, NSW Health Department.

## 1.4 MATERNAL COUNTRY OF BIRTH

In the period 1995–1999, almost three-quarters of confinements were to mothers who were born in Australia. Numbers of confinements to mothers born in European countries continued to decline while confinements to mothers born in Asian and Pacific Island countries increased over the five year period (Table 4). Further information on maternal country of birth is shown in Part 4.

**TABLE 4**

**CONFINEMENTS BY MATERNAL COUNTRY OF BIRTH, NSW 1995–1999\***

Country of birth	1995		1996		Year 1997		1998		1999	
	No.	%	No.	%	No.	%	No.	%	No.	%
Australia	63623	73.8	62309	73.0	63292	72.8	62606	73.6	62555	72.8
United Kingdom	2850	3.3	2707	3.2	2593	3.0	2471	2.9	2627	3.1
China	1649	1.9	1950	2.3	2111	2.4	1892	2.2	2015	2.3
New Zealand	1821	2.1	1790	2.1	1826	2.1	1762	2.1	1966	2.3
Vietnam	1828	2.1	1865	2.2	1853	2.1	1462	1.7	1804	2.1
Lebanon	2153	2.5	2042	2.4	1983	2.3	1942	2.3	1788	2.1
Philippines	1245	1.4	1266	1.5	1275	1.5	1308	1.5	1319	1.5
Former Yugoslavia	746	0.9	689	0.8	714	0.8	659	0.8	662	0.8
India	587	0.7	576	0.7	673	0.8	634	0.7	635	0.7
Fiji	577	0.7	602	0.7	603	0.7	640	0.8	604	0.7
Indonesia	312	0.4	381	0.4	398	0.5	424	0.5	460	0.5
Iraq	164	0.2	234	0.3	326	0.4	360	0.4	414	0.5
Hong Kong	676	0.8	659	0.8	531	0.6	433	0.5	409	0.5
South Africa	263	0.3	310	0.4	349	0.4	329	0.4	386	0.4
United States of America	317	0.4	322	0.4	330	0.4	340	0.4	372	0.4
South Korea	299	0.3	261	0.3	308	0.4	370	0.4	370	0.4
Western Samoa	276	0.3	280	0.3	312	0.4	349	0.4	318	0.4
Turkey	367	0.4	376	0.4	364	0.4	340	0.4	314	0.4
Tonga	272	0.3	263	0.3	292	0.3	312	0.4	308	0.4
Cambodia	325	0.4	311	0.4	305	0.4	238	0.3	303	0.4
Sri Lanka	256	0.3	274	0.3	279	0.3	276	0.3	295	0.3
Ireland	274	0.3	276	0.3	275	0.3	280	0.3	287	0.3
Malaysia	299	0.3	308	0.4	307	0.4	259	0.3	286	0.3
Japan	228	0.3	215	0.3	226	0.3	239	0.3	264	0.3
Germany	176	0.2	208	0.2	213	0.2	187	0.2	226	0.3
Chile	242	0.3	220	0.3	209	0.2	214	0.3	224	0.3
Italy	312	0.4	285	0.3	272	0.3	230	0.3	221	0.3
Egypt	236	0.3	254	0.3	253	0.3	202	0.2	218	0.3
Thailand	164	0.2	166	0.2	186	0.2	194	0.2	207	0.2
Pakistan	98	0.1	137	0.2	202	0.2	200	0.2	192	0.2
Canada	160	0.2	170	0.2	155	0.2	177	0.2	185	0.2
Syria	151	0.2	154	0.2	141	0.2	143	0.2	145	0.2
Iran	158	0.2	134	0.2	147	0.2	139	0.2	140	0.2
Papua New Guinea	115	0.1	130	0.2	150	0.2	131	0.2	136	0.2
Bangladesh	82	0.1	94	0.1	125	0.1	140	0.2	134	0.2
Poland	157	0.2	125	0.1	120	0.1	100	0.1	123	0.1
Portugal	131	0.2	145	0.2	121	0.1	136	0.2	120	0.1
Afghanistan	75	0.1	83	0.1	110	0.1	85	0.1	120	0.1
Laos	135	0.2	140	0.2	133	0.2	126	0.1	118	0.1
Greece	203	0.2	174	0.2	178	0.2	140	0.2	109	0.1
France	98	0.1	93	0.1	85	0.1	114	0.1	108	0.1
Netherlands	96	0.1	84	0.1	94	0.1	92	0.1	102	0.1
Singapore	114	0.1	109	0.1	89	0.1	102	0.1	101	0.1
Other—Not stated	1953	2.3	2131	2.5	2412	2.8	2295	2.7	2277	2.6
TOTAL	86263	100.0	85302	100.0	86920	100.0	85072	100.0	85967	100.0

Source: NSW Midwives Data Collection (HOIST). Epidemiology and Surveillance Branch, NSW Health Department.

# Countries of birth for which there were 100 or more confinements in 1999.

## 1.5 MATERNAL ABORIGINALITY

The reported number of Aboriginal or Torres Strait Islander mothers giving birth increased from 1,739 in 1995 (2.0 per cent of all mothers) to 2,059 in 1999 (2.4 per cent of all mothers) (Table 5). Part of this increase is likely to be due to an increased willingness of mothers to be identified as Aboriginal or Torres Strait Islander. Further information on maternal Aboriginality and reporting of Aboriginality are shown in Parts 3 and 8 respectively.

**TABLE 5**

**CONFINEMENTS BY MATERNAL ABORIGINALITY, NSW 1995–1999**

Aboriginality	1995		1996		Year 1997		1998		1999	
	No.	%	No.	%	No.	%	No.	%	No.	%
Aboriginal and Torres Strait Islander	1739	2.0	1712	2.0	1842	2.1	2043	2.4	2059	2.4
Non-Aboriginal or Torres Strait Islander	84450	97.9	83486	97.9	84854	97.6	82787	97.3	83899	97.6
Not stated	74	0.1	104	0.1	224	0.3	242	0.3	9	0.0
TOTAL	86263	100.0	85302	100.0	86920	100.0	85072	100.0	85967	85967

Source: NSW Midwives Data Collection (HOIST), Epidemiology and Surveillance Branch, NSW Health Department.

## 1.6 NUMBER OF PREVIOUS PREGNANCIES

In recent years there were no substantial changes in the reported number of previous pregnancies greater than 20 weeks gestation (Table 6). About 40 per cent of mothers gave birth for the first time, about 58 per cent gave birth to a second to fourth baby and less than two per cent reported more than five previous births.

**TABLE 6**

**CONFINEMENTS BY NUMBER OF PREVIOUS PREGNANCIES, NSW 1995–1999**

Number of previous pregnancies (>20 weeks gestation)	1995		1996		Year 1997		1998		1999	
	No.	%	No.	%	No.	%	No.	%	No.	%
0	34459	39.9	34267	40.2	34984	40.2	34376	40.4	35311	41.1
1–4	50449	58.5	49692	58.3	50451	58.0	49462	58.1	49432	57.5
5+	1256	1.5	1237	1.5	1267	1.5	1184	1.4	1206	1.4
Not stated	99	0.1	106	0.1	218	0.3	50	0.1	18	0.0
TOTAL	86263	100.0	85302	100.0	86920	100.0	85072	100.0	85967	100.0

Source: NSW Midwives Data Collection (HOIST), Epidemiology and Surveillance Branch, NSW Health Department.

## 1.7 DURATION OF PREGNANCY AT FIRST ANTENATAL VISIT

Since 1995, the proportion of mothers starting antenatal care at 20-plus weeks gestation has been stable at about 13 per cent (Table 7).

<b>TABLE 7</b>										
<b>CONFINEMENTS BY DURATION OF PREGNANCY AT FIRST ANTENATAL VISIT, NSW 1995–1999</b>										
Duration of pregnancy (weeks)	1995		1996		Year 1997		1998		1999	
	No.	%	No.	%	No.	%	No.	%	No.	%
0–19	73331	85.0	72726	85.3	73666	84.8	72257	84.9	74077	87.1
20-plus	11395	13.2	10972	12.9	11549	13.3	11410	13.4	10979	12.9
Not stated	1537	1.8	1604	1.9	1705	2.0	1405	1.7	911	1.1
TOTAL	86263	100.0	85302	100.0	86920	100.0	85072	100.0	95967	100.0

Source: NSW Midwives Data Collection (HOIST). Epidemiology and Surveillance Branch, NSW Health Department.

## 1.8 SMOKING IN PREGNANCY

The proportion of mothers reporting any smoking during pregnancy declined slightly between 1995 and 1999: in 1995, 18,549 (21.5 per cent) mothers reported smoking in pregnancy, compared to, 17,957 (21.1 per cent) in 1996, 17,871 (20.6 per cent) in 1997, 16,859 (19.8 per cent) in 1998, and 16,302 (19.0 per cent) in 1999.

Of mothers who smoked during pregnancy, about four per cent stopped smoking in the second half of pregnancy and about half smoked more than 10 cigarettes per day in the second half of pregnancy (Table 8).

<b>TABLE 8</b>										
<b>MOTHERS WHO SMOKED AT ALL DURING PREGNANCY BY NUMBER OF CIGARETTES SMOKED IN THE SECOND HALF OF PREGNANCY, NSW 1995–1999</b>										
Cigarettes smoked in the second half of pregnancy	1995		1996		Year 1997		1998		1999	
	No.	%	No.	%	No.	%	No.	%	No.	%
None	556	3.0	556	3.1	570	3.2	690	4.1	739	4.5
More than ten per day	9542	51.4	8842	49.2	8574	48.0	8171	48.5	7966	48.9
1–10 per day	7928	42.7	7925	44.1	7872	44.0	7634	45.3	7303	44.8
Smoked, amount not stated	511	2.8	623	3.5	833	4.7	358	2.1	294	1.8
Not stated	12	0.1	11	0.1	22	0.1	6	0.0	0	0.0
TOTAL	18549	100.0	17957	100.0	17871	100.0	16859	100.0	16302	100.0

Source: NSW Midwives Data Collection (HOIST). Epidemiology and Surveillance Branch, NSW Health Department.

## 1.9 PLACE OF BIRTH

The majority of mothers plan to give birth in a hospital labour ward, and about four per cent of mothers plan to give birth in a birth centre (Table 9, Figure 2). The reported number of mothers planning a home birth in NSW fell from 269 in 1995 to 182 in 1999.

**TABLE 9**

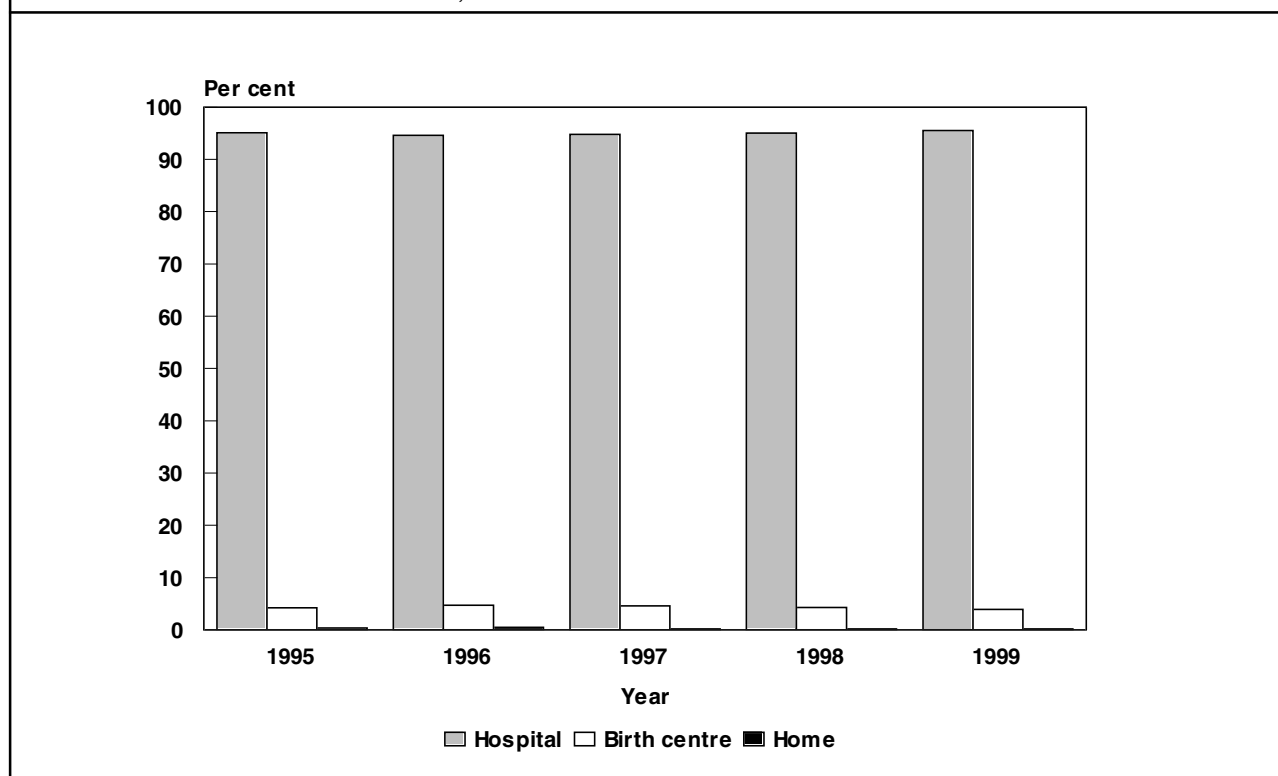
**CONFINEMENTS BY PLACE OF BIRTH, NSW 1995–1999**

Place of birth	1995		1996		Year 1997		1998		1999	
	No.	%	No.	%	No.	%	No.	%	No.	%
Hospital	82074	95.1	80714	94.6	82410	94.8	80835	95.0	82103	95.5
Birth centre	2741	3.2	2899	3.4	2795	3.2	2514	3.0	2249	2.6
Planned birth centre–hospital admission	881	1.0	1116	1.3	1188	1.4	1154	1.4	1070	1.2
Planned home birth	179	0.2	192	0.2	159	0.2	147	0.2	139	0.2
Planned home birth–hospital admission	90	0.1	55	0.1	43	0.0	55	0.1	43	0.1
Born before arrival	297	0.3	324	0.4	297	0.3	366	0.4	363	1.4
Not stated	1	0.0	2	0.0	28	0.0	1	0.0	0	0.0
<b>TOTAL</b>	<b>86263</b>	<b>100.0</b>	<b>85302</b>	<b>100.0</b>	<b>86920</b>	<b>100.0</b>	<b>85072</b>	<b>100.0</b>	<b>85967</b>	<b>100.0</b>

Source: NSW Midwives Data Collection (HOIST), Epidemiology and Surveillance Branch, NSW Health Department.

**FIGURE 2**

**CONFINEMENTS BY PLANNED PLACE OF BIRTH, NSW 1995–1999**



Source: NSW Midwives Data Collection (HOIST), Epidemiology and Surveillance Branch, NSW Health Department.

## 1.10 LABOUR AND DELIVERY

The rate of induction of labour rose from 20.6 per cent in 1995 to 24.0 per cent in 1999. About one in 10 labours were augmented with oxytocics or prostaglandins in 1999. The rate of spontaneous onset of labour fell from 70.0 to 65.4 per cent (Table 10).

The rate of normal vaginal birth has decreased slightly from 71.0 per cent in 1995 to 68.6 per cent in 1999 (Table 11). The caesarean section rate increased from 17.4 to 19.7

per cent. The rate of instrumental delivery remained steady at about 10.5 per cent, accompanied by a change in the pattern of instrumental delivery: the rate of vacuum extraction rose from 3.4 to 6.0 per cent and the rate of forceps delivery declined from 7.1 to 4.9 per cent.

While operative and instrumental deliveries continue to be more common among privately than publicly insured mothers, the changing pattern in type of delivery is evident in both groups (Table 12).

**TABLE 10**

**CONFINEMENTS BY ONSET AND AUGMENTATION OF LABOUR, NSW 1995–1999**

Onset of labour	1995		1996		Year 1997		1998		1999	
	No.	%	No.	%	No.	%	No.	%	No.	%
Spontaneous	40150	46.5	39891	46.8	39839	45.8	39281	46.2	39706	46.2
Spontaneous augmented with ARM	11062	12.8	10564	12.4	9764	11.2	7997	9.4	7844	9.1
Spontaneous augmented with oxytocics–prostaglandins	8961	10.4	9222	10.8	9622	11.1	8411	9.9	8657	10.1
No labour	8231	9.5	8052	9.4	8616	9.9	8800	10.3	9147	10.6
Induced—oxytocics–prostaglandins	5514	6.4	5644	6.6	5934	6.8	7893	9.3	7626	8.9
Induced—ARM only	1155	1.3	1211	1.4	1238	1.4	1462	1.7	1305	1.5
Induced—ARM+oxytocics–prostaglandins	11071	12.8	10601	12.4	11722	13.5	11069	13.0	11527	13.4
Induced—other#	61	0.1	67	0.1	87	0.1	138	0.2	154	0.2
Not stated	58	0.1	50	0.1	98	0.1	21	0.0	1	0.0
TOTAL	86263	100.0	85302	100.0	86920	100.0	85072	100.0	85967	100.0

Source: NSW Midwives Data Collection (HOIST), Epidemiology and Surveillance Branch, NSW Health Department.

# This category includes other forms of induction such as Foley's catheter.

**TABLE 11**

**CONFINEMENTS BY TYPE OF DELIVERY, NSW 1995–1999**

Type of delivery	1995		1996		Year 1997		1998		1999	
	No.	%	No.	%	No.	%	No.	%	No.	%
Normal vaginal	61215	71.0	60339	70.7	61175	70.4	59097	69.5	58951	68.6
Forceps	6083	7.1	5724	6.7	5014	5.8	4478	5.3	4190	4.9
Vacuum extraction	2943	3.4	3286	3.9	3919	4.5	4453	5.2	5152	6.0
Vaginal breech	918	1.1	874	1.0	921	1.1	805	0.9	762	0.9
Elective caesarean section	8231	9.5	8052	9.4	8616	9.9	8800	10.3	9147	10.6
Emergency caesarean section#	6818	7.9	6955	8.2	7195	8.3	7416	8.7	7765	9.0
Not stated	55	0.1	72	0.1	80	0.1	23	0.0	0	0.0
TOTAL	86263	100.0	85302	100.0	86920	100.0	85072	100.0	85967	100.0

Source: NSW Midwives Data Collection (HOIST), Epidemiology and Surveillance Branch, NSW Health Department.

# Emergency caesarean section includes caesarean sections where the onset of labour was not stated.

**TABLE 12****CONFINEMENTS BY HEALTH INSURANCE STATUS AND TYPE OF DELIVERY, NSW 1995–1998**

Insurance status–type of delivery	Year							
	1995		1996		1997		1998	
	No.	%	No.	%	No.	%	No.	%
<b>Public</b>								
Normal vaginal	42004	75.7	43495	75.4	45183	75.1	43988	73.8
Emergency caesarean section <sup>#</sup>	4133	7.4	4472	7.7	4610	7.7	4987	8.4
Elective caesarean section	4184	7.5	4408	7.6	4684	7.8	5030	8.4
Vacuum extraction	1528	2.8	1587	2.8	2295	3.8	2644	4.4
Forceps	2970	5.4	3019	5.2	2643	4.4	2358	4.0
Vaginal breech	630	1.1	680	1.2	733	1.2	615	1.0
Not stated	36	0.1	47	0.1	45	0.1	13	0.0
<b>TOTAL</b>	<b>55485</b>	<b>100.0</b>	<b>57708</b>	<b>100.0</b>	<b>60193</b>	<b>100.0</b>	<b>59635</b>	<b>100.0</b>
<b>Private</b>								
Normal vaginal	19194	62.4	16834	61.0	15929	59.8	13727	58.4
Emergency caesarean section <sup>#</sup>	2685	8.7	2482	9.0	2581	9.7	2268	9.6
Elective caesarean section	4046	13.2	3642	13.2	3927	14.7	3635	15.5
Vacuum extraction	1415	4.6	1697	6.2	1621	6.1	1703	7.2
Forceps	3112	10.1	2705	9.8	2368	8.9	2028	8.6
Vaginal breech	288	0.9	194	0.7	185	0.7	150	0.6
Not stated	17	0.1	25	0.1	34	0.1	10	0.0
<b>TOTAL</b>	<b>30757</b>	<b>100.0</b>	<b>27579</b>	<b>100.0</b>	<b>26645</b>	<b>100.0</b>	<b>23521</b>	<b>100.0</b>
<b>TOTAL<sup>##</sup></b>								
Normal vaginal	61215	71.0	60339	70.7	61175	70.4	59097	69.5
Emergency caesarean section <sup>#</sup>	6818	7.9	6955	8.2	7195	8.3	7416	8.7
Elective caesarean section	8231	9.5	8052	9.4	8616	9.9	8800	10.3
Vacuum extraction	2943	3.4	3286	3.9	3919	4.5	4453	5.2
Forceps	6083	7.1	5724	6.7	5014	5.8	4478	5.3
Vaginal breech	918	1.1	874	1.0	921	1.1	805	0.9
Not stated	55	0.1	72	0.1	80	0.1	23	0.0
<b>TOTAL</b>	<b>86263</b>	<b>100.0</b>	<b>85302</b>	<b>100.0</b>	<b>86920</b>	<b>100.0</b>	<b>85072</b>	<b>100.0</b>

Source: 1995–1997: NSW Midwives Data Collection (HOIST). 1998: Linked data of the NSW Midwives Data Collection and NSW Inpatient Statistics Collection. Epidemiology and Surveillance Branch, NSW Health Department.

# Emergency caesarean section includes caesarean sections where the onset of labour was not stated.

## Total includes confinements where type of health insurance was not stated.

**1.11 PAIN RELIEF**

Information on pain relief was collected by the MDC from 1998. In 1999 almost one half (49.3 per cent) of all mothers used nitrous oxide for pain relief, 28.3 per cent had an epidural anaesthetic, 26.5 per cent had intra-muscular narcotics, and no pain relief was reported for 13.3 per cent of mothers (Table 13).

**TABLE 13****CONFINEMENTS BY TYPE OF PAIN RELIEF, NSW 1998–1999**

Type of pain relief <sup>#</sup>	Year			
	1998		1999	
	No.	%	No.	%
Epidural	22917	26.9	24289	28.3
General anaesthetic	5004	5.9	4735	5.5
IM Narcotics	22274	26.2	22800	26.5
Nitrous Oxide	41273	48.5	42361	49.3
Spinal	3314	3.9	4179	4.9
Nil	12656	14.9	11468	13.3
<b>TOTAL CONFINEMENTS</b>	<b>85072</b>	<b>100.0</b>	<b>85967</b>	<b>100.0</b>

Source: NSW Midwives Data Collection (HOIST). Epidemiology and Surveillance Branch, NSW Health Department.

# More than one type of pain relief may be used.



## 1.12 BABY SEX

There were no significant changes in the pattern of baby sex since 1995, with slightly more male babies born than females in each year. In 1999, 44,805 (51.3 per cent) of babies were male, 42,473 (48.7 per cent) were female, 10 were of indeterminate sex, and the sex was not reported for one baby. This compares with babies born in 1995, when 44,759 (51.2 per cent) were male, 42,599 (48.7 per cent) were female, 16 were of indeterminate sex, and the sex was not reported for 17 babies.

## 1.13 GESTATIONAL AGE

Since 1995 there has been a slight increase in the percentage of babies born at 32–36 weeks gestation, and a decrease in the percentage born at 42 weeks or more (Table 14). The overall rate of premature births (less than 37 weeks gestation) rose from 6.3 per cent in 1995 to 7.1 per cent in 1999. There was no change in the proportion of babies who were very premature (less than 32 weeks) or extremely premature (less than 28 weeks).

**TABLE 14**

**BIRTHS BY GESTATIONAL AGE, NSW 1995–1999**

Gestational age (weeks)	1995		1996		Year 1997		1998		1999	
	No.	%	No.	%	No.	%	No.	%	No.	%
20–27	484	0.6	531	0.6	562	0.6	588	0.7	585	0.7
28–31	570	0.7	574	0.7	596	0.7	607	0.7	625	0.7
32–36	4471	5.1	4689	5.4	4852	5.5	4758	5.5	5026	5.8
37–41	79367	90.8	78406	90.7	79987	90.8	78463	90.9	79114	90.6
42+	2480	2.8	2187	2.5	2091	2.4	1871	2.2	1932	2.2
Not stated	19	0.0	42	0.0	45	0.1	18	0.0	7	0.0
TOTAL	87391	100.0	86429	100.0	88133	100.0	86305	100.0	87289	100.0

Source: NSW Midwives Data Collection (HOIST). Epidemiology and Surveillance Branch, NSW Health Department.

## 1.14 BIRTHWEIGHT

Since 1995, the rate of low birthweight (less than 2,500 grams) was constant at about six per cent (Table 15). The rate was 6.3 per cent in 1999.

**TABLE 15**

**BIRTHS BY BIRTHWEIGHT, NSW 1995–1999**

Birthweight (grams)	1995		1996		Year 1997		1998		1999	
	No.	%	No.	%	No.	%	No.	%	No.	%
Less than 500	140	0.2	158	0.2	182	0.2	190	0.2	212	0.2
500–999	378	0.4	362	0.4	414	0.5	398	0.5	391	0.4
1000–1499	446	0.5	454	0.5	467	0.5	481	0.6	509	0.6
1500–1999	921	1.1	906	1.0	1033	1.2	1017	1.2	1076	1.2
2000–2499	3206	3.7	3158	3.7	3318	3.8	3147	3.6	3353	3.8
2500–2999	13314	15.2	13098	15.2	13487	15.3	12810	14.8	12942	14.8
3000–3499	31879	36.5	31378	36.3	31863	36.2	30974	35.9	30978	35.5
3500–3999	26835	30.7	26793	31.0	26957	30.6	26818	31.1	27173	31.1
4000–4499	8644	9.9	8593	9.9	8816	10.0	8807	10.2	9002	10.3
4500+	1592	1.8	1477	1.7	1535	1.7	1597	1.9	1629	1.9
Not stated	36	0.0	52	0.1	61	0.1	66	0.1	24	0.0
TOTAL	87391	100.0	86429	100.0	88133	100.0	86305	100.0	87289	100.0

Source: NSW Midwives Data Collection (HOIST). Epidemiology and Surveillance Branch, NSW Health Department.

## 1.15 APGAR SCORE

In 1999, 2.4 per cent of babies were born with an Apgar score of less than seven at five minutes and 1.1 per cent were born with a score less than four (Table 16). These rates are similar to those of previous years.

**TABLE 16**

**BIRTHS BY APGAR SCORE AT FIVE MINUTES, NSW 1995–1999<sup>#</sup>**

Apgar score	1995		1996		Year 1997		1998		1999	
	No.	%	No.	%	No.	%	No.	%	No.	%
0–4	993	1.1	989	1.1	1065	1.2	1001	1.2	996	1.1
5–7	1220	1.4	1127	1.3	1116	1.3	990	1.1	1098	1.3
7+	85025	97.3	84153	97.4	85788	97.3	84114	97.5	85028	97.4
Not stated	153	0.2	160	0.2	164	0.2	200	0.2	167	0.2
TOTAL	87391	100.0	86429	100.0	88133	100.0	86305	100.0	87289	100.0

Source: NSW Midwives Data Collection (HOIST). Epidemiology and Surveillance Branch, NSW Health Department.

# Includes stillbirths and live births.

## 1.16 PERINATAL OUTCOMES

In the period 1995–1999 the perinatal mortality rate varied from 8.8 to 9.4 per 1,000 (Table 17). In 1998, about two-thirds of all perinatal deaths were stillbirths and one quarter were neonatal deaths.

In 1999, of the 804 perinatal deaths in NSW, 791 (98.4 per cent) were reported among planned hospital births, seven (0.9 per cent) among planned birth centre births, one among planned home births, and five were among babies born before arrival at hospital.

**TABLE 17**

**BIRTHS BY PERINATAL OUTCOME, NSW 1995–1999<sup>#</sup>**

Year	Liveborn surviving		Stillborn		Perinatal Outcome Neonatal death		Not stated		Total births		Perinatal mortality rate/1,000 births
	No.	%	No.	%	No.	%	No.	%	No.	%	
1995	86600	99.1	521	0.6	248	0.3	22	0.0	87391	100.0	8.8
1996	85627	99.1	545	0.6	227	0.3	30	0.0	86429	100.0	8.9
1997	87200	98.9	587	0.7	262	0.3	84	0.1	88133	100.0	9.6
1998	85376	98.9	595	0.7	216	0.3	118	0.1	86305	100.0	9.4
1999	86468	99.1	533	0.6	271	0.3	17	0.0	87289	100.0	9.2

Source: NSW Midwives Data Collection (HOIST). Epidemiology and Surveillance Branch, NSW Health Department.

# Perinatal deaths include deaths reported to the MDC only. As the MDC form is completed at discharge or transfer of the baby, deaths occurring after this time may not be reported to the MDC.

## 1.17 MATERNAL DEATHS

In the period 1990–1997, 95 deaths were reported among pregnant women or women who gave birth less than six weeks previously. Of these, 33 (34.7 per cent) died of incidental causes not related to the pregnancy or its management; 47 (49.5 per cent) deaths were found to be directly due to pregnancy or its management; and 15 (15.8 per cent) deaths were found to result from pre-existing

disease or disease which developed during pregnancy (not due to direct obstetric causes), but which may have been aggravated by the physiologic effects of pregnancy (Table 18).

**TABLE 18**

**MATERNAL DEATHS BY YEAR, NSW 1990–1999\***

Year	Direct		Indirect		Classification Total Direct & Indirect		Incidental		TOTAL	
	No.	Rate/ 100,000	No.	Rate/ 100,000	No.	Rate/ 100,000	No.	Rate/ 100,000	No.	Rate/ 100,000
1990	4	4.6	6	6.9	10	11.6	2	2.3	12	13.9
1991	4	4.7	1	1.2	5	5.8	1	1.2	6	7.0
1992	5	5.7	1	1.1	6	6.8	5	5.7	11	12.5
1993	6	6.9	1	1.2	7	8.1	6	6.9	13	15.0
1994	8	9.2	1	1.2	9	10.4	3	3.5	12	13.8
1995	7	8.1	2	2.3	9	10.4	6	7.0	15	17.4
1996	6	7.0	1	1.2	7	8.2	5	5.9	12	14.1
1997	7	8.1	2	2.3	9	10.5	5	5.8	14	16.1
1998**									12	14.1
1999**									12	14.0

Source: NSW Maternal and Perinatal Committee.

# Includes all deaths of women who were pregnant at the time of death, or who died within 42 days of childbirth.

Direct deaths include those resulting from obstetric complications of the pregnant state, including its management.

Indirect deaths include those resulting from preexisting disease or disease which developed during pregnancy and was not due to direct obstetric causes but which may have been aggravated by the physiological effects of pregnancy.<sup>1</sup>

Incidental deaths are those where the pregnancy is unlikely to have contributed significantly to the death.

\*\* Classification incomplete for 1998 and 1999.

**TABLE 19**

**MATERNAL DEATHS BY CAUSE, NSW 1997**

Classification	Cause	No.
Incidental	Cardiac arrhythmia	1
Incidental	Haemoptysis following pneumonia	1
Incidental	Multiple injuries following motor vehicle accident	1
Incidental	Sotalol overdose and hypertrophic obstructive cardiomyopathy	1
Incidental	Overdose of multiple drugs and alcohol	1
Indirect	Suicide by hanging	1
Indirect	Subarachnoid haemorrhage	1
Direct	Pulmonary embolus	2
Direct	Suicide by hanging following post partum depression	1
Direct	Amniotic fluid embolism	1
Direct	Puerperal cardiomyopathy	1
Direct	Cardiac failure following pregnancy induced hypertension	2
TOTAL		14

Source: NSW Maternal and Perinatal Committee.

# Includes all deaths of women who were pregnant at the time of death, or who died within 42 days of childbirth.

Direct deaths include those resulting from obstetric complications of the pregnant state, including its management.

Indirect deaths include those resulting from preexisting disease or disease which developed during pregnancy and was not due to direct obstetric causes but which may have been aggravated by the physiological effects of pregnancy.<sup>1</sup>

Incidental deaths are those where the pregnancy is unlikely to have contributed significantly to the death.

## Reference

1. National Health and Medical Research Council. *Report on Maternal Deaths in Australia 1991–93—Report of the Maternal Mortality Working Party*. Canberra: NHMRC, 1998.

## PART 2: AREA HEALTH SERVICES

Information on the health of Aboriginal and Torres Strait Islander mothers, and mothers born in non-English speaking countries is shown in Parts 3 and 4 respectively.

### 2.1 CONFINEMENTS

Continuing the pattern of recent years, the largest numbers of confinements in 1999 were among mothers resident in the South Western Sydney (12,219, 14.2 per cent) and Western Sydney Health Areas (10,712, 12.5 per cent). These two health areas contributed about one quarter of the state's births. Seventy-nine per cent of confinements were to mothers resident in the metropolitan Health Areas (including the Central Coast, Hunter and Illawarra Health Areas), and 19.8 per cent were to mothers resident in rural areas.

### 2.2 MATERNAL AGE

As in previous years, there were large variations in the distribution of the age of women giving birth throughout the state (Table 20). The proportion of women giving birth at less than 20 years of age varied from 0.8 per cent in the Northern Sydney Health Area to 14.3 per cent in the Far West Health Area, while the proportion of mothers giving birth at 35 years of age or more ranged from 8.0 per cent in the Far West Health Area to 28.6 per cent in the Northern Sydney Health Area.

### 2.3 MATERNAL COUNTRY OF BIRTH

Eighty per cent of women who gave birth in NSW in 1999 were born in English speaking countries, 10.8 per cent were born in Asian countries and 4.2 per cent were born in the Middle East or Africa (Table 21).

The highest proportions of mothers born in non-English speaking countries were in the Central Sydney and South Western Sydney Health Areas. In Central Sydney, the majority of mothers born in non-English speaking countries were born in North East Asia (11.3 per cent) and South East Asia (10.4 per cent). In South Western Sydney, the majority of mothers born in non-English speaking countries were born in South East Asia (15.5 per cent).

### 2.4 MATERNAL ABORIGINALITY

In 1999, 2.4 per cent of mothers were reported to be Aboriginal or Torres Strait Islander (Table 22). The proportion of Aboriginal or Torres Strait Islander mothers varied from 0.1 per cent in the Northern Sydney Area to 30.4 per cent in the Far West Area.

### 2.5 PLACE OF BIRTH

Ninety-five per cent of mothers chose to deliver in a hospital labour ward in 1999, compared to 3.9 per cent who planned a birth centre birth and 0.2 per cent who planned a homebirth (Table 23). Planned birth centre births were most common in the Hunter and Central Sydney

Health Areas, and planned home births were most common in the Northern Rivers Health Area.

### 2.6 LABOUR AND DELIVERY

In 1999, the onset of labour was spontaneous in 65.4 per cent of confinements (Table 24). Labour was induced in 24.0 per cent of confinements and no labour (elective caesarean section) was reported in 10.6 per cent of confinements.

The rate of spontaneous onset of labour was highest among residents of the Far West Health Area (75.1 per cent). The highest rate of induction of labour was among residents of the New England Health Area (29.4 per cent).

Almost seventy per cent of confinements were by normal vaginal birth, 10.9 per cent were instrumental and 19.7 per cent were by caesarean section (Table 25). The highest rate of normal vaginal birth was among residents of Far West Health Area (77.9 per cent), while the highest rate of instrumental delivery was among residents of Northern Sydney Health Area (15.5 per cent). The caesarean section rate varied from 15.2 per cent among mothers resident in the South Western Sydney Health Area to 25.0 per cent in the Northern Sydney Health Area.

**TABLE 20**

**CONFINEMENTS BY MATERNAL AGE AND HEALTH AREA OF RESIDENCE, NSW 1999**

Health Area	Maternal age (years)																TOTAL	
	12-19		20-24		25-29		30-34		35-39		40-44		45+		Not stated		No.	%
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%		
Central Sydney	149	2.2	768	11.6	1858	28.0	2194	33.1	1366	20.6	275	4.2	14	0.2	1	0.0	6625	100.0
Northern Sydney	77	0.8	486	5.3	2248	24.3	3787	41.0	2239	24.2	387	4.2	18	0.2	0	0.0	9242	100.0
Western Sydney	482	4.5	1839	17.2	3566	33.3	3189	29.8	1386	12.9	246	2.3	4	0.0	0	0.0	10712	100.0
Wentworth	278	5.7	902	18.6	1732	35.7	1320	27.2	519	10.7	96	2.0	4	0.1	0	0.0	4851	100.0
South Western Sydney	587	4.8	2389	19.6	4362	35.7	3270	26.8	1345	11.0	250	2.0	15	0.1	1	0.0	12219	100.0
Central Coast	196	5.3	637	17.4	1259	34.4	1041	28.4	451	12.3	80	2.2	1	0.0	0	0.0	3665	100.0
Hunter	445	6.4	1384	19.9	2452	35.2	1796	25.8	763	11.0	119	1.7	6	0.1	0	0.0	6965	100.0
Illawarra	274	6.2	814	18.4	1492	33.8	1219	27.6	527	11.9	79	1.8	6	0.1	2	0.0	4413	100.0
South Eastern Sydney	172	1.8	892	9.5	2779	29.5	3463	36.7	1783	18.9	325	3.4	13	0.1	1	0.0	9428	100.0
Northern Rivers	181	6.2	597	20.6	903	31.1	746	25.7	376	13.0	74	2.5	5	0.2	21	0.7	2903	100.0
Mid North Coast	248	8.5	588	20.2	952	32.8	669	23.0	373	12.8	72	2.5	3	0.1	1	0.0	2906	100.0
New England	219	9.3	525	22.4	775	33.0	542	23.1	238	10.1	46	2.0	3	0.1	0	0.0	2348	100.0
Macquarie	134	8.4	330	20.7	519	32.5	431	27.0	158	9.9	23	1.4	1	0.1	0	0.0	1596	100.0
Mid Western	198	8.6	459	20.0	772	33.6	623	27.1	213	9.3	31	1.3	1	0.0	0	0.0	2297	100.0
Far West	76	14.3	128	24.0	189	35.5	97	18.2	39	7.3	4	0.8	0	0.0	0	0.0	533	100.0
Greater Murray	186	7.1	516	19.8	901	34.6	676	26.0	287	11.0	36	1.4	1	0.0	0	0.0	2603	100.0
Southern	157	8.5	368	19.9	633	34.3	435	23.6	214	11.6	35	1.9	2	0.1	1	0.1	1845	100.0
Other-Not stated	40	4.9	168	20.6	286	35.0	205	25.1	95	11.6	21	2.6	0	0.0	1	0.1	816	100.0
TOTAL	4099	4.8	13790	16.0	27678	32.2	25703	29.9	12372	14.4	2199	2.6	97	0.1	29	0.0	85967	100.0

Source: NSW Midwives Data Collection (HOIST). Epidemiology and Surveillance Branch, NSW Health Department.

**TABLE 21**

**CONFINEMENTS BY MATERNAL COUNTRY OF BIRTH AND HEALTH AREA OF RESIDENCE, NSW 1999\***

Health Area	Country of birth group																		TOTAL			
	English speaking		Central & South America		Melanesia, Micronesia & Polynesia		Southern Europe		Western & Northern Europe		Eastern Europe, Russia, Central Asian & Baltic States		Middle East & Africa		South East Asia		North East Asia		Southern Asia		No.	%
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%				
Central Sydney	3749	56.6	86	1.3	247	3.7	201	3.0	76	1.1	42	0.6	578	8.7	687	10.4	746	11.3	211	3.2	6623	100.0
Northern Sydney	7288	78.9	79	0.9	82	0.9	115	1.2	189	2.0	73	0.8	230	2.5	346	3.7	644	7.0	195	2.1	9241	100.0
Western Sydney	6841	63.9	96	0.9	449	4.2	182	1.7	52	0.5	64	0.6	991	9.3	828	7.7	704	6.6	504	4.7	10711	100.0
Wentworth	4402	90.7	32	0.7	49	1.0	58	1.2	33	0.7	13	0.3	69	1.4	106	2.2	26	0.5	63	1.3	4851	100.0
South Western Sydney	7570	62.0	233	1.9	419	3.4	357	2.9	55	0.5	72	0.6	1111	9.1	1892	15.5	328	2.7	181	1.5	12218	100.0
Central Coast	3539	96.6	12	0.3	21	0.6	8	0.2	19	0.5	3	0.1	10	0.3	32	0.9	13	0.4	8	0.2	3665	100.0
Hunter	6731	96.7	10	0.1	26	0.4	37	0.5	19	0.3	6	0.1	16	0.2	87	1.2	19	0.3	13	0.2	6964	100.0
Illawarra	4047	91.7	19	0.4	27	0.6	103	2.3	32	0.7	9	0.2	61	1.4	74	1.7	28	0.6	12	0.3	4412	100.0
South Eastern Sydney	6948	73.7	134	1.4	138	1.5	244	2.6	118	1.3	122	1.3	468	5.0	466	4.9	640	6.8	150	1.6	9428	100.0
Northern Rivers	2788	96.1	4	0.1	13	0.4	3	0.1	27	0.9	2	0.1	10	0.3	34	1.2	15	0.5	6	0.2	2902	100.0
Mid North Coast	2802	96.5	7	0.2	11	0.4	1	0.0	14	0.5	3	0.1	7	0.2	35	1.2	10	0.3	14	0.5	2904	100.0
New England	2289	97.5	2	0.1	6	0.3	2	0.1	14	0.6	2	0.1	5	0.2	13	0.6	10	0.4	5	0.2	2348	100.0
Macquarie	1565	98.1	1	0.1	5	0.3	1	0.1	5	0.3	2	0.1	5	0.3	8	0.5	4	0.3	0	0.0	1596	100.0
Mid Western	2241	97.6	1	0.0	9	0.4	7	0.3	10	0.4	4	0.2	1	0.0	14	0.6	8	0.3	2	0.1	2297	100.0
Far West	526	98.7	0	0.0	1	0.2	1	0.2	1	0.2	0	0.0	0	0.0	3	0.6	1	0.2	0	0.0	533	100.0
Greater Murray	2513	96.5	3	0.1	18	0.7	6	0.2	7	0.3	1	0.0	8	0.3	9	0.3	12	0.5	26	1.0	2603	100.0
Southern	1773	96.1	2	0.1	12	0.7	8	0.4	11	0.6	2	0.1	5	0.3	16	0.9	9	0.5	6	0.3	1844	100.0
Other-Not stated	769	94.4	4	0.5	7	0.9	3	0.4	8	1.0	1	0.1	4	0.5	9	1.1	8	1.0	2	0.2	815	100.0
TOTAL	68381	79.6	725	0.8	1540	1.8	1337	1.6	690	0.8	421	0.5	3579	4.2	4659	5.4	3225	3.8	1398	1.6	85955	100.0

Source: NSW Midwives Data Collection (HOIST). Epidemiology and Surveillance Branch, NSW Health Department.

# Excludes 12 mothers for whom country of birth was not stated. Maternal countries of birth and country of birth groups are shown in Appendix 3.

**TABLE 22****CONFINEMENTS BY MATERNAL ABORIGINALITY AND HEALTH AREA OF RESIDENCE, NSW 1999**

Health Area	Aboriginal Torres Strait Islander		Aboriginality Non-Aboriginal Torres Strait Islander		Not stated		TOTAL	
	No.	%	No.	%	No.	%	No.	%
	Central Sydney	61	0.9	6564	99.1	0	0.0	6625
Northern Sydney	9	0.1	9233	99.9	0	0.0	9242	100.0
Western Sydney	139	1.3	10573	98.7	0	0.0	10712	100.0
Wentworth	74	1.5	4777	98.5	0	0.0	4851	100.0
South Western Sydney	91	0.7	12128	99.3	0	0.0	12219	100.0
Central Coast	50	1.4	3614	98.6	1	0.0	3665	100.0
Hunter	98	1.4	6867	98.6	0	0.0	6965	100.0
Illawarra	104	2.4	4309	97.6	0	0.0	4413	100.0
South Eastern Sydney	45	0.5	9383	99.5	0	0.0	9428	100.0
Northern Rivers	162	5.6	2738	94.3	3	0.1	2903	100.0
Mid North Coast	230	7.9	2674	92.0	2	0.1	2906	100.0
New England	273	11.6	2075	88.4	0	0.0	2348	100.0
Macquarie	230	14.4	1365	85.5	1	0.1	1596	100.0
Mid Western	123	5.4	2174	94.6	0	0.0	2297	100.0
Far West	162	30.4	371	69.6	0	0.0	533	100.0
Greater Murray	116	4.5	2487	95.5	0	0.0	2603	100.0
Southern	68	3.7	1775	96.2	2	0.1	1845	100.0
Other-Not stated	24	2.9	792	97.1	0	0.0	816	100.0
TOTAL	2059	2.4	83899	97.6	9	0.0	85967	100.0

Source: NSW Midwives Data Collection (HOIST). Epidemiology and Surveillance Branch, NSW Health Department.

**TABLE 23****CONFINEMENTS BY PLACE OF BIRTH AND HEALTH AREA OF RESIDENCE, NSW 1999**

Health Area	Hospital		Birth centre		Planned birth centre hospital admission		Place of birth				Born before arrival		TOTAL	
	No.	%	No.	%	No.	%	Planned home birth	Planned home birth hospital admission	Born before arrival	No.	%	No.	%	
	Central Sydney	5964	90.0	432	6.5	195	2.9	9	0.1	1	0.0	24	0.4	6625
Northern Sydney	9074	98.2	105	1.1	33	0.4	11	0.1	3	0.0	16	0.2	9242	100.0
Western Sydney	10157	94.8	253	2.4	238	2.2	5	0.0	5	0.0	54	0.5	10712	100.0
Wentworth	4748	97.9	38	0.8	36	0.7	8	0.2	4	0.1	17	0.4	4851	100.0
South Western Sydney	11997	98.2	115	0.9	41	0.3	7	0.1	3	0.0	56	0.5	12219	100.0
Central Coast	3624	98.9	15	0.4	5	0.1	5	0.1	0	0.0	16	0.4	3665	100.0
Hunter	5997	86.1	768	11.0	171	2.5	2	0.0	2	0.0	25	0.4	6965	100.0
Illawarra	4323	98.0	14	0.3	41	0.9	15	0.3	2	0.0	18	0.4	4413	100.0
South Eastern Sydney	8704	92.3	449	4.8	222	2.4	7	0.1	4	0.0	42	0.4	9428	100.0
Northern Rivers	2811	96.8	11	0.4	11	0.4	36	1.2	14	0.5	20	0.7	2903	100.0
Mid North Coast	2818	97.0	24	0.8	32	1.1	14	0.5	3	0.1	15	0.5	2906	100.0
New England	2335	99.4	3	0.1	5	0.2	0	0.0	1	0.0	4	0.2	2348	100.0
Macquarie	1578	98.9	3	0.2	7	0.4	1	0.1	0	0.0	7	0.4	1596	100.0
Mid Western	2253	98.1	4	0.2	23	1.0	2	0.1	1	0.0	14	0.6	2297	100.0
Far West	524	98.3	0	0.0	1	0.2	1	0.2	0	0.0	7	1.3	533	100.0
Greater Murray	2584	99.3	3	0.1	1	0.0	1	0.0	0	0.0	14	0.5	2603	100.0
Southern	1814	98.3	6	0.3	4	0.2	13	0.7	0	0.0	8	0.4	1845	100.0
Other-Not stated	798	97.8	6	0.7	4	0.5	2	0.2	0	0.0	6	0.7	816	100.0
TOTAL	82103	95.5	2249	2.6	1070	1.2	139	0.2	43	0.1	363	0.4	85967	100.0

Source: NSW Midwives Data Collection (HOIST). Epidemiology and Surveillance Branch, NSW Health Department.

**TABLE 24**

**CONFINEMENTS BY ONSET AND AUGMENTATION OF LABOUR AND HEALTH AREA OF RESIDENCE, NSW 1999**

Health Area	Spontaneous		Spontaneous augmented with ARM		Spontaneous augmented with oxytocics prostaglandins		No labour		Onset of labour Induced-oxytocics prostaglandins		Induced ARM only		Induced-ARM+ oxytocics prostaglandins		Induced-other#		Not stated		TOTAL	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
	Central Sydney	3299	49.8	303	4.6	957	14.4	662	10.0	952	14.4	59	0.9	384	5.8	9	0.1	0	0.0	6625
Northern Sydney	3427	37.1	777	8.4	1248	13.5	1340	14.5	747	8.1	189	2.0	1503	16.3	11	0.1	0	0.0	9242	100.0
Western Sydney	5317	49.6	847	7.9	1100	10.3	989	9.2	585	5.5	59	0.6	1797	16.8	18	0.2	0	0.0	10712	100.0
Wentworth	2433	50.2	384	7.9	344	7.1	526	10.8	351	7.2	49	1.0	752	15.5	12	0.2	0	0.0	4851	100.0
South Western Sydney	5947	48.7	1170	9.6	1166	9.5	1043	8.5	979	8.0	129	1.1	1731	14.2	54	0.4	0	0.0	12219	100.0
Central Coast	1508	41.1	451	12.3	439	12.0	393	10.7	275	7.5	87	2.4	510	13.9	2	0.1	0	0.0	3665	100.0
Hunter	4050	58.1	260	3.7	262	3.8	688	9.9	642	9.2	216	3.1	843	12.1	4	0.1	0	0.0	6965	100.0
Illawarra	1994	45.2	449	10.2	397	9.0	414	9.4	355	8.0	70	1.6	715	16.2	19	0.4	0	0.0	4413	100.0
South Eastern Sydney	3529	37.4	1100	11.7	1369	14.5	1151	12.2	900	9.5	128	1.4	1245	13.2	6	0.1	0	0.0	9428	100.0
Northern Rivers	1425	49.1	319	11.0	263	9.1	289	10.0	261	9.0	47	1.6	298	10.3	0	0.0	1	0.0	2903	100.0
Mid North Coast	1352	46.5	303	10.4	240	8.3	335	11.5	259	8.9	36	1.2	377	13.0	4	0.1	0	0.0	2906	100.0
New England	855	36.4	356	15.2	190	8.1	257	10.9	316	13.5	50	2.1	324	13.8	0	0.0	0	0.0	2348	100.0
Macquarie	741	46.4	197	12.3	123	7.7	168	10.5	126	7.9	42	2.6	195	12.2	4	0.3	0	0.0	1596	100.0
Mid Western	981	42.7	340	14.8	153	6.7	283	12.3	207	9.0	51	2.2	280	12.2	2	0.1	0	0.0	2297	100.0
Far West	289	54.2	61	11.4	50	9.4	43	8.1	33	6.2	8	1.5	48	9.0	1	0.2	0	0.0	533	100.0
Greater Murray	1234	47.4	245	9.4	139	5.3	293	11.3	389	14.9	56	2.2	240	9.2	7	0.3	0	0.0	2603	100.0
Southern	952	51.6	195	10.6	128	6.9	200	10.8	188	10.2	22	1.2	160	8.7	0	0.0	0	0.0	1845	100.0
Other-Not stated	373	45.7	87	10.7	89	10.9	73	8.9	61	7.5	7	0.9	125	15.3	1	0.1	0	0.0	816	100.0
TOTAL	39706	46.2	7844	9.1	8657	10.1	9147	10.6	7626	8.9	1305	1.5	11527	13.4	154	0.2	1	0.0	85967	100.0

Source: NSW Midwives Data Collection (HOIST). Epidemiology and Surveillance Branch, NSW Health Department.

# This category includes other forms of induction such as Foley's catheter.

**TABLE 25**

**CONFINEMENTS BY TYPE OF DELIVERY AND HEALTH AREA OF RESIDENCE, NSW 1999**

Health Area	Normal vaginal		Forceps		Vacuum extraction		Type of delivery Vaginal breech		Elective caesarean section		Emergency caesarean section#		TOTAL	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
	Central Sydney	4361	65.8	329	5.0	524	7.9	59	0.9	662	10.0	690	10.4	6625
Northern Sydney	5458	59.1	577	6.2	851	9.2	42	0.5	1340	14.5	974	10.5	9242	100.0
Western Sydney	7512	70.1	734	6.9	462	4.3	111	1.0	989	9.2	904	8.4	10712	100.0
Wentworth	3407	70.2	226	4.7	189	3.9	43	0.9	526	10.8	460	9.5	4851	100.0
South Western Sydney	9059	74.1	374	3.1	765	6.3	163	1.3	1043	8.5	815	6.7	12219	100.0
Central Coast	2466	67.3	104	2.8	325	8.9	32	0.9	393	10.7	345	9.4	3665	100.0
Hunter	5002	71.8	176	2.5	420	6.0	55	0.8	688	9.9	624	9.0	6965	100.0
Illawarra	3203	72.6	141	3.2	301	6.8	41	0.9	414	9.4	313	7.1	4413	100.0
South Eastern Sydney	5697	60.4	719	7.6	683	7.2	77	0.8	1151	12.2	1101	11.7	9428	100.0
Northern Rivers	2130	73.4	121	4.2	56	1.9	20	0.7	289	10.0	287	9.9	2903	100.0
Mid North Coast	2105	72.4	149	5.1	42	1.4	28	1.0	335	11.5	247	8.5	2906	100.0
New England	1700	72.4	80	3.4	109	4.6	15	0.6	257	10.9	187	8.0	2348	100.0
Macquarie	1182	74.1	73	4.6	46	2.9	11	0.7	168	10.5	116	7.3	1596	100.0
Mid Western	1603	69.8	105	4.6	63	2.7	20	0.9	283	12.3	223	9.7	2297	100.0
Far West	415	77.9	20	3.8	9	1.7	6	1.1	43	8.1	40	7.5	533	100.0
Greater Murray	1736	66.7	162	6.2	168	6.5	20	0.8	293	11.3	224	8.6	2603	100.0
Southern	1333	72.2	54	2.9	107	5.8	11	0.6	200	10.8	140	7.6	1845	100.0
Other-Not stated	582	71.3	46	5.6	32	3.9	8	1.0	73	8.9	75	9.2	816	100.0
TOTAL	58951	68.6	4190	4.9	5152	6.0	762	0.9	9147	10.6	7765	9.0	85967	100.0

Source: NSW Midwives Data Collection (HOIST). Epidemiology and Surveillance Branch, NSW Health Department.

# Emergency caesarean section includes caesarean sections where the onset of labour was not stated.

## 2.7 BIRTHWEIGHT

In 1999, 6.3 per cent of births were low birthweight (less than 2,500 grams). These comprised 0.6 per cent of birthweight less than 1,000 grams, 0.6 per cent in the 1,000 to 1,499 gram range, and 5.1 per cent in the 1,500 to 2,499 gram range (Table 26). The highest rate of low birthweight was in the Far West Health Area (8.9 per cent) and the lowest rate was in the Southern Health Area (4.8 per cent).

## 2.8 GESTATIONAL AGE

The majority of births (90.6 per cent) were at term and 2.2 per cent were post-term (42-plus weeks). The 7.1 per cent of preterm births comprised 0.7 per cent born at 20–27 weeks, 0.7 per cent at 28–31 weeks and 5.8 per cent at 32–36 weeks. The highest rate of preterm birth was in the Central Coast Health Area (9.5 per cent), while the lowest rate was 4.5 per cent in the Southern Health Area (Table 27).

**TABLE 26**

**BIRTHS BY BIRTHWEIGHT AND HEALTH AREA OF RESIDENCE, NSW 1999**

Health Area	Birthweight (grams)																		TOTAL No. %					
	Less than 500		500–999		1000–1499		1500–1999		2000–2499		2500–2999		3000–3499		3500–3999		4000–4499			4500+		Not stated		
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%		No.	%	No.	%	No.
Central Sydney	16	0.2	29	0.4	42	0.6	77	1.1	232	3.5	1003	14.9	2543	37.9	2038	30.4	621	9.3	110	1.6	2	0.0	6713	100.0
Northern Sydney	18	0.2	41	0.4	45	0.5	105	1.1	310	3.3	1236	13.1	3293	34.9	3076	32.6	1116	11.8	185	2.0	2	0.0	9427	100.0
Western Sydney	24	0.2	52	0.5	50	0.5	136	1.3	391	3.6	1688	15.5	3915	36.1	3292	30.3	1109	10.2	201	1.9	1	0.0	10859	100.0
Wentworth	6	0.1	29	0.6	29	0.6	64	1.3	178	3.6	726	14.8	1681	34.2	1580	32.2	519	10.6	99	2.0	0	0.0	4911	100.0
South Western																								
Sydney	32	0.3	61	0.5	72	0.6	155	1.2	530	4.3	2028	16.3	4459	35.9	3727	30.0	1146	9.2	207	1.7	3	0.0	12420	100.0
Central Coast	13	0.3	15	0.4	29	0.8	55	1.5	175	4.7	499	13.4	1250	33.5	1166	31.3	425	11.4	101	2.7	1	0.0	3729	100.0
Hunter	23	0.3	43	0.6	65	0.9	97	1.4	302	4.3	940	13.3	2338	33.0	2307	32.6	820	11.6	149	2.1	1	0.0	7085	100.0
Illawarra	6	0.1	19	0.4	29	0.6	63	1.4	169	3.8	656	14.6	1582	35.3	1409	31.4	470	10.5	81	1.8	1	0.0	4485	100.0
South Eastern																								
Sydney	32	0.3	38	0.4	60	0.6	110	1.1	338	3.5	1401	14.6	3570	37.3	2951	30.8	921	9.6	155	1.6	2	0.0	9578	100.0
Northern Rivers	7	0.2	6	0.2	11	0.4	33	1.1	104	3.5	415	14.1	999	34.0	968	32.9	339	11.5	51	1.7	5	0.2	2938	100.0
Mid North Coast	6	0.2	9	0.3	25	0.8	50	1.7	129	4.4	470	15.9	1005	34.1	880	29.8	314	10.6	60	2.0	1	0.0	2949	100.0
New England	6	0.3	3	0.1	17	0.7	26	1.1	99	4.2	414	17.4	847	35.7	726	30.6	202	8.5	32	1.3	1	0.0	2373	100.0
Macquarie	6	0.4	7	0.4	5	0.3	16	1.0	63	3.9	244	15.1	566	35.1	502	31.1	168	10.4	36	2.2	0	0.0	1613	100.0
Mid Western	4	0.2	17	0.7	11	0.5	29	1.2	93	4.0	337	14.4	853	36.5	696	29.8	262	11.2	33	1.4	0	0.0	2335	100.0
Far West	1	0.2	4	0.7	3	0.6	7	1.3	33	6.1	93	17.3	209	38.8	140	26.0	41	7.6	7	1.3	0	0.0	538	100.0
Greater Murray	7	0.3	10	0.4	8	0.3	24	0.9	109	4.1	403	15.2	908	34.2	847	31.9	268	10.1	67	2.5	1	0.0	2652	100.0
Southern	4	0.2	6	0.3	3	0.2	11	0.6	66	3.5	281	15.1	673	36.1	603	32.4	170	9.1	43	2.3	3	0.2	1863	100.0
Other–Not stated	1	0.1	2	0.2	5	0.6	18	2.2	32	3.9	108	13.2	287	35.0	265	32.3	91	11.1	12	1.5	0	0.0	821	100.0
TOTAL	212	0.2	391	0.4	509	0.6	1076	1.2	3353	3.8	12942	14.8	30978	35.5	27173	31.1	9002	10.3	1629	1.9	24	0.0	87289	100.0

Source: NSW Midwives Data Collection (HOIST). Epidemiology and Surveillance Branch, NSW Health Department.

**TABLE 27**

**BIRTHS BY GESTATIONAL AGE AND HEALTH AREA OF RESIDENCE, NSW 1999**

Health Area	Gestational age (weeks)										Not stated		TOTAL	
	20–27		28–31		32–36		37–41		42+		No.	%	No.	%
	No.	%	No.	%	No.	%	No.	%	No.	%				
Central Sydney	45	0.7	53	0.8	372	5.5	6117	91.1	126	1.9	0	0.0	6713	100.0
Northern Sydney	58	0.6	55	0.6	483	5.1	8621	91.5	209	2.2	1	0.0	9427	100.0
Western Sydney	69	0.6	61	0.6	607	5.6	9826	90.5	296	2.7	0	0.0	10859	100.0
Wentworth	32	0.7	34	0.7	277	5.6	4423	90.1	145	3.0	0	0.0	4911	100.0
South Western														
Sydney	86	0.7	95	0.8	756	6.1	11222	90.4	259	2.1	2	0.0	12420	100.0
Central Coast	29	0.8	33	0.9	292	7.8	3311	88.8	64	1.7	0	0.0	3729	100.0
Hunter	67	0.9	79	1.1	484	6.8	6262	88.4	193	2.7	0	0.0	7085	100.0
Illawarra	20	0.4	39	0.9	245	5.5	4100	91.4	81	1.8	0	0.0	4485	100.0
South Eastern														
Sydney	69	0.7	71	0.7	534	5.6	8793	91.8	110	1.1	1	0.0	9578	100.0
Northern Rivers	16	0.5	10	0.3	156	5.3	2617	89.1	136	4.6	3	0.1	2938	100.0
Mid North Coast	19	0.6	28	0.9	164	5.6	2660	90.2	78	2.6	0	0.0	2949	100.0
New England	7	0.3	11	0.5	131	5.5	2191	92.3	33	1.4	0	0.0	2373	100.0
Macquarie	9	0.6	13	0.8	89	5.5	1488	92.3	14	0.9	0	0.0	1613	100.0
Mid Western	22	0.9	18	0.8	125	5.4	2115	90.6	55	2.4	0	0.0	2335	100.0
Far West	6	1.1	3	0.6	39	7.2	481	89.4	9	1.7	0	0.0	538	100.0
Greater Murray	16	0.6	14	0.5	145	5.5	2429	91.6	48	1.8	0	0.0	2652	100.0
Southern	10	0.5	3	0.2	71	3.8	1734	93.1	45	2.4	0	0.0	1863	100.0
Other–Not stated	5	0.6	5	0.6	56	6.8	724	88.2	31	3.8	0	0.0	821	100.0
TOTAL	585	0.7	625	0.7	5026	5.8	79114	90.6	1932	2.2	7	0.0	87289	100.0

Source: NSW Midwives Data Collection (HOIST). Epidemiology and Surveillance Branch, NSW Health Department.



## 2.9 PERINATAL OUTCOMES

The perinatal mortality rate in 1999 was 9.2 per 1,000 births. This rate includes all births and deaths of babies of at least 400 grams birthweight or at least 20 weeks gestation (Table 28). The rate varied from 5.8 per 1,000 in the Illawarra Health Area to 13.6 per 1,000 in the Macquarie Health Area.

**TABLE 28**

**PERINATAL OUTCOMES BY HEALTH AREA OF RESIDENCE, NSW 1999<sup>#</sup>**

Health Area	Liveborn surviving		Stillborn		Perinatal outcome Neonatal death		Not stated		Total births		Perinatal mortality rate/1,000 births
	No.	%	No.	%	No.	%	No.	%	No.	%	
Central Sydney	6645	99.0	43	0.6	25	0.4	0	0.0	6713	100.0	10.1
Northern Sydney	9354	99.2	42	0.4	31	0.3	0	0.0	9427	100.0	7.7
Western Sydney	10765	99.1	59	0.5	34	0.3	1	0.0	10859	100.0	8.6
Wentworth	4873	99.2	25	0.5	13	0.3	0	0.0	4911	100.0	7.7
South Western Sydney	12291	99.0	85	0.7	44	0.4	0	0.0	12420	100.0	10.4
Central Coast	3698	99.2	18	0.5	13	0.3	0	0.0	3729	100.0	8.3
Hunter	7007	98.9	48	0.7	30	0.4	0	0.0	7085	100.0	11.0
Illawarra	4459	99.4	22	0.5	4	0.1	0	0.0	4485	100.0	5.8
South Eastern Sydney	9486	99.0	59	0.6	33	0.3	0	0.0	9578	100.0	9.6
Northern Rivers	2905	98.9	22	0.7	8	0.3	3	0.1	2938	100.0	10.2
Mid North Coast	2914	98.8	23	0.8	4	0.1	8	0.3	2949	100.0	9.2
New England	2349	99.0	15	0.6	9	0.4	0	0.0	2373	100.0	10.1
Macquarie	1591	98.6	19	1.2	3	0.2	0	0.0	1613	100.0	13.6
Mid Western	2311	99.0	18	0.8	6	0.3	0	0.0	2335	100.0	10.3
Far West	532	98.9	4	0.7	2	0.4	0	0.0	538	100.0	11.2
Greater Murray	2629	99.1	17	0.6	6	0.2	0	0.0	2652	100.0	8.7
Southern	1845	99.0	8	0.4	5	0.3	5	0.3	1863	100.0	7.0
Other-Not stated	814	99.1	6	0.7	1	0.1	0	0.0	821	100.0	8.5
Total	86468	99.1	533	0.6	271	0.3	17	0.0	87289	100.0	9.2

Source: NSW Midwives Data Collection (HOIST), Epidemiology and Surveillance Branch, NSW Health Department.

# Perinatal deaths include deaths reported to the MDC only. As the MDC form is completed at discharge or transfer of the baby, deaths occurring after this time may not be reported to the MDC.

## PART 3: ABORIGINAL AND TORRES STRAIT ISLANDER MOTHERS AND BABIES

### 3.1 TRENDS IN BIRTHS

Maternal Aboriginality is under-reported on the MDC. The extent of under-reporting is described in detail in Part 8 of this report. Reporting was assessed by comparing maternal Aboriginality as reported to the MDC with information on birth registrations reported to the NSW Registry of Birth Deaths and Marriages. Using capture-recapture methods, an estimate of the total number of Aboriginal mothers was obtained and compared with the number of Aboriginal mothers reported to the MDC. In summary, it was found that the percentage of the estimated total number of Aboriginal mothers reported to the MDC rose from 58.7 to 64.8 per cent over the five year period 1994–1998. Reporting was better in rural hospitals than urban hospitals: it is estimated that in 1998 47.0 per cent of births to Aboriginal mothers in urban hospitals were

correctly reported as Aboriginal compared to 85.6 per cent in rural hospitals, though there was a trend towards improved reporting in both urban and rural hospitals over the five year period.

This chapter describes the health of Aboriginal and Torres Strait Islander mothers and babies as reported to the MDC. In interpreting the information, it is important to note that a substantial number of Aboriginal births are not reported to the MDC, particularly in urban areas.

Between 1995 and 1999, the reported number of babies born to Aboriginal and Torres Strait Islander mothers increased from 1,759 to 2,078 (Table 29), an increase from 2.0 to 2.4 per cent of all babies born in NSW. Multiple pregnancies (twins, triplets etc.) were reported for about one per cent of mothers.

**TABLE 29**

**ABORIGINAL AND TORRES STRAIT ISLANDER MOTHERS AND BABIES BY PLURALITY, NSW 1995–1999**

Plurality	1995		1996		Year 1997		1998		1999	
	No.	%	No.	%	No.	%	No.	%	No.	%
<b>Confinements</b>										
Singleton	1719	98.8	1700	99.3	1828	99.2	2017	98.7	2040	99.1
Multiple	20	1.2	12	0.7	14	0.8	26	1.3	19	0.9
TOTAL	1739	100.0	1712	100.0	1842	100.0	2043	100.0	2059	100.0
<b>Births</b>										
Singleton	1719	97.7	1700	98.6	1828	98.6	2017	97.5	2040	98.2
Multiple	40	2.3	24	1.4	26	1.4	51	2.5	38	1.8
TOTAL	1759	100.0	1724	100.0	1854	100.0	2068	100.0	2078	100.0

Source: NSW Midwives Data Collection (HOIST), Epidemiology and Surveillance Branch, NSW Health Department.

### 3.2 PREVIOUS PREGNANCIES

In 1999, about 30 per cent of Aboriginal/Torres Strait Islander mothers gave birth for the first time, and 63 per cent gave birth to their second to fourth baby (Table 30). Seven per cent of mothers had given birth to five or more babies. This pattern has not changed substantially since 1995.

**TABLE 30**

**NUMBER OF PREVIOUS PREGNANCIES AMONG ABORIGINAL AND TORRES STRAIT ISLANDER MOTHERS, NSW 1995–1999**

No. previous pregnancies (>20 weeks)	1995		1996		Year 1997		1998		1999	
	No.	%	No.	%	No.	%	No.	%	No.	%
0	510	29.3	510	29.8	554	30.1	599	29.3	613	29.8
1-4	1094	62.9	1065	62.2	1147	62.3	1280	62.7	1301	63.2
5+	134	7.7	134	7.8	139	7.5	161	7.9	144	7.0
Not stated	1	0.1	3	0.2	2	0.1	3	0.1	1	0.0
TOTAL	1739	100.0	1712	100.0	1842	100.0	2043	100.0	2059	100.0

Source: NSW Midwives Data Collection (HOIST), Epidemiology and Surveillance Branch, NSW Health Department.

### 3.3 MATERNAL AGE

The reported number of babies born to Aboriginal and Torres Strait Islander mothers has increased at all ages. About one in five Aboriginal and Torres Strait Islander mothers were teenagers in 1999. Following statewide trends, the number of mothers giving birth at 35 years of age or more has increased over the last five years. The proportion of mothers aged 35-plus years increased from 3.6 in 1995 to 6.0 per cent in 1999 (Table 31, Figure 3).

**TABLE 31**

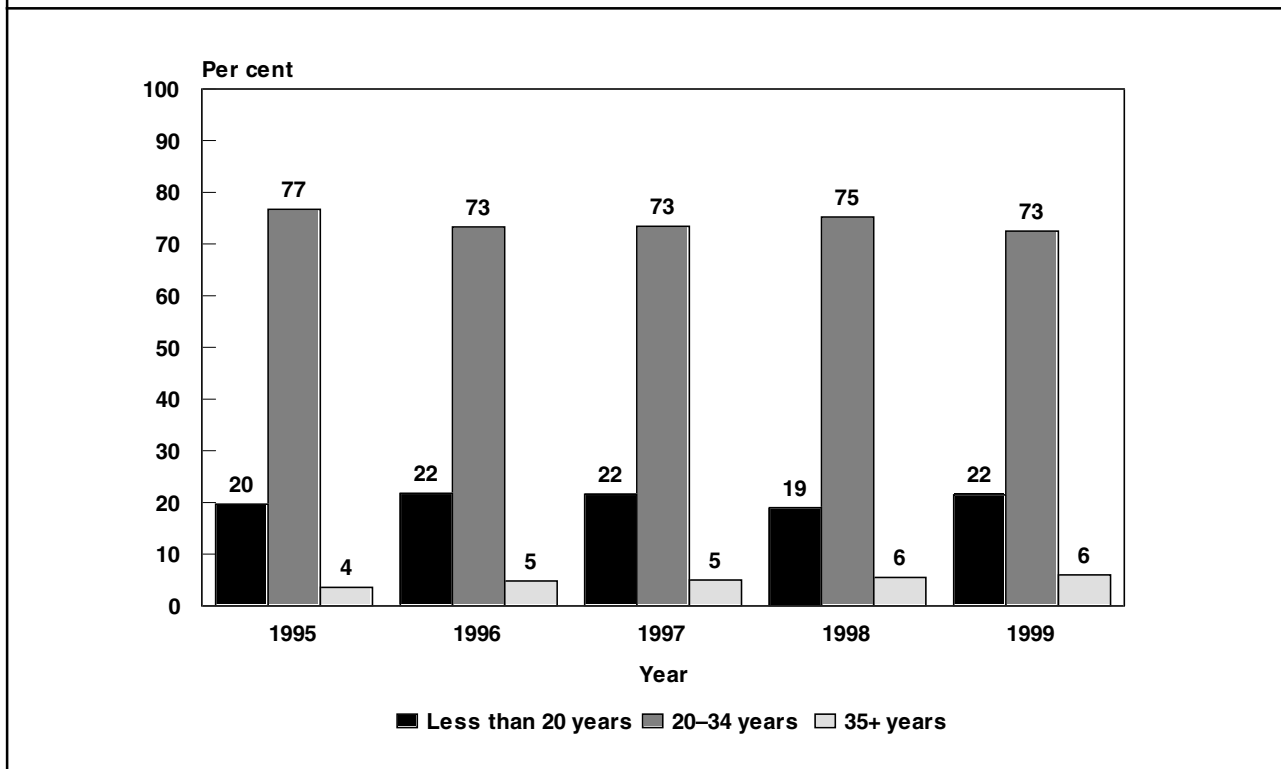
**AGE OF ABORIGINAL AND TORRES STRAIT ISLANDER MOTHERS, NSW 1995–1999**

Maternal age (years)	1995		1996		Year 1997		1998		1999	
	No.	%	No.	%	No.	%	No.	%	No.	%
12-19	342	19.7	374	21.8	398	21.6	398	19.0	443	21.5
20-34	1334	76.7	1255	73.3	1352	73.4	1536	75.2	1492	72.5
35+	63	3.6	83	4.8	92	5.0	113	5.5	124	6.0
Not stated	0	0.0	0	0.0	0	0.0	5	0.2	5	0.2
TOTAL	1739	100.0	1712	100.0	1842	100.0	2043	100.0	2059	100.0

Source: NSW Midwives Data Collection (HOIST). Epidemiology and Surveillance Branch, NSW Health Department.

**FIGURE 3**

**AGE OF ABORIGINAL AND TORRES STRAIT ISLANDER MOTHERS, NSW 1995–1999**



Source: NSW Midwives Data Collection (HOIST). Epidemiology and Surveillance Branch, NSW Health Department.

### 3.4 HEALTH AREA OF RESIDENCE

The reported number of Aboriginal and Torres Strait Islander mothers who gave birth in 1999 ranged from nine (0.4 per cent) in the Northern Sydney Area to 273 (13.3 per cent) in the New England Area (Table 32).

In 1999, over one quarter of Aboriginal and Torres Strait Islander mothers in the Mid North Coast, Far West and Southern Areas were teenagers (Table 33).

**TABLE 32**

**HEALTH AREA OF RESIDENCE OF ABORIGINAL AND TORRES STRAIT ISLANDER MOTHERS, NSW 1995–1999**

Health Area	1995		1996		Year 1997		1998		1999	
	No.	%	No.	%	No.	%	No.	%	No.	%
Central Sydney	89	5.1	66	3.9	70	3.8	71	3.5	61	3.0
Northern Sydney	12	0.7	9	0.5	7	0.4	10	0.5	9	0.4
Western Sydney	124	7.1	108	6.3	105	5.7	172	8.4	139	6.8
Wentworth	38	2.2	43	2.5	47	2.6	77	3.8	74	3.6
South Western Sydney	90	5.2	93	5.4	89	4.8	108	5.3	91	4.4
Central Coast	21	1.2	27	1.6	37	2.0	42	2.1	50	2.4
Hunter	82	4.7	100	5.8	107	5.8	103	5.0	98	4.8
Illawarra	112	6.4	101	5.9	125	6.8	119	5.8	104	5.1
South Eastern Sydney	42	2.4	30	1.8	36	2.0	47	2.3	45	2.2
Northern Rivers	153	8.8	132	7.7	146	7.9	161	7.9	162	7.9
Mid North Coast	153	8.8	157	9.2	181	9.8	167	8.2	230	11.2
New England	209	12.0	238	13.9	255	13.8	267	13.1	273	13.3
Macquarie	148	8.5	171	10.0	202	11.0	212	10.4	230	11.2
Mid Western	109	6.3	111	6.5	99	5.4	113	5.5	123	6.0
Far West	177	10.2	157	9.2	172	9.3	169	8.3	162	7.9
Greater Murray	98	5.6	120	7.0	100	5.4	120	5.9	116	5.6
Southern	69	4.0	39	2.3	51	2.8	64	3.1	68	3.3
Other–Not stated	13	0.7	10	0.6	13	0.7	21	1.0	24	1.2
TOTAL	1739	100.0	1712	100.0	1842	100.0	2043	100.0	2059	100.0

Source: NSW Midwives Data Collection (HOIST). Epidemiology and Surveillance Branch, NSW Health Department.

**TABLE 33**

**HEALTH AREA OF RESIDENCE OF ABORIGINAL AND TORRES STRAIT MOTHERS BY AGE, NSW 1999**

Health Area	Maternal age (years)					
	Less than 20		20+		TOTAL	
	No.	%	No.	%	No.	%
Central Sydney	10	16.4	51	83.6	61	100.0
Northern Sydney #	–	–	–	–	9	100.0
Western Sydney	26	18.7	113	81.3	139	100.0
Wentworth	14	18.9	60	81.1	74	100.0
South Western Sydney	18	19.8	73	80.2	91	100.0
Central Coast	10	20.0	40	80.0	50	100.0
Hunter	20	20.4	78	79.6	98	100.0
Illawarra	24	23.1	80	76.9	104	100.0
South Eastern Sydney	1	2.2	44	97.8	45	100.0
Northern Rivers	29	17.9	133	82.1	162	100.0
Mid North Coast	58	25.2	172	74.8	230	100.0
New England	64	23.4	209	76.6	273	100.0
Macquarie	52	22.6	178	77.4	230	100.0
Mid Western	24	19.5	99	80.5	123	100.0
Far West	43	26.5	119	73.5	162	100.0
Greater Murray	25	21.6	91	78.4	116	100.0
Southern	20	29.4	48	70.6	68	100.0
Other–Not stated	3	12.5	21	87.5	24	100.0
TOTAL	443	21.5	1616	78.5	2059	100.0

Source: NSW Midwives Data Collection (HOIST). Epidemiology and Surveillance Branch, NSW Health Department.  
# Information not shown for Health Areas where the number of mothers is less than five in a group.

### 3.5 BOOKING STATUS

Between 1995 and 1999, there was no substantial change in the proportion of mothers who were booked into the hospital of birth—88.0 per cent in 1995 and 86.4 per cent in 1999.

This compares with 98.3 per cent of non-Aboriginal or Torres Strait Islander mothers who were booked into the hospital of birth in 1999.

### 3.6 DURATION OF PREGNANCY AT FIRST ANTENATAL CHECK

Between 1995 and 1999, there was a slight increase in the proportion of mothers who commenced antenatal care at less than 20 weeks gestation—from 66.8 per cent in 1995 to 69.2 per cent in 1999. This compares with 87.5 per cent of non-Aboriginal and Torres Strait Islander mothers who commenced antenatal care at less than 20 weeks gestation in 1999.

In 1999, the proportion of Aboriginal and Torres Strait Islander mothers who commenced antenatal care at less than 20 weeks gestation varied from 49.6 per cent in the Western Sydney Area to 82.1 per cent in New England Area (Table 34).

**TABLE 34**

**DURATION OF PREGNANCY AT FIRST ANTENATAL VISIT AMONG ABORIGINAL AND TORRES STRAIT ISLANDER MOTHERS BY HEALTH AREA OF RESIDENCE, NSW 1999**

Health Area	Duration of pregnancy at first antenatal visit (weeks)						TOTAL	
	0-19		20+		Not stated		No.	%
	No.	%	No.	%	No.	%	No.	%
Central Sydney	34	55.7	27	44.3	0	0.0	61	100.0
Northern Sydney <sup>#</sup>	—	—	—	—	—	—	9	100.0
Western Sydney	69	49.6	67	48.2	3	2.2	139	100.0
Wentworth	46	62.2	24	32.4	4	5.4	74	100.0
South Western Sydney	46	50.5	40	44.0	5	5.5	91	100.0
Central Coast	37	74.0	12	24.0	1	2.0	50	100.0
Hunter	65	66.3	31	31.6	2	2.0	98	100.0
Illawarra	71	68.3	31	29.8	2	1.9	104	100.0
South Eastern Sydney	26	57.8	15	33.3	4	8.9	45	100.0
Northern Rivers	100	61.7	56	34.6	6	3.7	162	100.0
Mid North Coast	155	67.4	60	26.1	15	6.5	230	100.0
New England	224	82.1	38	13.9	11	4.0	273	100.0
Macquarie	140	60.9	78	33.9	12	5.2	230	100.0
Mid Western	88	71.5	26	21.1	9	7.3	123	100.0
Far West	93	57.4	50	30.9	19	11.7	162	100.0
Greater Murray	91	78.4	20	17.2	5	4.3	116	100.0
Southern	39	57.4	17	25.0	12	17.6	68	100.0
Other—Not stated	17	70.8	5	20.8	2	8.3	24	100.0
TOTAL	1348	65.5	599	29.1	112	5.4	2059	100.0

Source: NSW Midwives Data Collection (HOIST), Epidemiology and Surveillance Branch, NSW Health Department.

# Information not shown for Health Areas where the number of mothers is less than five in a group.

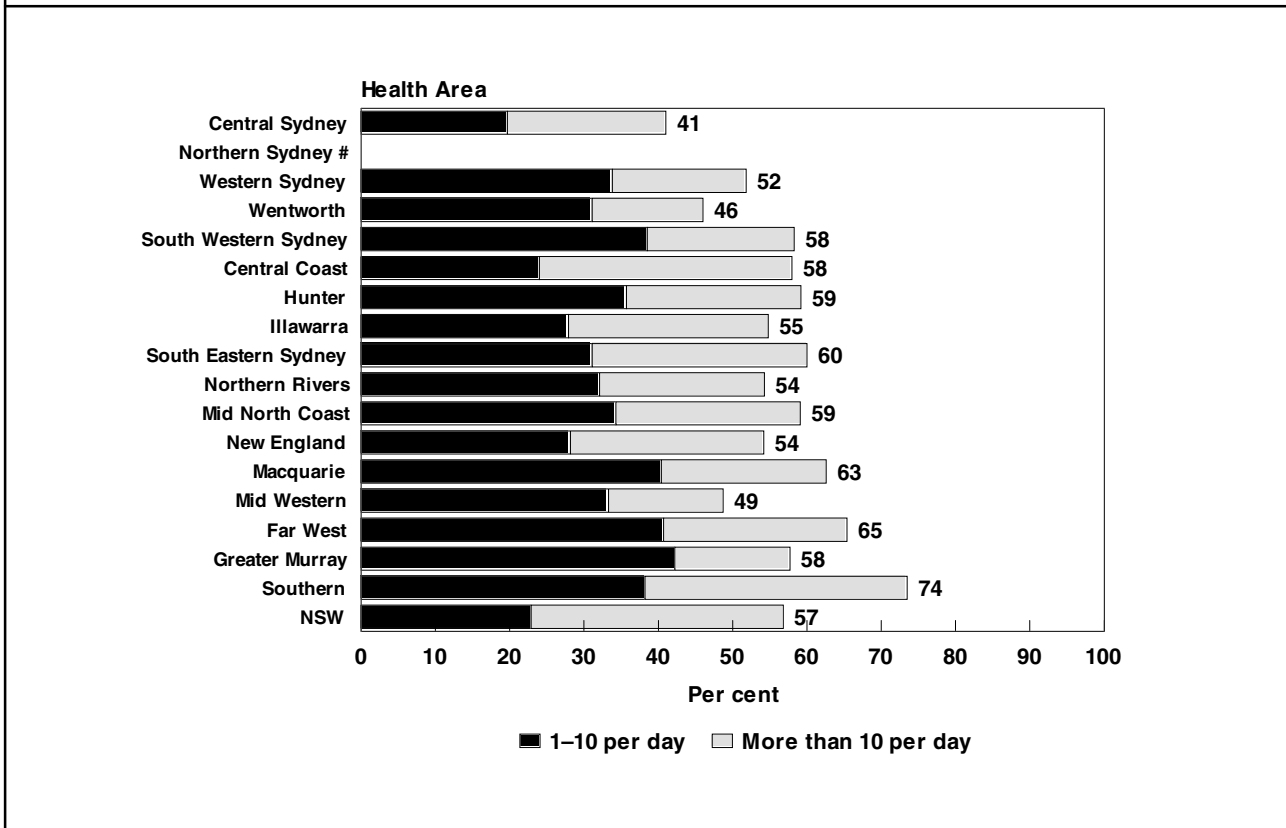
### 3.7 SMOKING IN PREGNANCY

In 1999, 58.9 per cent of Aboriginal and Torres Strait Islander mothers reported smoking at some time during pregnancy, compared to 60.9 per cent in 1995. This compares with 18.0 per cent of all mothers who reported smoking at some time during pregnancy in 1999 (see Section 1.8, page 21).

Smoking in the second half of pregnancy poses the greatest risk to the health of both mother and baby. In 1999, 56.8 per cent of Aboriginal and Torres Strait Islander mothers reported smoking in the second half of pregnancy. This percentage varied from 46.0 per cent in the Wentworth Area to 73.5 per cent in the Southern Area (Figure 4).

**FIGURE 4**

**SMOKING IN THE SECOND HALF OF PREGNANCY AMONG ABORIGINAL AND TORRES STRAIT ISLANDER MOTHERS BY AMOUNT SMOKED AND HEALTH AREA OF RESIDENCE, NSW 1999**



Source: NSW Midwives Data Collection (HOIST). Epidemiology and Surveillance Branch, NSW Health Department.  
 # Information not shown for Health Areas where the number of mothers is less than five in a group.

### 3.8 MEDICAL CONDITIONS AND OBSTETRIC COMPLICATIONS

In 1999, there were similar rates of diabetes and essential hypertension reported among Aboriginal and Torres Strait

Islander mothers than non-Aboriginal or Torres Strait Islander mothers, and slightly lower rates of gestational diabetes and pregnancy induced hypertension (Table 35).

**TABLE 35**

**MATERNAL MEDICAL CONDITIONS AND OBSTETRIC COMPLICATIONS BY ABORIGINALITY, NSW 1999**

Condition	Aboriginal and Torres Strait Islander		Aboriginality Non-Aboriginal or Torres Strait Islander		TOTAL	
	No.	%	No.	%	No.	%
Diabetes mellitus	13	0.6	350	0.4	363	0.4
Gestational diabetes	65	3.2	3189	3.8	3254	3.8
Essential hypertension	21	1.0	795	0.9	816	0.9
Pregnancy- induced hypertension	121	5.9	6073	7.2	6194	7.2
TOTAL CONFINEMENTS <sup>#</sup>	2059	100.0	83899	100.0	85967	100.0

Source: NSW Midwives Data Collection (HOIST). Epidemiology and Surveillance Branch, NSW Health Department.

# Total confinements include nine confinements where maternal Aboriginality was not stated.

### 3.9 LABOUR AND DELIVERY

The rate of induction of labour among Aboriginal and Torres Strait Islander mothers increased from 15.2 to 18.2 per cent between 1995 and 1999, while the rate of spontaneous onset of labour decreased from 77.3 to 73.4 per cent (Table 36).

These trends follow statewide trends (Section 1.10, page 23). However, the rate of induction of labour among Aboriginal

and Torres Strait Islander mothers continued to be lower than the NSW rate, which was 24.1 per cent in 1999.

Since 1995, the rate of normal vaginal birth has remained stable at about 77 per cent and the caesarean section rate was stable at about 16 per cent (Table 37). Over the five year period, the percentage of deliveries by vacuum extraction almost doubled from 1.4 to 2.6 per cent.

**TABLE 36**

**LABOUR ONSET FOR ABORIGINAL AND TORRES STRAIT ISLANDER MOTHERS, NSW 1995–1999**

Labour onset	1995		1996		Year 1997		1998		1999	
	No.	%	No.	%	No.	%	No.	%	No.	%
Spontaneous	1345	77.3	1315	76.8	1377	74.8	1467	71.8	1512	73.4
No labour <sup>#</sup>	128	7.4	112	6.5	153	8.3	176	8.6	172	8.4
Induced	265	15.2	284	16.6	311	16.9	400	19.6	375	18.2
Not stated	1	0.1	1	0.1	1	0.1	0	0.0	0	0.0
TOTAL	1739	100.0	1712	100.0	1842	100.0	2043	100.0	2059	100.0

Source: NSW Midwives Data Collection (HOIST). Epidemiology and Surveillance Branch, NSW Health Department.

# No labour indicates elective caesarean section.

**TABLE 37**

**TYPE OF DELIVERY AMONG ABORIGINAL AND TORRES STRAIT ISLANDER MOTHERS, NSW 1995–1999**

Type of delivery	1995		1996		Year 1997		1998		1999	
	No.	%	No.	%	No.	%	No.	%	No.	%
Normal vaginal	1347	77.5	1327	77.5	1423	77.3	1563	76.5	1586	77.0
Forceps	57	3.3	51	3.0	47	2.6	56	2.7	64	3.1
Vacuum extraction	25	1.4	31	1.8	45	2.4	43	2.1	54	2.6
Vaginal breech	25	1.4	28	1.6	15	0.8	27	1.3	25	1.2
Elective caesarean section	128	7.4	112	6.5	153	8.3	176	8.6	172	8.4
Emergency caesarean section <sup>#</sup>	155	8.9	162	9.5	159	8.6	177	8.7	158	7.7
Not stated	2	0.1	1	0.1	0	0.0	1	0.0	0	0.0
TOTAL	1739	100.0	1712	100.0	1842	100.0	2043	100.0	2059	100.0

Source: NSW Midwives Data Collection (HOIST). Epidemiology and Surveillance Branch, NSW Health Department.

# Emergency caesarean section includes caesarean sections where the onset of labour was not stated.

### 3.10 BIRTHWEIGHT

Since 1995, the rate of low birthweight (less than 2,500 grams) in Aboriginal and Torres Strait Islander babies has been over 10 per cent and was 12.6 per cent in 1999 (Table 38). This is about twice the rate for NSW overall, which was 6.2 per cent in 1999. In 1999, the highest rates of low birthweight were 17.8 per cent in both Far West and South Eastern Sydney Areas (Table 39).

**TABLE 38**

**WEIGHT OF ABORIGINAL AND TORRES STRAIT ISLANDER BABIES, NSW 1995–1999**

Birthweight (grams)	1995		1996		Year 1997		1998		1999	
	No.	%	No.	%	No.	%	No.	%	No.	%
Less than 1,000	20	1.1	25	1.5	30	1.6	24	1.2	20	1.0
1,000–1,499	19	1.1	15	0.9	18	1.0	19	0.9	24	1.2
1,500–2,499	157	8.9	143	8.3	175	9.4	174	8.4	217	10.4
2,500+	1562	88.8	1538	89.2	1631	88.0	1850	89.5	1816	87.4
Not stated	1	0.1	3	0.2	0	0.0	1	0.0	1	0.0
TOTAL	1759	100.0	1724	100.0	1854	100.0	2068	100.0	2078	100.0

Source: NSW Midwives Data Collection (HOIST), Epidemiology and Surveillance Branch, NSW Health Department.

**TABLE 39**

**WEIGHT OF ABORIGINAL AND TORRES STRAIT ISLANDER BABIES BY HEALTH AREA OF RESIDENCE, NSW 1999**

Health Area	Less than 2,500		Birthweight (grams) 2,500+		Not stated		TOTAL	
	No.	%	No.	%	No.	%	No.	%
Central Sydney	9	14.8	52	85.2	0	0.0	61	100.0
Northern Sydney	0	0.0	9	100.0	0	0.0	9	100.0
Western Sydney	15	10.8	124	89.2	0	0.0	139	100.0
Wentworth	4	5.4	70	94.6	0	0.0	74	100.0
South Western Sydney	15	16.1	78	83.9	0	0.0	93	100.0
Central Coast	6	12.0	44	88.0	0	0.0	50	100.0
Hunter	18	18.4	80	81.6	0	0.0	98	100.0
Illawarra	7	6.7	97	93.3	0	0.0	104	100.0
South Eastern Sydney	8	17.8	37	82.2	0	0.0	45	100.0
Northern Rivers	17	10.4	146	89.6	0	0.0	163	100.0
Mid North Coast	22	9.5	210	90.5	0	0.0	232	100.0
New England	38	13.9	236	86.1	0	0.0	274	100.0
Macquarie	30	12.9	202	87.1	0	0.0	232	100.0
Mid Western	22	16.8	109	83.2	0	0.0	131	100.0
Far West	29	17.8	134	82.2	0	0.0	163	100.0
Greater Murray	8	6.8	109	93.2	0	0.0	117	100.0
Southern	10	14.5	58	84.1	1	1.4	69	100.0
Other–Not stated	3	12.5	21	87.5	0	0.0	24	100.0
TOTAL	261	12.6	1816	87.4	1	0.0	2078	100.0

Source: NSW Midwives Data Collection (HOIST), Epidemiology and Surveillance Branch, NSW Health Department.



### 3.13 GESTATIONAL AGE

Since 1995, the rate of prematurity (less than 37 weeks gestation) in Aboriginal and Torres Strait Islander babies has been over 10 per cent. The rate was 12.3 per cent in 1999 (Table 40)—about one and a half times higher than the rate of 7.2 per cent for NSW overall. In 1999, the highest rates of prematurity were in the Central Sydney (26.2 per cent) and Hunter Areas (21.4 per cent) (Table 41).

**TABLE 40**

**GESTATIONAL AGE OF ABORIGINAL AND TORRES STRAIT ISLANDER BABIES, NSW 1995–1999**

Gestational age (weeks)	1995		1996		Year 1997		1998		1999	
	No.	%	No.	%	No.	%	No.	%	No.	%
20–27	22	1.3	25	1.5	29	1.6	26	1.3	18	0.9
28–31	19	1.1	17	1.0	18	1.0	26	1.3	29	1.4
32–36	147	8.4	139	8.1	182	9.8	167	8.1	209	10.1
37–41	1530	87.0	1508	87.5	1584	85.4	1822	88.1	1780	85.7
42+	40	2.3	33	1.9	40	2.2	27	1.3	42	2.0
Not stated	1	0.1	2	0.1	1	0.1	0	0.0	0	0.0
TOTAL	1759	100.0	1724	100.0	1854	100.0	2068	100.0	2078	100.0

Source: NSW Midwives Data Collection (HOIST). Epidemiology and Surveillance Branch, NSW Health Department.

**TABLE 41**

**GESTATIONAL AGE OF ABORIGINAL AND TORRES STRAIT ISLANDER BABIES BY HEALTH AREA OF RESIDENCE, NSW 1999**

Health Area	Less than 37		Gestational age (weeks) 37+		TOTAL	
	No.	%	No.	%	No.	%
Central Sydney	16	26.2	45	73.8	61	100.0
Northern Sydney <sup>#</sup>	—	—	—	—	9	100.0
Western Sydney	16	11.5	123	88.5	139	100.0
Wentworth	7	9.5	67	90.5	74	100.0
South Western Sydney	13	14.0	80	86.0	93	100.0
Central Coast	6	12.0	44	88.0	50	100.0
Hunter	21	21.4	77	78.6	98	100.0
Illawarra	9	8.7	95	91.3	104	100.0
South Eastern Sydney	5	11.1	40	88.9	45	100.0
Northern Rivers	14	8.6	149	91.4	163	100.0
Mid North Coast	25	10.8	207	89.2	232	100.0
New England	28	10.2	246	89.8	274	100.0
Macquarie	29	12.5	203	87.5	232	100.0
Mid Western	23	17.6	108	82.4	131	100.0
Far West	26	16.0	137	84.0	163	100.0
Greater Murray	8	6.8	109	93.2	117	100.0
Southern	6	8.7	63	91.3	69	100.0
Other—Not stated	3	12.5	21	87.5	24	100.0
TOTAL	256	12.3	1822	87.7	2078	100.0

Source: NSW Midwives Data Collection (HOIST). Epidemiology and Surveillance Branch, NSW Health Department.

<sup>#</sup> Information not shown for Health Areas where the number of babies is less than five in a group.

### 3.14 APGAR SCORE

In 1999, 2.9 per cent of Aboriginal and Torres Strait Islander babies were born with an Apgar score less than seven (Table 42). This rate has decreased since 1995, but is still slightly higher than the rate of 2.4 per cent for NSW overall (Section 1.15, page 26).

**TABLE 42**

**APGAR SCORE OF ABORIGINAL AND TORRES STRAIT ISLANDER BABIES, NSW 1995–1999**

Apgar score at 5 minutes	1995		1996		Year 1997		1998		1999	
	No.	%	No.	%	No.	%	No.	%	No.	%
0–4	51	2.9	33	1.9	42	2.3	38	1.8	36	1.7
5–7	27	1.5	34	2.0	34	1.8	28	1.4	24	1.2
7+	1675	95.2	1652	95.8	1770	95.5	1989	96.2	2003	96.4
Not stated	6	0.3	5	0.3	8	0.4	13	0.6	15	0.7
TOTAL	1759	100.0	1724	100.0	1854	100.0	2068	100.0	2078	100.0

Source: NSW Midwives Data Collection (HOIST). Epidemiology and Surveillance Branch, NSW Health Department.

### 3.15 PERINATAL MORTALITY

Since 1995, the perinatal mortality rate among Aboriginal and Torres Strait Islander babies has varied from 14.0 to 20.0 per 1,000 births (Table 43). The rate of 14.0 per 1,000 in 1999 is about one and a half times the rate of 9.2 per 1,000 for NSW overall (Section 1.16, page 26).

**TABLE 43**

**PERINATAL DEATHS AMONG ABORIGINAL AND TORRES STRAIT ISLANDER BABIES, NSW 1995–1999#**

Perinatal deaths	1995		1996		Year 1997		1998		1999	
	No.	Rate/1,000	No.	Rate/1,000	No.	Rate/1,000	No.	Rate/1,000	No.	Rate/1,000
Stillbirth	21	11.9	20	11.6	24	12.9	21	10.2	21	10.1
Neonatal death	13	7.4	10	5.8	13	7.0	11	5.3	8	3.8
TOTAL PERINATAL DEATHS	34	19.3	30	17.4	37	20.0	32	15.5	29	14.0

Source: NSW Midwives Data Collection (HOIST). Epidemiology and Surveillance Branch, NSW Health Department.

# Perinatal deaths include deaths reported to the MDC only. As the MDC form is completed at discharge or transfer of the baby, deaths occurring after this time may not be reported to the MDC.

## PART 4: MATERNAL COUNTRY OF BIRTH

In this section maternal countries of birth are combined into English-speaking and other regional groups. The country groups and individual countries are listed in Appendix 3. Recent trends in confinements for individual maternal countries of birth are shown in Table 4.

### 4.1 TRENDS IN CONFINEMENTS

Between 1995 and 1999, about 20 per cent of mothers were born in non-English speaking countries (Table 44). The proportion of mothers from Asian countries increased slightly from 9.9 to 10.8 per cent, while the proportion of mothers from southern European countries continued to decrease slightly from 1.9 to 1.6 per cent.

**TABLE 44**

**CONFINEMENTS AND BIRTHS BY COUNTRY OF BIRTH GROUP, NSW 1995–1999**

Plurality	1995		1996		Year 1997		1998		1999	
	No.	%	No.	%	No.	%	No.	%	No.	%
<b>Confinements</b>										
English speaking	69311	80.3	67889	79.6	68827	79.2	67971	79.9	68381	79.5
Central & South America	669	0.8	756	0.9	687	0.8	683	0.8	725	0.8
Melanesia, Micronesia & Polynesia	1356	1.6	1410	1.7	1561	1.8	1590	1.9	1540	1.8
Southern Europe	1632	1.9	1530	1.8	1516	1.7	1380	1.6	1337	1.6
Western & Northern Europe	612	0.7	614	0.7	627	0.7	646	0.8	690	0.8
Eastern Europe, Russia, Central Asian & Baltic States	403	0.5	364	0.4	393	0.5	362	0.4	421	0.5
Middle East & Africa	3690	4.3	3676	4.3	3793	4.4	3670	4.3	3579	4.2
South East Asia	4462	5.2	4587	5.4	4599	5.3	4157	4.9	4659	5.4
North East Asia	2961	3.4	3226	3.8	3325	3.8	3097	3.6	3225	3.8
Southern Asia	1102	1.3	1170	1.4	1407	1.6	1349	1.6	1398	1.6
Other–Not stated	65	0.1	80	0.1	185	0.2	167	0.2	12	0.0
<b>TOTAL</b>	<b>86263</b>	<b>100.0</b>	<b>85302</b>	<b>100.0</b>	<b>86920</b>	<b>100.0</b>	<b>85072</b>	<b>100.0</b>	<b>85967</b>	<b>100.0</b>
<b>Births</b>										
English speaking	70255	80.4	68816	79.6	69843	79.2	69008	80.0	69460	79.6
Central & South America	675	0.8	761	0.9	693	0.8	689	0.8	730	0.8
Melanesia, Micronesia & Polynesia	1370	1.6	1431	1.7	1585	1.8	1610	1.9	1555	1.8
Southern Europe	1662	1.9	1559	1.8	1532	1.7	1412	1.6	1361	1.6
Western & Northern Europe	623	0.7	625	0.7	633	0.7	652	0.8	710	0.8
Eastern Europe, Russia, Central Asian & Baltic States	411	0.5	366	0.4	398	0.5	365	0.4	423	0.5
Middle East & Africa	3726	4.3	3722	4.3	3854	4.4	3731	4.3	3644	4.2
South East Asia	4507	5.2	4624	5.4	4636	5.3	4181	4.8	4707	5.4
North East Asia	2976	3.4	3260	3.8	3355	3.8	3118	3.6	3266	3.7
Southern Asia	1119	1.3	1182	1.4	1416	1.6	1360	1.6	1420	1.6
Other–Not stated	67	0.1	83	0.1	188	0.2	179	0.2	13	0.0
<b>TOTAL</b>	<b>87391</b>	<b>100.0</b>	<b>86429</b>	<b>100.0</b>	<b>88133</b>	<b>100.0</b>	<b>86305</b>	<b>100.0</b>	<b>87289</b>	<b>100.0</b>

Source: NSW Midwives Data Collection (HOIST). Epidemiology and Surveillance Branch, NSW Health Department.

## 4.2 MATERNAL AGE

Births to teenage mothers were more common among mothers born in English-speaking countries than non-English speaking countries (Table 45, Figure 5), while the largest proportions of mothers aged 35 years and over were born in North East Asia (30.5 per cent) and Western and Northern Europe (27.4 per cent).

**TABLE 45**

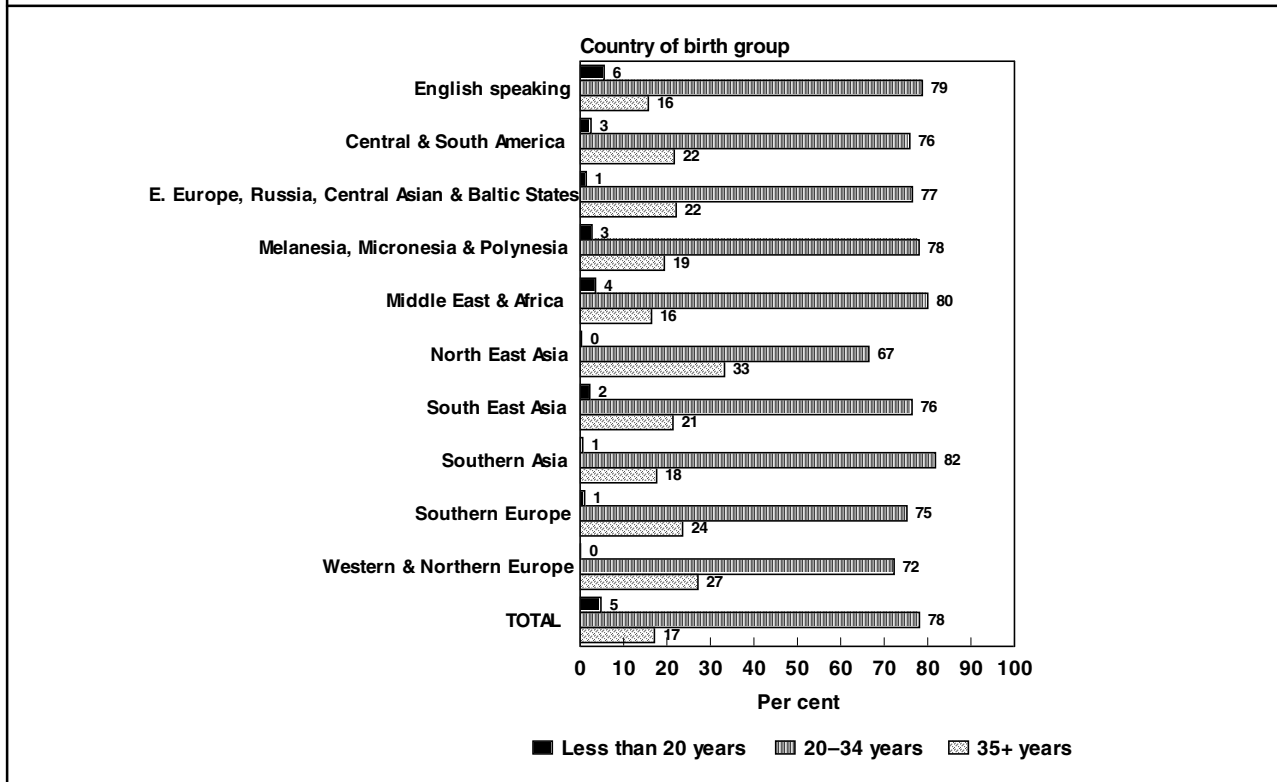
**AGE OF MOTHER BY COUNTRY OF BIRTH GROUP, NSW 1999**

Country of birth group	12-19		20-34		Maternal age (years) 35+		Not stated		TOTAL	
	No.	%	No.	%	No.	%	No.	%	No.	%
English speaking	3770	5.5	53875	78.8	10712	15.7	24	0.0	68381	100.0
Central & South America	18	2.5	550	75.9	157	21.7	0	0.0	725	100.0
Melanesia, Micronesia & Polynesia	41	2.7	1201	78.0	298	19.4	0	0.0	1540	100.0
Southern Europe	14	1.0	1006	75.2	316	23.6	1	0.1	1337	100.0
Western & Northern Europe	1	0.1	499	72.3	187	27.1	3	0.4	690	100.0
Eastern Europe, Russia, Central Asian & Baltic States	6	1.4	322	76.5	93	22.1	0	0.0	421	100.0
Middle East & Africa	126	3.5	2864	80.0	588	16.4	1	0.0	3579	100.0
South East Asia	104	2.2	3558	76.4	997	21.4	0	0.0	4659	100.0
North East Asia	10	0.3	2145	66.5	1070	33.2	0	0.0	3225	100.0
Southern Asia	9	0.6	1143	81.8	246	17.6	0	0.0	1398	100.0
Other-Not stated	0	0.0	8	66.7	4	33.3	0	0.0	12	100.0
<b>TOTAL</b>	<b>4099</b>	<b>4.8</b>	<b>67171</b>	<b>78.1</b>	<b>14668</b>	<b>17.1</b>	<b>29</b>	<b>0.0</b>	<b>85967</b>	<b>100.0</b>

Source: NSW Midwives Data Collection (HOIST). Epidemiology and Surveillance Branch, NSW Health Department.

**FIGURE 5**

**AGE OF MOTHER BY COUNTRY OF BIRTH GROUP, NSW 1999**



Source: NSW Midwives Data Collection (HOIST). Epidemiology and Surveillance Branch, NSW Health Department.

### 4.3 HEALTH AREA OF RESIDENCE

In 1999, the proportion of mothers born in non-English speaking countries was highest in the Central Sydney Area (43.4 per cent), followed by the South Western Sydney and Western Sydney Areas (38.0 and 36.1 per cent respectively). Five per cent of mothers were born in South East Asian countries, 40.6 per cent of whom were

resident in the South Western Sydney Area. Four per cent of mothers were born in Middle Eastern or African countries and 58.7 per cent of these mothers were resident in the South Western or Western Sydney Areas. A further 3.8 per cent of mothers were born in North East Asian countries, the majority living in the Central Sydney, Northern Sydney or Western Sydney Areas (Table 46).

**TABLE 46**

**HEALTH AREA OF RESIDENCE BY MATERNAL COUNTRY OF BIRTH GROUP, NSW 1999\***

Health Area	Country of birth group																				TOTAL			
	English speaking		Central & South America		Melanesia & Micronesia & Polynesia		Southern Europe		Western & Northern Europe		Eastern Europe Russia, Central Asian & Baltic States		Middle East & Africa		South East Asia		North East Asia		Southern Asia			Other-Not stated		
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%		No.	%	No.
Central Sydney	3749	56.6	86	1.3	247	3.7	201	3.0	76	1.1	42	0.6	578	8.7	687	10.4	746	11.3	211	3.2	2	0.0	6625	100.0
Northern Sydney	7288	78.9	79	0.9	82	0.9	115	1.2	189	2.0	73	0.8	230	2.5	346	3.7	644	7.0	195	2.1	1	0.0	9242	100.0
Western Sydney	6841	63.9	96	0.9	449	4.2	182	1.7	52	0.5	64	0.6	991	9.3	828	7.7	704	6.6	504	4.7	1	0.0	10712	100.0
Wentworth South	4402	90.7	32	0.7	49	1.0	58	1.2	33	0.7	13	0.3	69	1.4	106	2.2	26	0.5	63	1.3	0	0.0	4851	100.0
Western Sydney	7570	62.0	233	1.9	419	3.4	357	2.9	55	0.5	72	0.6	1111	9.1	1892	15.5	328	2.7	181	1.5	1	0.0	12219	100.0
Central Coast	3539	96.6	12	0.3	21	0.6	8	0.2	19	0.5	-	-	10	0.3	32	0.9	13	0.4	8	0.2	-	-	3665	100.0
Hunter Illawarra	6731	96.6	10	0.1	26	0.4	37	0.5	19	0.3	6	0.1	16	0.2	87	1.2	19	0.3	13	0.2	1	0.0	6965	100.0
South Eastern Sydney	4047	91.7	19	0.4	27	0.6	103	2.3	32	0.7	9	0.2	61	1.4	74	1.7	28	0.6	12	0.3	1	0.0	4413	100.0
Northern Rivers	6948	73.7	134	1.4	138	1.5	244	2.6	118	1.3	122	1.3	468	5.0	466	4.9	640	6.8	150	1.6	0	0.0	9428	100.0
Mid North Coast	2788	96.0	-	-	13	0.4	-	-	27	0.9	-	-	10	0.3	34	1.2	15	0.5	6	0.2	1	0.0	2903	100.0
New England	2802	96.4	7	0.2	11	0.4	-	-	14	0.5	-	-	7	0.2	35	1.2	10	0.3	14	0.5	-	-	2906	100.0
Macquarie	2289	97.5	-	-	6	0.3	-	-	14	0.6	-	-	5	0.2	13	0.6	10	0.4	5	0.2	0	0.0	2348	100.0
Mid Western	1565	98.1	-	-	5	0.3	-	-	5	0.3	-	-	5	0.3	8	0.5	-	-	0	0.0	0	0.0	1596	100.0
Far West	2241	97.6	-	-	9	0.4	7	0.3	10	0.4	-	-	1	0.0	14	0.6	8	0.3	-	-	0	0.0	2297	100.0
Greater Murray	526	98.7	0	0.0	-	-	-	-	-	-	0	0.0	0	0.0	-	-	-	-	0	0.0	0	0.0	533	100.0
Southern	2513	96.5	-	-	18	0.7	6	0.2	7	0.3	-	-	8	0.3	9	0.3	12	0.5	26	1.0	0	0.0	2603	100.0
Other-Not stated	1773	96.1	-	-	12	0.7	8	0.4	11	0.6	-	-	5	0.3	16	0.9	9	0.5	6	0.3	1	0.1	1845	100.0
TOTAL	769	94.2	4	0.5	-	-	3	0.4	-	-	1	0.1	-	-	-	-	8	1.0	-	-	1	0.1	816	100.0
	68381	79.5	725	0.8	1540	1.8	1337	1.6	690	0.8	421	0.5	3579	4.2	4659	5.4	3225	3.8	1398	1.6	12	0.0	85967	100.0

Source: NSW Midwives Data Collection (HOIST). Epidemiology and Surveillance Branch, NSW Health Department.

# Data not shown for country of birth groups with less than five in a group.

#### 4.4 BOOKING STATUS

In 1999, 98.0 per cent of all mothers were booked at the hospital of birth. The lowest rate (94.7 per cent) was in mothers born in Melanesia, Micronesia and Polynesia. This compared with 97.9 per cent of mothers born in English speaking countries and over 98 per cent of mothers in other country of birth groups.

#### 4.5 DURATION OF PREGNANCY AT FIRST ANTENATAL VISIT

In 1999, 86.2 per cent of all mothers commenced antenatal care before 20 weeks gestation. There was some variation between country of birth groups, with 88.1 per cent of mothers born in English speaking countries commencing antenatal care before 20 weeks gestation, compared with 55.0 per cent of mothers born in Melanesia, Micronesia and Polynesia and 70.8 per cent of mothers born in the Middle East and Africa (Table 47).

**TABLE 47**

**CONFINEMENTS BY COUNTRY OF BIRTH GROUP AND DURATION OF PREGNANCY AT FIRST ANTENATAL VISIT, NSW 1999**

Country of birth group	0-19		Duration of pregnancy at first antenatal visit (weeks)				TOTAL	
	No.	%	No.	%	No.	%	No.	%
English speaking	60229	88.1	7407	10.8	745	1.1	68381	100.0
Central & South America	605	83.4	116	16.0	4	0.6	725	100.0
Melanesia, Micronesia & Polynesia	847	55.0	636	41.3	57	3.7	1540	100.0
Southern Europe	1158	86.6	170	12.7	9	0.7	1337	100.0
Western & Northern Europe	621	90.0	66	9.6	3	0.4	690	100.0
Eastern Europe, Russia, Central Asian & Baltic States	344	81.7	72	17.1	5	1.2	421	100.0
Middle East & Africa	2533	70.8	1028	28.7	18	0.5	3579	100.0
South East Asia	3902	83.8	725	15.6	32	0.7	4659	100.0
North East Asia	2654	82.3	546	16.9	25	0.8	3225	100.0
Southern Asia	1178	84.3	211	15.1	9	0.6	1398	100.0
Other-Not stated	6	50.0	2	16.7	4	33.3	12	100.0
<b>TOTAL</b>	<b>74077</b>	<b>86.2</b>	<b>10979</b>	<b>12.8</b>	<b>911</b>	<b>1.1</b>	<b>85967</b>	<b>100.0</b>

Source: NSW Midwives Data Collection (HOIST). Epidemiology and Surveillance Branch, NSW Health Department.

#### 4.6 SMOKING IN PREGNANCY

In 1999, smoking at any time during pregnancy was far more common among mothers born in English speaking countries than mothers born in non-English speaking countries (Table 48). About one in five mothers born in English speaking countries smoked at some time during pregnancy, compared with one in eight or fewer mothers born in non-English speaking countries.

Smoking in the second half of pregnancy poses the greatest risk to the health of both mother and baby. Mothers born in non-English speaking countries were more likely to quit smoking in the second half of pregnancy compared to mothers born in English-speaking countries (Table 49).

**TABLE 48**

**CONFINEMENTS BY COUNTRY OF BIRTH GROUP AND SMOKING IN PREGNANCY, NSW 1999**

Country of birth group	No		Smoking in pregnancy				TOTAL	
	No.	%	No.	%	No.	%	No.	%
English speaking	53143	77.7	15227	22.3	11	0.0	68381	100.0
Central & South America	675	93.1	50	6.9	0	0.0	725	100.0
Melanesia, Micronesia & Polynesia	1370	89.0	170	11.0	0	0.0	1540	100.0
Southern Europe	1165	87.1	172	12.9	0	0.0	1337	100.0
Western & Northern Europe	612	88.7	77	11.2	1	0.1	690	100.0
Eastern Europe, Russia, Central Asian & Baltic States	386	91.7	35	8.3	0	0.0	421	100.0
Middle East & Africa	3204	89.5	375	10.5	0	0.0	3579	100.0
South East Asia	4518	97.0	140	3.0	1	0.0	4659	100.0
North East Asia	3184	98.7	41	1.3	0	0.0	3225	100.0
Southern Asia	1385	99.1	13	0.9	0	0.0	1398	100.0
Other-Not stated	10	83.3	2	16.7	0	0.0	12	100.0
<b>TOTAL</b>	<b>69652</b>	<b>81.0</b>	<b>16302</b>	<b>19.0</b>	<b>13</b>	<b>0.0</b>	<b>85967</b>	<b>100.0</b>

Source: NSW Midwives Data Collection (HOIST). Epidemiology and Surveillance Branch, NSW Health Department.

**TABLE 49****MOTHERS WHO SMOKED AT ALL DURING PREGNANCY BY NUMBER OF CIGARETTES SMOKED IN THE SECOND HALF OF PREGNANCY AND COUNTRY OF BIRTH GROUP, NSW 1999**

Country of birth group	Cigarettes smoked in the second half of pregnancy								TOTAL	
	None		More than ten per day		1-10 per day		Amount not stated			
	No.	%	No.	%	No.	%	No.	%	No.	%
English speaking	658	4.3	7580	49.8	6720	44.1	269	1.8	15227	100.0
Central & South America	4	8.0	20	40.0	25	50.0	1	2.0	50	100.0
Melanesia, Micronesia & Polynesia	10	5.9	58	34.1	98	57.6	4	2.4	170	100.0
Southern Europe	8	4.7	77	44.8	85	49.4	2	1.2	172	100.0
Western & Northern Europe	5	6.5	33	42.9	38	49.4	1	1.3	77	100.0
Eastern Europe, Russia, Central Asian & Baltic States	3	8.6	13	37.1	18	51.4	1	2.9	35	100.0
Middle East & Africa	16	4.3	143	38.1	208	55.5	8	2.1	375	100.0
South East Asia	20	14.3	33	23.6	81	57.9	6	4.3	140	100.0
North East Asia	11	26.8	6	14.6	23	56.1	1	2.4	41	100.0
Southern Asia	4	30.8	2	15.4	6	46.2	1	7.7	13	100.0
Other-Not stated	0	0.0	1	50.0	1	50.0	0	0.0	2	100.0
TOTAL	739	4.5	7966	48.9	7303	44.8	294	1.8	16302	100.0

Source: NSW Midwives Data Collection (HOIST), Epidemiology and Surveillance Branch, NSW Health Department.

#### 4.7 MEDICAL CONDITIONS AND OBSTETRIC COMPLICATIONS

In 1999, 1.0 per cent of mothers born in Melanesia, Micronesia and Polynesia were reported to have diabetes mellitus, twice the rate for all mothers in NSW. The rates of gestational diabetes in mothers born in Asian countries and Melanesia, Micronesia and Polynesia were over 7 per cent, and were more than twice the rate for all mothers in NSW (Table 50).

**TABLE 50****MATERNAL MEDICAL CONDITIONS AND OBSTETRIC COMPLICATIONS BY COUNTRY OF BIRTH GROUP, NSW 1999<sup>#</sup>**

Condition	Country of birth group																						TOTAL	
	English speaking		Central & South America		Melanesia & Micronesia & Polynesia		Southern Europe		Western & Northern Europe		Eastern Europe, Russia, Central Asian & Baltic States		Middle East & Africa		South East Asia		North East Asia		Southern Asia		Other/ Not stated			
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%		
Diabetes mellitus	279	0.4	4	0.6	15	1.0	5	0.4	2	0.3	1	0.2	12	0.3	23	0.5	16	0.5	6	0.4	0	0.0	363	0.4
Gestational diabetes	1859	2.7	41	5.7	120	7.8	78	5.8	21	3.0	14	3.3	220	6.1	416	8.9	336	10.4	149	10.7	0	0.0	3254	3.8
Essential hypertension	699	1.0	10	1.4	21	1.4	7	0.5	3	0.4	4	1.0	25	0.7	30	0.6	11	0.3	6	0.4	0	0.0	816	0.9
Pregnancy-induced hypertension	5252	7.7	59	8.1	113	7.3	86	6.4	57	8.3	21	5.0	140	3.9	248	5.3	115	3.6	103	7.4	0	0.0	6194	7.2
TOTAL <sup>#</sup>	68381	100.0	725	100.0	1540	100.0	1337	100.0	690	100.0	421	100.0	3579	100.0	4659	100.0	3225	100.0	1398	100.0	12	100.0	85967	100.0

Source: NSW Midwives Data Collection (HOIST), Epidemiology and Surveillance Branch, NSW Health Department.

# Total refers to total confinements in NSW.

## 4.8 LABOUR AND DELIVERY

Mothers born in non-English speaking countries were more likely to have a spontaneous onset of labour than mothers born in English speaking countries and less likely to be induced (Table 51).

Mothers born in the Middle East and Africa were more likely to have a normal vaginal delivery than mothers in other country of birth groups (Table 52). The highest caesarean section rate was among mothers born in Central and South America (21.1 per cent).

**TABLE 51**

**LABOUR ONSET BY COUNTRY OF BIRTH GROUP, NSW 1999**

Country of birth group	Spontaneous		No labour <sup>#</sup>		Onset of labour Induced		Not stated		TOTAL	
	No.	%	No.	%	No.	%	No.	%	No.	%
English speaking	43351	63.4	7442	10.9	17587	25.7	1	0.0	68381	100.0
Central & South America	506	69.8	70	9.7	149	20.6	0	0.0	725	100.0
Melanesia, Micronesia & Polynesia	1123	72.9	136	8.8	281	18.2	0	0.0	1540	100.0
Southern Europe	865	64.7	173	12.9	299	22.4	0	0.0	1337	100.0
Western & Northern Europe	458	66.4	73	10.6	159	23.0	0	0.0	690	100.0
Eastern Europe, Russia, Central Asian & Baltic States	302	71.7	41	9.7	78	18.5	0	0.0	421	100.0
Middle East & Africa	2652	74.1	289	8.1	638	17.8	0	0.0	3579	100.0
South East Asia	3639	78.1	394	8.5	626	13.4	0	0.0	4659	100.0
North East Asia	2349	72.8	382	11.8	494	15.3	0	0.0	3225	100.0
Southern Asia	952	68.1	146	10.4	300	21.5	0	0.0	1398	100.0
Other–Not stated	10	83.3	1	8.3	1	8.3	0	0.0	12	100.0
TOTAL	56207	65.4	9147	10.6	20612	24.0	1	0.0	85967	100.0

Source: NSW Midwives Data Collection (HOIST). Epidemiology and Surveillance Branch, NSW Health Department.

# No labour indicates elective caesarean section.

**TABLE 52**

**TYPE OF DELIVERY BY COUNTRY OF BIRTH GROUP, NSW 1999**

Country of birth group	Normal vaginal		Forceps		Vacuum extraction		Type of delivery Vaginal breech		Elective caesarean section		Emergency caesarean section <sup>#</sup>		TOTAL	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
English speaking	46833	68.5	3341	4.9	4003	5.9	591	0.9	7442	10.9	6171	9.0	68381	100.0
Central & South America	479	66.1	34	4.7	50	6.9	9	1.2	70	9.7	83	11.4	725	100.0
Melanesia, Micronesia & Polynesia	1157	75.1	48	3.1	56	3.6	19	1.2	136	8.8	124	8.1	1540	100.0
Southern Europe	899	67.2	64	4.8	91	6.8	12	0.9	173	12.9	98	7.3	1337	100.0
Western & Northern Europe	470	68.1	39	5.7	50	7.2	7	1.0	73	10.6	51	7.4	690	100.0
Eastern Europe, Russia, Central Asian & Baltic States	288	68.4	27	6.4	24	5.7	3	0.7	41	9.7	38	9.0	421	100.0
Middle East & Africa	2756	77.0	123	3.4	139	3.9	41	1.1	289	8.1	231	6.5	3579	100.0
South East Asia	3202	68.7	220	4.7	361	7.7	48	1.0	394	8.5	434	9.3	4659	100.0
North East Asia	1991	61.7	199	6.2	283	8.8	23	0.7	382	11.8	347	10.8	3225	100.0
Southern Asia	867	62.0	94	6.7	94	6.7	9	0.6	146	10.4	188	13.4	1398	100.0
Other–Not stated	9	75.0	1	8.3	1	8.3	0	0.0	1	8.3	0	0.0	12	100.0
TOTAL	58951	68.6	4190	4.9	5152	6.0	762	0.9	9147	10.6	7765	9.0	85967	100.0

Source: NSW Midwives Data Collection (HOIST). Epidemiology and Surveillance Branch, NSW Health Department.

# Emergency caesarean section includes caesarean sections where the onset of labour was not stated.



## 4.9 BIRTHWEIGHT

The rate of low birthweight (less than 2,500 grams) in 1999 was 6.3 per cent in NSW. The highest rates of low birthweight were in babies of mothers born in Southern Asian countries (9.1 per cent) (Table 53). Babies of mothers born in North East Asia and Southern Europe were least likely to be low birthweight.

**TABLE 53**

**BIRTHWEIGHT BY MATERNAL COUNTRY OF BIRTH GROUP, NSW 1999**

Country of birth group	Birthweight (grams)							
	Less than 2,500		2,500+		Not stated		TOTAL	
	No.	%	No.	%	No.	%	No.	%
English speaking	4450	6.4	64990	93.6	20	0.0	69460	100.0
Central & South America	48	6.6	682	93.4	0	0.0	730	100.0
Melanesia, Micronesia & Polynesia	89	5.7	1466	94.3	0	0.0	1555	100.0
Southern Europe	76	5.6	1284	94.3	1	0.1	1361	100.0
Western & Northern Europe	52	7.3	657	92.5	1	0.1	710	100.0
Eastern Europe, Russia, Central Asian & Baltic States	25	5.9	398	94.1	0	0.0	423	100.0
Middle East & Africa	207	5.7	3437	94.3	0	0.0	3644	100.0
South East Asia	319	6.8	4386	93.2	2	0.0	4707	100.0
North East Asia	142	4.3	3124	95.7	0	0.0	3266	100.0
Southern Asia	129	9.1	1291	90.9	0	0.0	1420	100.0
Other/Not stated	4	30.8	9	69.2	0	0.0	13	100.0
TOTAL	5541	6.3	81724	93.6	24	0.0	87289	100.0

Source: NSW Midwives Data Collection (HOIST). Epidemiology and Surveillance Branch, NSW Health Department.

## 4.10 GESTATIONAL AGE

The rate of prematurity (less than 37 weeks gestation) in 1999 was 7.1 per cent in NSW. The highest rates of prematurity were in babies of mothers born in Southern Asian countries (7.5 per cent). Babies of mothers born in North East Asia or the Middle East and Africa were least likely to be premature (Table 54).

**TABLE 54**

**GESTATIONAL AGE BY MATERNAL COUNTRY OF BIRTH GROUP, NSW 1999**

Country of birth group	Gestational age (weeks)							
	Less than 37		37+		Not stated		TOTAL	
	No.	%	No.	%	No.	%	No.	%
English speaking	5036	7.3	64417	92.7	7	0.0	69460	100.0
Central & South America	50	6.8	680	93.2	0	0.0	730	100.0
Melanesia, Micronesia & Polynesia	105	6.8	1450	93.2	0	0.0	1555	100.0
Southern Europe	92	6.8	1269	93.2	0	0.0	1361	100.0
Western & Northern Europe	66	9.3	644	90.7	0	0.0	710	100.0
Eastern Europe, Russia, Central Asian & Baltic States	31	7.3	392	92.7	0	0.0	423	100.0
Middle East & Africa	223	6.1	3421	93.9	0	0.0	3644	100.0
South East Asia	340	7.2	4367	92.8	0	0.0	4707	100.0
North East Asia	182	5.6	3084	94.4	0	0.0	3266	100.0
Southern Asia	107	7.5	1313	92.5	0	0.0	1420	100.0
Other-Not stated	4	30.8	9	69.2	0	0.0	13	100.0
TOTAL	6236	7.1	81046	92.8	7	0.0	87289	100.0

Source: NSW Midwives Data Collection (HOIST). Epidemiology and Surveillance Branch, NSW Health Department.

#### 4.11 APGAR SCORE

In 1999, 2.4 per cent of all babies (including stillborn babies) had an Apgar score of 7 or less at five minutes and 1.1 per cent had a score of less than 4 (Table 55). Low Apgar scores were most common among babies of mothers born in Melanesia, Micronesia and Polynesia (3.5 per cent).

**TABLE 55**

**BIRTHS BY COUNTRY OF BIRTH GROUP AND APGAR SCORE AT FIVE MINUTES, NSW 1999#**

Country of birth group	0-4		5-6		Apgar score 7+		Not stated		TOTAL	
	No.	%	No.	%	No.	%	No.	%	No.	%
English speaking	777	1.1	865	1.2	67686	97.4	132	0.2	69460	100.0
Central & South America	12	1.6	9	1.2	707	96.8	2	0.3	730	100.0
Melanesia, Micronesia & Polynesia	26	1.7	28	1.8	1497	96.3	4	0.3	1555	100.0
Southern Europe	14	1.0	18	1.3	1327	97.5	2	0.1	1361	100.0
Western & Northern Europe	8	1.1	7	1.0	691	97.3	4	0.6	710	100.0
Eastern Europe, Russia, Central Asian & Baltic States	3	0.7	5	1.2	415	98.1	0	0.0	423	100.0
Middle East & Africa	42	1.2	49	1.3	3547	97.3	6	0.2	3644	100.0
South East Asia	54	1.1	77	1.6	4566	97.0	10	0.2	4707	100.0
North East Asia	35	1.1	26	0.8	3203	98.1	2	0.1	3266	100.0
Southern Asia	24	1.7	14	1.0	1377	97.0	5	0.4	1420	100.0
Other/Not stated	1	7.7	0	0.0	12	92.3	0	0.0	13	100.0
TOTAL	996	1.1	1098	1.3	85028	97.4	167	0.2	87289	100.0

Source: NSW Midwives Data Collection (HOIST). Epidemiology and Surveillance Branch, NSW Health Department.  
# Births include stillbirths.

#### 4.12 PERINATAL OUTCOMES

In 1999, 99 per cent of babies born in NSW and reported to the MDC were born alive and survived until discharge from the hospital of birth (Table 56). Perinatal mortality was highest among babies of mothers born in Southern Asia, Central and South America and Melanesia, Micronesia and Polynesia.

**TABLE 56**

**PERINATAL OUTCOMES BY COUNTRY OF BIRTH GROUP, NSW 1999#**

Country of birth group	Liveborn surviving		Stillborn		Perinatal outcome Neonatal death		Not stated		Total births		Perinatal mortality rate/1,000 births
	No.	%	No.	%	No.	%	No.	%	No.	%	
English speaking	68815	99.1	416	0.6	216	0.3	13	0.0	69460	100.0	9.1
Central & South America	721	98.8	7	1.0	2	0.3	0	0.0	730	100.0	12.3
Melanesia, Micronesia & Polynesia	1536	98.8	12	0.8	7	0.5	0	0.0	1555	100.0	12.2
Southern Europe	1352	99.3	7	0.5	2	0.1	0	0.0	1361	100.0	6.6
Western & Northern Europe	701	98.7	5	0.7	2	0.3	2	0.3	710	100.0	9.9
Eastern Europe, Russia, Central Asian & Baltic States##	420	99.3	2	0.5	1	0.2	0	0.0	423	100.0	-
Middle East & Africa	3605	98.9	24	0.7	15	0.4	0	0.0	3644	100.0	10.7
South East Asia	4668	99.2	27	0.6	12	0.3	0	0.0	4707	100.0	8.3
North East Asia	3237	99.1	20	0.6	8	0.2	1	0.0	3266	100.0	8.6
Southern Asia	1401	98.7	13	0.9	6	0.4	0	0.0	1420	100.0	13.4
Other/Not stated	12	92.3	0	0.0	0	0.0	1	7.7	13	100.0	-
TOTAL	86468	99.1	533	0.6	271	0.3	17	0.0	87289	100.0	9.2

Source: NSW Midwives Data Collection (HOIST). Epidemiology and Surveillance Branch, NSW Health Department.

# Perinatal deaths include deaths reported to the MDC only. As the MDC form is completed at discharge or transfer of the baby, deaths occurring after this time may not be reported to the MDC.

## Perinatal mortality rate not calculated for country of birth groups with less than five perinatal deaths.

## PART 5: NEONATAL INTENSIVE CARE

Information on infants admitted to a neonatal intensive care unit was obtained from the Neonatal Intensive Care Units (NICUS) Data Collection, which is described in Part 1 under Data Sources.

### 5.1 REGISTRATION RATE

There were 1,991 infants registered in NICUS in 1999. The most common reasons for registration of an infant were assisted ventilation for four hours or more (74.4 per cent) and gestational age less than 29 weeks (19.4 per cent). Infants generally met more than one of the registration criteria.

The NICUS registration rate in 1999 was 21.8 per 1,000 live births, which has increased slightly each year since 1992 (17.9 per 1,000 live births). The ACT joined NICUS in 1995. Figure 6 and Table 57 show the registration rate according to the mothers' health area of residence. The relatively low registration rates from the health areas adjoining the

New South Wales border reflect the fact that some infants are preferentially referred interstate. The registration rate in health areas with low numbers of births should be interpreted with caution. The proportion of mothers in each health area has remained relatively constant since 1992.

Sixty-one of the 1,991 infants (3.1 per cent) registered in NICUS were born to Aboriginal and/or Torres Strait Islander mothers. There were 2,118 live births to Aboriginal and Torres Strait Islander women recorded by the NSW and ACT Midwives Data Collections for 1999. The registration rate for these infants was 28.8 per 1,000 live births and has increased since 1992. Fifty-six of the 1,828 mothers (3.1 per cent) were Aboriginal and Torres Strait Islander, of whom 17 (30.4 per cent) were residents of the Mid North Coast and Mid Western Health Areas (Table 58). Fifteen of the 367 mothers (4.1 per cent) of infants less than 29 weeks and/or less than 1,000 grams were Aboriginal and Torres Strait Islander.

**TABLE 57**

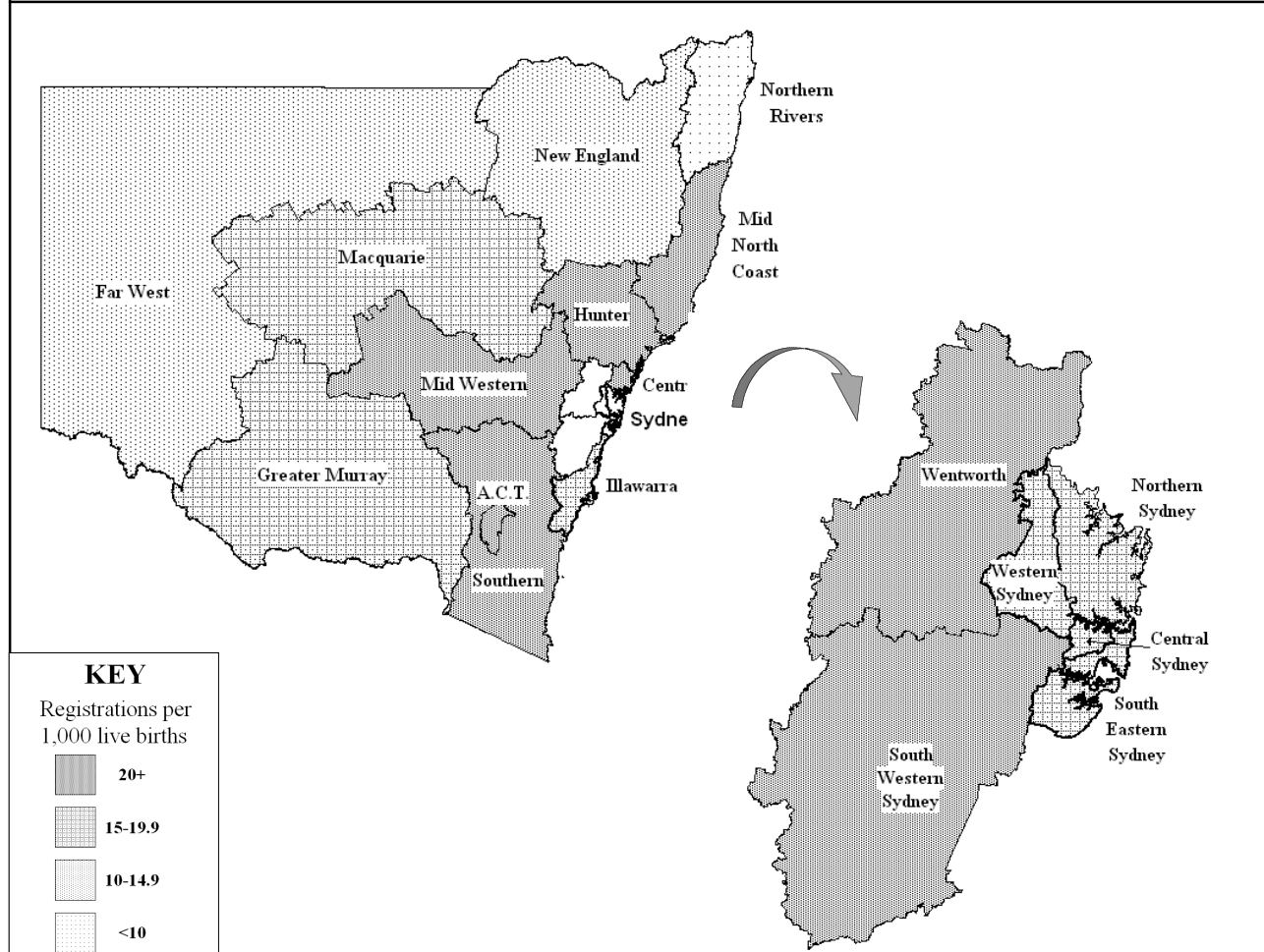
**NICUS REGISTRATIONS BY HEALTH AREA OF RESIDENCE, NSW & ACT 1999**

Health Area	Total NICUS registrants		Total NSW & ACT live births	Registrants per 1,000 live births
	No.	%	No.	
Central Sydney	118	5.9	6712	17.5
North Sydney	172	8.6	9393	18.3
South East Sydney	171	8.6	9568	17.9
South West Sydney	283	14.2	10924	25.9
Wentworth	120	6.0	4439	27.0
Western Sydney	229	11.5	12714	18.0
Central Coast	109	5.5	3784	28.8
Hunter	292	14.7	7087	41.2
Illawarra	68	3.4	4481	15.2
Far West	6	0.3	528	11.4
Greater Murray	45	2.3	2664	16.9
Macquarie	26	1.3	1598	16.3
Mid North Coast	70	3.5	2911	24.0
Mid Western	54	2.7	2318	23.3
New England	33	1.7	2353	14.0
Northern Rivers	13	0.7	2890	4.5
Southern	56	2.8	2322	24.1
ACT	113	5.7	4124	27.4
Interstate	7	0.4	609	11.5
Overseas	6	0.3	0	—
Not stated	0	0.0	11	—
<b>TOTAL</b>	<b>1991</b>	<b>100.0</b>	<b>91430</b>	<b>21.8</b>

Source: NICUS Data Collection. NSW Centre for Perinatal Health Services Research. NSW Midwives Data Collection 1999. Epidemiology and Surveillance Branch, NSW Health Department. ACT Maternal-Perinatal Data Collection, 1998.

**FIGURE 6**

**NEONATAL INTENSIVE CARE REGISTRATION RATE BY MATERNAL HEALTH AREA OF RESIDENCE, NSW & ACT, 1999**



Source: NICUS Data Collection. NSW Centre for Perinatal Health Services Research.

**TABLE 58**

**CONFINEMENTS BY HEALTH AREA OF RESIDENCE AND ABORIGINALITY, NSW & ACT 1999**

Health Area	Aboriginal		Non-Aboriginal		TOTAL	
	No.	%	No.	%	No.	%
Central Sydney	4	3.7	104	96.3	108	5.9
North Sydney	0	0.0	161	100.0	161	8.8
South East Sydney	1	0.6	159	99.4	160	8.7
South West Sydney	2	0.8	252	99.2	254	13.9
Wentworth	4	3.5	110	96.5	114	6.2
Western Sydney	3	1.4	214	98.6	217	11.9
Central Coast	0	0.0	99	100.0	99	5.4
Hunter	3	1.2	256	98.8	259	14.2
Illawarra	2	3.1	62	96.9	64	3.5
Far West	3	50.0	3	50.0	6	0.3
Greater Murray	2	4.7	41	95.3	43	2.4
Macquarie	6	23.1	20	76.9	26	1.4
Mid North Coast	10	15.9	53	84.1	63	3.4
Mid Western	7	14.3	42	85.7	49	2.7
New England	4	13.8	25	86.2	29	1.6
Northern Rivers	1	8.3	11	91.7	12	0.7
Southern	2	4.0	48	96.0	50	2.7
ACT	2	2.0	100	98.0	102	5.6
Interstate	0	0.0	6	100.0	6	0.3
Overseas	0	0.0	6	100.0	6	0.3
<b>TOTAL</b>	<b>56</b>	<b>3.1</b>	<b>1772</b>	<b>96.9</b>	<b>1828</b>	<b>100.0</b>

Source: NICUS Data Collection. NSW Centre for Perinatal Health Services Research.

## 5.2 MATERNAL CHARACTERISTICS

There were 1,828 mothers of the 1,991 infants registered in NICUS during 1999. Nearly 80 per cent of the mothers were residents of the Sydney, Central Coast, Hunter and Illawarra Health Areas. The distribution of the mothers Health Area of residence for infants less than 29 weeks and/or less than 1,000 grams was similar to those for the whole group. Of the 367 mothers of infants in this group just over half (58.5 per cent) were residents of the South Western Sydney, Western Sydney, Hunter, South Eastern Sydney or Northern Sydney Health Areas.

The age of mothers of NICUS infants ranged from 15 to 48 years with a mean age of 29.4 years. The mean maternal age was similar across all gestational age groups and has remained constant since 1992. The proportion of mothers aged 35 years or more has increased from 13.7 per cent in 1992 to 20.8 per cent in 1999. There were 5.1 per cent of mothers aged less than 20 years (Table 59). The health areas of residence with the highest proportion of teenage mothers were Far West, Macquarie, Mid North Coast, Illawarra and Southern.

There were 1,641 mothers (89.8 per cent) who had an antenatal complication. The most common antenatal complications were threatened preterm labour (860/1,828; 47.0 per cent), fetal distress (408/1,828; 22.3 per cent), hypertensive disease of pregnancy (339/1,828; 18.5 per cent) and antepartum haemorrhage (314/1,828; 17.2 per cent). Antenatal complications were more frequent in mothers delivering at less than 37 weeks compared with at term. Even so, 63.5 per cent (325/512) of mothers giving birth at 37–41 weeks gestation had an antenatal complication.

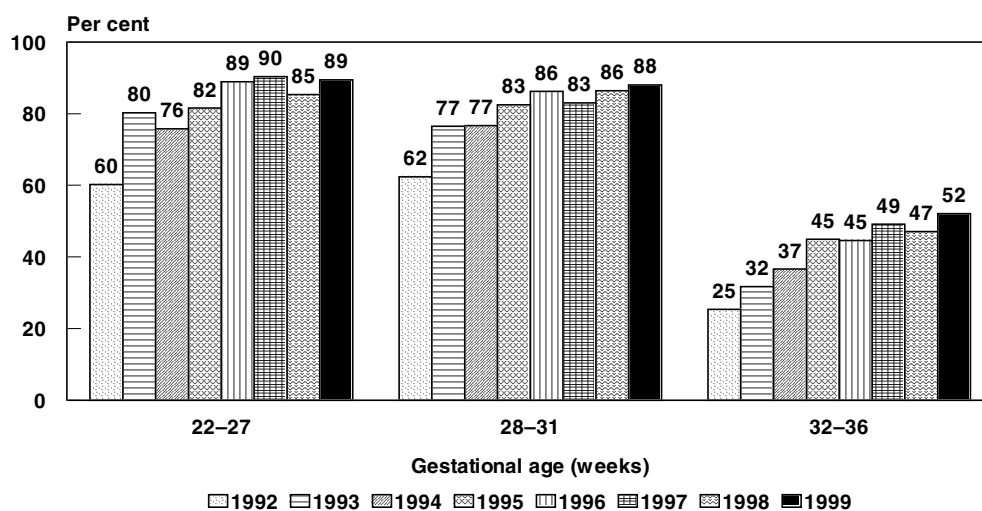
In 1999, 89.4 per cent of mothers of infants born at less than 28 weeks received corticosteroids (Figure 7 and Table 60). Over three-quarters (88.0 per cent) of mothers of 28–31 week gestation infants received antenatal corticosteroids. The overall proportion of mothers receiving antenatal corticosteroids has increased from 45 per cent in 1992 to 72.5 per cent in 1999.

**TABLE 59**

**CONFINEMENTS BY HEALTH AREA OF RESIDENCE AND MATERNAL AGE, NSW & ACT 1999**

Health Area	Less than 20		Maternal age (years)				TOTAL	
	No	%	20–34		35+		No	%
Central Sydney	3	2.8	67	62.0	38	35.2	108	5.9
North Sydney	1	0.6	106	65.8	54	33.5	161	8.8
South East Sydney	5	3.1	110	68.8	45	28.1	160	8.7
South West Sydney	12	4.7	197	77.9	45	17.7	254	13.9
Wentworth	7	6.1	86	75.4	21	18.4	114	6.2
Western Sydney	7	3.2	169	77.9	41	18.9	217	11.9
Central Coast	3	3.0	81	81.8	15	15.2	99	5.4
Hunter	15	5.8	213	82.2	31	12.0	259	14.2
Illawarra	8	12.5	41	64.1	15	23.4	64	3.5
Far West	2	33.3	4	66.7	0	0.0	6	0.3
Greater Murray	4	9.3	35	81.4	4	9.3	43	2.4
Macquarie	5	19.2	19	73.1	2	7.7	26	1.4
Mid North Coast	8	12.7	42	66.7	13	20.6	63	3.4
Mid Western	2	4.1	37	75.5	10	20.4	49	2.7
New England	2	6.9	23	79.3	4	13.8	29	1.6
Northern Rivers	0	0.0	11	91.7	1	8.3	12	0.7
Southern	4	8.0	37	74.0	9	18.0	50	2.7
ACT	3	2.9	69	67.6	30	29.4	102	5.6
Interstate	1	16.7	5	83.3	0	0.0	6	0.3
Overseas	0	0.0	3	50.0	3	50.0	6	0.3
TOTAL	92	5.1	1355	74.1	381	20.8	1828	100.0

Source: NICUS Data Collection. NSW Centre for Perinatal Health Services Research.

**FIGURE 7****CONFINEMENTS BY ANTENATAL CORTICOSTEROID ADMINISTRATION AND GESTATIONAL AGE, NSW & ACT 1992–1999**

Source: NICUS Data Collection. NSW Centre for Perinatal Health Services Research.

**TABLE 60****CONFINEMENTS BY ANTENATAL CORTICOSTEROID ADMINISTRATION AND GESTATIONAL AGE, NSW & ACT 1995–1999**

Year	Corticosteroid administration	Gestational age (weeks)						TOTAL	
		22-27		28-31		32-36		No.	%
		No.	%	No.	%	No.	%	No.	%
1995	No	37	18.4	80	17.5	264	55.1	381	33.5
	Yes	164	81.6	376	82.5	215	44.9	755	66.5
	TOTAL	201	100.0	456	100.0	479	100.0	1136	100.0
1996	No	23	11.1	64	13.8	291	55.4	378	31.6
	Yes	185	88.9	400	86.2	234	44.6	819	68.4
	TOTAL	208	100.0	464	100.0	525	100.0	1197	100.0
1997	No	20	9.7	79	17.0	261	50.9	360	30.4
	Yes	186	90.3	385	83.0	252	49.1	823	69.6
	TOTAL	206	100.0	464	100.0	513	100.0	1183	100.0
1998	No	37	14.7	70	13.6	274	52.9	381	29.7
	Yes	214	85.3	444	86.4	244	47.1	902	70.3
	TOTAL	251	100.0	514	100.0	518	100.0	1283	100.0
1999	No	27	10.6	57	12.0	273	47.9	357	27.5
	Yes	227	89.4	419	88.0	297	52.1	943	72.5
	TOTAL	254	100.0	476	100.0	570	100.0	1300	100.0

Source: NICUS Data Collection. NSW Centre for Perinatal Health Services Research.

### 5.3 TRANSFER STATUS, LABOUR AND DELIVERY

Infants are admitted to a neonatal intensive care unit after:

- delivery which has been booked to occur in a tertiary centre;
- delivery in a tertiary centre following maternal transfer;
- delivery in a non-tertiary centre followed by infant transfer to a tertiary centre.

Thirty-six per cent of all births were booked at a tertiary centre, ranging from 39.5 per cent for the 32–36 week gestational age group to 31.6 per cent for the 37-plus week gestational age group (Table 61). Maternal transfer was most common at gestations less than 32 weeks. The rate of maternal transfer was similar for infants born before 28 weeks gestation (54.7 per cent) and for those born at 28–31 weeks gestation (55.9 per cent). The overall rate of maternal transfer was 33.2 per cent.

Thirty-one per cent of infants were transferred to a tertiary centre following birth. There were 6.9 per cent (102/1,477) of infants transferred from one tertiary centre to another within four hours of commencing assisted ventilation or for major surgery. Transfer following birth was most common in the 37-plus weeks gestational age group (65.5 per cent). Fifty infants (50/1,151; 4.3 per cent) greater than 31 weeks gestation were discharged home prior to the admission that qualified them for registration in NICUS.

The inverse relationship between gestational age groups and the proportion of births in a tertiary centre is shown in Figure 8 and Table 62. The proportion of infants born in a tertiary centre increased from 61.3 per cent in 1992 to 74.2 per cent 1999. In 1999, 91.2 per cent of infants less than 32 weeks gestation were born in a tertiary centre

compared with 72.7 per cent of 32–36 week gestation infants and 48.9 per cent of term infants.

The pattern of transfer status (Table 63) and place of birth (Table 64) by birthweight is similar to that of gestational age, with the majority (91.6 per cent) of the very low birthweight infants (less than 1,500 grams) born in a tertiary centre.

Spontaneous onset of labour was more common among mothers of infants less than 28 weeks gestation (Table 65). Augmentation and induction of labour was most common in term and post-term births.

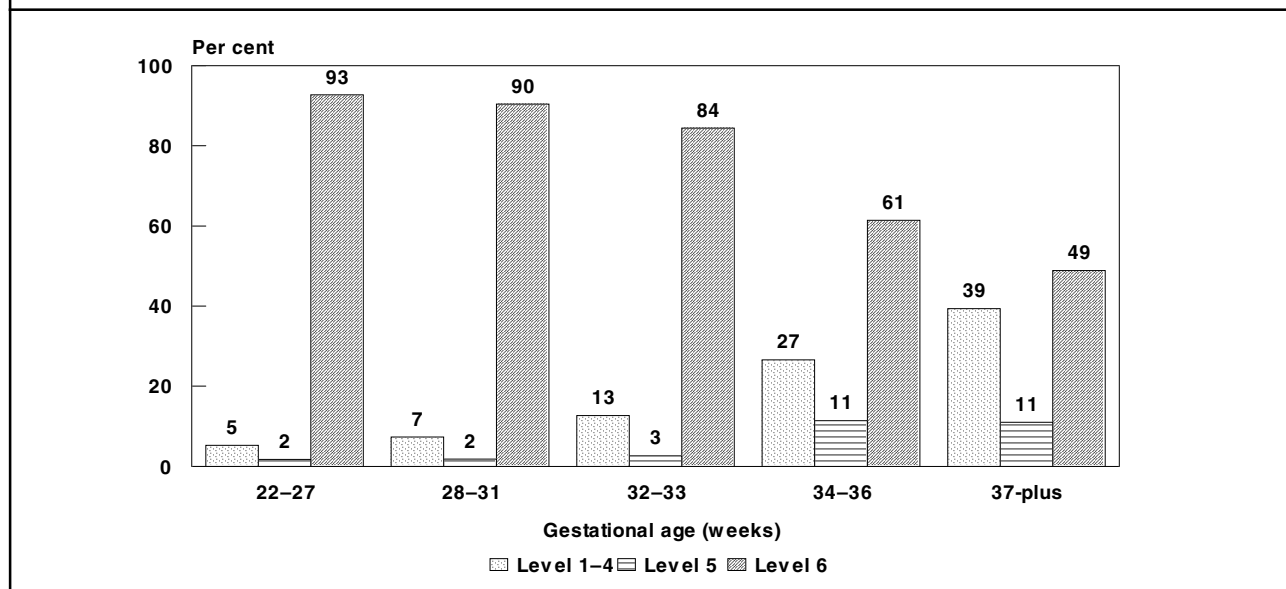
The proportion of mothers who gave birth by elective caesarean section (caesarean section without labour) increased from 27.5 per cent in 1992 to 32.1 per cent in 1999. Spontaneous onset of labour occurred in just over half (54.1 per cent) of all infants less than 2,500 grams birth weight (Table 66). As expected, augmentation or induction of labour was most common in mothers of infants with a birthweight of 2,500 grams or more (33.5 per cent).

Prolonged rupture of membranes (greater than 24 hours) was more common at lower gestations, affecting about 30 per cent of infants less than 28 weeks gestation (Table 67).

The most common type of delivery was caesarean section (53.1 per cent in 1992 to 50.5 per cent in 1999), followed by normal vaginal delivery (33.8 per cent in 1992 to 39.1 per cent in 1999) and vaginal breech delivery (6.0 per cent in 1992 to 5.4 per cent in 1999) (Tables 68 and 69). The high rate of caesarean section and breech delivery in the NICUS cohort is related to the high proportion of preterm births. The rate of caesarean section in term and post-term births was 34.7 per cent, almost double the rate for all births in NSW and the ACT in 1999.

**FIGURE 8**

PLACE OF BIRTH (LEVEL OF OBSTETRIC HOSPITAL) BY GESTATIONAL AGE, NSW & ACT 1999



Source: NICUS Data Collection. NSW Centre for Perinatal Health Services Research.

**TABLE 61****BIRTHS BY BOOKING STATUS, TRANSFER STATUS AND GESTATIONAL AGE, NSW & ACT 1999**

Booking status and transfer status	Gestational age (weeks)										TOTAL	
	22-27		28-31		32-36		37-41		42+			
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Booked at tertiary hosp	110	38.1	189	34.3	246	39.5	161	31.4	6	37.5	712	35.8
Transfer before birth	158	54.7	308	55.9	181	29.1	15	2.9	0	0.0	662	33.2
Transfer after birth	21	7.3	54	9.8	196	31.5	336	65.6	10	62.5	617	31.0
TOTAL	289	100.0	551	100.0	623	100.0	512	100.0	16	100.0	1991	100.0

Source: NICUS Data Collection. NSW Centre for Perinatal Health Services Research.

**TABLE 62****BIRTHS BY PLACE OF BIRTH (LEVEL OF OBSTETRIC HOSPITAL) AND GESTATIONAL AGE, NSW & ACT 1999**

Place of birth	Gestational age (weeks)										TOTAL	
	22-27		28-31		32-33		34-36		37+			
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Level 1-4	15	5.2	40#	7.3	39	12.7	84	26.6	208	39.4	386	19.4
Level 5	5	1.7	10#	1.8	8	2.6	36	11.4	58	11.0	117	5.9
Level 6	268	92.7	498#	90.4	259	84.4	194	61.4	258	48.9	1477	74.2
Planned home birth	0	0.0	0	0.0	0	0.0	2	0.6	0	0.0	2	0.1
Born before arrival	1	0.3	3	0.5	1	0.3	0	0.0	4	0.8	9	0.5
TOTAL	289	100.0	551	100.0	307	100.0	316	100.0	528	100.0	1991	100.0

Source: NICUS Data Collection. NSW Centre for Perinatal Health Services Research.  
 # 26/50 (52%) babies not born in a level 6 hospital were 30-31 weeks gestation.  
 304/498 (61%) babies born in a level 6 hospital were 30-31 weeks gestation.

**TABLE 63****BIRTHS BY BOOKING STATUS, TRANSFER STATUS AND BIRTHWEIGHT, NSW & ACT 1999**

Booking status and transfer status	Birthweight (grams)								TOTAL	
	Less than 1,000		1,000-1,499		1,500-2,499		2,500+			
	No.	%	No.	%	No.	%	No.	%	No.	%
Booked at tertiary hosp	107	37.9	161	35.2	220	36.7	224	34.4	712	35.8
Transfer before birth	154	54.6	255	55.8	225	37.5	28	4.3	662	33.2
Transfer after birth	21	7.4	41	9.0	155	25.8	400	61.3	617	31.0
TOTAL	282	100.0	457	100.0	600	100.0	652	100.0	1991	100.0

Source: NICUS Data Collection. NSW Centre for Perinatal Health Services Research.

**TABLE 64****BIRTHS BY PLACE OF BIRTH (LEVEL OF OBSTETRIC HOSPITAL) AND BIRTHWEIGHT, NSW & ACT 1999**

Place of birth	Birthweight (grams)								TOTAL	
	Less than 1,000		1,000-1,499		1,500-2,499		2,500+			
	No.	%	No.	%	No.	%	No.	%	No.	%
Level 1-4	14	5.0	31	6.8	93	15.5	248	38.0	386	19.4
Level 5	5	1.8	8	1.8	36	6.0	68	10.4	117	5.9
Level 6	261	92.6	416	91.0	468	78.0	332	50.9	1477	74.2
Planned home birth	0	0.0	0	0.0	2	0.3	0	0.0	2	0.1
Born before arrival	2	0.7	2	0.4	1	0.2	4	0.6	9	0.5
TOTAL	282	100.0	457	100.0	600	100.0	652	100.0	1991	100.0

Source: NICUS Data Collection. NSW Centre for Perinatal Health Services Research.



**TABLE 65****CONFINEMENTS BY ONSET OF LABOUR AND GESTATIONAL AGE, NSW & ACT 1999**

Onset of labour	Gestational age (weeks)										TOTAL	
	22-27		28-31		32-36		37-41		42+		No.	%
	No.	%	No.	%	No.	%	No.	%	No.	%		
Spontaneous	167	65.7	256	53.8	276	48.4	217	42.4	6	37.5	922	50.4
Augmented	12	4.7	17	3.6	31	5.4	55	10.7	1	6.3	116	6.3
Induced	2	0.8	7	1.5	49	8.6	133	26.0	9	56.3	200	10.9
No labour	73	28.7	196	41.2	214	37.5	107	20.9	0	0.0	590	32.3
TOTAL	254	100.0	476	100.0	570	100.0	512	100.0	16	100.0	1828	100.0

Source: NICUS Data Collection. NSW Centre for Perinatal Health Services Research.

**TABLE 66****CONFINEMENTS BY ONSET OF LABOUR AND BIRTHWEIGHT, NSW & ACT 1999**

Onset of labour	Birthweight (grams)								TOTAL	
	Less than 1,000		1,000-1,499		1,500-2,499		2,500+		No.	%
	No.	%	No.	%	No.	%	No.	%		
Spontaneous	138	56.1	191	48.2	308	57.5	285	43.8	922	50.4
Augmented	9	3.7	19	4.8	24	4.5	64	9.8	116	6.3
Induced	2	0.8	9	2.3	35	6.5	154	23.7	200	10.9
No labour	97	39.4	177	44.7	169	31.5	147	22.6	590	32.3
TOTAL	246	100.0	396	100.0	536	100.0	650	100.0	1828	100.0

Source: NICUS Data Collection. NSW Centre for Perinatal Health Services Research.

**TABLE 67****BIRTHS BY DURATION OF RUPTURE OF MEMBRANES AND GESTATIONAL AGE, NSW & ACT 1999**

Duration of rupture of membranes	Gestational age (weeks)										TOTAL	
	22-27		28-31		32-36		37-41		42+		No.	%
	No.	%	No.	%	No.	%	No.	%	No.	%		
Less than 24 hours	203	70.2	400	72.6	507	81.4	474	92.6	15	93.8	1599	80.3
24 hours to seven days	50	17.3	96	17.4	72	11.6	28	5.5	1	6.3	247	12.4
8+ days	36	12.5	55	10.0	44	7.1	10	2.0	0	0.0	145	7.3
TOTAL	289	100.0	551	100.0	623	100.0	512	100.0	16	100.0	1991	100.0

Source: NICUS Data Collection. NSW Centre for Perinatal Health Services Research.

**TABLE 68****BIRTHS BY TYPE OF DELIVERY AND GESTATIONAL AGE, NSW & ACT 1999**

Type of delivery	Gestational age (weeks)										TOTAL	
	22-27		28-31		32-36		37-41		42+		No.	%
	No.	%	No.	%	No.	%	No.	%	No.	%		
Normal vaginal	102	35.3	180	32.7	214	34.3	274	53.5	8	50.0	778	39.1
Forceps	6	2.1	5	0.9	14	2.2	16	3.1	2	12.5	43	2.2
Forceps rotation	0	0.0	0	0.0	0	0.0	7	1.4	1	6.3	8	0.4
Vacuum extraction	1	0.3	1	0.2	17	2.7	28	5.5	2	12.5	49	2.5
Vaginal breech	43	14.9	32	5.8	26	4.2	7	1.4	0	0.0	108	5.4
Elective caesarean	81	28.0	219	39.7	233	37.4	107	20.9	0	0.0	640	32.1
Emergency caesarean	56	19.4	114	20.7	119	19.1	73	14.3	3	18.8	365	18.3
TOTAL	289	100.0	551	100.0	623	100.0	512	100.0	16	100.0	1991	100.0

Source: NICUS Data Collection. NSW Centre for Perinatal Health Services Research.

**TABLE 69****BIRTHS BY TYPE OF DELIVERY AND BIRTHWEIGHT, NSW & ACT 1999**

Type of delivery	Less than 1,000		1,000–1,499		Birthweight (grams)				TOTAL	
					1,500–2,499		2,500+			
	No.	%	No.	%	No.	%	No.	%	No.	%
Normal vaginal	78	27.7	140	30.6	226	37.7	334	51.2	778	39.1
Forceps	5	1.8	5	1.1	15	2.5	18	2.8	43	2.2
Forceps rotation	0	0.0	0	0.0	0	0.0	8	1.2	8	0.4
Vacuum extraction	1	0.4	2	0.4	13	2.2	33	5.1	49	2.5
Vaginal breech	37	13.1	35	7.7	26	4.3	10	1.5	108	5.4
Elective Caesarean	110	39.0	199	43.5	183	30.5	148	22.7	640	32.1
Emergency Caesarean	51	18.0	76	16.6	137	22.8	101	15.5	365	18.3
TOTAL	282	100.0	457	100.0	600	100.0	652	100.0	1991	100.0

Source: NICUS Data Collection. NSW Centre for Perinatal Health Services Research.

#### 5.4 INFANT CHARACTERISTICS

Nearly three quarters of the infants (73.5 per cent) were preterm (less than 37 weeks gestation), 42.2 per cent were very preterm (less than 32 weeks gestation) and 14.5 per cent were extremely preterm (less than 28 weeks gestation) (Figure 9). The proportion of infants in each gestational age group has remained constant (Table 70). Almost all live born infants at 24–30 weeks gestation were admitted to a NICU, about two-thirds at 31–32 weeks gestation, and one-fifth at 33–34 weeks gestation (Table 71).

Sixty-eight per cent of infants had a low birthweight (less than 2,500 grams), 37.1 per cent had a very low birthweight (less than 1,500 grams) and 14.2 per cent had an extremely low birthweight (less than 1,000 grams) (Table 72). The proportion of infants in each birthweight group has remained constant (Table 73).

Overall, 56.0 per cent of infants were male. The ratio of males to females was approximately 3:2 in most gestational age groups (Table 74).

The overall proportion of the infants who had a major congenital anomaly decreased from 20.9 per cent in 1992 to 18.1 per cent in 1999. Congenital anomalies were more common among term infants (37 plus weeks gestational age), of whom 43.0 per cent had a major congenital anomaly and 5.9 per cent had a minor congenital anomaly (Table 75).

The overall proportion of infants born following a multiple pregnancy has remained constant since 1992. In 1999 most of the infants (80.2 per cent) were from a singleton pregnancy, 17.2 per cent were from a twin pregnancy and 2.6 per cent were from a triplet pregnancy. Infants born as a result of a multiple gestation were more likely to be preterm, with 26.4 per cent of infants less than 37 weeks gestation being from a multiple gestation pregnancy (Table 76). Multiple births represented 3.1 per cent of all NSW and ACT births in 1999. The higher than expected rate of multiple births among the 1999 NICUS cohort reflects the high proportion of multiple pregnancies resulting in preterm birth.

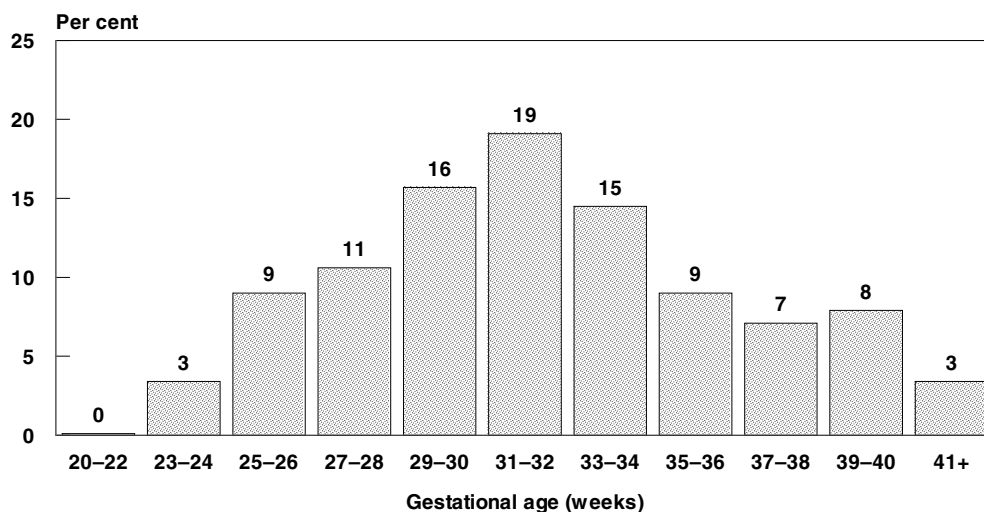
Table 77 shows the median, 25th and 75th percentiles for one- and five-minute Apgar scores according to gestational age groups. For infants greater than 27 weeks gestational age the median one-minute Apgar score was seven and the median five minute score was nine. The proportion of infants with a one-minute Apgar score of 0–4 has decreased from 38.7 per cent in 1992 to 26.6 per cent in 1999, similarly the proportion of infants with a five-minute Apgar score of 0–4 has decreased from 10.8 per cent in 1992 to 6.6 per cent in 1999 (Table 78).

*continued on p.62*

**TABLE 70****BIRTHS BY GESTATIONAL AGE, NSW & ACT 1995–1999**

Gestational age (weeks)	1995		1996		Year 1997		1998		1999	
	No.	%	No.	%	No.	%	No.	%	No.	%
22–27	230	13.3	237	13.3	232	13.2	287	15.1	289	14.5
28–31	513	29.6	528	29.6	535	30.5	589	31.0	551	27.7
32–36	506	29.2	552	30.9	538	30.7	536	28.2	623	31.3
37–41	461	26.6	461	25.8	427	24.3	479	25.2	512	25.7
42+	24	1.4	8	0.4	22	1.3	8	0.4	16	0.8
TOTAL	1734	100.0	1786	100.0	1754	100.0	1899	100.0	1991	100.0

Source: NICUS Data Collection. NSW Centre for Perinatal Health Services Research.

**FIGURE 9****BIRTHS BY GESTATIONAL AGE, NSW & ACT 1999**

Source: NICUS Data Collection. NSW Centre for Perinatal Health Services Research.

**TABLE 71****BIRTHS BY NICUS REGISTRATION AND GESTATIONAL AGE, NSW & ACT 1999\***

Gestational age (weeks)	NSW & ACT		Registrations No.	NICUS Rate per 1,000 live births	% of cohort
	Stillbirths No.	Live births No.			
Less than 21	33	19	0	0.0	0.0
21	46	30	0	0.0	0.0
22	42	28	2	71.4	0.1
23	31	42	15	357.1	0.8
24	34	46	42	913.0	2.1
25	22	44	63	1431.8	3.2
26	25	75	85	1133.3	4.3
27	14	93	82	881.7	4.1
28	23	119	97	815.1	4.9
29	10	133	124	932.3	6.2
30	20	143	145	1014.0	7.3
31	16	226	185	818.6	9.3
32	20	315	154	488.9	7.7
33	17	475	153	322.1	7.7
34	27	750	118	157.3	5.9
35	18	1211	92	76.0	4.6
36	32	2451	106	43.2	5.3
37	32	4948	82	16.6	4.1
38	37	13787	121	8.8	6.1
39	23	19645	101	5.1	5.1
40	34	30555	134	4.4	6.7
41	20	14217	74	5.2	3.7
42	3	1988	16	8.0	0.8
43	0	66	0	0.0	0.0
44	0	5	0	0.0	0.0
45	0	1	0	0.0	0.0
Not stated	0	18	0	0.0	0.0
TOTAL	579	91430	1991	21.8	100.0

Source: NICUS Data Collection. NSW Centre for Perinatal Health Services Research, 1999. NSW Midwives Data Collection. Epidemiology and Surveillance Branch, NSW Health Department, 1999. ACT Maternal-Perinatal Data Collection, 1998.

# Excludes 117 babies reported to the MDC in 1999 for whom the birth outcome was not known.

**TABLE 72****BIRTHS BY BIRTHWEIGHT, NSW & ACT 1999**

Birthweight (grams)	1995		1996		Year of birth 1997		1998		1999	
	No.	%	No.	%	No.	%	No.	%	No.	%
Less than 400	0	0.0	0	0.0	2	0.1	0	0.0	3	0.2
400-499	8	0.5	4	0.2	3	0.2	6	0.3	9	0.5
500-599	11	0.6	19	1.1	19	1.1	23	1.2	24	1.2
600-699	40	2.3	38	2.1	42	2.4	43	2.3	51	2.6
700-799	53	3.1	61	3.4	58	3.3	62	3.3	62	3.1
800-899	65	3.7	62	3.5	48	2.7	65	3.4	75	3.8
900-999	68	3.9	63	3.5	80	4.6	85	4.5	58	2.9
1,000-1,249	169	9.7	192	10.8	202	11.5	207	10.9	210	10.5
1,250-1,499	226	13.0	211	11.8	223	12.7	238	12.5	247	12.4
1,500-1,749	178	10.3	168	9.4	161	9.2	205	10.8	207	10.4
1,750-1,999	134	7.7	149	8.3	137	7.8	143	7.5	151	7.6
2,000-2,499	218	12.6	238	13.3	227	12.9	221	11.6	242	12.1
2,500-2,999	199	11.5	217	12.2	179	10.2	198	10.4	211	10.6
3,000-3,499	185	10.7	184	10.3	191	10.9	214	11.3	205	10.3
3,500-3,999	132	7.6	110	6.2	123	7.0	128	6.7	153	7.7
4,000+	48	2.8	70	3.9	59	3.4	61	3.2	83	4.2
TOTAL	1734	100.0	1786	100.0	1754	100.0	1899	100.0	1991	100.0

Source: NICUS Data Collection. NSW Centre for Perinatal Health Services Research.

**TABLE 73****BIRTHS BY NICUS REGISTRATION AND BIRTHWEIGHT, NSW & ACT 1999#**

Birthweight (grams)	NSW & ACT		Registrations No.	NICUS Rate per 1,000 live births	% of cohort
	Stillbirths No.	Live births# No.			
Less than 400	97	46	3	65.2	0.2
400-499	57	50	9	18.0	0.5
500-599	50	42	24	571.4	1.2
600-699	29	63	51	809.5	2.6
700-799	19	62	62	1000.0	3.1
800-899	12	77	75	974.0	3.8
900-999	12	69	58	840.6	2.9
1,000-1,249	27	219	210	958.9	10.5
1,250-1,499	15	289	247	854.7	12.4
1,500-1,749	28	421	207	491.7	10.4
1,750-1,999	38	666	151	226.7	7.6
2,000-2,499	45	3504	242	69.1	12.1
2,500-2,999	61	13562	211	15.6	10.6
3,000-3,499	53	32506	205	6.3	10.3
3,500-3,999	29	28643	153	5.3	7.7
4,000+	7	11211	83	7.4	4.2
TOTAL	579	91430	1991	21.8	100.0

Source: NICUS Data Collection. NSW Centre for Perinatal Health Services Research, 1999. NSW Midwives Data Collection. Epidemiology and Surveillance Branch, NSW Health Department. ACT Maternal-Perinatal Data Collection, 1998.

# Excludes 17 babies reported to the MDC in 1999 for whom the birth outcome was not known.

**TABLE 74****BIRTHS BY GENDER AND GESTATIONAL AGE, NSW & ACT 1999**

Sex	Gestational age (weeks)											
	22-27		28-31		32-36		37-41		42+		TOTAL	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Male	174	60.2	279	50.6	356	57.1	296	57.8	10	62.5	1115	56.0
Female	115	39.8	272	49.4	267	42.9	216	42.2	6	37.5	876	44.0
TOTAL	289	100.0	551	100.0	623	100.0	512	100.0	16	100.0	1991	100.0

Source: NICUS Data Collection. NSW Centre for Perinatal Health Services Research.

**TABLE 75****BIRTHS BY CONGENITAL ANOMALIES AND GESTATIONAL AGE, NSW & ACT 1999**

Congenital anomaly	Gestational age (weeks)											
	22-27		28-31		32-36		37-41		42+		TOTAL	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
None	272	94.1	513	93.1	497	79.8	261	51.0	9	56.3	1552	78.0
Minor	9	3.1	11	2.0	27	4.3	30	5.9	1	6.3	78	3.9
Major	8	2.8	27	4.9	99	15.9	221	43.2	6	37.5	361	18.1
TOTAL	289	100.0	551	100.0	623	100.0	512	100.0	16	100.0	1991	100.0

Source: NICUS Data Collection. NSW Centre for Perinatal Health Services Research.

**TABLE 76****BIRTHS BY PLURALITY AND GESTATIONAL AGE, NSW & ACT 1999**

Plurality	Gestational age (weeks)											
	22-27		28-31		32-36		37-41		42+		TOTAL	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Singleton	215	74.4	401	72.8	461	74.0	503	98.2	16	100.0	1596	80.2
Twins	63	21.8	121	22.0	150	24.1	9	1.8	0	0.0	343	17.2
Triplets	11	3.8	29	5.3	12	1.9	0	0.0	0	0.0	52	2.6
TOTAL	289	100.0	551	100.0	623	100.0	512	100.0	16	100.0	1991	100.0

Source: NICUS Data Collection. NSW Centre for Perinatal Health Services Research.

**TABLE 77****BIRTHS BY APGAR SCORE AND GESTATIONAL AGE, NSW & ACT 1999**

Apgar Score	Gestational age (weeks)							
	22-27 Median (25%,75%)		28-31 Median (25%,75%)		32-36 Median (25%,75%)		37+ Median (25%,75%)	
One-minute Apgar	5	(3,6)	7	(5,8)	7	(5,9)	7	(5,9)
Five-minute Apgar	7	(6,8)	9	(8,9)	9	(8,9)	9	(7,9)

Source: NICUS Data Collection. NSW Centre for Perinatal Health Services Research.

**TABLE 78****BIRTHS BY APGAR SCORE AT ONE AND FIVE MINUTES, NSW & ACT 1995-1999**

Apgar Score	Year									
	1995		1996		1997		1998		1999	
	No.	%	No.	%	No.	%	No.	%	No.	%
One minute										
0-4	604	34.8	533	29.8	453	25.8	533	28.1	530	26.6
5-7	566	32.6	654	36.6	647	36.9	693	36.5	689	34.6
8+	550	31.7	586	32.8	644	36.7	657	34.6	766	38.5
Not stated	14	0.8	13	0.7	10	0.6	16	0.8	6	0.3
TOTAL	1734	100.0	1786	100.0	1754	100.0	1899	100.0	1991	100.0
Five minutes										
0-4	140	8.1	150	8.4	121	6.9	142	7.5	132	6.6
5-7	502	29.0	453	25.4	413	23.5	412	21.7	436	21.9
8+	1077	62.1	1170	65.5	1211	69.0	1329	70.0	1417	71.2
Not stated	15	0.9	13	0.7	9	0.5	16	0.8	6	0.3
TOTAL	1734	100.0	1786	100.0	1754	100.0	1899	100.0	1991	100.0

Source: NICUS Data Collection. NSW Centre for Perinatal Health Services Research.

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Infants with major congenital anomalies ( $n=361$ ) have been excluded from the analysis of morbidity and mortality.

The majority of infants without a major congenital anomaly ( $n=1,630$ ; 88.4 per cent) in the 1999 NICUS cohort received assisted ventilation (intermittent mandatory ventilation and/or continuous positive airways pressure) (Table 79).

The main indication for ventilation for most infants was Respiratory Distress Syndrome (Figure 10). Main indication for assisted ventilation varied with gestational age. Respiratory distress syndrome, immature lung and transient tachypnoea were more common in the preterm groups, whereas perinatal asphyxia, meconium aspiration, pulmonary hypertension and apnoea were more common in term infants (Table 80).

Proven systemic infection has decreased from 22.9 per cent in 1992 to 15.8 per cent of infants in 1999. Infection was most common among infants less than 28 weeks gestation (44.5 per cent) (Table 81).

The overall proportion of ventilated infants who received surfactant has increased from 33.8 per cent in 1992 to 46.2 per cent in 1999 (Table 82). In 1999, the majority (70.1 per cent) of ventilated infants with a diagnosis of Respiratory Distress Syndrome received surfactant. Sixty per cent of the infants who received surfactant were less than 32 weeks gestational age.

Overall, the incidence of treated patent ductus arteriosus (PDA) has decreased from 18.7 per cent in 1993 to 13.6 per cent in 1999. In 1999, 92.8 per cent of the infants treated for PDA were less than 32 weeks gestational age (Table 83). The majority of infants with a PDA requiring treatment received indomethacin only (12.9 per cent). Surgical treatment of PDA was predominantly performed on infants less than 28 weeks gestation (2.8 per cent). Some infants (0.8 per cent) were treated with both indomethacin and surgery.

Overall, the incidence of necrotising enterocolitis (NEC) has decreased from 9.7 per cent in 1992 to 3.2 per cent in 1999 (Table 84). The diagnosis of NEC was made radiologically or at surgery in 48.1 per cent of infants and clinically in the remainder. NEC was more common at the lower gestational age groups and 82.7 per cent of the infants with NEC were born at less than 32 weeks gestation.

The overall incidence of major surgery has decreased from 7.6 per cent in 1992 to 3.7 per cent in 1999. In 1999, 57.4 per cent of the infants who required major surgery were less than 32 weeks gestation (Table 85). The most common surgical procedures amongst these infants were for patent ductus arteriosus and necrotising enterocolitis.

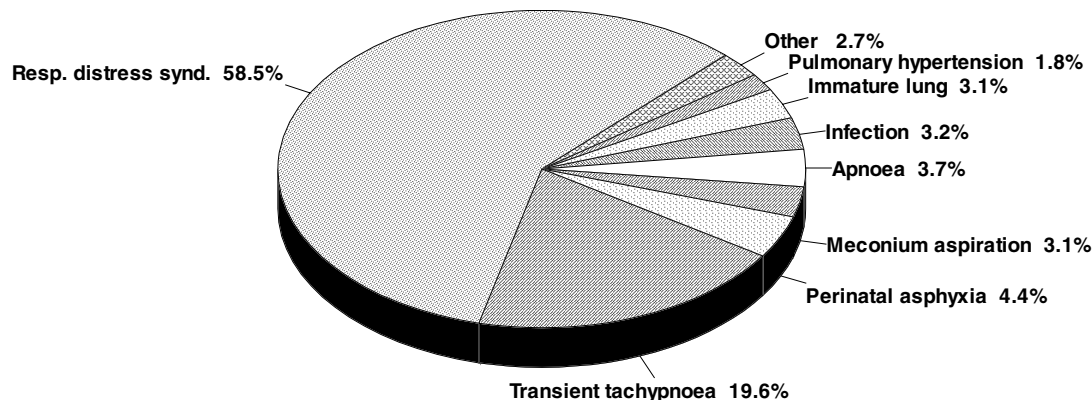
continued on p.65

**TABLE 79**

**ASSISTED VENTILATION AND GESTATIONAL AGE, NSW & ACT 1995–1999\***

Year	Assisted ventilation	Gestational age (weeks)								TOTAL	
		22–27		28–31		32–36		37+		No.	%
		No.	%	No.	%	No.	%	No.	%	No.	%
1995	No	0	0	104	21.3	51	11.8	7	2.6	162	11.5
	Yes	220	100.0	385	78.7	381	88.2	265	97.4	1251	88.5
	TOTAL	220	100.0	489	100.0	432	100.0	272	100.0	1413	100.0
1996	No	1	0.4	117	23.4	48	10.2	6	2.2	172	11.7
	Yes	227	99.6	384	76.6	424	89.8	267	97.8	1302	88.3
	TOTAL	228	100.0	501	100.0	472	100.0	273	100.0	1474	100.0
1997	No	0	0	101	19.6	57	12.3	9	3.5	167	11.4
	Yes	227	100.0	413	80.4	406	87.7	248	96.5	1294	88.6
	TOTAL	227	100.0	514	100.0	463	100.0	257	100.0	1461	100.0
1998	No	2	0.7	99	17.6	48	10.4	7	2.6	156	9.9
	Yes	278	99.3	465	82.4	415	89.6	265	97.4	1423	90.1
	TOTAL	280	100.0	564	100.0	463	100.0	272	100.0	1579	100.0
1999	No	1	0.4	119	22.7	60	11.5	9	3.0	189	11.6
	Yes	280	99.6	405	77.3	464	88.5	292	97.0	1441	88.4
	TOTAL	281	100.0	524	100.0	524	100.0	301	100.0	1630	100.0

Source: NICUS Data Collection. NSW Centre for Perinatal Health Services Research.  
# Babies with major congenital anomalies excluded.

**FIGURE 10****BIRTHS BY MAIN INDICATION FOR ASSISTED VENTILATION, NSW & ACT 1998\***

Source: NICUS Data Collection. NSW Centre for Perinatal Health Services Research.

# Babies with major congenital anomalies or not ventilated excluded.

**TABLE 80****MAIN INDICATION FOR ASSISTED VENTILATION OF BABIES BY GESTATIONAL AGE, NSW & ACT 1999\***

Indication	Gestational age (weeks)								TOTAL	
	22-27		28-31		32-36		37+		No.	%
	No.	%	No.	%	No.	%	No.	%	No.	%
Respiratory distress syndrome	248	88.6	269	66.4	269	58.0	57	19.5	843	58.5
Transient tachypnoea of newborn	3	1.1	79	19.5	136	29.3	64	21.9	282	19.6
Meconium aspiration	0	0.0	0	0.0	2	0.4	42	14.4	44	3.1
Infection	2	0.7	6	1.5	17	3.7	21	7.2	46	3.2
Perinatal asphyxia	4	1.4	6	1.5	14	3.0	39	13.4	63	4.4
Immature lung	15	5.4	29	7.2	1	0.2	0	0.0	45	3.1
Apnoea	7	2.5	15	3.7	13	2.8	18	6.2	53	3.7
Pulmonary hypertension	1	0.4	0	0.0	1	0.2	24	8.2	26	1.8
Congenital anomaly	0	0.0	0	0.0	2	0.4	4	1.4	6	0.4
Cardiac disorder	0	0.0	0	0.0	0	0.0	6	2.1	6	0.4
Peri surgery	0	0.0	1	0.2	4	0.9	9	3.1	14	1.0
Other	0	0.0	0	0.0	5	1.1	8	2.7	13	0.9
TOTAL	280	100.0	405	100.0	464	100.0	292	100.0	1441	100.0

Source: NICUS Data Collection. NSW Centre for Perinatal Health Services Research.

# Babies with major congenital anomalies or not ventilated excluded.

**TABLE 81****PROVEN SYSTEMIC INFECTION BY GESTATIONAL AGE, NSW & ACT 1999\***

Infection	Gestational age (weeks)								TOTAL	
	22-27		28-31		32-36		37+		No.	%
	No.	%	No.	%	No.	%	No.	%	No.	%
No	156	55.5	439	83.8	496	94.7	282	93.7	1373	84.2
Yes	125	44.5	85	16.2	28	5.3	19	6.3	257	15.8
TOTAL	281	100.0	524	100.0	524	100.0	301	100.0	1630	100.0

Source: NICUS Data Collection. NSW Centre for Perinatal Health Services Research.

# Babies with major congenital anomalies excluded.

**TABLE 82****SURFACTANT ADMINISTRATION BY GESTATIONAL AGE, NSW & ACT 1995–1999\***

Year	Surfactant administration	Gestational age (weeks)									
		22–27		28–31		32–36		37+		TOTAL	
		No.	%	No.	%	No.	%	No.	%	No.	%
1995	No	58	26.4	176	45.7	204	53.5	210	79.2	648	51.8
	Yes	162	73.6	209	54.3	177	46.5	55	20.8	603	48.2
	TOTAL	220	100.0	385	100.0	381	100.0	265	100.0	1251	100.0
1996	No	46	20.3	149	38.8	226	53.3	208	77.9	629	48.3
	Yes	181	79.7	235	61.2	198	46.7	59	22.1	673	51.7
	TOTAL	227	100.0	384	100.0	424	100.0	267	100.0	1302	100.0
1997	No	60	26.4	175	42.4	218	53.7	187	75.4	640	49.5
	Yes	167	73.6	238	57.6	188	46.3	61	24.6	654	50.5
	TOTAL	227	100.0	413	100.0	406	100.0	248	100.0	1294	100.0
1998	No	53	19.1	212	45.6	213	51.3	208	78.5	686	48.2
	Yes	225	80.9	253	54.4	202	48.7	57	21.5	737	51.8
	TOTAL	278	100.0	465	100.0	415	100.0	265	100.0	1423	100.0
1999	No	57	20.4	218	53.8	282	60.8	218	74.7	775	53.8
	Yes	223	79.6	187	46.2	182	39.2	74	25.3	666	46.2
	TOTAL	280	100.0	405	100.0	464	100.0	292	100.0	1441	100.0

Source: NICUS Data Collection. NSW Centre for Perinatal Health Services Research.  
# Babies with major congenital malformations and babies not ventilated excluded.

**TABLE 83****TREATED PATENT DUCTUS ARTERIOSUS (PDA) BY GESTATIONAL AGE, NSW & ACT 1999\***

PDA—Treatment for PDA	Gestational age (weeks)									
	22–27		28–31		32–36		37+		TOTAL	
	No.	%	No.	%	No.	%	No.	%	No.	%
No treated PDA	172	61.2	465	88.7	511	97.5	1148	86.4		
Indomethacin only	101	35.9	57	10.9	13	2.5	171	12.9		
Surgery only	0	0.0	1	0.2	0	0.0	1	0.1		
Indomethacin & surgery	8	2.8	1	0.2	0	0.0	9	0.7		
TOTAL	281	100.0	524	100.0	524	100.0	1329	100.0		

Source: NICUS Data Collection. NSW Centre for Perinatal Health Services Research.  
# Babies with major congenital anomalies excluded.

**TABLE 84****NECROTISING ENTEROCOLITIS (NEC) BY GESTATIONAL AGE, NSW & ACT 1999\***

NEC—Treatment for NEC	Gestational age (weeks)									
	22–27		28–31		32–36		37+		TOTAL	
	No.	%	No.	%	No.	%	No.	%	No.	%
No NEC	263	93.6	499	95.2	515	98.3	301	100.0	1578	96.8
Clinical diagnosis	4	1.4	18	3.4	5	1.0	0	0.0	27	1.7
X-ray diagnosis	8	2.8	6	1.1	3	0.6	0	0.0	17	1.0
Surgery for NEC	6	2.1	1	0.2	1	0.2	0	0.0	8	0.5
TOTAL	281	100.0	524	100.0	524	100.0	301	100.0	1630	100.0

Source: NICUS Data Collection. NSW Centre for Perinatal Health Services Research.  
# Babies with major congenital anomalies excluded.



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The incidence of intraventricular haemorrhage (IVH) among preterm infants (less than 37 weeks gestational age) has remained relatively constant (17.1 per cent in 1999). In 1999, confirmed IVH was most common among infants less than 28-weeks gestation (42.9 per cent)—43.1 per cent of these infants had severe IVH (grade 3 or 4). Six infants less than 32 weeks gestation with severe IVH required surgical drainage for post haemorrhagic hydrocephalus (6/57; 10.5 per cent). Of the surviving infants born before 32 weeks gestation, 94.0 per cent had a head ultrasound examination

to detect IVH (Table 86). The incidence of severe IVH has remained constant since 1992.

The proportion of infants with severe grades (Grade 3 or Grade 4) of retinopathy of prematurity (ROP) has decreased from 7.5 per cent in 1992 to 3.9 per cent in 1999. In 1999, all infants with severe grades of ROP were less than 32 weeks gestation and 72.4 per cent of the infants less than 28 weeks gestation received either cryo- or laser therapy. Importantly, 17.6 per cent of surviving infants of 28–31 weeks gestational age did not have an eye examination recorded (Table 87).

**TABLE 85**

**MAJOR SURGERY BY GESTATIONAL AGE, NSW & ACT 1999\***

Major Surgery	Gestational age (weeks)								TOTAL	
	22–27		28–31		32–36		37+		No.	%
	No.	%	No.	%	No.	%	No.	%	No.	%
No	257	91.5	513	97.9	514	98.1	285	94.7	1569	96.3
Yes	24	8.5	11	2.1	10	1.9	16	5.3	61	3.7
TOTAL	281	100.0	524	100.0	524	100.0	301	100.0	1630	100.0

Source: NICUS Data Collection. NSW Centre for Perinatal Health Services Research.

# Babies with major congenital anomalies excluded.

**TABLE 86**

**INTRAVENTRICULAR HAEMORRHAGE BY GESTATIONAL AGE, NSW & ACT 1999\***

Head ultrasound	Gestational age (weeks)								TOTAL	
	22–27		28–31		32–36				No.	%
	No.	%	No.	%	No.	%			No.	%
No IVH	145	51.6	391	74.6	282	53.8			818	61.6
Grade 1	39	13.9	61	11.6	29	5.5			129	9.7
Grade 2	23	8.2	11	2.1	0	0.0			34	2.6
Grade 3	24	8.5	5	1.0	6	1.1			35	2.6
Grade 4	23	8.2	5	1.0	1	0.2			29	2.2
Hydrocephalus requiring drainage	3	6.4	3	30.0	0	0.0			6	16.7
Not examined & lived	0	0.0	46	8.8	201	38.4			247	18.6
Not examined & died	27	9.6	5	1.0	5	1.0			37	2.8
TOTAL	281	100.0	524	100.0	524	100.0			1329	100.0

Source: NICUS Data Collection. NSW Centre for Perinatal Health Services Research.

# Babies with major congenital anomalies excluded.

**TABLE 87**

**RETINOPATHY OF PREMATURITY BY GESTATIONAL AGE, NSW & ACT 1999#**

Retinopathy of prematurity (ROP)	Gestational age (weeks)				TOTAL	
	22–27		28–31		No.	%
	No.	%	No.	%	No.	%
No ROP	93	33.1	366	69.8	459	57.0
Grade 1	27	9.6	32	6.1	59	7.3
Grade 2	54	19.2	17	3.2	71	8.8
Grade 3	27	9.6	2	0.4	29	3.6
Grade 4	2	0.7	0	0.0	2	0.2
Treated with cryotherapy–laser	21	7.5	0	0.0	21	2.6
Not examined & lived	3	1.1	92	17.6	95	11.8
Not examined & died	75	26.7	15	2.9	90	11.2
TOTAL	281	100.0	524	100.0	805	100.0

Source: NICUS Data Collection. NSW Centre for Perinatal Health Services Research.

# Babies with major congenital anomalies excluded.

## 5.5 SERVICE UTILISATION

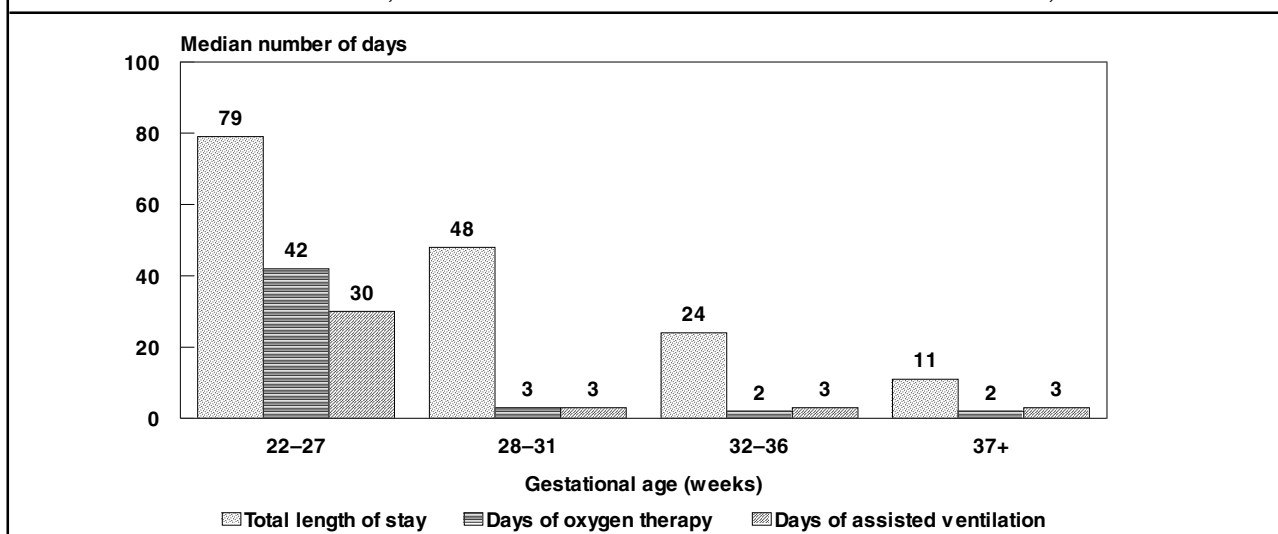
Indicators of service utilisation collected as part of NICUS include length of stay in tertiary and non-tertiary centres, days on assisted ventilation and days in oxygen (Figures 11 and 12 and Table 88). On an individual basis, infants born at less than 28 weeks gestation consumed most resources. However, as a group those born at 28–31 weeks gestation consumed more bed days than any other group due to their higher numbers. In 1999, the total cohort used 53,442 bed days in a tertiary centre in NSW and the ACT (range 46,091 in 1993 to 56,576 in 1998); as well as 19,094 in a non-tertiary centre (level 2 neonatal unit) in NSW and

the ACT (14,287 in 1992 to 19,094 in 1999). Even when these infants leave the neonatal intensive care unit, they still require substantial resources.

In 1999, NICUS registrants used 17,455 days of assisted ventilation (range 15,282 in 1993 to 18,059 in 1998) and 26,667 days of oxygen therapy (range 22,526 in 1992 to 30,323 in 1998). The overall proportion of infants going home on supplemental oxygen was 3.4 per cent in 1999 (range 2.1 per cent in 1992 to 5.1 per cent in 1998). The proportion of infants less than 28 weeks gestation going home on supplemental oxygen was 13.5 per cent (range 10.1 per cent in 1997 to 20.0 in 1998) (Table 89).

**FIGURE 11**

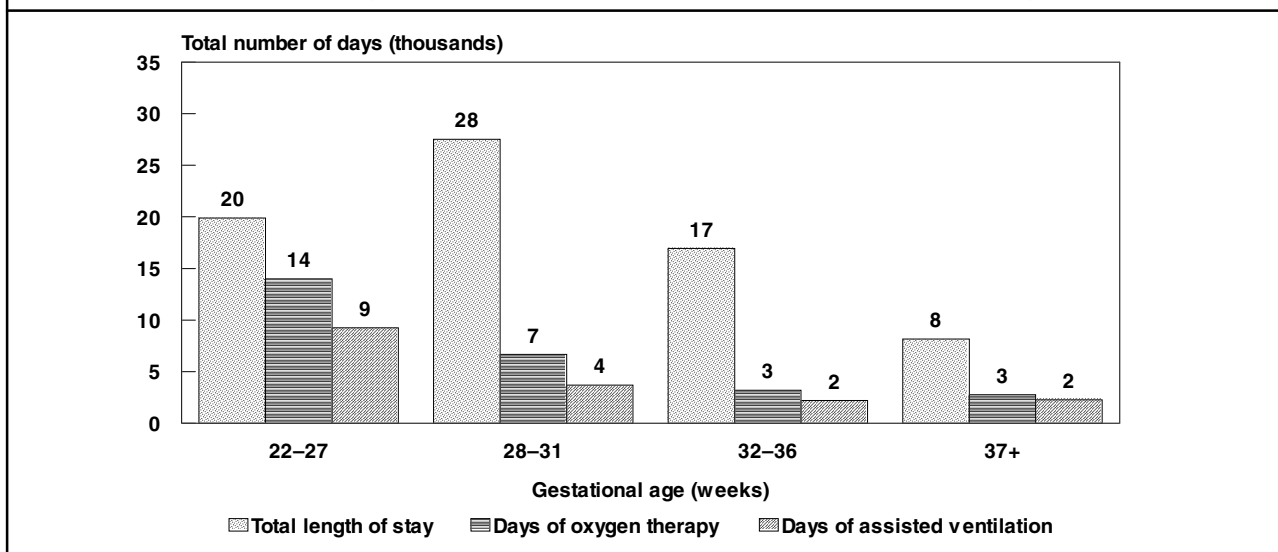
MEDIAN NUMBER OF DAYS IN HOSPITAL, OXYGEN THERAPY AND ASSISTED VENTILATION BY GESTATIONAL AGE, NSW & ACT 1999



Source: NICUS Data Collection. NSW Centre for Perinatal Health Services Research.

**FIGURE 12**

TOTAL NUMBER OF DAYS IN HOSPITAL, OXYGEN THERAPY AND ASSISTED VENTILATION BY GESTATIONAL AGE, NSW & ACT 1999



Source: NICUS Data Collection. NSW Centre for Perinatal Health Services Research.

**TABLE 88****SERVICE UTILISATION INDICATORS BY GESTATIONAL AGE, NSW & ACT 1999**

Indicators	Gestational age (weeks)				TOTAL
	22-27	28-31	32-36	37+	
<b>Non tertiary hospital stay (days)</b>					
Minimum	0	0	0	0	0
Maximum	105	151	150	72	151
Sum	2581	9802	5599	1112	19094
Median	0	18	3	0	1
25 <sup>th</sup> percentile	0	0	0	0	0
75 <sup>th</sup> percentile	13	30	16	2	17
<b>Tertiary hospital stay (days)</b>					
Minimum	1	1	1	1	1
Maximum	147	198	248	211	248
Sum	17305	17720	11352	7065	53442
Median	66	28	13	8	16
25 <sup>th</sup> percentile	20	13	7	5	7
75 <sup>th</sup> percentile	94	45	23	16	36
<b>Total hospital stay (days)</b>					
Minimum	1	1	1	1	1
Maximum	165	221	248	211	248
Sum	19886	27522	16951	8177	72536
Median	79	48	24	11	29
25 <sup>th</sup> percentile	21	37	16	7	12
75 <sup>th</sup> percentile	102	59	34	19	51
<b>Mechanical ventilation (days)</b>					
Minimum	0	0	0	0	0
Maximum	78	59	33	80	80
Sum	4226	1585	1381	1863	9055
Median	8	1	1	2	2
25 <sup>th</sup> percentile	3	0	0	1	0
75 <sup>th</sup> percentile	22	4	3	4	4
<b>Continuous positive airways pressure (days)</b>					
Minimum	0	0	0	0	0
Maximum	79	47	37	98	98
Sum	5031	2119	828	422	8400
Median	14	1	0	0	0
25 <sup>th</sup> percentile	0	0	0	0	0
75 <sup>th</sup> percentile	31	4	2	1	3
<b>Assisted ventilation (days)</b>					
Minimum	0	0	0	0	0
Maximum	157	64	66	178	178
Sum	9257	3704	2209	2285	17455
Median	30	3	3	3	3
25 <sup>th</sup> percentile	7	1	1	1	1
75 <sup>th</sup> percentile	53	8	4	4	7
<b>Oxygen therapy (days)</b>					
Minimum	0	0	0	0	0
Maximum	164	198	248	182	248
Sum	14000	6670	3220	2777	26667
Median	42	3	2	2	3
25 <sup>th</sup> percentile	6	1	1	1	1
75 <sup>th</sup> percentile	86	14	5	6	10

Source: NICUS Data Collection. NSW Centre for Perinatal Health Services Research.

**TABLE 89****HOME OXYGEN ADMINISTRATION AND GESTATIONAL AGE, NSW & ACT 1995-1999#**

Year	Home oxygen	Gestational age (weeks)								TOTAL	
		22-27		28-31		32-36		37+		No.	%
		No.	%	No.	%	No.	%	No.	%	No.	%
1995	No	185	84.1	469	95.9	430	99.5	271	99.6	1355	95.9
	Yes	35	15.9	20	4.1	2	0.5	1	0.4	58	4.1
	TOTAL	220	100.0	489	100.0	432	100.0	272	100.0	1413	100.0
1996	No	191	83.8	482	96.2	469	99.4	267	97.8	1409	95.6
	Yes	37	16.2	19	3.8	3	0.6	6	2.2	65	4.4
	TOTAL	228	100.0	501	100.0	472	100.0	273	100.0	1474	100.0
1997	No	204	89.9	495	96.3	460	99.6	254	98.8	1413	96.8
	Yes	23	10.1	19	3.7	2	0.4	3	1.2	47	3.2
	TOTAL	227	100.0	514	100.0	462	100.0	257	100.0	1460	100.0
1998	No	224	80.0	550	97.5	459	99.1	266	97.8	1499	94.9
	Yes	56	20.0	14	2.5	4	0.9	6	2.2	80	5.1
	TOTAL	280	100.0	564	100.0	463	100.0	272	100.0	1579	100.0
1999	No	243	86.5	512	97.7	521	99.4	298	99.0	1574	96.6
	Yes	38	13.5	12	2.3	3	0.6	3	1.0	56	3.4
	TOTAL	281	100.0	524	100.0	524	100.0	301	100.0	1630	100.0

Source: NICUS Data Collection. NSW Centre for Perinatal Health Services Research.

# Babies with major congenital anomalies excluded.

**TABLE 90****DURATION OF SURVIVAL OF BABIES BY GESTATIONAL AGE, NSW & ACT 1999#**

Gestational age (weeks)	Alive at six months		Age at death (days)						TOTAL	
	No.	%	0-7		8-28		28+		No.	%
	No.	%	No.	%	No.	%	No.	%	No.	%
22	0	0.0	2	100.0	0	0.0	0	0.0	2	0.1
23	4	26.7	10	66.7	0	0.0	1	6.7	15	0.9
24	22	53.7	11	26.8	4	9.8	4	9.8	41	2.5
25	38	61.3	17	27.4	6	9.7	1	1.6	62	3.8
26	64	76.2	13	15.5	3	3.6	4	4.8	84	5.2
27	68	88.3	6	7.8	3	3.9	0	0.0	77	4.7
28	94	97.9	1	1.0	1	1.0	0	0.0	96	5.9
29	109	93.2	7	6.0	0	0.0	1	0.9	117	7.2
30	137	98.6	1	0.7	1	0.7	0	0.0	139	8.5
31	168	97.7	1	0.6	3	1.7	0	0.0	172	10.5
32	139	99.3	1	0.7	0	0.0	0	0.0	140	8.6
33	135	98.5	2	1.5	0	0.0	0	0.0	137	8.4
34	99	99.0	1	1.0	0	0.0	0	0.0	100	6.1
35	77	100.0	0	0.0	0	0.0	0	0.0	77	4.7
36	66	94.3	2	2.9	2	2.9	0	0.0	70	4.3
37	47	97.9	1	2.1	0	0.0	0	0.0	48	2.9
38	64	94.1	2	2.9	2	2.9	0	0.0	68	4.2
39	50	90.9	4	7.3	0	0.0	1	1.8	55	3.4
40	66	89.2	5	6.8	3	4.1	0	0.0	74	4.5
41	43	93.5	2	4.3	1	2.2	0	0.0	46	2.8
42	9	90.0	0	0.0	0	0.0	1	10.0	10	0.6
TOTAL	1499	92.0	89	5.5	29	1.8	13	0.8	1630	100.0

Source: NICUS Data Collection. NSW Centre for Perinatal Health Services Research.

# Babies with major congenital anomalies excluded.

## 5.6 SURVIVAL

Infants with a major congenital anomaly have been excluded from the analysis of survival with the exception of data reported in Table 92.

The six-month survival rate for all infants without a major congenital anomaly in the 1999 cohort was 92.0 per cent (compared with 87.8 per cent in 1992 to 92.5 per cent in 1998). Survival of infants born at less than 25 weeks gestation was 44.8 per cent (range 33.9 per cent in 1998 to 54.8 per cent in 1993). There was a trend for survival to improve with gestational age up to 35 weeks gestation after which it decreased slightly. Term infants (92.7 per cent) were more likely to survive than preterm infants (91.8 per cent). Amongst infants who died, 67.9 per cent of deaths occurred during the first week of life (compared with 63.0 per cent in 1998 to 75.5 in 1994) with a further 22.1 per cent occurring during the first month of life (Table 90).

The six-month survival rate improved with increasing birth weight, ranging from 62.5 per cent for infants in the 500–599 grams group to 86.0 per cent for the 900–999 gram group. Six-month survival continued to improve with increasing birthweight to a maximum of 98.0 per cent for infants of 1,500–1,749 grams birthweight and then decreased slightly (Table 91).

The majority of infants registered in NICUS were born at a tertiary centre. Although the gestational age is the most important risk factor for mortality, disease severity is also important. At each gestational age group those with severe disease are more likely to be transferred to a neonatal intensive care unit.

In 1999, the six-month survival rate for infants born at 22 to 27 weeks was greater for those born in a tertiary centre

(72.4 per cent) compared with those born in a non tertiary centre (35.0 per cent). This trend was also evident for those born between 1992–1998. Place of birth did not affect survival for infants in the other gestational age groups (Table 92).

The six-month survival rate for all male infants (90.8 per cent) was similar to that for all female infants (93.5 per cent). The six-month survival rate was similar for males and females for all gestational age groups: less than 28 weeks (66.3 per cent versus 75.0 per cent), 28–31 weeks (96.2 per cent versus 97.7 per cent), 32–36 weeks (98.3 per cent versus 98.7 per cent) and 37–41 weeks gestation groups (93.6 per cent versus 91.7 per cent).

The six-month survival rate was 92.3 per cent ( $n=1,265$ ) for singleton infants and 91.0 per cent ( $n=365$ ) for multiple gestation infants. Plurality did not influence survival in the 28–31 weeks, 32–36 weeks and 37 plus gestational age groups. There were only five infants born of a multiple pregnancy in the 37–41 weeks group and none in the 42 plus weeks group. In 1999 the survival rate for infants in the less than 28 week gestation group was lower for infants born of a multiple (47/74; 63.5 per cent) than a singleton pregnancy (149/207; 72.0 per cent).

As expected survival was generally lower (79.5 per cent) in the presence of a major congenital anomaly (Table 93).

Post-mortem examinations were performed on 34 of the 131 infants (26.0 per cent) who died in the 1999 cohort (Figure 13 and Table 94). Post-mortem examinations were most commonly not requested for infant's 22–27 weeks gestation (52.9 per cent) and 28–31 weeks gestation (50.0 per cent). The highest rate of refusal was in 32–36 weeks gestation group (50.0 per cent) and the highest rate of post-mortems done was in the term group (50.0 per cent).

**TABLE 91**

**DURATION OF SURVIVAL BY BIRTHWEIGHT, NSW & ACT 1999\***

Birthweight (grams)	Alive at six months		Age at death (days)				TOTAL			
	No.	%	0–7		8–28		28+			
			No.	%	No.	%	No.	%		
<400	0	0.0	3	100.0	0	0.0	0	0.0	3	0.2
400–499	2	25.0	6	75.0	0	0.0	0	0.0	8	0.5
500–599	15	62.5	3	12.5	3	12.5	3	12.5	24	1.5
600–699	31	62.0	13	26.0	3	6.0	3	6.0	50	3.1
700–799	41	68.3	15	25.0	2	3.3	2	3.3	60	3.7
800–899	53	76.8	9	13.0	5	7.2	2	2.9	69	4.2
900–999	49	86.0	6	10.5	1	1.8	1	1.8	57	3.5
1,000–1,249	190	95.0	8	4.0	2	1.0	0	0.0	200	12.3
1,250–1,499	224	97.8	4	1.7	1	0.4	0	0.0	229	14.0
1,500–1,749	192	98.0	1	0.5	3	1.5	0	0.0	196	12.0
1,750–1,999	128	97.7	2	1.5	1	0.8	0	0.0	131	8.0
2,000–2,499	181	97.8	4	2.2	0	0.0	0	0.0	185	11.3
2,500–2,999	138	93.2	8	5.4	2	1.4	0	0.0	148	9.1
3,000–3,499	111	92.5	5	4.2	3	2.5	1	0.8	120	7.4
3,500–3,999	92	95.8	1	1.0	3	3.1	0	0.0	96	5.9
4,000+	52	96.3	1	1.9	0	0.0	1	1.9	54	3.3
TOTAL	1499	92.0	89	5.5	29	1.8	13	0.8	1630	100.0

Source: NICUS Data Collection. NSW Centre for Perinatal Health Services Research.  
# Babies with major congenital anomalies excluded.

**TABLE 92****DURATION OF SURVIVAL BY PLACE OF BIRTH AND GESTATIONAL AGE, NSW & ACT 1999#**

Gestational age (weeks)	Place of birth	Alive at six months		0-7		Age at death (days) 8-28		28+		TOTAL	
		No.	%	No.	%	No.	%	No.	%	No.	%
22-27	Non tertiary	7	35.0	10	50.0	2	10.0	1	5.0	20	7.1
	Tertiary	189	72.4	49	18.8	14	5.4	9	3.4	261	92.9
	Sub-total	196	69.8	59	21.0	16	5.7	10	3.6	281	100.0
28-31	Non tertiary	49	96.1	1	2.0	1	2.0	0	0.0	51	9.7
	Tertiary	459	97.0	9	1.9	4	0.8	1	0.2	473	90.3
	Sub-total	508	96.9	10	1.9	5	1.0	1	0.2	524	100.0
32-36	Non tertiary	142	97.9	1	0.7	2	1.4	0	0.0	145	27.7
	Tertiary	374	98.7	5	1.3	0	0.0	0	0.0	379	72.3
	Sub-total	516	98.5	6	1.1	2	0.4	0	0.0	524	100.0
37-41	Non tertiary	136	91.3	7	4.7	5	3.4	1	0.7	149	51.2
	Tertiary	134	94.4	7	4.9	1	0.7	0	0.0	142	48.8
	Sub-total	270	92.8	14	4.8	6	2.1	1	0.3	291	100.0
42+	Non tertiary	4	80.0	0	0.0	0	0.0	1	20.0	5	50.0
	Tertiary	5	100.0	0	0.0	0	0.0	0	0.0	5	50.0
	Sub-total	9	90.0	0	0.0	0	0.0	1	10.0	10	100.0
TOTAL		1499	92.0	89	5.5	29	1.8	13	0.8	1630	100.0

Source: NICUS Data Collection. NSW Centre for Perinatal Health Services Research.

# Babies with major congenital anomalies excluded. Babies born before arrival excluded.

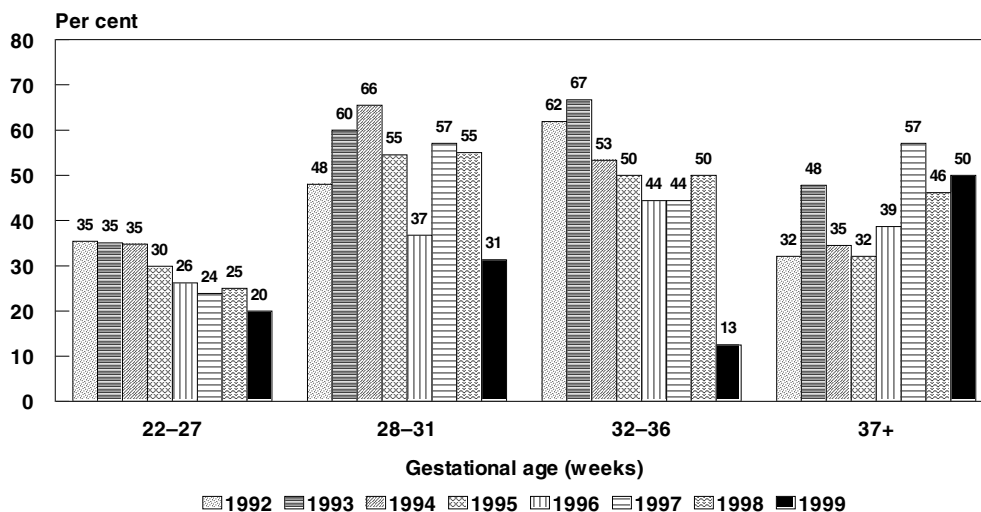
**TABLE 93****DURATION OF SURVIVAL BY MAJOR CONGENITAL ANOMALY AND GESTATIONAL AGE, NSW & ACT 1999**

Gestational age (weeks)	Major congenital anomaly	Alive at six months		0-7		Age at death (days) 8-28		28+		TOTAL	
		No.	%	No.	%	No.	%	No.	%	No.	%
22-27	No	196	69.8	59	21.0	16	5.7	10	3.6	281	97.2
	Yes	7	87.5	1	12.5	0	0.0	0	0.0	8	2.8
	Sub-total	203	70.2	60	20.8	16	5.5	10	3.5	289	100.0
28-31	No	508	96.9	10	1.9	5	1.0	1	0.2	524	95.1
	Yes	19	70.4	5	18.5	2	7.4	1	3.7	27	4.9
	Sub-total	527	95.7	15	2.7	7	1.3	2	0.4	551	100.0
32-36	No	516	98.5	6	1.1	2	0.4	0	0.0	524	84.1
	Yes	76	76.8	14	14.1	3	3.0	6	6.1	99	15.9
	Sub-total	592	95.0	20	3.2	5	0.8	6	1.0	623	100.0
37-41	No	270	92.8	14	4.8	6	2.1	1	0.3	291	56.8
	Yes	180	81.4	23	10.4	12	5.4	6	2.7	221	43.2
	Sub-total	450	87.9	37	7.2	18	3.5	7	1.4	512	100.0
42+	No	9	90.0	0	0.0	0	0.0	1	10.0	10	62.5
	Yes	5	83.3	0	0.0	1	16.7	0	0.0	6	37.5
	Sub-total	14	87.5	0	0.0	1	6.3	1	6.3	16	100.0
TOTAL		1786	89.7	132	6.6	47	2.4	26	1.3	1991	100.0

Source: NICUS Data Collection. NSW Centre for Perinatal Health Services Research.

**FIGURE 13**

**DEATHS BY POST-MORTEM EXAMINATION AND GESTATIONAL AGE, NSW & ACT 1992–1999#**



Source: NICUS Data Collection. NSW Centre for Perinatal Health Services Research.

# Infants with major congenital anomalies excluded.

**TABLE 94**

**POST-MORTEM EXAMINATION BY GESTATIONAL AGE, NSW & ACT 1999#**

Post-mortem	Gestational age (weeks)								TOTAL	
	22-27		28-31		32-36		37+		No.	%
	No.	%	No.	%	No.	%	No.	%	No.	%
Not requested	45	52.9	8	50.0	3	37.5	9	40.9	65	49.6
Refused	23	27.1	3	18.8	4	50.0	2	9.1	32	24.4
Done	17	20.0	5	31.3	1	12.5	11	50.0	34	26.0
TOTAL	85	100.0	16	100.0	8	100.0	22	100.0	131	100.0

Source: NICUS Data Collection. NSW Centre for Perinatal Health Services Research.

# Babies with major congenital anomalies excluded.

## PART 6: BIRTH DEFECTS

### 6.1 BIRTH DEFECTS AMONG STILLBORN AND LIVEBORN INFANTS

A birth defect is any structural defect detected during pregnancy or at birth, excluding birth injuries and minor anomalies such as skin tags, talipes, birthmarks or clicky hips. A list of common exclusions is shown in Appendix 1.

From 1 January 1998 doctors, hospitals and laboratories are required to notify birth defects detected during pregnancy, at birth, or up to one year of life under NSW Public Health Act 1991. Information reported is included in the NSW Birth Defects Register (BDR). The quality of information received by the BDR has improved since 1998, particularly in relation to pregnancy outcome.

Descriptions of some common birth defects are shown in Appendix 2. This chapter reports birth defects detected during pregnancy or in the first year of life for 1993–1998 and birth defects detected during pregnancy or at birth for 1999.

#### 6.1.1 TRENDS IN REPORTED BIRTH DEFECTS

Between 1993 and 1998, the reported number of infants with birth defects has remained stable at just over two per cent (Table 95). In 1999, 988 cases of birth defects detected during pregnancy or at birth were reported.

#### 6.1.2 BIRTH DEFECTS BY DIAGNOSTIC CATEGORY

The most common categories of birth defects for births of more than 20 weeks gestation or with a birthweight greater than 400 grams are presented in Table 96. Birth defects are classified using the British Paediatric Association

**TABLE 95**

**BIRTH DEFECT CASES, NSW 1993–1999\***

Year	Birth defect cases	Births	Rate/1,000 births
1993	2142	87143	24.6
1994	1989	87262	22.8
1995	1947	86648	22.5
1996	1880	85706	21.9
1997	2001	87416	22.9
1998	1949	85627	22.8
1999	988	86468	11.4

Source: NSW Birth Defects Register. Epidemiology and Surveillance Branch, NSW Health Department.

# For 1993–1998, cases reported during pregnancy and up to one year of age are included. For 1999, cases reported during pregnancy or at birth are reported.

(BPA) Classification of Diseases, which is primarily organised by body system.<sup>1</sup> For infants with more than one defect, each defect is counted separately. The number of birth defects reported therefore exceeds the number of affected infants.

In 1993–1999, defects of the cardiovascular system were most commonly reported, followed by defects of the musculoskeletal system and defects of the genito-urinary system. This is a similar pattern to previous years. In 1998, the overall rate of defects was slightly lower than the previous five years combined (42.1 versus 55.4 per 1,000), due to a decrease in the number of babies with multiple malformations. The proportion of reported cases with three or more malformations fell from 22.3 to 19.0 per cent between 1993 and 1998.

**TABLE 96**

**BIRTH DEFECTS AMONG STILLBIRTHS AND LIVE BIRTHS BY DIAGNOSTIC CATEGORY, NSW 1993–1999**

Diagnostic category	No. defects			Rate/1,000 births				
	1993–97	1998	1999	1993–99	1993–97	1998	1999	1993–99
<b>Defects of nervous system</b>								
Anencephaly	57	11	5	73	0.2	0.1	0.1	0.1
Spina Bifida	171	28	22	221	0.5	0.3	0.3	0.4
Encephalocele	45	5	4	54	0.1	0.1	0.0	0.1
Microcephaly	156	27	4	187	0.4	0.3	0.0	0.3
Congenital hydrocephalus	195	38	25	258	0.6	0.4	0.3	0.4
Other nervous system defects	406	90	38	534	1.2	1.0	0.4	0.9
TOTAL	1030	199	98	1327	3.0	2.3	1.1	2.2
<b>Defects of eye</b>								
Anophthalmos–microphthalmos	78	12	13	103	0.2	0.1	0.2	0.2
Buphthalmos–congenital glaucoma	38	5	0	43	0.1	0.1	0.0	0.1
Congenital cataract	79	23	7	109	0.2	0.3	0.1	0.2
Other eye defects	193	42	16	251	0.6	0.5	0.2	0.4
TOTAL	388	82	36	506	1.1	0.9	0.4	0.8
<b>Defects of ear, face and neck</b>								
Absence–stricture auditory canal	43	11	9	63	0.1	0.1	0.1	0.1
Absent auricle	6	1	1	8	0.0	0.0	0.0	0.0
Defects of face and neck	39	12	2	53	0.1	0.1	0.0	0.1
Other ear defects	89	22	10	121	0.3	0.3	0.1	0.2
TOTAL	177	46	22	245	0.5	0.5	0.3	0.4
<b>Defects of cardiovascular system</b>								
Transposition of great vessels	214	47	22	283	0.6	0.5	0.3	0.5
Tetralogy of Fallot	145	36	13	194	0.4	0.4	0.2	0.3
Ventricular septal defect	1073	210	83	1366	3.1	2.4	1.0	2.3
Atrial septal defect	1119	169	63	1351	3.2	1.9	0.7	2.2
Heart valve defects	882	149	73	1104	2.5	1.7	0.9	1.8



**TABLE 96 (CONT)**
**BIRTH DEFECTS AMONG STILLBIRTHS AND LIVE BIRTHS BY DIAGNOSTIC CATEGORY, NSW 1993–1999\***

Diagnostic category	No. defects			Rate/1,000 births				
	1993–1997	1998	1999	1993–1999	1993–1997	1998	1999	1993–1999
<b>Defects of cardiovascular system (cont)</b>								
Patent ductus arteriosus > 37 weeks	666	105	60	831	1.9	1.2	0.7	1.4
Coarctation of aorta	192	37	18	247	0.6	0.4	0.2	0.4
Other defects of aorta	97	31	16	144	0.3	0.4	0.2	0.2
Defects of pulmonary artery	148	31	12	191	0.4	0.4	0.1	0.3
Other cardiovascular defects	976	168	133	1277	2.8	1.9	1.6	2.1
<b>TOTAL</b>	<b>5512</b>	<b>983</b>	<b>493</b>	<b>6988</b>	<b>15.9</b>	<b>11.2</b>	<b>5.8</b>	<b>11.5</b>
<b>Defects of respiratory system</b>								
Defects of nose	78	20	8	106	0.2	0.2	0.1	0.2
Defects of larynx, trachea and bronchus	45	14	2	61	0.1	0.2	0.0	0.1
Defects of lung	88	21	22	131	0.3	0.2	0.3	0.2
Other respiratory defects	3	0	0	3	0.0	0.0	0.0	0.0
<b>TOTAL</b>	<b>214</b>	<b>55</b>	<b>32</b>	<b>301</b>	<b>0.6</b>	<b>0.6</b>	<b>0.4</b>	<b>0.5</b>
<b>Defects of gastrointestinal system</b>								
Cleft palate only	434	77	49	560	1.3	0.9	0.6	0.9
Cleft lip only	180	32	27	239	0.5	0.4	0.3	0.4
Cleft palate and cleft lip	267	53	43	363	0.8	0.6	0.5	0.6
Oesophageal atresia only	12	0	2	14	0.0	0.0	0.0	0.0
Oesophageal atresia with TOF	90	19	19	128	0.3	0.2	0.2	0.2
Tracheo-oesophageal fistula (TOF) only	29	7	5	41	0.1	0.1	0.1	0.1
Atresia–stenosis of small intestine	137	20	15	172	0.4	0.2	0.2	0.3
Atresia–stenosis of anus	160	33	24	217	0.5	0.4	0.3	0.4
Other gastrointestinal defects	528	113	44	685	1.5	1.3	0.5	1.1
<b>TOTAL</b>	<b>1837</b>	<b>354</b>	<b>228</b>	<b>2419</b>	<b>5.3</b>	<b>4.0</b>	<b>2.7</b>	<b>4.0</b>
<b>Defects of genito-urinary system</b>								
Defects of female genitals	81	14	5	100	0.2	0.2	0.1	0.2
Undescended testis	465	84	25	574	1.3	1.0	0.3	0.9
Hypospadias	999	193	148	1340	2.9	2.2	1.7	2.2
Epispadias	24	7	2	33	0.1	0.1	0.0	0.1
Chordee	220	29	9	258	0.6	0.3	0.1	0.4
Indeterminate sex–ambiguous genitalia	74	10	6	90	0.2	0.1	0.1	0.1
Renal agenesis–dysgenesis	148	53	29	230	0.4	0.6	0.3	0.4
Obstructive defects of renal pelvis and ureter	842	157	57	1056	2.4	1.8	0.7	1.7
Other genito-urinary system defects	752	153	61	966	2.2	1.8	0.7	1.6
<b>TOTAL</b>	<b>3605</b>	<b>700</b>	<b>342</b>	<b>4647</b>	<b>10.4</b>	<b>8.0</b>	<b>4.0</b>	<b>7.7</b>
<b>Defects of musculoskeletal system</b>								
Congenital dislocation of the hips	875	153	69	1097	2.5	1.8	0.8	1.8
Talipes equinovarus	328	46	29	403	0.9	0.5	0.3	0.7
Polydactyly	483	100	77	660	1.4	1.1	0.9	1.1
Syndactyly	161	41	19	221	0.5	0.5	0.2	0.4
Reduction deformities of limbs	356	56	49	461	1.0	0.6	0.6	0.8
Craniosynostosis	481	75	7	563	1.4	0.9	0.1	0.9
Diaphragmatic hernia	121	21	28	170	0.3	0.2	0.3	0.3
Exomphalos	73	14	12	99	0.2	0.2	0.1	0.2
Gastroschisis	82	17	17	116	0.2	0.2	0.2	0.2
Other musculoskeletal defects	1307	233	135	1675	3.8	2.7	1.6	2.8
<b>TOTAL</b>	<b>4267</b>	<b>756</b>	<b>442</b>	<b>5465</b>	<b>12.3</b>	<b>8.6</b>	<b>5.2</b>	<b>9.0</b>
<b>Defects of integumentary system</b>								
Cystic hygroma	379	78	33	490	1.1	0.9	0.4	0.8
<b>TOTAL</b>	<b>49</b>	<b>12</b>	<b>4</b>	<b>65</b>	<b>0.1</b>	<b>0.1</b>	<b>0.0</b>	<b>0.1</b>
<b>Chromosomal defects</b>								
Trisomy 21	558	112	69	739	1.6	1.3	0.8	1.2
Trisomy 13	21	6	7	34	0.1	0.1	0.1	0.1
Trisomy 18	90	21	20	131	0.3	0.2	0.2	0.2
Turner syndrome	43	12	5	60	0.1	0.1	0.1	0.1
Other chromosomal defects	202	52	31	285	0.6	0.6	0.4	0.5
<b>TOTAL</b>	<b>914</b>	<b>203</b>	<b>132</b>	<b>1249</b>	<b>2.6</b>	<b>2.3</b>	<b>1.5</b>	<b>2.1</b>
<b>Situs inversus</b>								
<b>TOTAL</b>	<b>24</b>	<b>5</b>	<b>3</b>	<b>32</b>	<b>0.1</b>	<b>0.1</b>	<b>0.0</b>	<b>0.1</b>
<b>Congenital malformation syndromes</b>								
<b>TOTAL</b>	<b>198</b>	<b>43</b>	<b>18</b>	<b>259</b>	<b>0.6</b>	<b>0.5</b>	<b>0.2</b>	<b>0.4</b>
<b>Congenital rubella syndrome</b>								
<b>TOTAL</b>	<b>6</b>	<b>0</b>	<b>0</b>	<b>6</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>
<b>Congenital cytomegalovirus infection</b>								
<b>TOTAL</b>	<b>12</b>	<b>2</b>	<b>1</b>	<b>15</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>
<b>Congenital toxoplasmosis</b>								
<b>TOTAL</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>
<b>Non-immune hydrops foetalis</b>								
<b>TOTAL</b>	<b>86</b>	<b>30</b>	<b>20</b>	<b>136</b>	<b>0.2</b>	<b>0.3</b>	<b>0.2</b>	<b>0.2</b>
<b>Other and unspecified birth defects</b>								
<b>TOTAL</b>	<b>526</b>	<b>129</b>	<b>21</b>	<b>676</b>	<b>1.5</b>	<b>1.5</b>	<b>0.2</b>	<b>1.1</b>
<b>TOTAL</b>	<b>19226</b>	<b>3677</b>	<b>1925</b>	<b>24828</b>	<b>55.4</b>	<b>42.1</b>	<b>22.5</b>	<b>41.0</b>

Source: NSW Birth Defects Register. Epidemiology and Surveillance Branch, NSW Health Department.

# For 1993–1998, cases reported during pregnancy and up to one year of age are included. For 1999, cases reported during pregnancy or at birth are reported.

### 6.1.3 INFANT CHARACTERISTICS

In the period 1993–1999, a single defect was reported in 62.3 per cent of infants, two defects in 17.6 per cent, three defects in 8.0 per cent, and four or more defects in 12.2 per cent of cases.

The sex was male in 59.5 per cent of infants, female in 39.8 per cent, indeterminate in 0.4 per cent of infants, and was not stated for 0.4 per cent.

Birth defects were more common in preterm and post-term infants than infants born at term (Table 97). Birth defects were also more common in infants born of a multiple

pregnancy than a singleton pregnancy: in 1993–1999, 2.1 per cent of singleton babies, 2.9 per cent of twins and 3.0 per cent of triplets were born with a birth defect.

Almost 10 per cent of infants born with birth defects died in the perinatal period, with stillbirths contributing about half the perinatal deaths (Table 98). These figures comprise all birth defect cases, including those where the cause of death may not be directly related to the birth defect(s). By comparison, the perinatal mortality rate among all births reported to the NSW Midwives Data Collection was 9.2 per 1,000 in 1999 (see Section 1.16).

**TABLE 97**

**BIRTH DEFECT CASES BY GESTATIONAL AGE, NSW 1993–1999<sup>#</sup>**

Gestational age (weeks)	1993–1997		1998		Year 1999		1993–1999		Rate/1,000 births
	No.	%	No.	%	No.	%	No.	%	
20–27	384	3.9	114	5.8	80	8.1	578	4.5	154.8
28–31	294	3.0	64	3.3	24	2.4	382	3.0	91.0
32–36	1106	11.1	211	10.8	122	12.3	1439	11.2	44.3
37–41	7523	75.5	1452	74.5	736	74.5	9711	75.3	17.7
42 +	284	2.9	39	2.0	25	2.5	348	2.7	21.5
Not stated	368	3.7	69	3.5	1	0.1	438	3.4	–
TOTAL	9959	100.0	1949	100.0	988	100.0	12896	100.0	21.3

Source: NSW Birth Defects Register. Epidemiology and Surveillance Branch, NSW Health Department.

# For 1993–1998, cases reported during pregnancy and up to one year of age are included. For 1999, cases reported during pregnancy or at birth are reported.

**TABLE 98**

**BIRTH DEFECT CASES BY PREGNANCY OUTCOME, NSW 1993–1999<sup>#</sup>**

Pregnancy outcome	1993–1997		1998		Year 1999		1993–1999	
	No.	%	No.	%	No.	%	No.	%
Stillbirth	448	4.5	115	5.9	85	8.6	648	5.0
Liveborn–neonatal death	438	4.4	82	4.2	69	7.0	589	4.6
Liveborn–postneonatal death	89	0.9	18	0.9	8	0.8	115	0.9
Liveborn surviving	8984	90.2	1734	89.0	826	83.6	11544	89.5
TOTAL	9959	100.0	1949	100.0	988	100.0	12896	100.0

Source: NSW Birth Defects Register. Epidemiology and Surveillance Branch, NSW Health Department.

# For 1993–1998, cases reported during pregnancy and up to one year of age are included. For 1999, cases reported during pregnancy or at birth are reported. Postneonatal mortality was recorded from 1993.

### 6.1.4 MATERNAL CHARACTERISTICS

After 20 years of age, the incidence of birth defects increased with increasing maternal age (Table 99). While the rate of birth defects is higher in older women, the majority of births occur in younger women: in 1993–1999, 78.0 per cent of babies with birth defects were born to women aged less than 35 years.

In 1993–1999, 218 babies of Aboriginal or Torres Strait Islander mothers were reported to have birth defects. The rate of birth defects among these babies was 17.6 per 1,000 compared with 21.4 per cent for non-Aboriginal mothers.

**TABLE 99**

**BIRTH DEFECT CASES BY MATERNAL AGE, NSW 1993–1999\***

Maternal age (years)	1993–1997		1998		1999		1993–1999		Rate/1,000 births
	No.	%	No.	%	No.	%	No.	%	
Under 20	508	5.1	94	4.8	53	5.4	655	5.1	21.9
20–24	1683	16.9	313	16.1	149	15.1	2145	16.6	19.6
25–29	2840	28.5	589	30.2	304	30.8	3733	28.9	19.0
30–34	2754	27.7	507	26.0	266	26.9	3527	27.3	19.6
35–39	1244	12.5	258	13.2	168	17.0	1670	12.9	21.9
40–44	256	2.6	65	3.3	44	4.5	365	2.8	28.9
45+	21	0.2	2	0.1	3	0.3	26	0.2	53.3
Not stated	653	6.6	121	6.2	1	0.1	775	6.0	–
TOTAL	9959	100.0	1949	100.0	988	100.0	12896	100.0	21.3

Source: NSW Birth Defects Register. Epidemiology and Surveillance Branch, NSW Health Department.

# For 1993–1998, cases reported during pregnancy and up to one year of age are included. For 1999, cases reported during pregnancy or at birth are reported. Postneonatal mortality was recorded from 1993.

### 6.2 BIRTH DEFECTS AMONG TERMINATIONS OF PREGNANCY, SPONTANEOUS ABORTIONS AND UNKNOWN OUTCOMES OF PREGNANCY

In the period 1993–1997, about 130 terminations of pregnancy per year were reported to the NSW Birth Defects Register (Table 100). Following the introduction of a requirement to notify birth defects under the NSW Public Health Act 1991 from 1 January 1998, the number of terminations reported rose to 250 in 1998 and 236 in 1999.

Of the total 1,150 terminations of pregnancy reported in 1993–99, 644 (56.0 per cent) were associated with a chromosomal abnormality, the most common of which was Down syndrome, and 277 (24.1 per cent) were associated with a neural tube defect (Table 101). In 1993–1999, 53.9 per cent of terminations were carried out in women aged less than 35 years (Table 102).

For spontaneous abortions, cytogenetic analysis is only carried out in cases of habitual abortion and the numbers presented therefore underestimate the number of spontaneous abortions which occur due to birth defects. Descriptions of some diagnostic terms used here are included in Appendix 2.

**TABLE 100**

**PREGNANCIES WITH FETUSES AFFECTED BY BIRTH DEFECTS AND RESULTING IN SPONTANEOUS ABORTION, TERMINATION OF PREGNANCY OR UNKNOWN OUTCOME, NSW 1993–1999**

Pregnancy outcome	Year			
	1993–1997 No.	1998 No.	1999 No.	1993–1999 No.
Spontaneous abortion	272	84	114	470
Termination of pregnancy less than 20 weeks gestation	664	250	236	1150
Unknown outcome	713	16	0	729
TOTAL	1649	350	350	2349

Source: NSW Birth Defects Register. Epidemiology and Surveillance Branch, NSW Health Department.

**TABLE 101**
**BIRTH DEFECTS AMONG SPONTANEOUS ABORTIONS, TERMINATIONS OF PREGNANCY AND UNKNOWN OUTCOME OF PREGNANCY BY DIAGNOSTIC CATEGORY, NSW 1993–1999**

Diagnostic category	1993–1997			Year 1998			1999			1993–1999		
	Spont. abortion	Termination of pregnancy less than 20 weeks gestation	Unknown outcome	Spont. abortion	Termination of pregnancy less than 20 weeks gestation	Unknown outcome	Spont. abortion	Termination of pregnancy less than 20 weeks gestation	Unknown outcome	Spont. abortion	Termination of pregnancy less than 20 weeks gestation	Unknown outcome
	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.
<b>Defects of nervous system</b>												
Neural tube defects	12	186	7	3	43	0	0	48	15	277	7	
Other nervous system defects	7	68	13	0	32	0	0	29	7	129	13	
TOTAL	19	254	20	3	75	0	0	77	22	406	20	
<b>Defects of eye</b>	1	3	1	0	0	0	0	1	1	4	1	
<b>Defects of ear, face and neck</b>	0	6	1	0	2	0	0	4	0	12	1	
<b>Defects of cardiovascular system</b>	2	88	44	2	24	0	0	44	4	156	44	
<b>Defects of respiratory system</b>	0	17	3	0	6	0	0	11	0	34	3	
<b>Defects of gastrointestinal system</b>	2	53	13	1	14	0	0	34	3	101	13	
<b>Defects of genito-urinary system</b>	7	120	21	0	32	2	4	39	11	191	23	
<b>Defects of musculoskeletal system</b>	12	250	34	9	75	0	4	89	25	414	34	
<b>Defects of integumentary system</b>	0	2	1	1	0	0	0	1	1	3	1	
<b>Cystic hygroma</b>	9	69	34	0	15	0	4	13	13	97	34	
<b>Chromosomal defects</b>												
Trisomy 21	27	134	274	8	73	6	10	69	45	276	280	
Trisomy 13	9	23	34	2	10	0	4	13	15	46	34	
Trisomy 18	17	55	95	4	35	1	7	29	28	119	96	
Other chromosomal defects	172	100	187	54	28	6	77	30	303	158	193	
Turner syndrome	32	28	43	10	8	1	10	9	52	45	44	
TOTAL	257	340	633	78	154	14	108	150	443	644	647	
<b>Situs inversus</b>	0	1	0	0	1	0	0	0	0	2	0	
<b>Congenital malformation syndromes</b>	0	20	2	0	2	0	0	3	0	25	2	
<b>Non-immune hydrops foetalis</b>	1	28	9	2	5	0	2	11	5	44	9	
<b>Other and unspecified birth defects</b>	0	26	23	1	10	0	0	8	1	44	23	
<b>TOTAL</b>	<b>310</b>	<b>1277</b>	<b>839</b>	<b>97</b>	<b>415</b>	<b>16</b>	<b>122</b>	<b>485</b>	<b>529</b>	<b>2177</b>	<b>855</b>	

Source: NSW Birth Defects Register. Epidemiology and Surveillance Branch, NSW Health Department.

**TABLE 102**
**TRENDS IN REPORTED TERMINATIONS OF PREGNANCY ASSOCIATED WITH BIRTH DEFECTS BY MATERNAL AGE, 1993–1999**

Year	Maternal age (years)																TOTAL	
	15–19		20–24		25–29		30–34		35–39		40–44		45+		Not stated			
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%		
1993	4	2.9	15	10.7	29	20.7	28	20.0	37	26.4	16	11.4	1	0.7	10	7.1	140	100.0
1994	5	3.6	26	18.8	20	14.5	23	16.7	29	21.0	17	12.3	2	1.4	16	11.6	138	100.0
1995	6	3.9	19	12.3	31	20.0	38	24.5	33	21.3	23	14.8	2	1.3	3	1.9	155	100.0
1996	3	2.8	16	15.1	22	20.8	24	22.6	24	22.6	11	10.4	0	0.0	6	5.7	106	100.0
1997	3	2.4	13	10.4	32	25.6	29	23.2	23	18.4	10	8.0	1	0.8	14	11.2	125	100.0
1998	3	1.2	17	6.8	53	21.2	40	16.0	56	22.4	43	17.2	4	1.6	34	13.6	250	100.0
1999	6	2.5	17	7.2	43	18.2	55	23.3	41	17.4	17	7.2	2	0.8	55	23.3	236	100.0
1993–1999	30	2.6	123	10.7	230	20.0	237	20.6	243	21.1	137	11.9	12	1.0	138	12.0	1150	100.0

Source: NSW Birth Defects Register. Epidemiology and Surveillance Branch, NSW Health Department.

### 6.3 TRENDS IN SELECTED BIRTH DEFECTS

Trends in a selection of common birth defects are shown in Figures 14 to 21. For 1993–1998, malformations reported up to one year of age are included and for 1999 malformations reported during pregnancy or at birth are included.

The reported number of infants born with neural tube defects fell from 79 in 1993 to 42 in 1998, and 31 have been reported for 1999 to date. The number of reported terminations of pregnancy was 32 in 1993 and 44 in 1999.

Over the period 1993–1999, the number of cases of isolated cleft palate ranged from 49 in 1999 to 91 in 1995 and for total cleft lip (including cases of cleft lip and cleft palate) from 77 in 1999 to 101 in 1995 (Figures 15 and 16). Termination of pregnancy was usually associated with other defects such as neural tube defects, chromosomal abnormalities or multiple abnormalities in addition to the cleft lip and/or cleft palate.

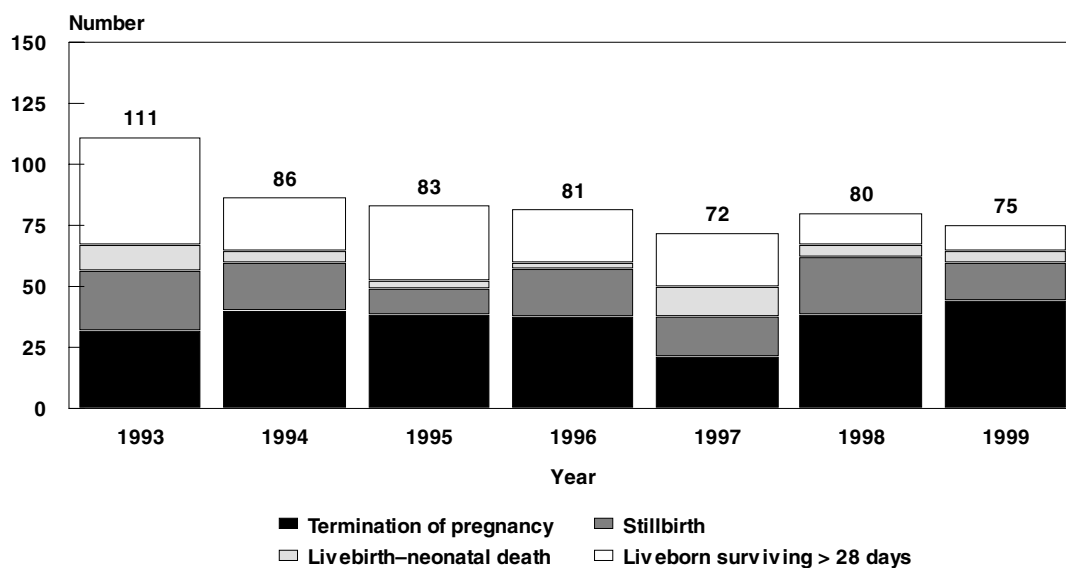
The number of reported cases of hypospadias varied from 148 in 1999 to 224 in 1993 (Figure 17), and cases of limb reduction defects varied from 44 in 1996 to 63 in 1993 (Figure 18).

The number of reported terminations of pregnancy for chromosomal abnormalities, including Down syndrome, increased following the introduction of a requirement to notify birth defects under the NSW Public Health Act 1991 from 1 January 1998 (Figures 19 and 20).

There was a trend towards improved notification of cases of renal agenesis and dysgenesis, particularly in 1998. The increased reporting is due partly to the introduction of notification requirements in 1998, but also to improved diagnosis of less severe forms of renal dysgenesis in infants. (Figure 21).

**FIGURE 14**

**NEURAL TUBE DEFECTS: CASES BY YEAR AND PREGNANCY OUTCOME, NSW 1993–1999\***

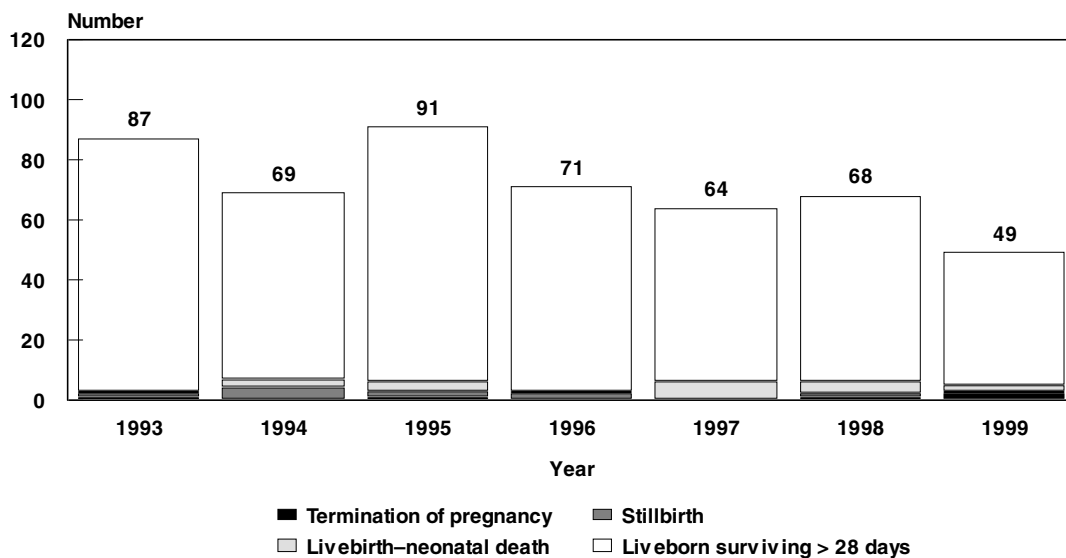


Source: NSW Birth Defects Register. Epidemiology and Surveillance Branch, NSW Health Department.

# For 1993–1998, cases reported during pregnancy and up to one year of age are included. For 1999, cases reported during pregnancy or at birth are reported.

**FIGURE 15**

**CLEFT PALATE: CASES BY YEAR AND PREGNANCY OUTCOME, NSW 1993–1999#**

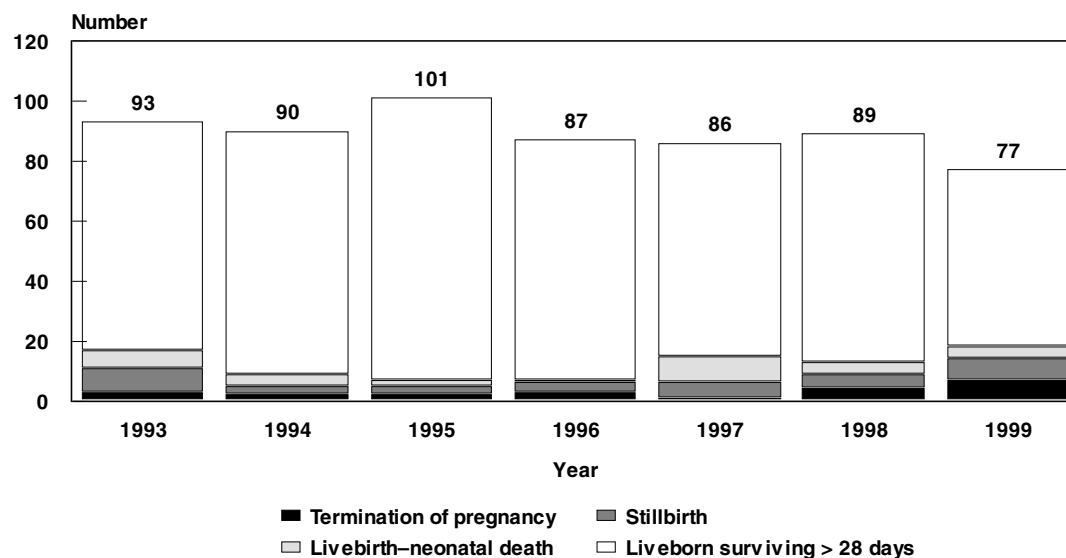


Source: NSW Birth Defects Register. Epidemiology and Surveillance Branch, NSW Health Department.

# For 1993–1998, cases reported during pregnancy and up to one year of age are included. For 1999, cases reported during pregnancy or at birth are reported.

**FIGURE 16**

**TOTAL CLEFT LIP: CASES BY YEAR AND PREGNANCY OUTCOME, NSW 1993–1999#**

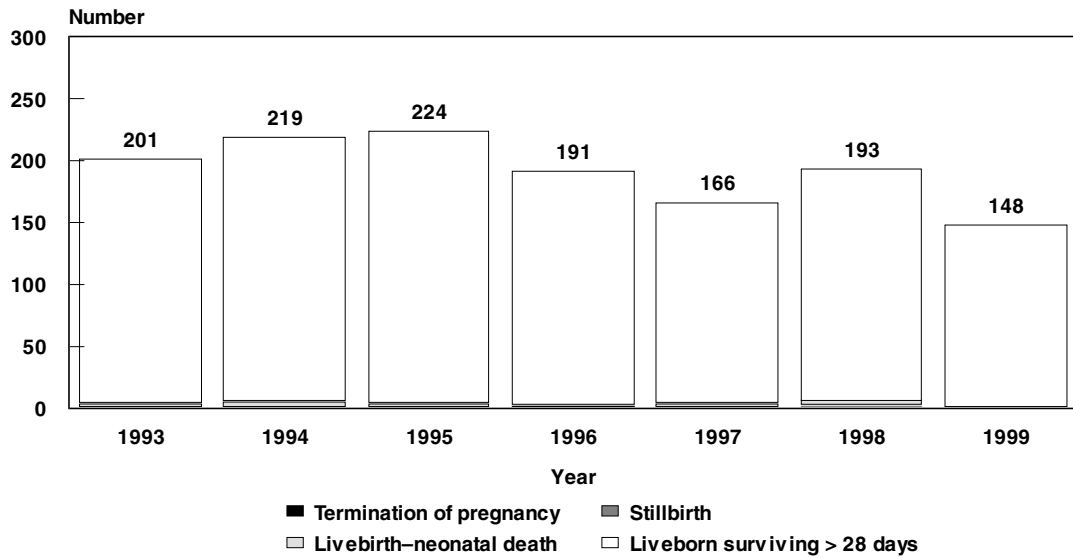


Source: NSW Birth Defects Register. Epidemiology and Surveillance Branch, NSW Health Department.

# For 1993–1998, cases reported during pregnancy and up to one year of age are included. For 1999, cases reported during pregnancy or at birth are reported.

**FIGURE 17**

**HYPOSPADIAS: CASES BY YEAR AND PREGNANCY OUTCOME, NSW 1993–1999#**

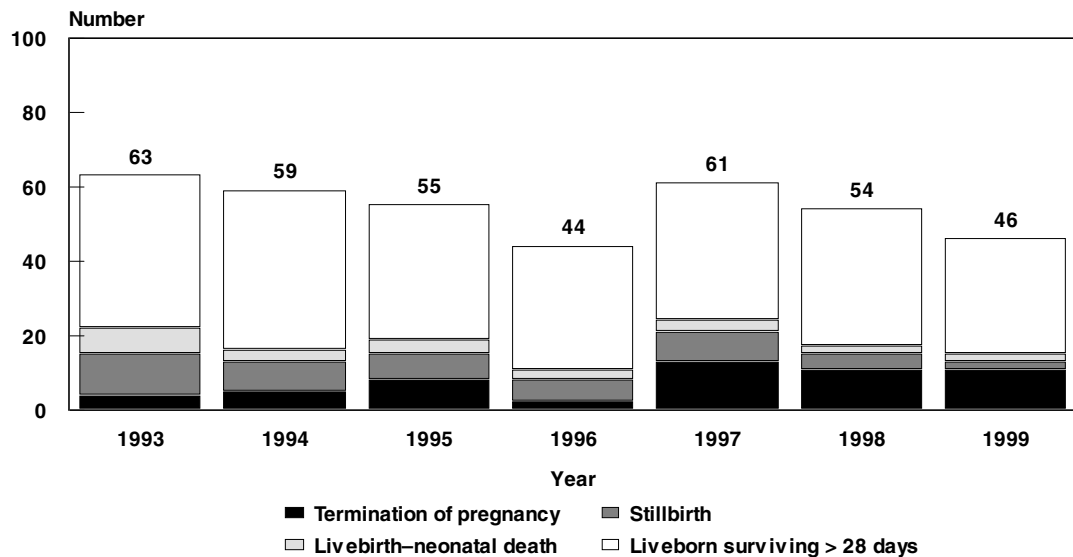


Source: NSW Birth Defects Register. Epidemiology and Surveillance Branch, NSW Health Department.

# For 1993–1998, cases reported during pregnancy and up to one year of age are included. For 1999, cases reported during pregnancy or at birth are reported.

**FIGURE 18**

**LIMB REDUCTION DEFECTS: CASES BY YEAR AND PREGNANCY OUTCOME, NSW 1993–1999#**

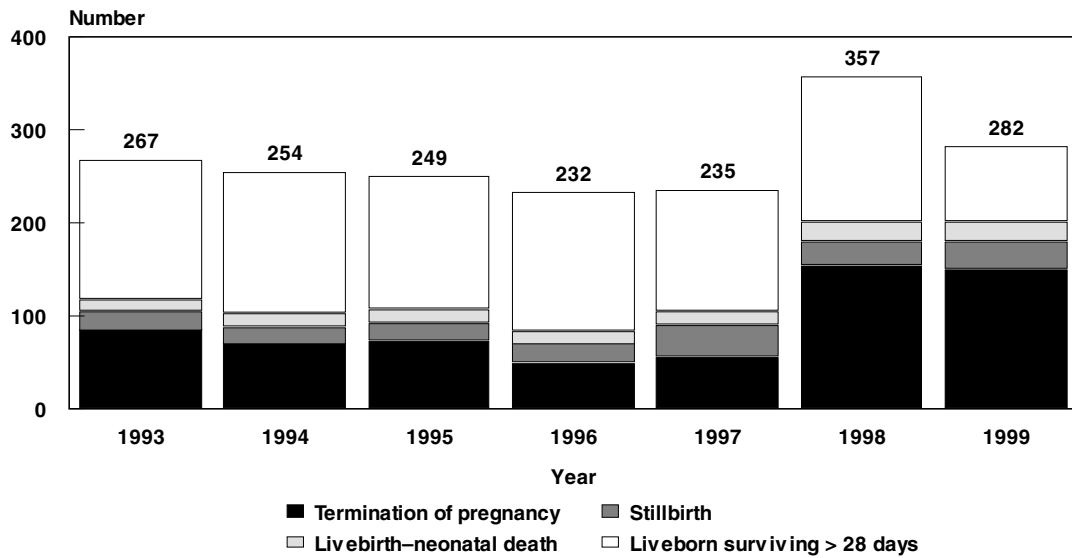


Source: NSW Birth Defects Register. Epidemiology and Surveillance Branch, NSW Health Department.

# For 1993–1998, cases reported during pregnancy and up to one year of age are included. For 1999, cases reported during pregnancy or at birth are reported.

**FIGURE 19**

**CHROMOSOMAL ABNORMALITIES: CASES BY YEAR AND PREGNANCY OUTCOME, NSW 1993–1999#**

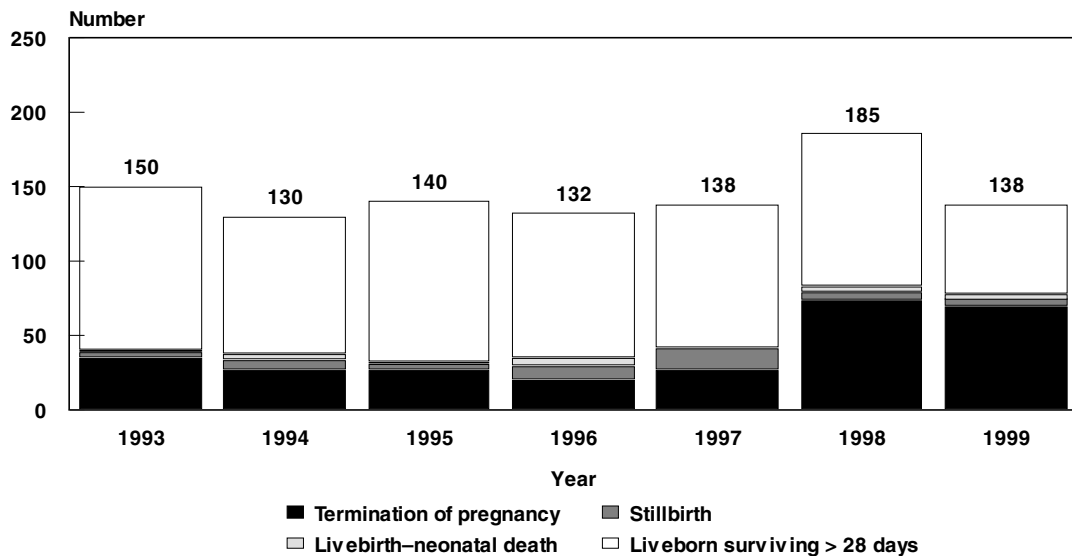


Source: NSW Birth Defects Register. Epidemiology and Surveillance Branch, NSW Health Department.

# From 1 January 1999 birth defects are notifiable under the NSW Public Health Act 1991. The increase in reported terminations of pregnancy in 1998 follows the introduction of this notification requirement. For 1993–1998, cases reported during pregnancy and up to one year of age are included. For 1999, cases reported during pregnancy or at birth are reported.

**FIGURE 20**

**DOWN SYNDROME: CASES BY YEAR AND PREGNANCY OUTCOME, NSW 1993–1999#**



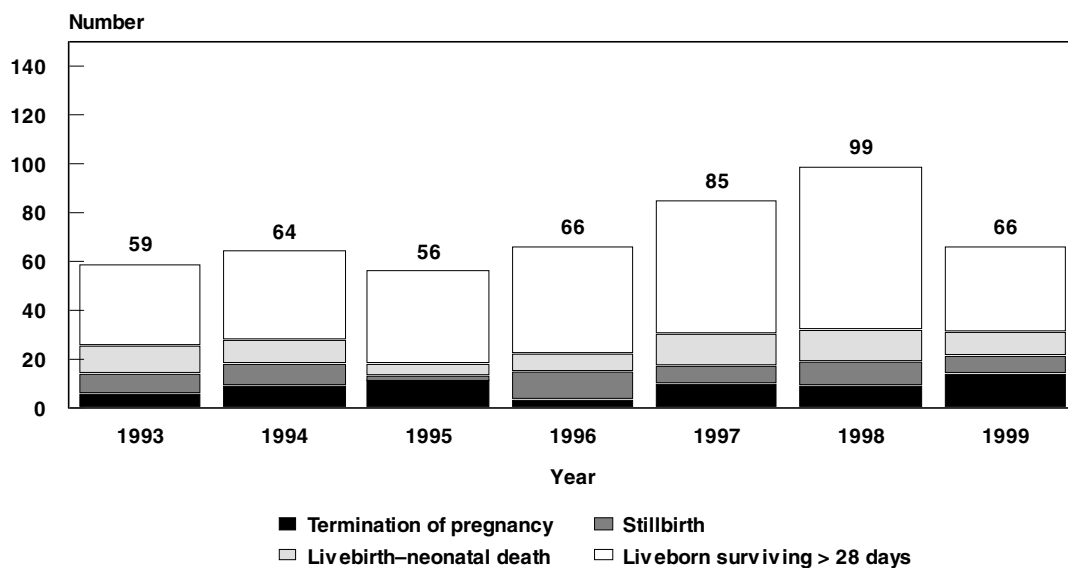
Source: NSW Birth Defects Register. Epidemiology and Surveillance Branch, NSW Health Department.

# From 1 January 1999 birth defects are notifiable under the NSW Public Health Act 1991. The increase in reported terminations of pregnancy in 1998 follows the introduction of this notification requirement. For 1993–1998, cases reported during pregnancy and up to one year of age are included. For 1999, cases reported during pregnancy or at birth are reported.



**FIGURE 21**

**RENAL AGENESIS AND DYSGENESIS: CASES BY YEAR AND PREGNANCY OUTCOME, NSW 1993–1999#**



Source: NSW Birth Defects Register. Epidemiology and Surveillance Branch, NSW Health Department.

# Includes cystic renal disease and excludes obstructive defects of the renal pelvis, abnormally shaped kidney, double/triple kidney, ectopic kidney and enlarged kidney without dysplasia. For 1993–1998, cases reported during pregnancy and up to one year of age are included. For 1999, cases reported during pregnancy or at birth are reported.

## 6.4 BIRTH DEFECTS BY NSW HEALTH AREAS

Crude rates of reported birth defects for NSW Health Areas and rates standardised for maternal age are shown in Table 103. For 1993–1999, birth defects detected up to one year of age are reported and for 1999 birth defects detected during pregnancy or at birth are reported. The denominator population includes live births and stillbirths among NSW residents as reported to the MDC. The rate of birth defects increases with increasing maternal age (Table 99). In order to allow direct comparison of geographic areas, rates have been standardised to the maternal age distribution of births in NSW in 1991.

Information shown in these tables reflects the reporting practices of the various areas. From 1 January 1998 doctors, hospitals and laboratories are required to notify birth defects detected during pregnancy, at birth or up to one year of life under NSW Public Health Act 1991. Thus higher rates of reported birth defects may be expected from 1998 onwards compared to previous years. In interpreting birth defect rates among NSW areas it should also be noted that infants with birth defects who are born to mothers resident in areas close to interstate borders may be transferred interstate for care and therefore may not be reported to the BDR.

Over the period 1993–1999 standardised rates of reported birth defects were lowest in the Northern Rivers Health Area and highest in the Hunter Health Area. Review of cases reported from the Hunter Health Area showed slightly increased reported rates of several birth defects including: unstable hip, unilateral (but not bilateral) undescended testis, first degree hypospadias (but not more severe forms of hypospadias), ventricular septal defect, patent foramen ovale and patent ductus arteriosus. A greater proportion of these cases reported from the Hunter Health Area had single birth defects compared with NSW as a whole. The range and generally less severe nature of the defects reported suggests that enumeration of less severe conditions is better in the Hunter Health Area compared with NSW as a whole.

Birth defect rates may vary markedly from year to year for some areas where the numbers of reported birth defects are small. For these areas, small variations in numbers of birth defect cases may result in a marked variation in the birth defect rate. The wide confidence intervals for some areas reflect this variability.

**TABLE 103**

**BIRTH DEFECTS IN NSW HEALTH AREAS, 1993–1999\***

Health Area	1993–1997			1998			1999			1993–1999			99% confidence intervals
	No.	Crude rate per 1,000 births	Standardised rate per 1,000 births	No.	Crude rate per 1,000 births	Standardised rate per 1,000 births	No.	Crude rate per 1,000 births	Standardised rate per 1,000 births	No.	Crude rate per 1,000 births	Standardised rate per 1,000 births	
Central Sydney	770	22.6	21.2	163	24.4	22.4	67	10.0	9.5	1000	21.0	19.8	18.0–21.6
Northern Sydney	1095	24.8	23.7	233	26.0	24.3	132	14.0	13.0	1460	23.4	22.4	20.4–24.4
Western Sydney	1270	24.5	23.6	261	24.4	23.5	150	13.8	13.3	1681	22.9	22.1	20.6–23.5
Wentworth	496	19.9	19.3	132	26.9	25.3	84	17.1	17.0	712	20.5	19.9	18.0–22.0
South Western Sydney	1398	22.7	21.8	289	23.7	22.5	152	12.2	12.4	1839	21.3	20.5	19.3–21.8
Central Coast	483	25.3	25.3	97	25.6	24.3	47	12.6	11.1	627	23.6	23.3	20.9–25.8
Hunter	1021	28.2	27.2	191	27.4	27.5	121	17.1	15.5	1333	26.5	25.5	23.7–27.4
Illawarra	497	21.7	21.2	108	24.4	22.6	51	11.4	11.0	656	20.6	19.9	17.9–22.1
South Eastern Sydney	1155	25.8	24.1	256	27.5	23.9	145	15.1	13.9	1556	24.5	22.6	20.9–24.4
Northern Rivers	272	18.0	18.3	72	24.2	24.4	46	15.7	15.3	390	18.6	18.9	16.5–21.5
Mid North Coast	348	22.3	22.4	76	25.4	23.8	35	11.9	11.1	459	21.3	21.1	18.6–23.8
New England	297	23.2	23.6	66	27.3	26.3	40	16.9	16.9	403	22.9	23.0	20.1–26.2
Macquarie	235	27.9	27.5	38	23.6	22.2	17	10.5	11.1	290	24.9	24.4	20.8–28.5
Mid Western	253	20.7	20.1	49	20.6	20.1	33	14.1	14.1	335	19.8	19.3	16.6–22.2
Far West	64	21.1	21.2	15	26.6	21.8	8	14.9	16.9	87	21.1	21.5	15.5–28.9
Greater Murray	382	21.3	21.3	57	19.1	17.9	34	12.8	12.6	473	20.1	19.9	17.6–22.5
Southern AHS	238	24.1	22.6	36	20.0	17.0	26	14.0	14.4	300	22.1	20.7	17.6–24.2
TOTAL NSW	10274	23.7	22.8	2139	25.0	23.6	1118	13.8	13.1	13601	22.4	21.5	21.0–22.0

Source: NSW Birth Defects Register. Epidemiology and Surveillance Branch, NSW Health Department.

# Cases include terminations of pregnancy, stillbirths and livebirths where the place of residence is known. For 1993–1998, cases reported during pregnancy and up to one year of age are included. For 1999, cases reported during pregnancy or at birth are reported.

### Reference

1. British Paediatric Association. *British Paediatric Association Classification of Diseases*. London: British Paediatric Association, 1979.





## 7.2 TYPE OF DELIVERY IN SELECTED HOSPITALS

Table 105 gives type of delivery for individual hospitals where the number of reported confinements exceeded 200 in 1999, totals for all hospitals within each health area and the NSW total.

**TABLE 105**

**CONFINEMENTS BY TYPE OF DELIVERY AND HOSPITAL, NSW 1999\***

Health Area and Hospital	Normal		Forceps vaginal		Type of delivery				Elective caesarean		Emergency caesarean		TOTAL	
	No.	%	No.	%	Vacuum extraction	Vaginal breech	No.	%	No.	%	No.	%	No.	%
<b>Central Sydney</b>														
Canterbury	1141	72.3	44	2.8	124	7.9	6	0.4	118	7.5	146	9.2	1579	100.0
King George V	2658	68.0	167	4.3	253	6.5	46	1.2	397	10.2	386	9.9	3907	100.0
NSW Private	180	57.1	16	5.1	21	6.7	3	1.0	61	19.4	34	10.8	315	100.0
ALL HOSPITALS	3979	68.6	227	3.9	398	6.9	55	0.9	576	9.9	566	9.8	5801	100.0
<b>Northern Sydney</b>														
Hornsby	728	65.0	88	7.9	70	6.3	1	0.1	137	12.2	96	8.6	1120	100.0
Manly	351	70.5	33	6.6	17	3.4	3	0.6	50	10.0	44	8.8	498	100.0
Mona Vale	696	68.3	66	6.5	69	6.8	12	1.2	75	7.4	101	9.9	1019	100.0
Royal North Shore	1081	57.9	84	4.5	174	9.3	13	0.7	285	15.3	230	12.3	1867	100.0
Ryde	510	69.9	21	2.9	62	8.5	7	1.0	57	7.8	73	10.0	730	100.0
Mater, North Sydney	864	49.0	95	5.4	265	15.0	2	0.1	343	19.4	196	11.1	1765	100.0
North Shore Private	784	47.7	110	6.7	219	13.3	4	0.2	314	19.1	212	12.9	1643	100.0
Sydney Adventist	1318	60.3	171	7.8	144	6.6	6	0.3	368	16.8	177	8.1	2184	100.0
ALL HOSPITALS	6332	58.5	668	6.2	1020	9.4	48	0.4	1629	15.0	1129	10.4	10826	100.0
<b>Western Sydney</b>														
Auburn	1155	82.3	59	4.2	30	2.1	23	1.6	78	5.6	59	4.2	1404	100.0
Blacktown	1838	75.4	143	5.9	116	4.8	17	0.7	154	6.3	169	6.9	2437	100.0
Westmead	2860	66.4	357	8.3	158	3.7	75	1.7	419	9.7	436	10.1	4305	100.0
The Hills Private	861	65.4	133	10.1	43	3.3	10	0.8	156	11.9	113	8.6	1316	100.0
ALL HOSPITALS	6714	71.0	692	7.3	347	3.7	125	1.3	807	8.5	777	8.2	9462	100.0
<b>Wentworth</b>														
Blue Mountains	325	77.4	6	1.4	24	5.7	5	1.2	32	7.6	28	6.7	420	100.0
Nepean	2343	71.3	92	2.8	144	4.4	27	0.8	352	10.7	330	10.0	3288	100.0
Jamison Private	485	64.8	56	7.5	5	0.7	4	0.5	108	14.4	91	12.1	749	100.0
Hawkesbury	708	71.2	79	7.9	45	4.5	8	0.8	80	8.0	74	7.4	994	100.0
ALL HOSPITALS	3861	70.8	233	4.3	218	4.0	44	0.8	572	10.5	523	9.6	5451	100.0
<b>South Western Sydney</b>														
Fairfield	1705	79.0	30	1.4	129	6.0	34	1.6	149	6.9	110	5.1	2157	100.0
Liverpool	2266	74.1	70	2.3	231	7.6	56	1.8	224	7.3	211	6.9	3058	100.0
Campbelltown	2221	77.5	37	1.3	161	5.6	28	1.0	236	8.2	184	6.4	2867	100.0
Bankstown-Lidcombe	1403	78.8	25	1.4	84	4.7	17	1.0	143	8.0	108	6.1	1780	100.0
Bankstown Private	360	57.2	39	6.2	72	11.4	3	0.5	96	15.3	59	9.4	629	100.0
Bowral	457	70.1	68	10.4	33	5.1	15	2.3	52	8.0	27	4.1	652	100.0
Other area hospitals	107	62.6	6	3.5	24	14.0	0	0.0	24	14.0	10	5.8	171	100.0
ALL HOSPITALS	8519	75.3	275	2.4	734	6.5	153	1.4	924	8.2	709	6.3	11314	100.0
<b>Central Coast</b>														
Gosford	1656	68.2	49	2.0	229	9.4	20	0.8	223	9.2	250	10.3	2427	100.0
Wyong	355	93.7	7	1.8	2	0.5	5	1.3	1	0.3	9	2.4	379	100.0
North Gosford Private	348	54.0	31	4.8	91	14.1	5	0.8	95	14.7	75	11.6	645	100.0
ALL HOSPITALS	2359	68.4	87	2.5	322	9.3	30	0.9	319	9.2	334	9.7	3451	100.0
<b>Hunter</b>														
Maitland	906	72.8	21	1.7	56	4.5	9	0.7	143	11.5	110	8.8	1245	100.0
Muswellbrook	197	84.2	1	0.4	11	4.7	3	1.3	7	3.0	15	6.4	234	100.0
Belmont	463	72.7	23	3.6	27	4.2	3	0.5	72	11.3	49	7.7	637	100.0
Singleton	174	80.9	0	0.0	16	7.4	0	0.0	16	7.4	9	4.2	215	100.0
John Hunter	2560	72.0	91	2.6	231	6.5	44	1.2	288	8.1	344	9.7	3558	100.0
Christo Road Private	586	61.9	39	4.1	83	8.8	0	0.0	141	14.9	97	10.3	946	100.0
Other area hospitals	203	67.7	2	0.7	6	2.0	1	0.3	70	23.3	18	6.0	300	100.0
ALL HOSPITALS	5089	71.3	177	2.5	430	6.0	60	0.8	737	10.3	642	9.0	7135	100.0
<b>Illawarra</b>														
Shoalhaven	591	73.8	45	5.6	0	0.0	5	0.6	90	11.2	70	8.7	801	100.0
Wollongong	1540	74.9	55	2.7	152	7.4	32	1.6	133	6.5	145	7.0	2057	100.0
Shellharbour	447	82.9	7	1.3	30	5.6	1	0.2	26	4.8	28	5.2	539	100.0
Illawarra Private	427	63.8	10	1.5	103	15.4	1	0.1	88	13.2	40	6.0	669	100.0
Other area hospitals	87	64.4	6	4.4	9	6.7	0	0.0	28	20.7	5	3.7	135	100.0
ALL HOSPITALS	3092	73.6	123	2.9	294	7.0	39	0.9	365	8.7	288	6.9	4201	100.0

**TABLE 105 (continued)**
**CONFINEMENTS BY TYPE OF DELIVERY AND HOSPITAL, NSW 1999<sup>#</sup>**

Health Area and Hospital	Normal		Forceps vaginal		Type of delivery				Elective caesarean		Emergency caesarean		TOTAL	
	No.	%	No.	%	Vacuum extraction	Vaginal breech	No.	%	No.	%	No.	%	No.	%
<b>South Eastern Sydney</b>														
Royal Hospital for Women	2379	62.6	292	7.7	269	7.1	54	1.4	364	9.6	443	11.7	3801	100.0
St. George	1518	63.6	123	5.2	175	7.3	16	0.7	255	10.7	300	12.6	2387	100.0
Sutherland	691	69.2	84	8.4	46	4.6	3	0.3	78	7.8	97	9.7	999	100.0
Hurstville Community	353	52.8	103	15.4	37	5.5	2	0.3	90	13.5	84	12.6	669	100.0
Kareena Private	352	48.4	110	15.1	31	4.3	1	0.1	137	18.8	96	13.2	727	100.0
St. George Private	519	47.1	130	11.8	65	5.9	3	0.3	208	18.9	176	16.0	1101	100.0
Prince of Wales Private	731	52.9	74	5.4	176	12.7	11	0.8	263	19.0	127	9.2	1382	100.0
ALL HOSPITALS	6543	59.1	916	8.3	799	7.2	90	0.8	1395	12.6	1323	12.0	11066	100.0
<b>Northern Rivers</b>														
Grafton Base	281	60.0	27	5.8	18	3.8	1	0.2	66	14.1	75	16.0	468	100.0
Lismore Base	968	71.8	72	5.3	25	1.9	11	0.8	129	9.6	144	10.7	1349	100.0
Murwillumbah	348	76.7	4	0.9	4	0.9	6	1.3	41	9.0	51	11.2	454	100.0
Tweed Heads	589	75.1	41	5.2	23	2.9	3	0.4	66	8.4	62	7.9	784	100.0
Other area hospitals	276	89.6	4	1.3	2	0.6	0	0.0	26	8.4	0	0.0	308	100.0
ALL HOSPITALS	2462	73.2	148	4.4	72	2.1	21	0.6	328	9.8	332	9.9	3363	100.0
<b>Mid North Coast</b>														
Coffs Harbour	503	65.8	53	6.9	4	0.5	5	0.7	129	16.9	70	9.2	764	100.0
Kempsey	233	83.5	5	1.8	2	0.7	1	0.4	21	7.5	17	6.1	279	100.0
Port Macquarie Base	522	71.5	44	6.0	14	1.9	4	0.5	62	8.5	84	11.5	730	100.0
Manning Base	544	76.7	39	5.5	14	2.0	13	1.8	50	7.1	49	6.9	709	100.0
Other area hospitals	229	74.8	7	2.3	2	0.7	0	0.0	53	17.3	15	4.9	306	100.0
ALL HOSPITALS	2031	72.8	148	5.3	36	1.3	23	0.8	315	11.3	235	8.4	2788	100.0
<b>New England</b>														
Armidale	387	83.8	8	1.7	17	3.7	2	0.4	25	5.4	23	5.0	462	100.0
Inverell	183	69.8	20	7.6	5	1.9	1	0.4	39	14.9	14	5.3	262	100.0
Moree	174	71.0	9	3.7	17	6.9	4	1.6	17	6.9	24	9.8	245	100.0
Tamworth Base	440	65.0	26	3.8	43	6.4	2	0.3	99	14.6	67	9.9	677	100.0
Other area hospitals	560	74.6	23	3.1	27	3.6	6	0.8	76	10.1	59	7.9	751	100.0
ALL HOSPITALS	1744	72.8	86	3.6	109	4.5	15	0.6	256	10.7	187	7.8	2397	100.0
<b>Macquarie</b>														
Dubbo Base	939	73.6	64	5.0	29	2.3	13	1.0	126	9.9	105	8.2	1276	100.0
Mudgee	180	77.9	3	1.3	12	5.2	1	0.4	21	9.1	14	6.1	231	100.0
Other area hospitals	128	80.5	5	3.1	4	2.5	0	0.0	21	13.2	1	0.6	159	100.0
ALL HOSPITALS	1247	74.8	72	4.3	45	2.7	14	0.8	168	10.1	120	7.2	1666	100.0
<b>Mid Western</b>														
Bathurst Base	336	65.1	33	6.4	4	0.8	3	0.6	74	14.3	66	12.8	516	100.0
Lithgow	181	78.7	5	2.2	6	2.6	0	0.0	24	10.4	14	6.1	230	100.0
Orange Base	531	69.1	49	6.4	29	3.8	8	1.0	76	9.9	76	9.9	769	100.0
Parkes	157	77.7	5	2.5	3	1.5	1	0.5	17	8.4	19	9.4	202	100.0
Other area hospitals	272	66.3	9	2.2	13	3.2	2	0.5	70	17.1	44	10.7	410	100.0
ALL HOSPITALS	1477	69.4	101	4.7	55	2.6	14	0.7	261	12.3	219	10.3	2127	100.0
<b>Far West</b>														
Broken Hill Base	222	81.3	11	4.0	3	1.1	3	1.1	14	5.1	20	7.3	273	100.0
Other area hospitals	65	90.3	3	4.2	0	0.0	1	1.4	0	0.0	3	4.2	72	100.0
ALL HOSPITALS	287	83.2	14	4.1	3	0.9	4	1.2	14	4.1	23	6.7	345	100.0
<b>Greater Murray</b>														
Deniliquin	132	63.5	10	4.8	21	10.1	2	1.0	27	13.0	16	7.7	208	100.0
Griffith Base	350	69.2	18	3.6	22	4.3	5	1.0	63	12.5	48	9.5	506	100.0
Wagga Wagga Base	565	66.9	57	6.8	43	5.1	8	0.9	89	10.5	82	9.7	844	100.0
Calvary, Wagga Wagga	209	52.8	46	11.6	59	14.9	1	0.3	53	13.4	28	7.1	396	100.0
Other area hospitals	553	75.1	38	5.2	24	3.3	3	0.4	62	8.4	56	7.6	736	100.0
ALL HOSPITALS	1809	67.2	169	6.3	169	6.3	19	0.7	294	10.9	230	8.6	2690	100.0
<b>Southern</b>														
Bega	141	67.8	4	1.9	25	12.0	0	0.0	22	10.6	16	7.7	208	100.0
Goulburn Base	219	67.6	25	7.7	10	3.1	2	0.6	45	13.9	23	7.1	324	100.0
Queanbeyan	249	75.5	6	1.8	16	4.8	2	0.6	30	9.1	27	8.2	330	100.0
Other area hospitals	651	74.5	19	2.2	50	5.7	2	0.2	90	10.3	62	7.1	874	100.0
ALL HOSPITALS	1260	72.6	54	3.1	101	5.8	6	0.3	187	10.8	128	7.4	1736	100.0
TOTAL NSW	58951	68.6	4190	4.9	5152	6.0	762	0.9	9147	10.6	7765	9.0	85967	100.0

Source: NSW Midwives Data Collection (HOIST). Epidemiology and Surveillance Branch, NSW Health Department.

<sup>#</sup> Hospitals with more than 200 deliveries are identified individually. All hospitals include all public and private hospitals.











## 7.5 BIRTHWEIGHT IN SELECTED HOSPITALS

Table 108 shows the birthweight among live born babies for individual hospitals where the number of reported confinements exceeded 200 in 1999, totals for all hospitals within each health area and the NSW total.

**TABLE 108**

**CONFINEMENTS BY BIRTHWEIGHT AND HOSPITAL, NSW 1999#**

Health Area and Hospital	Birthweight (grams)											
	Less than 1,000		1,000–1,499		1,500–2,499		2,500+		Not stated		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
<b>Central Sydney</b>												
Canterbury	6	0.4	0	0.0	64	4.0	1517	95.6	0	0.0	1587	100.0
King George V	76	1.9	64	1.6	285	7.1	3566	89.3	2	0.1	3993	100.0
NSW Private	1	0.3	0	0.0	5	1.6	309	98.1	0	0.0	315	100.0
ALL HOSPITALS	83	1.4	64	1.1	354	6.0	5392	91.5	2	0.0	5895	100.0
<b>Northern Sydney</b>												
Hornsby	4	0.4	2	0.2	48	4.2	1084	95.3	0	0.0	1138	100.0
Manly	1	0.2	0	0.0	21	4.2	484	95.7	0	0.0	506	100.0
Mona Vale	1	0.1	1	0.1	33	3.2	997	96.6	0	0.0	1032	100.0
Royal North Shore	49	2.5	47	2.4	157	8.2	1669	86.8	1	0.1	1923	100.0
Ryde	3	0.4	0	0.0	24	3.3	706	96.3	0	0.0	733	100.0
Mater, North Sydney	2	0.1	0	0.0	59	3.3	1737	96.6	1	0.1	1799	100.0
North Shore Private	2	0.1	4	0.2	72	4.3	1608	95.4	0	0.0	1686	100.0
Sydney Adventist	7	0.3	2	0.1	83	3.7	2138	95.9	0	0.0	2230	100.0
ALL HOSPITALS	69	0.6	56	0.5	497	4.5	10423	94.4	2	0.0	11047	100.0
<b>Western Sydney</b>												
Auburn	8	0.6	2	0.1	51	3.6	1356	95.7	0	0.0	1417	100.0
Blacktown	14	0.6	4	0.2	130	5.3	2317	94.0	1	0.0	2466	100.0
Westmead	67	1.5	50	1.1	282	6.4	4002	90.9	0	0.0	4401	100.0
The Hills Private	0	0.0	2	0.2	39	2.9	1287	96.9	0	0.0	1328	100.0
ALL HOSPITALS	89	0.9	58	0.6	502	5.2	8962	93.2	1	0.0	9612	100.0
<b>Wentworth</b>												
Blue Mountains	1	0.2	1	0.2	10	2.4	409	97.1	0	0.0	421	100.0
Nepean	40	1.2	37	1.1	221	6.6	3038	91.1	0	0.0	3336	100.0
Jamison Private	1	0.1	0	0.0	12	1.6	747	98.3	0	0.0	760	100.0
Hawkesbury	0	0.0	1	0.1	39	3.9	961	96.0	0	0.0	1001	100.0
ALL HOSPITALS	42	0.8	39	0.7	282	5.1	5155	93.4	0	0.0	5518	100.0
<b>South Western Sydney</b>												
Fairfield	2	0.1	2	0.1	101	4.6	2078	95.1	1	0.0	2184	100.0
Liverpool	58	1.9	65	2.1	261	8.3	2746	87.7	0	0.0	3130	100.0
Campbelltown	13	0.4	6	0.2	134	4.6	2749	94.7	0	0.0	2902	100.0
Bankstown–Lidcombe	5	0.3	2	0.1	81	4.5	1708	95.0	1	0.1	1797	100.0
Bankstown Private	2	0.3	1	0.2	22	3.5	612	96.1	0	0.0	637	100.0
Bowral	3	0.5	1	0.2	16	2.4	635	96.9	0	0.0	655	100.0
Other area hospitals	0	0.0	0	0.0	5	2.9	169	97.1	0	0.0	174	100.0
ALL HOSPITALS	83	0.7	77	0.7	620	5.4	10697	93.2	2	0.0	11479	100.0
<b>Central Coast</b>												
Gosford	14	0.6	7	0.3	153	6.2	2293	92.9	1	0.0	2468	100.0
Wyong	0	0.0	1	0.3	7	1.8	371	97.9	0	0.0	379	100.0
North Gosford Private	1	0.2	0	0.0	18	2.8	629	97.1	0	0.0	648	100.0
ALL HOSPITALS	15	0.4	8	0.2	178	5.1	3293	94.2	1	0.0	3495	100.0
<b>Hunter</b>												
Maitland	4	0.3	1	0.1	76	6.0	1185	93.6	0	0.0	1266	100.0
Muswellbrook	1	0.4	0	0.0	5	2.1	230	97.5	0	0.0	236	100.0
Belmont	0	0.0	3	0.5	15	2.3	623	97.2	0	0.0	641	100.0
Singleton	0	0.0	0	0.0	6	2.8	209	97.2	0	0.0	215	100.0
John Hunter	60	1.6	79	2.2	300	8.2	3212	88.0	0	0.0	3651	100.0
Christo Road Private	2	0.2	0	0.0	48	5.0	911	94.7	1	0.1	962	100.0
Other area hospitals	1	0.3	0	0.0	8	2.7	291	97.0	0	0.0	300	100.0
ALL HOSPITALS	68	0.9	83	1.1	458	6.3	6661	91.6	1	0.0	7271	100.0
<b>Illawarra</b>												
Shoalhaven	3	0.4	1	0.1	42	5.1	771	94.4	0	0.0	817	100.0
Wollongong	12	0.6	12	0.6	157	7.5	1917	91.3	1	0.0	2099	100.0
Shellharbour	1	0.2	1	0.2	6	1.1	531	98.5	0	0.0	539	100.0
Illawarra Private	0	0.0	0	0.0	10	1.5	664	98.5	0	0.0	674	100.0
Other area hospitals	0	0.0	0	0.0	1	0.7	134	99.3	0	0.0	135	100.0
ALL HOSPITALS	16	0.4	14	0.3	216	5.1	4017	94.2	1	0.0	4264	100.0

**TABLE 108 (continued)**

**CONFINEMENTS BY BIRTHWEIGHT AND HOSPITAL, NSW 1999#**

Health Area and Hospital	Less than 1,000		1,000–1,499		1,500–2,499		2,500+		Not stated		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
<b>South Eastern Sydney</b>												
Royal Hospital for Women	49	1.3	68	1.8	218	5.6	3544	91.3	2	0.1	3881	100.0
St. George	13	0.5	4	0.2	107	4.4	2293	94.8	1	0.0	2418	100.0
Sutherland	1	0.1	1	0.1	47	4.6	964	95.2	0	0.0	1013	100.0
Hurstville Community	1	0.1	0	0.0	26	3.8	654	96.0	0	0.0	681	100.0
Kareena Private	0	0.0	0	0.0	20	2.7	714	97.3	0	0.0	734	100.0
St. George Private	4	0.4	3	0.3	45	4.0	1065	95.3	0	0.0	1117	100.0
Prince of Wales Private	4	0.3	0	0.0	48	3.4	1350	96.3	0	0.0	1402	100.0
ALL HOSPITALS	72	0.6	76	0.7	511	4.5	10584	94.1	3	0.0	11246	100.0
<b>Northern Rivers</b>												
Grafton Base	1	0.2	1	0.2	23	4.9	447	94.7	0	0.0	472	100.0
Lismore Base	8	0.6	7	0.5	77	5.6	1280	93.2	1	0.1	1373	100.0
Murwillumbah	0	0.0	1	0.2	13	2.9	442	96.9	0	0.0	456	100.0
Tweed Heads	3	0.4	2	0.3	31	3.9	751	95.3	1	0.1	788	100.0
Other area hospitals	0	0.0	0	0.0	6	1.9	302	98.1	0	0.0	308	100.0
ALL HOSPITALS	12	0.4	11	0.3	150	4.4	3222	94.8	2	0.1	3397	100.0
<b>Mid North Coast</b>												
Coffs Harbour	2	0.3	2	0.3	42	5.4	729	94.1	0	0.0	775	100.0
Kempsey	1	0.4	0	0.0	9	3.2	269	96.4	0	0.0	279	100.0
Port Macquarie Base	3	0.4	0	0.0	41	5.5	696	93.9	1	0.1	741	100.0
Manning Base	4	0.6	3	0.4	40	5.6	672	93.5	0	0.0	719	100.0
Other area hospitals	0	0.0	0	0.0	12	3.9	298	96.1	0	0.0	310	100.0
ALL HOSPITALS	10	0.4	5	0.2	144	5.1	2664	94.3	1	0.0	2824	100.0
<b>New England</b>												
Armidale	1	0.2	1	0.2	33	7.1	432	92.5	0	0.0	467	100.0
Inverell	1	0.4	1	0.4	9	3.4	252	95.5	1	0.4	264	100.0
Moree	1	0.4	0	0.0	9	3.7	235	95.9	0	0.0	245	100.0
Tamworth Base	3	0.4	1	0.1	47	6.9	634	92.6	0	0.0	685	100.0
Other area hospitals	1	0.1	2	0.3	18	2.4	735	97.2	0	0.0	756	100.0
ALL HOSPITALS	7	0.3	5	0.2	116	4.8	2288	94.7	1	0.0	2417	100.0
<b>Macquarie</b>												
Dubbo Base	12	0.9	1	0.1	67	5.2	1215	93.8	0	0.0	1295	100.0
Mudgee	0	0.0	0	0.0	3	1.3	228	98.7	0	0.0	231	100.0
Other area hospitals	0	0.0	0	0.0	9	5.7	150	94.3	0	0.0	159	100.0
ALL HOSPITALS	12	0.7	1	0.1	79	4.7	1593	94.5	0	0.0	1685	100.0
<b>Mid Western</b>												
Bathurst Base	0	0.0	0	0.0	28	5.3	497	94.7	0	0.0	525	100.0
Lithgow	1	0.4	0	0.0	6	2.6	224	97.0	0	0.0	231	100.0
Orange Base	3	0.4	2	0.3	51	6.5	731	92.9	0	0.0	787	100.0
Parkes	1	0.5	0	0.0	3	1.5	198	98.0	0	0.0	202	100.0
Other area hospitals	1	0.2	0	0.0	9	2.2	400	97.6	0	0.0	410	100.0
ALL HOSPITALS	6	0.3	2	0.1	97	4.5	2050	95.1	0	0.0	2155	100.0
<b>Far West</b>												
Broken Hill Base	3	1.1	0	0.0	11	4.0	260	94.9	0	0.0	274	100.0
Other area hospitals	1	1.4	1	1.4	6	8.3	64	88.9	0	0.0	72	100.0
ALL HOSPITALS	4	1.2	1	0.3	17	4.9	324	93.6	0	0.0	346	100.0
<b>Greater Murray</b>												
Deniliquin	0	0.0	0	0.0	8	3.8	205	96.2	0	0.0	213	100.0
Griffith Base	0	0.0	1	0.2	23	4.5	487	95.3	0	0.0	511	100.0
Wagga Wagga Base	8	0.9	4	0.5	60	6.9	791	91.6	1	0.1	864	100.0
Calvary, Wagga Wagga	1	0.2	0	0.0	18	4.4	389	95.3	0	0.0	408	100.0
Other area hospitals	0	0.0	1	0.1	21	2.8	716	97.0	0	0.0	738	100.0
ALL HOSPITALS	9	0.3	6	0.2	130	4.8	2588	94.7	1	0.0	2734	100.0
<b>Southern</b>												
Bega	0	0.0	1	0.5	18	8.5	192	91.0	0	0.0	211	100.0
Goulburn Base	3	0.9	0	0.0	12	3.7	311	95.4	0	0.0	326	100.0
Queanbeyan	1	0.3	0	0.0	8	2.4	321	96.7	2	0.6	332	100.0
Other area hospitals	2	0.2	2	0.2	36	4.1	844	95.4	1	0.1	885	100.0
ALL HOSPITALS	6	0.3	3	0.2	74	4.2	1668	95.1	3	0.2	1754	100.0

Source: NSW Midwives Data Collection (HOIST). Epidemiology and Surveillance Branch, NSW Health Department.

# Hospitals with more than 200 total deliveries are identified individually. All hospitals include all public and private hospitals.

## 7.6 GESTATIONAL AGE IN SELECTED HOSPITALS

Table 109 shows the gestational age among live born babies for individual hospitals where the number of reported confinements exceeded 200 in 1999, totals for all hospitals within each health area and the NSW total.

**TABLE 109**

**CONFINEMENTS BY GESTATIONAL AGE AND HOSPITAL, NSW 1999\***

Health Area and Hospital	Gestational age (weeks)										TOTAL	
	20-31		32-33		34-36		37+		Not stated		No.	%
	No.	%	No.	%	No.	%	No.	%	No.	%		
<b>Central Sydney</b>												
King George V	172	4.3	79	2.0	222	5.6	3520	88.2	0	0.0	3993	100.0
Canterbury	6	0.4	5	0.3	51	3.2	1525	96.1	0	0.0	1587	100.0
NSW Private	1	0.3	0	0.0	6	1.9	308	97.8	0	0.0	315	100.0
ALL HOSPITALS	179	3.0	84	1.4	279	4.7	5353	90.8	0	0.0	5895	100.0
<b>Northern Sydney</b>												
Hornsby	6	0.5	4	0.4	50	4.4	1078	94.7	0	0.0	1138	100.0
Mater, North Sydney	2	0.1	9	0.5	68	3.8	1720	95.6	0	0.0	1799	100.0
Ryde	3	0.4	0	0.0	24	3.3	706	96.3	0	0.0	733	100.0
Royal North Shore	106	5.5	66	3.4	90	4.7	1660	86.3	1	0.1	1923	100.0
Sydney Adventist	8	0.4	11	0.5	106	4.8	2105	94.4	0	0.0	2230	100.0
North Shore Private	5	0.3	11	0.7	91	5.4	1579	93.7	0	0.0	1686	100.0
Manly	2	0.4	0	0.0	22	4.3	482	95.3	0	0.0	506	100.0
Mona Vale	1	0.1	7	0.7	38	3.7	986	95.5	0	0.0	1032	100.0
ALL HOSPITALS	133	1.2	108	1.0	489	4.4	10316	93.4	1	0.0	11047	100.0
<b>Western Sydney</b>												
Blacktown	20	0.8	23	0.9	134	5.4	2289	92.8	0	0.0	2466	100.0
Westmead	118	2.7	79	1.8	198	4.5	4006	91.0	0	0.0	4401	100.0
Auburn	10	0.7	4	0.3	49	3.5	1354	95.6	0	0.0	1417	100.0
The Hills Private	2	0.2	2	0.2	55	4.1	1269	95.6	0	0.0	1328	100.0
ALL HOSPITALS	150	1.6	108	1.1	436	4.5	8918	92.8	0	0.0	9612	100.0
<b>Wentworth</b>												
Nepean	77	2.3	58	1.7	178	5.3	3023	90.6	0	0.0	3336	100.0
Blue Mountains	1	0.2	1	0.2	15	3.6	404	96.0	0	0.0	421	100.0
Jamison Private	1	0.1	0	0.0	28	3.7	731	96.2	0	0.0	760	100.0
Hawkesbury	2	0.2	0	0.0	41	4.1	958	95.7	0	0.0	1001	100.0
ALL HOSPITALS	81	1.5	59	1.1	262	4.7	5116	92.7	0	0.0	5518	100.0
<b>South Western Sydney</b>												
Liverpool	140	4.5	65	2.1	181	5.8	2744	87.7	0	0.0	3130	100.0
Campbelltown	17	0.6	9	0.3	168	5.8	2706	93.2	2	0.1	2902	100.0
Bankstown Private	2	0.3	0	0.0	28	4.4	607	95.3	0	0.0	637	100.0
Bankstown-Lidcombe	7	0.4	5	0.3	90	5.0	1695	94.3	0	0.0	1797	100.0
Fairfield	7	0.3	4	0.2	116	5.3	2057	94.2	0	0.0	2184	100.0
Bowral	4	0.6	1	0.2	19	2.9	631	96.3	0	0.0	655	100.0
Other area hospitals	0	0.0	0	0.0	6	3.4	168	96.6	0	0.0	174	100.0
ALL HOSPITALS	177	1.5	84	0.7	608	5.3	10608	92.4	2	0.0	11479	100.0
<b>Central Coast</b>												
Gosford	21	0.9	14	0.6	190	7.7	2243	90.9	0	0.0	2468	100.0
North Gosford Private	1	0.2	2	0.3	26	4.0	619	95.5	0	0.0	648	100.0
Wyong	1	0.3	1	0.3	6	1.6	371	97.9	0	0.0	379	100.0
ALL HOSPITALS	23	0.7	17	0.5	222	6.4	3233	92.5	0	0.0	3495	100.0
<b>Hunter</b>												
John Hunter	147	4.0	113	3.1	241	6.6	3150	86.3	0	0.0	3651	100.0
Maitland	8	0.6	3	0.2	94	7.4	1161	91.7	0	0.0	1266	100.0
Christo Road Private	3	0.3	2	0.2	68	7.1	889	92.4	0	0.0	962	100.0
Muswellbrook	1	0.4	0	0.0	5	2.1	230	97.5	0	0.0	236	100.0
Belmont	2	0.3	1	0.2	13	2.0	625	97.5	0	0.0	641	100.0
Singleton	1	0.5	1	0.5	6	2.8	207	96.3	0	0.0	215	100.0
Other area hospitals	1	0.3	0	0.0	6	2.0	293	97.7	0	0.0	300	100.0
ALL HOSPITALS	163	2.2	120	1.7	433	6.0	6555	90.2	0	0.0	7271	100.0
<b>Illawarra</b>												
Wollongong	21	1.0	27	1.3	147	7.0	1904	90.7	0	0.0	2099	100.0
Shoalhaven	7	0.9	1	0.1	47	5.8	762	93.3	0	0.0	817	100.0
Shellharbour	3	0.6	0	0.0	1	0.2	535	99.3	0	0.0	539	100.0
Illawarra Private	1	0.1	0	0.0	4	0.6	669	99.3	0	0.0	674	100.0
Other area hospitals	0	0.0	0	0.0	1	0.7	134	99.3	0	0.0	135	100.0
ALL HOSPITALS	32	0.8	28	0.7	200	4.7	4004	93.9	0	0.0	4264	100.0

**TABLE 109 (continued)**

**CONFINEMENTS BY GESTATIONAL AGE AND HOSPITAL, NSW 1999#**

Health Area and Hospital	Gestational age (weeks)										TOTAL	
	20-31		32-33		34-36		37+		Not stated		No.	%
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
<b>South Eastern Sydney</b>												
Royal Hospital for Women	128	3.3	54	1.4	184	4.7	3514	90.5	1	0.0	3881	100.0
St. George	17	0.7	23	1.0	132	5.5	2246	92.9	0	0.0	2418	100.0
St. George Private	5	0.4	2	0.2	60	5.4	1050	94.0	0	0.0	1117	100.0
Hurstville Community	1	0.1	1	0.1	39	5.7	640	94.0	0	0.0	681	100.0
Prince of Wales Private	5	0.4	4	0.3	49	3.5	1344	95.9	0	0.0	1402	100.0
Sutherland	2	0.2	8	0.8	51	5.0	952	94.0	0	0.0	1013	100.0
Kareena Private	0	0.0	3	0.4	35	4.8	696	94.8	0	0.0	734	100.0
ALL HOSPITALS	158	1.4	95	0.8	550	4.9	10442	92.9	1	0.0	11246	100.0
<b>Northern Rivers</b>												
Tweed Heads	6	0.8	3	0.4	37	4.7	742	94.2	0	0.0	788	100.0
Lismore Base	15	1.1	9	0.7	86	6.3	1263	92.0	0	0.0	1373	100.0
Grafton Base	2	0.4	3	0.6	28	5.9	439	93.0	0	0.0	472	100.0
Murwillumbah	1	0.2	0	0.0	8	1.8	447	98.0	0	0.0	456	100.0
Other area hospitals	0	0.0	0	0.0	7	2.3	301	97.7	0	0.0	308	100.0
ALL HOSPITALS	24	0.7	15	0.4	166	4.9	3192	94.0	0	0.0	3397	100.0
<b>Mid North Coast</b>												
Port Macquarie Base	5	0.7	5	0.7	39	5.3	692	93.4	0	0.0	741	100.0
Manning Base	7	1.0	3	0.4	31	4.3	678	94.3	0	0.0	719	100.0
Coffs Harbour	7	0.9	3	0.4	30	3.9	735	94.8	0	0.0	775	100.0
Kempsey	1	0.4	1	0.4	9	3.2	268	96.1	0	0.0	279	100.0
Other Area hospitals	0	0.0	0	0.0	8	2.6	302	97.4	0	0.0	310	100.0
ALL HOSPITALS	20	0.7	12	0.4	117	4.1	2675	94.7	0	0.0	2824	100.0
<b>New England</b>												
Moree	2	0.8	0	0.0	7	2.9	236	96.3	0	0.0	245	100.0
Tamworth Base	3	0.4	4	0.6	53	7.7	625	91.2	0	0.0	685	100.0
Armidale	1	0.2	5	1.1	20	4.3	441	94.4	0	0.0	467	100.0
Inverell	1	0.4	1	0.4	9	3.4	253	95.8	0	0.0	264	100.0
Other area hospitals	3	0.4	2	0.3	15	2.0	736	97.4	0	0.0	756	100.0
ALL HOSPITALS	10	0.4	12	0.5	104	4.3	2291	94.8	0	0.0	2417	100.0
<b>Macquarie</b>												
Dubbo Base	15	1.2	6	0.5	71	5.5	1203	92.9	0	0.0	1295	100.0
Mudgee	0	0.0	0	0.0	2	0.9	229	99.1	0	0.0	231	100.0
Other area hospitals	0	0.0	0	0.0	7	4.4	152	95.6	0	0.0	159	100.0
ALL HOSPITALS	15	0.9	6	0.4	80	4.7	1584	94.0	0	0.0	1685	100.0
<b>Mid Western</b>												
Orange Base	8	1.0	4	0.5	50	6.4	725	92.1	0	0.0	787	100.0
Parkes	1	0.5	0	0.0	1	0.5	200	99.0	0	0.0	202	100.0
Lithgow	1	0.4	0	0.0	7	3.0	223	96.5	0	0.0	231	100.0
Bathurst Base	1	0.2	0	0.0	31	5.9	493	93.9	0	0.0	525	100.0
Other area hospitals	3	0.7	0	0.0	9	2.2	398	97.1	0	0.0	410	100.0
ALL HOSPITALS	14	0.6	4	0.2	98	4.5	2039	94.6	0	0.0	2155	100.0
<b>Far West</b>												
Broken Hill Base	3	1.1	1	0.4	12	4.4	258	94.2	0	0.0	274	100.0
Other area hospitals	3	4.2	0	0.0	7	9.7	62	86.1	0	0.0	72	100.0
ALL HOSPITALS	6	1.7	1	0.3	19	5.5	320	92.5	0	0.0	346	100.0
<b>Greater Murray</b>												
Wagga Wagga Base	12	1.4	8	0.9	58	6.7	786	91.0	0	0.0	864	100.0
Calvary, Wagga Wagga	2	0.5	4	1.0	24	5.9	378	92.6	0	0.0	408	100.0
Griffith Base	2	0.4	3	0.6	21	4.1	485	94.9	0	0.0	511	100.0
Deniliquin	0	0.0	1	0.5	10	4.7	202	94.8	0	0.0	213	100.0
Other area hospitals	0	0.0	2	0.3	16	2.2	720	97.6	0	0.0	738	100.0
ALL HOSPITALS	16	0.6	18	0.7	129	4.7	2571	94.0	0	0.0	2734	100.0
<b>Southern</b>												
Queanbeyan	1	0.3	0	0.0	7	2.1	324	97.6	0	0.0	332	100.0
Goulburn Base	3	0.9	0	0.0	9	2.8	314	96.3	0	0.0	326	100.0
Bega	1	0.5	1	0.5	10	4.7	199	94.3	0	0.0	211	100.0
Other area hospitals	4	0.5	3	0.3	31	3.5	847	95.7	0	0.0	885	100.0
ALL HOSPITALS	9	0.5	4	0.2	57	3.2	1684	96.0	0	0.0	1754	100.0
TOTAL NSW	1210	1.4	775	0.9	4251	4.9	81046	92.8	7	0.0	87289	100.0

Source: NSW Midwives Data Collection (HOIST). Epidemiology and Surveillance Branch, NSW Health Department.

# Hospitals with more than 200 deliveries are identified individually. All hospitals include all public and private hospitals.

## 7.7 BABY DISCHARGE STATUS IN SELECTED HOSPITALS

Table 110 shows the discharge status of babies born in hospitals where the number of reported confinements exceeded 200 in 1999, totals for all hospitals within each health area and the NSW total.

**TABLE 110**

**CONFINEMENTS BY BABY DISCHARGE STATUS AND HOSPITAL, NSW 1999\***

Health Area and Hospital	Discharged		Stillborn		Baby discharge status				Not stated		TOTAL	
	No.	%	No.	%	Neonatal death		Transferred		No.	%	No.	%
					No.	%	No.	%				
<b>Central Sydney</b>												
Canterbury	1561	98.4	5	0.3	3	0.2	18	1.1	0	0.0	1587	100.0
King George V	3749	93.9	40	1.0	35	0.9	169	4.2	0	0.0	3993	100.0
NSW Private	308	97.8	3	1.0	0	0.0	4	1.3	0	0.0	315	100.0
ALL HOSPITALS	5618	95.3	48	0.8	38	0.6	191	3.2	0	0.0	5895	100.0
<b>Northern Sydney</b>												
Hornsby	1121	98.5	4	0.4	3	0.3	10	0.9	0	0.0	1138	100.0
Manly	496	98.0	4	0.8	1	0.2	5	1.0	0	0.0	506	100.0
Mona Vale	1011	98.0	4	0.4	1	0.1	16	1.6	0	0.0	1032	100.0
Royal North Shore	1830	95.2	14	0.7	16	0.8	63	3.3	0	0.0	1923	100.0
Ryde	719	98.1	5	0.7	1	0.1	8	1.1	0	0.0	733	100.0
Mater, North Sydney	1780	98.9	4	0.2	0	0.0	15	0.8	0	0.0	1799	100.0
North Shore Private	1663	98.6	2	0.1	2	0.1	19	1.1	0	0.0	1686	100.0
Sydney Adventist	2198	98.6	7	0.3	3	0.1	22	1.0	0	0.0	2230	100.0
ALL HOSPITALS	10818	97.9	44	0.4	27	0.2	158	1.4	0	0.0	11047	100.0
<b>Western Sydney</b>												
Auburn	1384	97.7	6	0.4	4	0.3	23	1.6	0	0.0	1417	100.0
Blacktown	2421	98.2	14	0.6	6	0.2	24	1.0	1	0.0	2466	100.0
Westmead	4161	94.5	39	0.9	20	0.5	181	4.1	0	0.0	4401	100.0
The Hills Private	1304	98.2	4	0.3	4	0.3	16	1.2	0	0.0	1328	100.0
ALL HOSPITALS	9270	96.4	63	0.7	34	0.4	244	2.5	1	0.0	9612	100.0
<b>Wentworth</b>												
Blue Mountains	404	96.0	6	1.4	0	0.0	11	2.6	0	0.0	421	100.0
Nepean	3196	95.8	28	0.8	15	0.4	97	2.9	0	0.0	3336	100.0
Jamison Private	754	99.2	2	0.3	0	0.0	4	0.5	0	0.0	760	100.0
Hawkesbury	983	98.2	3	0.3	0	0.0	15	1.5	0	0.0	1001	100.0
ALL HOSPITALS	5337	96.7	39	0.7	15	0.3	127	2.3	0	0.0	5518	100.0
<b>South Western Sydney</b>												
Fairfield	2153	98.6	12	0.5	0	0.0	19	0.9	0	0.0	2184	100.0
Liverpool	2895	92.5	26	0.8	26	0.8	183	5.8	0	0.0	3130	100.0
Campbelltown	2762	95.2	20	0.7	8	0.3	112	3.9	0	0.0	2902	100.0
Bankstown-Lidcombe	1764	98.2	13	0.7	0	0.0	20	1.1	0	0.0	1797	100.0
Bankstown Private	628	98.6	3	0.5	0	0.0	6	0.9	0	0.0	637	100.0
Bowral	606	92.5	2	0.3	1	0.2	46	7.0	0	0.0	655	100.0
Other area hospitals	173	99.4	0	0.0	0	0.0	1	0.6	0	0.0	174	100.0
ALL HOSPITALS	10981	95.7	76	0.7	35	0.3	387	3.4	0	0.0	11479	100.0
<b>Central Coast</b>												
Gosford	1848	74.9	12	0.5	8	0.3	600	24.3	0	0.0	2468	100.0
Wyong	358	94.5	1	0.3	0	0.0	20	5.3	0	0.0	379	100.0
North Gosford Private	636	98.1	2	0.3	1	0.2	9	1.4	0	0.0	648	100.0
ALL HOSPITALS	2842	81.3	15	0.4	9	0.3	629	18.0	0	0.0	3495	100.0
<b>Hunter</b>												
Maitland	1175	92.8	5	0.4	2	0.2	84	6.6	0	0.0	1266	100.0
Muswellbrook	226	95.8	0	0.0	0	0.0	10	4.2	0	0.0	236	100.0
Belmont	603	94.1	0	0.0	0	0.0	38	5.9	0	0.0	641	100.0
Singleton	212	98.6	0	0.0	0	0.0	3	1.4	0	0.0	215	100.0
John Hunter	3261	89.3	41	1.1	27	0.7	322	8.8	0	0.0	3651	100.0
Christo Road Private	929	96.6	6	0.6	2	0.2	25	2.6	0	0.0	962	100.0
Other area hospitals	291	97.0	0	0.0	0	0.0	9	3.0	0	0.0	300	100.0
ALL HOSPITALS	6697	92.1	52	0.7	31	0.4	491	6.8	0	0.0	7271	100.0
<b>Illawarra</b>												
Shoalhaven	793	97.1	4	0.5	0	0.0	20	2.4	0	0.0	817	100.0
Wollongong	1884	89.8	17	0.8	2	0.1	196	9.3	0	0.0	2099	100.0
Shellharbour	517	95.9	0	0.0	1	0.2	21	3.9	0	0.0	539	100.0
Illawarra Private	657	97.5	0	0.0	0	0.0	17	2.5	0	0.0	674	100.0
Other area hospitals	133	98.5	0	0.0	0	0.0	2	1.5	0	0.0	135	100.0
ALL HOSPITALS	3984	93.4	21	0.5	3	0.1	256	6.0	0	0.0	4264	100.0

**TABLE 110 (continued)**
**CONFINEMENTS BY BABY DISCHARGE STATUS AND HOSPITAL, NSW 1999<sup>#</sup>**

Health Area and Hospital	Baby discharge status										TOTAL	
	Discharged		Stillborn		Neonatal death		Transferred		Not stated			
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
<b>South Eastern Sydney</b>												
Royal Hospital for Women	3658	94.3	32	0.8	28	0.7	163	4.2	0	0.0	3881	100.0
St. George	2372	98.1	17	0.7	6	0.2	23	1.0	0	0.0	2418	100.0
Sutherland	999	98.6	3	0.3	1	0.1	10	1.0	0	0.0	1013	100.0
Hurstville Community	675	99.1	0	0.0	1	0.1	5	0.7	0	0.0	681	100.0
Kareena Private	724	98.6	1	0.1	0	0.0	9	1.2	0	0.0	734	100.0
St. George Private	1105	98.9	6	0.5	0	0.0	6	0.5	0	0.0	1117	100.0
Prince of Wales Private	1387	98.9	4	0.3	1	0.1	10	0.7	0	0.0	1402	100.0
ALL HOSPITALS	10920	97.1	63	0.6	37	0.3	226	2.0	0	0.0	11246	100.0
<b>Northern Rivers</b>												
Grafton Base	434	91.9	2	0.4	1	0.2	35	7.4	0	0.0	472	100.0
Lismore Base	1031	75.1	14	1.0	3	0.2	325	23.7	0	0.0	1373	100.0
Murwillumbah	442	96.9	1	0.2	1	0.2	12	2.6	0	0.0	456	100.0
Tweed Heads	775	98.4	9	1.1	0	0.0	4	0.5	0	0.0	788	100.0
Other area hospitals	291	94.5	0	0.0	0	0.0	17	5.5	0	0.0	308	100.0
ALL HOSPITALS	2973	87.5	26	0.8	5	0.1	393	11.6	0	0.0	3397	100.0
<b>Mid North Coast</b>												
Coffs Harbour	700	90.3	3	0.4	3	0.4	69	8.9	0	0.0	775	100.0
Kempsey	275	98.6	2	0.7	0	0.0	2	0.7	0	0.0	279	100.0
Port Macquarie Base	655	88.4	5	0.7	1	0.1	80	10.8	0	0.0	741	100.0
Manning Base	670	93.2	7	1.0	0	0.0	42	5.8	0	0.0	719	100.0
Other area hospitals	289	93.2	1	0.3	0	0.0	20	6.5	0	0.0	310	100.0
ALL HOSPITALS	2589	91.7	18	0.6	4	0.1	213	7.5	0	0.0	2824	100.0
<b>New England</b>												
Armidale	427	91.4	2	0.4	0	0.0	38	8.1	0	0.0	467	100.0
Inverell	250	94.7	4	1.5	1	0.4	9	3.4	0	0.0	264	100.0
Moree	239	97.6	2	0.8	1	0.4	3	1.2	0	0.0	245	100.0
Tamworth Base	613	89.5	5	0.7	2	0.3	65	9.5	0	0.0	685	100.0
Other area hospitals	714	94.4	2	0.3	1	0.1	39	5.2	0	0.0	756	100.0
ALL HOSPITALS	2243	92.8	15	0.6	5	0.2	154	6.4	0	0.0	2417	100.0
<b>Macquarie</b>												
Dubbo Base	862	66.6	17	1.3	3	0.2	413	31.9	0	0.0	1295	100.0
Mudgee	224	97.0	0	0.0	0	0.0	7	3.0	0	0.0	231	100.0
Other area hospitals	144	90.6	0	0.0	0	0.0	15	9.4	0	0.0	159	100.0
ALL HOSPITALS	1230	73.0	17	1.0	3	0.2	435	25.8	0	0.0	1685	100.0
<b>Mid Western</b>												
Bathurst Base	457	87.0	1	0.2	0	0.0	67	12.8	0	0.0	525	100.0
Lithgow	225	97.4	2	0.9	0	0.0	4	1.7	0	0.0	231	100.0
Orange Base	621	78.9	6	0.8	1	0.1	159	20.2	0	0.0	787	100.0
Parkes	188	93.1	3	1.5	1	0.5	10	5.0	0	0.0	202	100.0
Other area hospitals	392	95.6	0	0.0	1	0.2	17	4.1	0	0.0	410	100.0
ALL HOSPITALS	1883	87.4	12	0.6	3	0.1	257	11.9	0	0.0	2155	100.0
<b>Far West</b>												
Broken Hill Base	266	97.1	2	0.7	1	0.4	5	1.8	0	0.0	274	100.0
Other area hospitals	63	87.5	0	0.0	0	0.0	9	12.5	0	0.0	72	100.0
ALL HOSPITALS	329	95.1	2	0.6	1	0.3	14	4.0	0	0.0	346	100.0
<b>Greater Murray</b>												
Deniliquin	192	90.1	0	0.0	1	0.5	20	9.4	0	0.0	213	100.0
Griffith Base	484	94.7	1	0.2	0	0.0	26	5.1	0	0.0	511	100.0
Wagga Wagga Base	756	87.5	9	1.0	1	0.1	98	11.3	0	0.0	864	100.0
Calvary, Wagga Wagga	394	96.6	3	0.7	0	0.0	11	2.7	0	0.0	408	100.0
Other area hospitals	714	96.7	1	0.1	0	0.0	23	3.1	0	0.0	738	100.0
ALL HOSPITALS	2540	92.9	14	0.5	2	0.1	178	6.5	0	0.0	2734	100.0
<b>Southern</b>												
Bega	194	91.9	0	0.0	0	0.0	17	8.1	0	0.0	211	100.0
Goulburn Base	301	92.3	4	1.2	1	0.3	20	6.1	0	0.0	326	100.0
Queanbeyan	317	95.5	1	0.3	1	0.3	8	2.4	5	1.5	332	100.0
Other area hospitals	854	96.5	3	0.3	1	0.1	27	3.1	0	0.0	885	100.0
ALL HOSPITALS	1666	95.0	8	0.5	3	0.2	72	4.1	5	0.3	1754	100.0
TOTAL NSW	82055	94.0	533	0.6	256	0.3	4428	5.1	17	0.0	87289	100.0

Source: NSW Midwives Data Collection (HOIST). Epidemiology and Surveillance Branch, NSW Health Department.

<sup>#</sup> Hospitals with more than 200 deliveries are identified individually. All hospitals include all public and private hospitals.



## 7.8 POSTNATAL LENGTH OF STAY IN SELECTED HOSPITALS

Table 111 shows the mother's postnatal length of stay in the hospital of birth for hospitals where the number of reported confinements exceeded 200 in 1998, totals for all hospitals within each health area and the NSW total.

**TABLE 111**

**AVERAGE MATERNAL POSTNATAL LENGTH OF STAY IN HOSPITAL OF BIRTH, NSW 1994–1998\***

Health Area and Hospital	Average postnatal length of stay (days)					Health Area and Hospital	Average postnatal length of stay (days)				
	1994	1995	1996	1997	1998		1994	1995	1996	1997	1998
<b>Central Sydney</b>						<b>South Eastern Sydney</b>					
Canterbury	3.5	3.5	3.1	–	2.8	Royal Hospital for Women	4.4	4.6	4.2	4.1	3.8
King George V	4.2	4.1	3.7	3.9	3.9	St. George	4.6	4.1	3.8	3.9	3.6
NSW Private	6.1	5.8	5.4	5.4	4.6	Sutherland	5.2	4.5	4.1	3.8	3.8
ALL HOSPITALS	4.2	4.1	3.8	4.0	3.9	Hurstville Community	6.4	6.2	6.5	6.6	6.4
<b>Northern Sydney</b>						Kareena Private	6.4	6.3	6.4	6.3	5.9
Hornsby	4.8	4.4	4.1	3.7	3.8	St. George Private	–	8.0	6.2	6.2	5.5
Manly	4.5	4.3	3.9	3.8	3.7	Prince of Wales Private	–	–	–	6.3	5.6
Mona Vale	4.6	4.3	4.2	3.9	3.8	Other area hospitals	6.6	6.0	5.8	5.8	5.6
Royal North Shore	4.5	4.3	4.3	3.9	4.1	ALL HOSPITALS	5.2	5.0	4.8	4.8	4.5
Ryde	4.2	4.0	4.3	3.6	3.3	<b>Northern Rivers</b>					
Mater, North Sydney	5.7	5.6	5.3	5.3	5.2	Grafton Base	4.4	4.4	4.8	4.5	3.9
North Shore Private	–	–	–	–	4.8	Lismore Base	3.5	3.8	3.3	3.2	3.4
Sydney Adventist	6.0	6.2	5.9	5.6	5.3	Murwillumbah	4.6	4.2	4.0	4.0	3.7
ALL HOSPITALS	5.1	4.9	4.8	4.5	4.5	Tweed Heads	3.7	3.1	3.4	3.0	3.1
<b>Western Sydney</b>						Other area hospitals	4.0	3.6	3.6	3.9	3.4
Auburn	3.5	3.6	3.4	3.0	2.8	ALL HOSPITALS	3.9	3.8	3.6	3.5	3.5
Blacktown	3.4	3.3	3.3	3.1	3.1	<b>Mid North Coast</b>					
Westmead	–	–	–	–	3.3	Coffs Harbour	4.6	4.5	4.4	3.9	4.0
The Hills Private	5.7	5.8	5.8	5.8	5.6	Kempsey	4.4	4.7	4.6	4.1	3.9
ALL HOSPITALS	4.1	3.9	3.7	3.6	3.5	Port Macquarie Base	3.9	3.9	3.9	3.7	3.8
<b>Wentworth</b>						Manning River Base	4.6	4.3	4.3	4.5	3.9
Blue Mountains	4.4	3.5	3.6	3.6	3.7	Other area hospitals	4.1	4.7	4.4	4.5	4.8
Nepean	3.5	3.5	3.4	3.5	3.2	ALL HOSPITALS	4.4	4.4	4.3	4.1	4.0
Jamison Private	5.2	5.3	5.3	5.5	5.3	<b>New England</b>					
Hawkesbury	–	–	3.8	3.8	3.5	Armidale	5.5	5.1	5.1	4.7	4.4
ALL HOSPITALS	3.9	3.7	3.7	3.9	3.6	Inverell	4.1	3.7	3.6	3.8	3.4
<b>South Western Sydney</b>						Moree	4.3	4.1	3.8	3.6	4.0
Camden	4.0	3.7	3.4	3.8	3.3	Tamworth Base	3.3	3.7	3.5	3.6	3.6
Fairfield	3.2	3.1	3.0	2.9	2.9	Other area hospitals	4.4	4.6	4.6	4.2	4.1
Liverpool	3.3	3.1	3.1	3.1	2.9	ALL HOSPITALS	4.2	4.3	4.2	4.0	3.9
Campbelltown	3.2	3.0	2.8	2.7	2.6	<b>Macquarie</b>					
Bankstown–Lidcombe	3.2	3.0	3.0	2.8	2.8	Dubbo Base	4.7	3.3	3.2	3.0	3.0
Bankstown Private	5.2	5.3	5.0	5.4	4.9	Mudgee	3.8	3.6	3.6	3.3	3.5
Bowral	3.5	3.7	3.2	3.0	3.0	Other area hospitals	3.8	3.4	3.2	3.3	3.5
ALL HOSPITALS	3.4	3.2	3.2	3.1	3.0	ALL HOSPITALS	4.3	3.3	3.3	3.1	3.1
<b>Central Coast</b>						<b>Mid Western</b>					
Gosford	3.8	3.7	3.5	3.1	2.4	Bathurst Base	4.1	4.2	3.7	3.2	3.3
Wyong	–	–	–	3.2	2.5	Lithgow	4.6	4.1	5.3	4.5	4.4
North Gosford Private	6.4	6.1	6.2	5.9	5.9	Orange Base	3.5	3.4	3.1	3.4	3.1
ALL HOSPITALS	4.3	4.2	4.1	3.7	3.1	Parkes	4.6	4.5	4.2	3.9	3.9
<b>Hunter</b>						Other area hospitals	4.7	4.5	4.7	4.1	3.8
Maitland	3.7	3.5	3.2	3.1	3.2	ALL HOSPITALS	4.1	4.0	3.9	3.7	3.5
Muswellbrook	4.1	3.9	3.9	3.8	3.5	<b>Far West</b>					
Belmont	3.8	3.6	3.3	3.5	3.5	Broken Hill Base	5.3	4.3	4.1	3.8	4.1
Singleton	4.1	4.2	3.7	3.3	3.5	Other area hospitals	3.3	3.2	3.8	2.9	2.8
John Hunter	3.8	3.9	3.7	4.0	3.9	ALL HOSPITALS	4.7	4.0	4.1	3.6	3.8
Christo Road Private	5.4	5.7	5.7	5.8	5.5	<b>Greater Murray</b>					
Other area hospitals	4.2	4.8	4.8	4.7	4.8	Mercy Care Centre, Albury	4.6	4.6	4.3	4.1	3.9
ALL HOSPITALS	3.9	4.0	3.9	4.1	4.0	Griffith Base	4.1	4.1	3.6	3.4	3.4
<b>Illawarra</b>						Wagga Wagga Base	4.4	4.0	3.7	3.4	3.3
Shoalhaven	3.1	2.9	2.7	2.3	2.5	Calvary, Wagga Wagga	6.0	5.9	6.3	6.5	5.5
Shellharbour	3.6	3.5	3.8	3.3	3.0	Other area hospitals	4.8	4.6	4.5	4.2	4.0
Wollongong	2.6	2.5	2.4	2.4	2.6	ALL HOSPITALS	4.7	4.5	4.4	4.2	3.9
Illawarra Private	0.0	6.3	5.6	6.3	5.6	<b>Southern</b>					
Other area hospitals	4.1	4.2	4.4	3.8	3.7	Bega	5.4	4.4	4.2	4.2	4.0
ALL HOSPITALS	3.0	2.9	2.7	2.5	3.0	Goulburn Base	4.4	4.1	3.6	3.8	3.3
						Queanbeyan	3.9	3.4	3.2	3.2	3.4
						Other area hospitals	4.3	4.2	4.1	3.8	3.9
						ALL HOSPITALS	4.4	4.0	3.8	3.7	3.7
						<b>TOTAL NSW</b>					
							4.2	4.1	4.0	3.9	3.7

Source: NSW Midwives Data Collection (HOIST). Epidemiology and Surveillance Branch, NSW Health Department.

\* Hospitals with more than 200 deliveries are identified individually. All hospitals include all public and private hospitals. Mercy Care Centre, Albury ceased deliveries in June 1998.

## 7.9 INDICATORS OF OBSTETRIC CARE

The Australian Council on Healthcare Standards and the Royal Australian and New Zealand College of Obstetricians and Gynaecologists have endorsed seven clinical indicators for use in Hospitals. Table 112 shows aggregate information for these indicators for all NSW hospitals and comparative information for all participating hospitals in Australia.

**TABLE 112**

**CLINICAL INDICATORS FOR OBSTETRICS, NSW HOSPITALS AND PARTICIPATING AUSTRALIAN HOSPITALS, 1999**

Indicator description	NSW (%)	Australia (%)
<b>Indicator 1:</b> Induction of labour for other than defined indications#.		
1.1 Mothers undergoing induction of labour for other than defined indications as a percentage of all mothers undergoing induction of labour for any reason.	29.9	30.5
1.2 Mothers undergoing induction of labour for other than defined indications as a percentage of all mothers giving birth.	7.2	8.8
<b>Indicator 2:</b> The rate of vaginal delivery after primary caesarean section.		
2.1 Mothers delivering vaginally at the birth immediately following primary caesarean section as a percentage of all mothers delivering at the birth immediately following primary caesarean section.	22.5	24.2
<b>Indicator 3:</b> Primary caesarean section for failure to progress.		
3.1 Mothers undergoing primary caesarean section for failure to progress after a period of labour with cervical dilation of 3 cm or less as a percentage of all mothers undergoing primary non-elective caesarean section.	10.0	9.1
3.2 Mothers undergoing primary caesarean section for failure to progress after a period of labour with cervical dilation of more than 3 cm as a percentage of all mothers undergoing primary non-elective caesarean section.	31.9	26.3
<b>Indicator 4:</b> Primary caesarean section for fetal distress.		
4.1 Mothers undergoing primary caesarean section for fetal distress as a percentage of total mothers delivering.	2.9	3.6
4.2 Mothers undergoing primary caesarean section for fetal distress as a percentage of mothers delivering by primary caesarean section.	21.3	26.5
<b>Indicator 5:</b> Incidence of intact lower genital tract in vaginal deliveries.		
5.1 Primiparous mothers not requiring surgical repair of the lower genital tract as a percentage of all primiparous mothers.	30.1	26.1
<b>Indicator 6:</b> Apgar score.		
6.1 Infants born with an Apgar score of four or less at five minutes post delivery as a percentage of all infants born##.	0.5	0.7
6.2 Infants born with an Apgar score of six or less at ten minutes post delivery as a percentage of all infants born###.	–	0.4
<b>Indicator 7:</b> Term infants transferred or admitted to a neonatal intensive care unit for reasons other than congenital abnormality####.		
7.1 Term infants admitted to a neonatal intensive care unit for reasons other than congenital abnormality as a percentage of all term infants born.	0.9	1.0

Source: NSW Midwives Data Collection (HOIST). Epidemiology and Surveillance Branch, NSW Health Department. Australian Council on Healthcare Standards (unpublished data).

# Defined indications include: diabetes, hypertensive disease, fetal distress, fetal death, chorioamnionitis, blood group isoimmunisation, prelabour rupture of membranes, prolonged pregnancy (41 or more weeks), and suspected intrauterine growth retardation.

## NSW denominator includes live births only.

### NSW data not collected.

#### NSW data are provided by hospital of birth and may be under-enumerated. Infants transferred to another hospital and then admitted to NICU for reasons other than congenital abnormality may not be reported by the hospital of birth.

## PART 8: QUALITY OF REPORTING OF ABORIGINALITY TO THE NSW MIDWIVES DATA COLLECTION

This chapter describes a study that used capture–recapture methods to assess the quality of information on Aboriginality reported to the NSW Midwives Data Collection (MDC). This report has been published previously.<sup>1</sup>

The NSW Aboriginal Health Strategic Plan states that: ‘In order to measure improvements and effectively target funding to programs which will improve the health of Aboriginal people, strategies are required to develop robust performance indicators, improve data collection and improve reporting processes.’<sup>2</sup> Aboriginality is known to be under-reported on Department of Health data collections in NSW, although it is not known to what extent. Improving the quality of information on Aboriginality in health data collections is an important part of improving the overall quality of information on Aboriginal health in NSW.

The MDC is a population-based surveillance system covering all births in NSW public and private hospitals, as well as home births. Births in NSW are required to be reported to the MDC under the NSW Public Health Act 1991. The data are used to monitor trends and variations in mortality and morbidity of mothers and newborns, quality of care and the major risk factors for adverse outcomes for mothers and babies. The MDC encompasses all live births and stillbirths of at least 20 weeks gestation or at least 400 grams birthweight.

### METHODS

The Aboriginality of the mother, rather than the baby, is reported to the MDC, although mother’s Aboriginality is frequently used as a proxy measure for the baby’s Aboriginality. Consequently, maternal Aboriginality was used for this analysis.

Aboriginal or Torres Straight Islander mothers were counted as one group in the MDC up to 1997 and as two separate groups thereafter. We were therefore unable to examine trends in the quality of reporting for both these groups. For ease of reference, in this report ‘Aboriginal’ will be used to refer to both groups combined.

Records of births reported to the MDC were linked to birth registration records of the NSW Registry of Births, Deaths and Marriages for births occurring in the five-year period 1994–1998. Records from the two files were matched using a probabilistic linkage software (Automatch). Prior to matching, residential address and mothers’ name were standardised using a standardisation software (Autostan). The overall linkage rate was 96.6 per cent of MDC records (97.8 per cent of birth registration records).

Capture–recapture methods are used to adjust estimates of counts to reflect ascertainment level or undercounting. Capture–recapture was carried out using the method

described by McCarty et al.<sup>3</sup> Analysis was carried out using SAS version 6.12. Analyses concerning geographic location were based on health area of hospital of birth as reported to the MDC. Home births were excluded from the analysis.

### RESULTS

The estimated percentage of births to Aboriginal mothers in NSW, which were reported as Aboriginal in the MDC, rose from 58.7 to 64.8 per cent over the five-year period 1994–1998 (Table 113, Figure 22). Reporting was better in rural hospitals than urban hospitals: in 1998 47.0 per cent of births to Aboriginal mothers in urban hospitals were reported compared to 85.6 per cent in rural hospitals, though there was a trend towards improved reporting in both urban and rural hospitals.

In 1998, the highest ascertainment rate was in hospitals in the New England Area (93.3 per cent) and the lowest in hospitals in the Northern Sydney Area (15.8 per cent) (Table 114). The number of reported births to Aboriginal mothers in Northern Sydney Area hospitals was small for both the MDC and the Registry of Births, Deaths and Marriages and the estimate of total births for this Area is not very reliable, as indicated by the wide confidence intervals (8.7–23.0 per cent).

Of the nine urban health areas, only three (Central Sydney, Wentworth, and Illawarra) had ascertainment rates of maternal Aboriginality of more than 50 per cent in 1998. All rural areas had ascertainment rates of more than 70 per cent.

### DISCUSSION

In using capture–recapture methods, three conditions need to be met:

- the two systems should be independent;
- all true matches and only matches should be identified;
- all cases identified by the two or more surveillance systems should be true cases that occurred in the population under investigation and within the appropriate time period.<sup>4</sup>

These three conditions are reasonably well met in this study. First, the two sources of data are independent. Second, the data linkage was carried out in such a way that the likelihood of obtaining true matches was maximised. For the third criteria, it is not known how many mothers in each data collection were incorrectly identified as Aboriginal. It is more likely that mothers would be incorrectly identified as non-Aboriginal than Aboriginal in NSW. If some mothers were incorrectly reported as Aboriginal in either data collection, this study would result in a larger estimate of total births to Aboriginal mothers than is actually the case.

**TABLE 113**

**BIRTHS TO ABORIGINAL MOTHERS BY SOURCE OF BIRTH REPORT, YEAR OF BIRTH AND URBAN-RURAL HEALTH AREA OF HOSPITAL, NSW 1994-1998<sup>#</sup>**

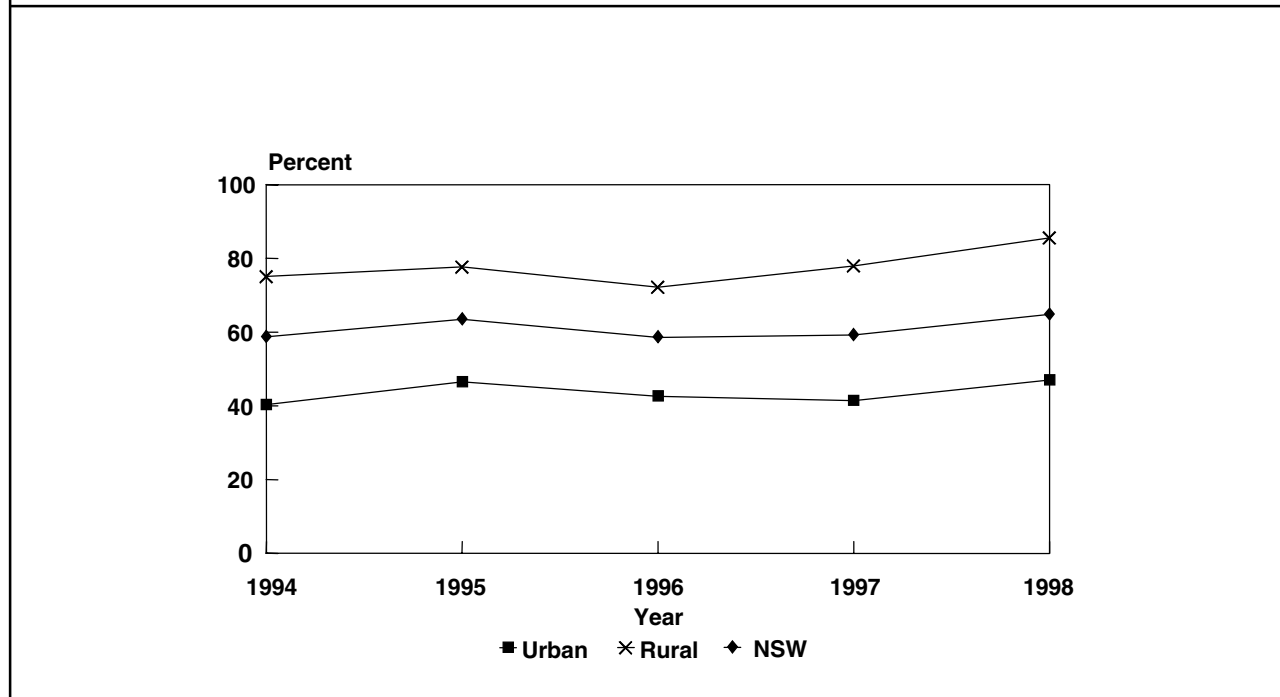
Urban-Rural locality of hospital and Year	MDC births No.	RBDM births No.	Births reported to both MDC-RBDM No.	Estimated Aboriginal births No.	Estimated Aboriginal births reported %	95% confidence interval of estimated births reported
<b>Urban</b>						
1994	553	665	268	1371	40.3	37.7-42.9
1995	642	742	345	1380	46.5	43.9-49.2
1996	593	794	338	1392	42.6	40.0-45.2
1997	658	1066	441	1590	41.4	39.0-43.8
1998	785	1053	495	1669	47.0	44.6-49.4
<b>Rural</b>						
1994	990	747	561	1318	75.1	72.8-77.4
1995	1117	887	689	1438	77.7	75.5-79.8
1996	1131	941	679	1567	72.2	70.0-74.4
1997	1196	1011	789	1532	78.0	76.0-80.1
1998	1280	901	771	1496	85.6	83.8-87.4
<b>NSW</b>						
1994	1543	1412	829	2628	58.7	56.8-60.6
1995	1759	1629	1034	2771	63.5	61.7-65.3
1996	1724	1735	1017	2941	58.6	56.8-60.4
1997	1854	2077	1230	3130	59.2	57.5-60.9
1998	2065	1954	1266	3187	64.8	63.1-66.5

Source: Linked NSW Midwives Data Collection and Registry of Births, Deaths and Marriages birth registration data.

# 'Urban' and 'Rural' refer to urban or rural Health Area of Hospital as reported to the MDC. Urban hospitals include those in the following health

**FIGURE 22**

**BIRTHS TO ABORIGINAL MOTHERS BY YEAR OF BIRTH AND URBAN-RURAL HEALTH AREA OF HOSPITAL, NSW 1994-1998<sup>#</sup>**



Source: Linked NSW Midwives Data Collection and Registry of Births, Deaths and Marriages birth registration data.

# Home births excluded.

A limitation of this study is that it is restricted to an estimation of the number of births to Aboriginal mothers. Paternal Aboriginality also influences the baby's Aboriginality, and when this is not taken into account the number of Aboriginal babies born in NSW is further under-enumerated. For 1998, the linked data set created for this study showed a further 980 births where the father was reported as Aboriginal and the mother was reported as non-Aboriginal both on the MDC and on the birth registration record. Assuming the reporting of paternal Aboriginality on the birth registration record is correct, these 980 births could be added to the 3,187 births to Aboriginal mothers in 1998, estimated by this study, to give an estimated total of 4,167 births of Aboriginal babies born in NSW in 1998. This is 4.8 per cent of all births in NSW in 1998 and double the 2.4 per cent of births to Aboriginal mothers reported to the MDC in 1998. As for maternal Aboriginality, it is likely that paternal Aboriginality is also under-reported and the true number of Aboriginal babies may be even higher.

In summary, while improvements have been made in the reporting of maternal Aboriginality to the MDC, resulting in a rise from 58.7 to 64.8 per cent of births to Aboriginal mothers being reported as Aboriginal over the five years 1994–1998, there is still a need for substantial improvement in reporting of maternal Aboriginality, particularly in urban hospitals. Also, consideration could be given as to whether information on paternal Aboriginality should be obtained from birth registration records on a regular basis and included in reports of the numbers of Aboriginal babies.

## REFERENCES

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TABLE 114

BIRTHS TO ABORIGINAL MOTHERS BY SOURCE OF BIRTH REPORT, YEAR AND HEALTH AREA OF BIRTH HOSPITAL, NSW 1994-1998

Health Area of hospital and Year	MDC births	RBDM births	Births reported to both	Estimated Aboriginal births reported	Estimated Aboriginal births	95% confidence interval of estimated births reported
	No.	MDC-RBDM No.			%	
<b>Central Sydney</b>						
1994	123	84	65	159	77.5	71.0-84.0
1995	113	78	63	140	80.9	74.4-87.4
1996	84	70	51	115	73.0	64.9-81.1
1997	86	101	56	155	55.6	47.8-63.4
1998	73	90	51	129	56.8	48.2-65.4
<b>Northern Sydney</b>						
1994	19	23	11	39	48.7	33.0-64.4
1995	13	24	7	43	30.4	16.6-44.2
1996	13	27	8	43	30.5	16.7-44.4
1997	8	35	6	45	17.7	6.6-28.8
1998	16	29	4	101	15.8	8.7-23.0
<b>Western Sydney</b>						
1994	77	93	32	221	34.8	28.5-41.1
1995	85	102	36	238	35.7	29.6-41.7
1996	67	130	42	206	32.5	26.1-38.9
1997	76	144	48	227	33.5	27.4-39.6
1998	127	162	80	257	49.5	43.4-55.6
<b>Wentworth</b>						
1994	66	73	31	154	42.9	35.1-50.7
1995	82	88	44	163	50.3	42.6-57.9
1996	84	97	40	202	41.5	34.8-48.3
1997	88	140	55	223	39.4	33.0-45.9
1998	131	146	80	239	54.9	48.6-61.2
<b>South Western</b>						
1994	76	120	25	357	21.3	17.0-25.5
1995	88	141	52	237	37.1	30.9-43.2
1996	91	142	48	267	34.0	28.3-39.7
1997	84	181	47	321	26.1	21.3-30.9
1998	112	208	63	368	30.4	25.7-35.1
<b>Central Coast</b>						
1994	15	34	9	55	27.3	15.5-39.0
1995	20	36	12	59	34.0	21.9-46.1
1996	27	48	21	61	44.0	31.6-56.4
1997	36	58	24	86	41.7	31.3-52.1
1998	42	55	24	95	44.1	34.1-54.0
<b>Hunter</b>						
1994	67	101	32	209	32.0	25.7-38.4
1995	94	127	52	228	41.1	34.8-47.5
1996	101	132	56	237	42.6	36.3-48.9
1997	123	183	92	244	50.3	44.1-56.6
1998	111	162	78	230	48.2	41.8-54.7
<b>Illawarra</b>						
1994	81	78	45	140	57.9	49.7-66.1
1995	112	83	60	155	72.4	65.4-79.5
1996	101	86	59	147	68.8	61.3-76.2
1997	124	122	86	176	70.6	63.8-77.3
1998	113	109	80	154	73.5	66.5-80.4
<b>South Eastern Sydney</b>						
1994	29	59	18	94	30.9	21.6-40.3
1995	35	63	19	114	30.6	22.2-39.1
1996	25	62	13	116	21.6	14.1-29.0
1997	33	102	27	124	26.6	18.8-34.4
1998	60	92	35	157	38.3	30.7-45.9

**TABLE 114 (continued)**

**BIRTHS TO ABORIGINAL MOTHERS BY SOURCE OF BIRTH REPORT, YEAR AND HEALTH AREA OF BIRTH HOSPITAL, NSW 1994–1998**

Health Area of hospital and Year	MDC births	RBDM births	Births reported to both MDC–RBDM	Estimated Aboriginal births	Estimated Aboriginal births reported %	95% confidence interval of estimated births reported
	No.	No.	No.	No.		
<b>Northern Rivers</b>						
1994	122	111	74	183	66.8	60.0–73.6
1995	165	120	95	208	79.2	73.7–84.7
1996	143	104	76	195	73.2	67.0–79.4
1997	160	151	111	218	73.6	67.7–79.4
1998	180	131	102	231	77.9	72.6–83.3
<b>Mid North Coast</b>						
1994	141	108	77	197	71.4	65.1–77.7
1995	158	121	92	208	76.1	70.3–81.9
1996	159	135	94	228	69.7	63.8–75.7
1997	174	148	104	247	70.4	64.7–76.0
1998	168	99	82	203	82.9	77.7–88.1
<b>New England</b>						
1994	199	154	122	251	79.3	74.3–84.3
1995	212	163	144	240	88.4	84.3–92.4
1996	246	178	149	294	83.7	79.5–88.0
1997	267	227	197	308	86.8	83.0–90.6
1998	283	208	194	303	93.3	90.5–96.1
<b>Macquarie</b>						
1994	193	143	117	236	81.9	76.9–86.8
1995	185	159	114	258	71.8	66.3–77.3
1996	238	210	149	335	71.0	66.1–75.9
1997	261	184	157	306	85.4	81.4–89.3
1998	257	181	164	284	90.6	87.2–94.0
<b>Mid Western</b>						
1994	100	74	53	139	71.8	64.3–79.3
1995	102	90	64	143	71.2	63.8–78.6
1996	103	111	68	168	61.4	54.0–68.7
1997	93	93	66	131	71.1	63.3–78.8
1998	106	91	67	144	73.7	66.5–80.9
<b>Far West</b>						
1994	93	56	51	102	91.1	85.6–96.7
1995	122	77	73	129	94.8	91.0–98.7
1996	76	46	41	85	89.2	82.7–95.8
1997	77	47	39	93	83.2	75.5–90.8
1998	90	52	46	102	88.6	82.4–94.8
<b>Greater Murray</b>						
1994	101	72	46	157	64.2	56.7–71.6
1995	107	107	69	166	64.6	57.3–71.9
1996	128	121	83	186	68.7	62.0–75.3
1997	113	118	86	155	72.9	65.9–79.9
1998	132	101	86	155	85.2	79.6–90.8
<b>Southern</b>						
1994	41	29	21	56	72.9	61.2–84.5
1995	66	50	38	87	76.2	67.2–85.2
1996	38	36	19	71	53.4	41.8–65.0
1997	51	43	29	75	67.8	57.2–78.3
1998	64	38	30	81	79.2	70.4–88.1

Source: *Linked NSW Midwives Data Collection and Registry of Births, Deaths and Marriages birth registration data.*

## APPENDIX 1

### DESCRIPTION OF SELECTED BIRTH DEFECTS

The following include descriptions of some of the birth defects included in this report :

<i>Anencephaly</i>	Absence of the cranial vault, with the brain tissue completely missing or markedly reduced.
<i>Spina bifida</i>	Defective closure of the bony encasement of the spinal cord, through which the spinal cord may protrude.
<i>Encephalocele</i>	Protrusion of brain through a congenital opening in the skull
<i>Hydrocephalus</i>	Dilatation of the cerebral ventricles accompanied by an accumulation of cerebral fluid within the skull.
<i>Buphthalmos</i>	Enlargement and distension of the fibrous coats of the eye.
<i>Hypospadias</i>	The opening of the urethra lies on the underside of the penis or on the perineum.
<i>Epispadias</i>	Absence of the upper wall of the urethra. The opening of the urethra lies on the dorsum of the penis in males, and anterior to or onto the clitoris in females.
<i>Chordee</i>	Downward bowing of the penis.
<i>Talipes equinovarus</i>	A deformity of the foot in which the heel is elevated and turned outward.
<i>Polydactyly</i>	Presence of additional fingers or toes on hands or feet.
<i>Syndactyly</i>	Attachment of adjacent fingers or toes on hands or feet.
<i>Craniosynostosis</i>	Premature closure of the sutures of the skull.
<i>Exomphalos</i>	Herniation of the abdominal contents into the umbilical cord.
<i>Gastroschisis</i>	A defect in the abdominal wall not involving the umbilicus and through which the abdominal contents herniate.
<i>Cystic hygroma</i>	A sac, cyst or bursa distended with fluid.

## APPENDIX 2

### BIRTH DEFECT EXCLUSION LIST

The following is a general list of minor defects and non-structural disorders which are excluded from the NSW Birth Defects Register. For further details, please contact the NSW Birth Defects Register (see Further Information, p.16).

Abnormal palmar creases	Inborn errors of metabolism other than phenylketonuria, galactosemia and congenital hypothyroidism.
Accessory nipples	Intrauterine growth retardation
Balanced chromosomal translocation (unless occurring with structural defects)	Low birthweight
Birthmarks (single, < 4 cms diameter)	Meconium ileus
Bronchopulmonary dysplasia	Minor ear anomalies
Cerebral palsy	Minor finger/hand anomalies
Clicky hips	Minor toe/foot anomalies
Congenital infections (unless occurring with structural defects)	Muscular dystrophies & myopathies
Congenital neoplasms/tumours (exception: cystic hygroma)	Oesophageal reflux
Cystic fibrosis	Patent ductus arteriosus (less than 37 weeks gestation)
Developmental disability	Pilonidal sinus
Deviated nasal septum	Sacral dimples
Fetal alcohol syndrome	Single umbilical artery (unless occurring with structural defects)
Glucose-6-phosphate dehydrogenase (G6PD) deficiency	Skin tag
Haemophilia	Strabismus
Heart murmurs (functional)	Talipes (exception: those requiring surgery)
Hernia (epigastric, hiatus, inguinal, umbilical)	Tongue tie
Hydrocele (testis)	Undescended testes (exception: those requiring surgery)
Hydrops fetalis due to isoimmunisation	Webbing of 2nd & 3rd toes
Hypoplastic lung (less than 37 weeks gestation)	Wide sutures
Imperforate hymen	



**APPENDIX 3****MATERNAL COUNTRIES OF BIRTH AND COUNTRY OF BIRTH GROUPS****English speaking**

Australia  
Christmas Island  
Cocos (Keeling) Islands  
Norfolk Island  
New Zealand  
United Kingdom  
Channel Islands  
Isle of Man  
Ireland  
Bermuda  
Canada  
United States of America  
South Africa

**Central and South America**

Argentina  
Bolivia  
Brazil  
Chile  
Colombia  
Ecuador  
Falkland Islands  
French Guiana  
Guyana  
Paraguay  
Peru  
Surinam  
Uruguay  
Venezuela  
Belize  
Costa Rica  
El Salvador  
Guatemala  
Honduras  
Mexico  
Nicaragua  
Panama  
Antigua and Barbuda  
Bahamas  
Barbados  
Cayman Islands  
Cuba  
Grenada  
Guadeloupe  
Jamaica  
Netherlands Antilles  
Puerto Rico  
St Kitts-Nevis  
St Lucia  
St Vincent and the Grenadines  
Trinidad and Tobago  
Turks and Caicos Islands

**Eastern Europe, Russia,  
Central Asian and Baltic States**

Bulgaria  
Czechoslovakia  
Hungary  
Poland  
Romania  
Armenia  
Azerbaijan  
Belarus (formerly Byelorussia)  
Estonia  
Georgia  
Kazakhstan  
Kyrgyzstan (formerly Kirghizia)  
Latvia  
Lithuania  
Moldova (formerly Moldavia)  
Russian Federation  
Ukraine  
Uzbekistan

**Melanesia, Micronesia and  
Polynesia**

New Caledonia  
Papua New Guinea  
Solomon Islands  
Vanuatu  
Guam  
Kiribati  
Nauru  
Cook Islands  
Fiji  
French Polynesia (including  
Tahiti)  
Niue  
American Samoa  
Western Samoa  
Tokelau  
Tonga  
Tuvalu  
Wallis and Fortuna

**Middle East and Africa**

Bahrain  
Gaza Strip  
Iran  
Iraq  
Israel  
Jordan  
Kuwait  
Lebanon  
Qatar  
Saudi Arabia  
Syria  
Turkey  
United Arab Emirates  
West Bank  
Yemen  
Algeria  
Egypt  
Libya  
Mauritania  
Morocco  
Sudan  
Tunisia  
Cameroon  
Central African Republic  
Congo  
Cote d'Ivoire  
Gambia  
Ghana  
Guinea-Bissau  
Liberia  
Mali  
Nigeria  
Senegal  
Sierra Leone  
Zaire  
Angola  
Botswana  
Djibouti  
Ethiopia  
Kenya  
Malawi  
Mauritius  
Mozambique  
Namibia  
Reunion  
Rwanda  
Seychelles  
Somalia  
Swaziland  
Tanzania  
Uganda  
Zambia  
Zimbabwe

**North East Asia**

China (excluding Taiwan)  
Hong Kong  
Japan  
North Korea  
South Korea  
Macau  
Mongolia  
Taiwan

**South East Asia**

Brunei  
Cambodia  
Indonesia  
Laos  
Malaysia  
Burma (Myanmar)  
Philippines  
Singapore  
Thailand  
Vietnam

**Southern Asia**

Afghanistan  
Bangladesh  
Bhutan  
India  
Maldives  
Nepal  
Pakistan  
Sri Lanka

**Southern Europe**

Albania  
Andorra  
Cyprus  
Gibraltar  
Greece  
Italy  
Malta  
Portugal  
Spain  
Former Yugoslavia (not  
otherwise defined)  
Croatia  
Slovenia

**Western and Northern Europe**

Austria  
Belgium  
France  
Germany (United)  
Luxembourg  
Netherlands  
Switzerland  
Denmark  
Faeroe Islands  
Finland  
Iceland  
Norway  
Sweden

**APPENDIX 4**

**MAP OF NSW HEALTH AREAS**

