

Part III: Maternal, perinatal and infant conditions

Chapter 7: Maternal and infant conditions

Chapter 8: Sudden infant death syndrome (SIDS)

Chapter 9: Congenital malformations

7. Maternal and infant conditions

The overwhelming majority of pregnancies and confinements in Australia do not result in mortality or severe illness. However, pregnancy, childbirth and infancy remain a time of vulnerability for mothers and their children.

Illness in an infant's first few days of life, and problems associated with the health of the mother, can impact on a child's future health as well as their immediate wellbeing and development. Many factors which affect the health of infants and children have their origin in the womb. Smoking during pregnancy can have a number of detrimental effects on the foetus, including low birthweight, spontaneous abortion and stillbirth (Winstanley et al. 1995). Excessive alcohol intake can also have a number of effects on the foetus, such as increased heartbeat and dilation of the small blood vessels. At the most serious level, alcohol use can cause foetal alcohol syndrome, the main features of which are cranio-facial malformations, prenatal and/or postnatal growth deficiency, and evidence of damage to the central nervous system (National Institute on Alcohol Abuse and Alcoholism 2000). Maternal nutrition is also important for the developing foetus, with poor nutrition possibly leaving it susceptible to disease later in life (Barker 1998). Diseases and conditions linked to under-nourishment of the foetus include coronary heart disease, hypertension and non-insulin dependent diabetes. There is also now strong evidence that an adequate intake of folate, a B-group vitamin, by the mother before and in early pregnancy, can prevent up to 70% of neural tube birth defects (spina bifida and related defects) and possible other non-neural tube defects (Lumley et al. 2001).

The age of the mother can also impact on the development of the foetus. When a woman becomes pregnant at either a relatively early or late age, the risk of encountering complications increases. Older and younger mothers have a greater risk of giving birth to a baby that is pre-term and of a low birthweight. Babies of older mothers are at greater risk of perinatal death and are more likely to be born with a chromosomal disorder, while women who become pregnant in adolescence are more likely to miscarry (ABS 2001a).

Adequate antenatal care is another factor shown to be important for the health of the neonate (Gibson & Colley 1982; Dixon et al. 2000). Early antenatal care is a protective factor for babies. New South Wales statistics have shown that the proportion of mothers who commenced antenatal care before 20 weeks gestation in 1995 and 1999 has remained stable at about 86% (NSW Health 2001).

This chapter introduces some factors associated with pregnancy, including trends in fertility, maternal age at confinement, and maternal mortality. Primarily, however, it focuses on the health of the foetus and neonate from a gestational age of 20 weeks and up to 28 days following birth (the perinatal period), because this is the time of greatest risk for infants developing serious illness in the first year of life.

The data presented are drawn from a variety of sources, including reports from the AIHW National Perinatal Statistics Unit, the AIHW National Hospital Morbidity Database and the AIHW Mortality Database, as well as data from the ABS.

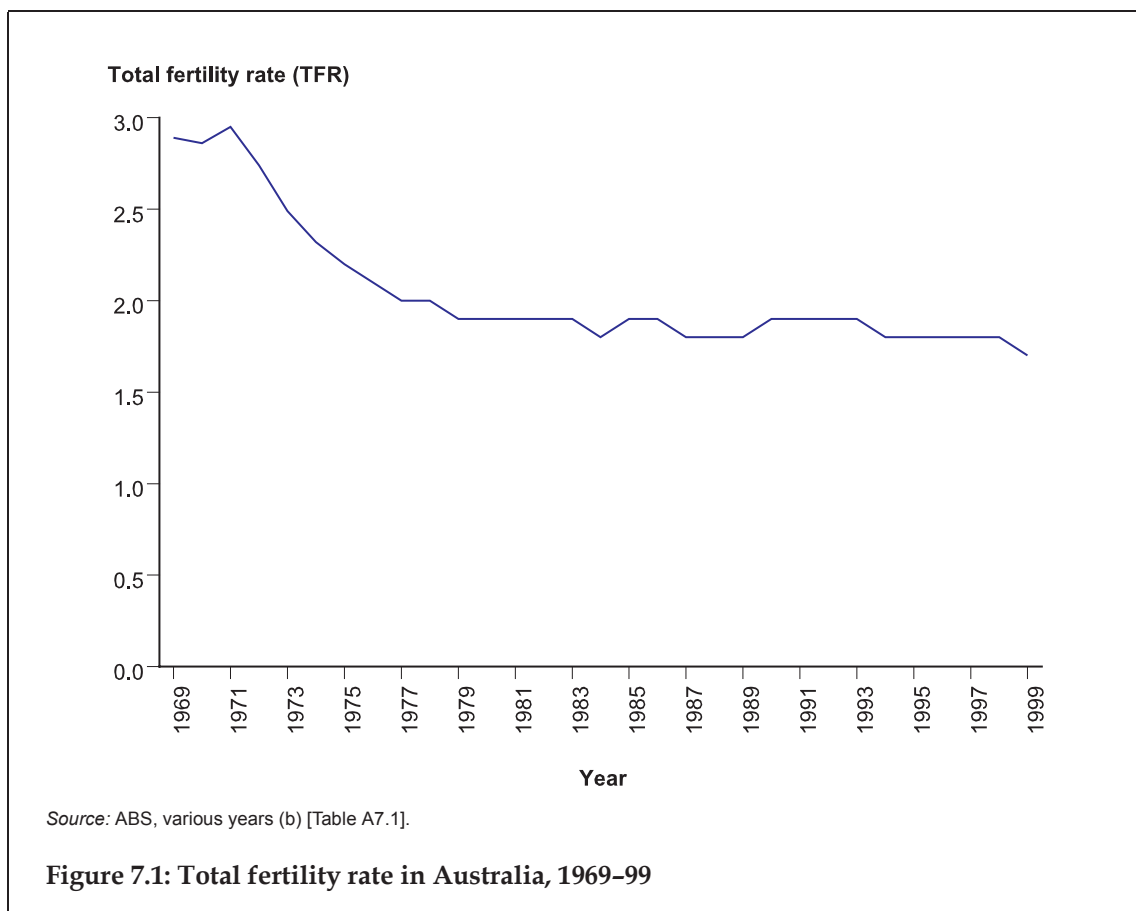
Maternal factors

Fertility

The level of child-bearing in a year is measured by the total fertility rate (TFR), which is the average number of children a woman would bear during her lifetime based on the rates of child-bearing experienced by women at each age in the reference year. For a

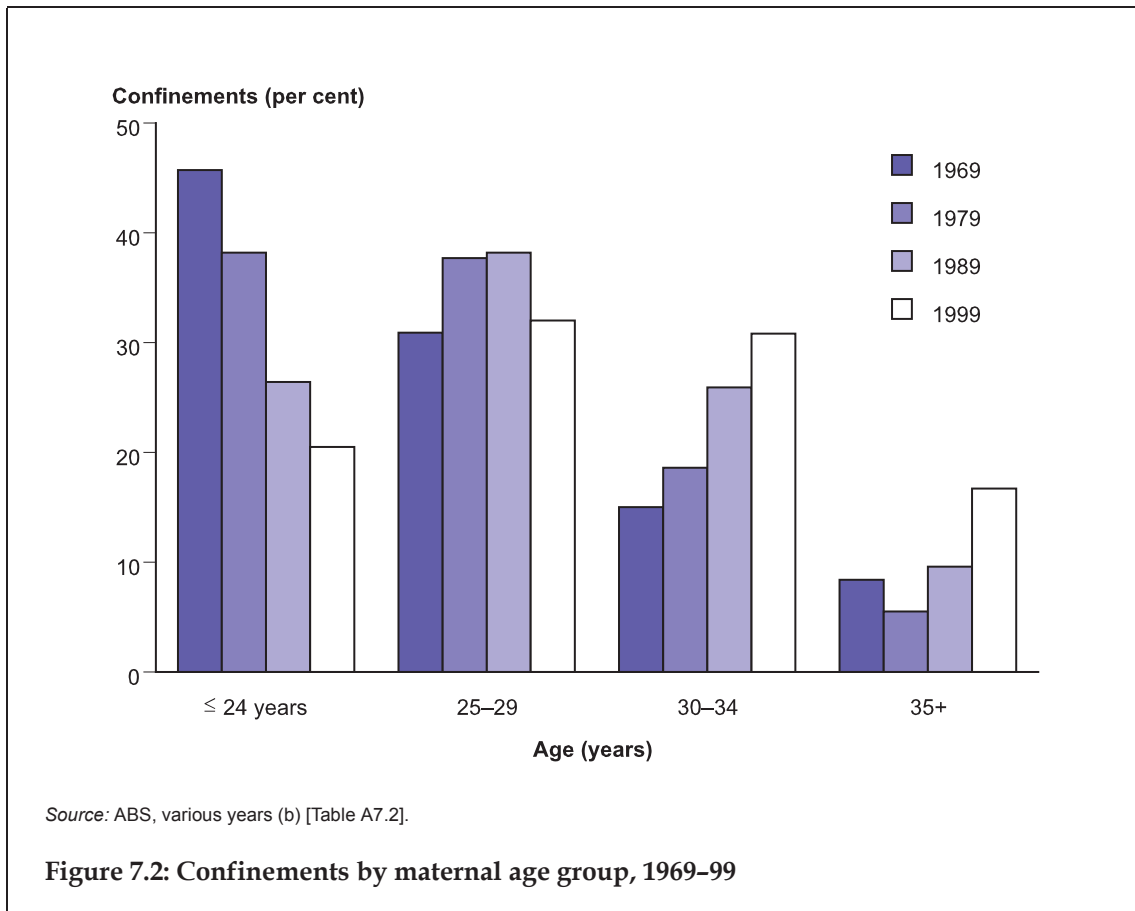
population to replace itself, the TFR should be 2.1 births per woman. Following a peak of 3.6 children per woman in the early 1960s, the TFR of Australian women has been falling. Between 1969 and 1999, the TFR decreased by 41% (2.9 births per woman compared with 1.7) (Figure 7.1).

The major contributing factors to the decline in the TFR in Australia in the last three decades are an increase in the proportion of women who postpone child-bearing to a later age and therefore have fewer children, and an increase in the proportion of women who never have children. This shift towards later family formation has also been observed in other developed countries.



- In 1999, the TFR was 1.7 children per woman. The TFR has been declining over the last three decades and has been below replacement since 1977.
- The sharpest decline occurred in the 1970s, when the TFR fell by 36%, from 3.0 in 1971 to 1.9 in 1979.

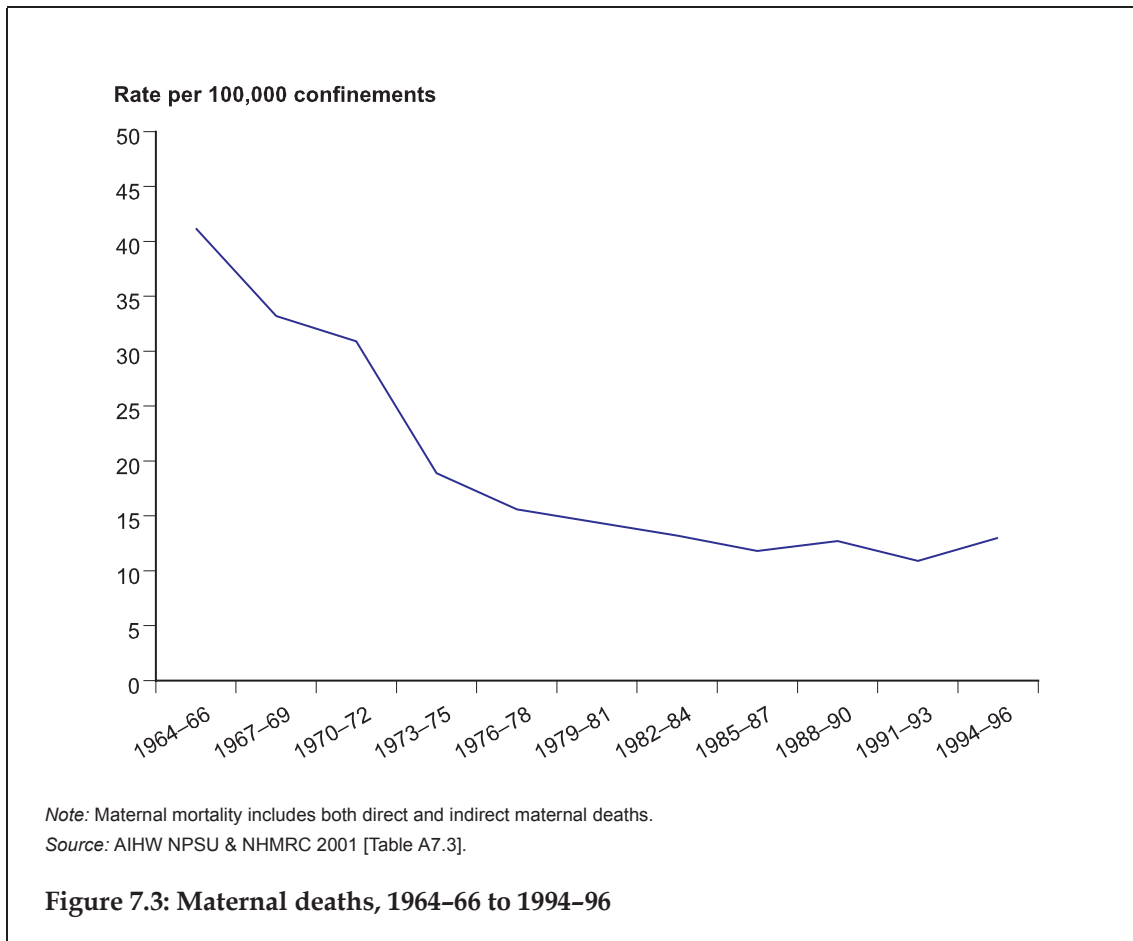
The fall in fertility has also been accompanied by a distinct change in the timing of births. The number of births distributed by maternal age is shown in Figure 7.2.



- In 1969, nearly 1 in 4 births (23%) were to women aged 30 years and over. By 1999, the proportion had almost doubled to 47%.
- The increase in the percentage of births to older women was accompanied by a decrease in the proportion of women aged 24 years or less giving birth (46% in 1969 compared with 21% in 1999).

Maternal mortality

Maternal deaths occur infrequently in Australia. Maternal mortality includes both direct maternal deaths (those resulting from obstetric complications of the pregnant state) and indirect maternal deaths (where the cause of death was a pre-existing disease, but which may have been aggravated by the effects of pregnancy). Trends in maternal mortality are presented in Figure 7.3.



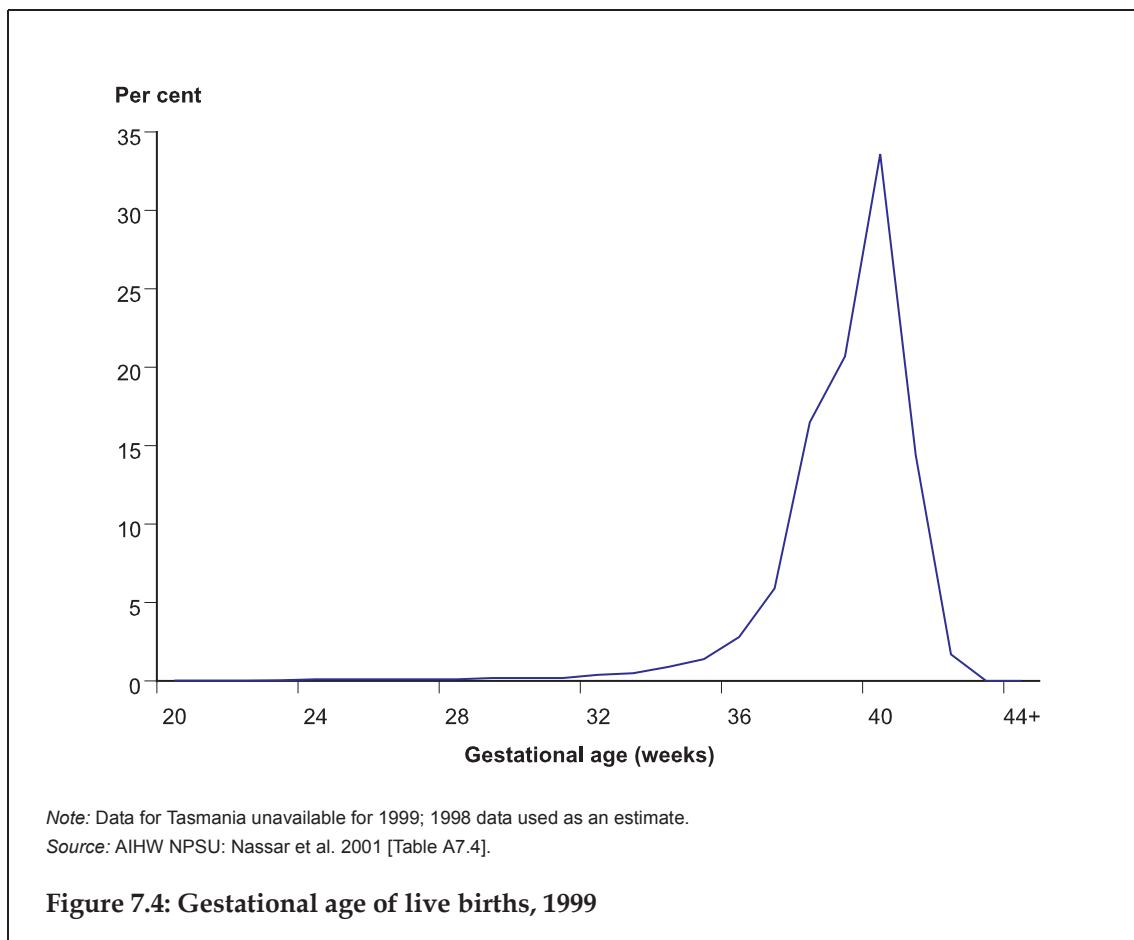
- Between 1964-66 and 1994-96, the maternal mortality rate decreased substantially, from 41.2 to 13.0 per 100,000 confinements per triennium (a 68% decrease).
- Over the 3 years 1994-96, there were 100 maternal deaths (13.0 per 100,000 confinements). The rate in 1994-96 represents an increase of 19% from the previous period (1991-93), when the rate was 10.9 per 100,000 confinements.
- The rate of direct maternal mortality in 1994-96 was 6.0 per 100,000 confinements (AIHW NPSU & NHMRC 2001). The main causes of direct maternal deaths were pulmonary embolism (17%), amniotic fluid embolism (17%) and pre-eclampsia (13%).

Factors associated with births

In Australia in 1999, there were 257,394 total births, based on birth notifications to the State and Territory perinatal collections. This section provides data on certain characteristics of these births, including gestational age, birthweight and Apgar score.

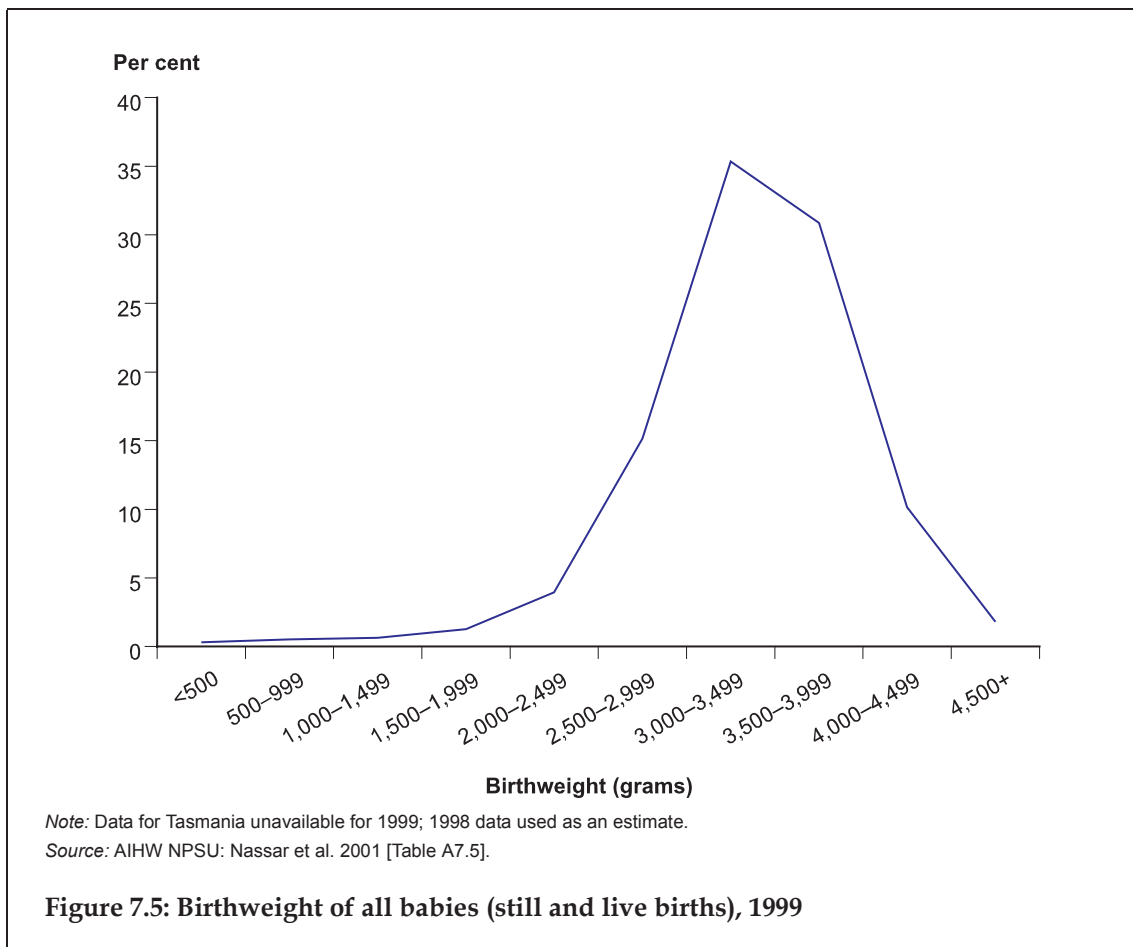
Gestational age and birthweight

Data on the outcomes of pregnancies are collected by the AIHW National Perinatal Statistics Unit (NPSU) and are published annually. Of the 257,394 total births in Australia in 1999 notified to the NPSU, the overwhelming majority were live births (232,514). Only 0.7% of all births were stillbirths (foetal deaths). Most live births occurred between 37 and 41 weeks of gestation. These births are known as full-term. Babies born before 37 weeks are known as pre-term. The distribution of births by gestational age in 1999 is shown in Figure 7.4.



- In 1999, approximately 9 out of 10 (91%) live births were full-term babies born between 37 and 41 weeks of gestation.
- Just over half of live births (55% or 138,609 births) occurred at 39 or 40 weeks.
- Just over 7% (18,359 births) of babies were pre-term and less than 1% of live births had a gestational age of 30 weeks or less.
- Only 2% of live births were more than 41 weeks.

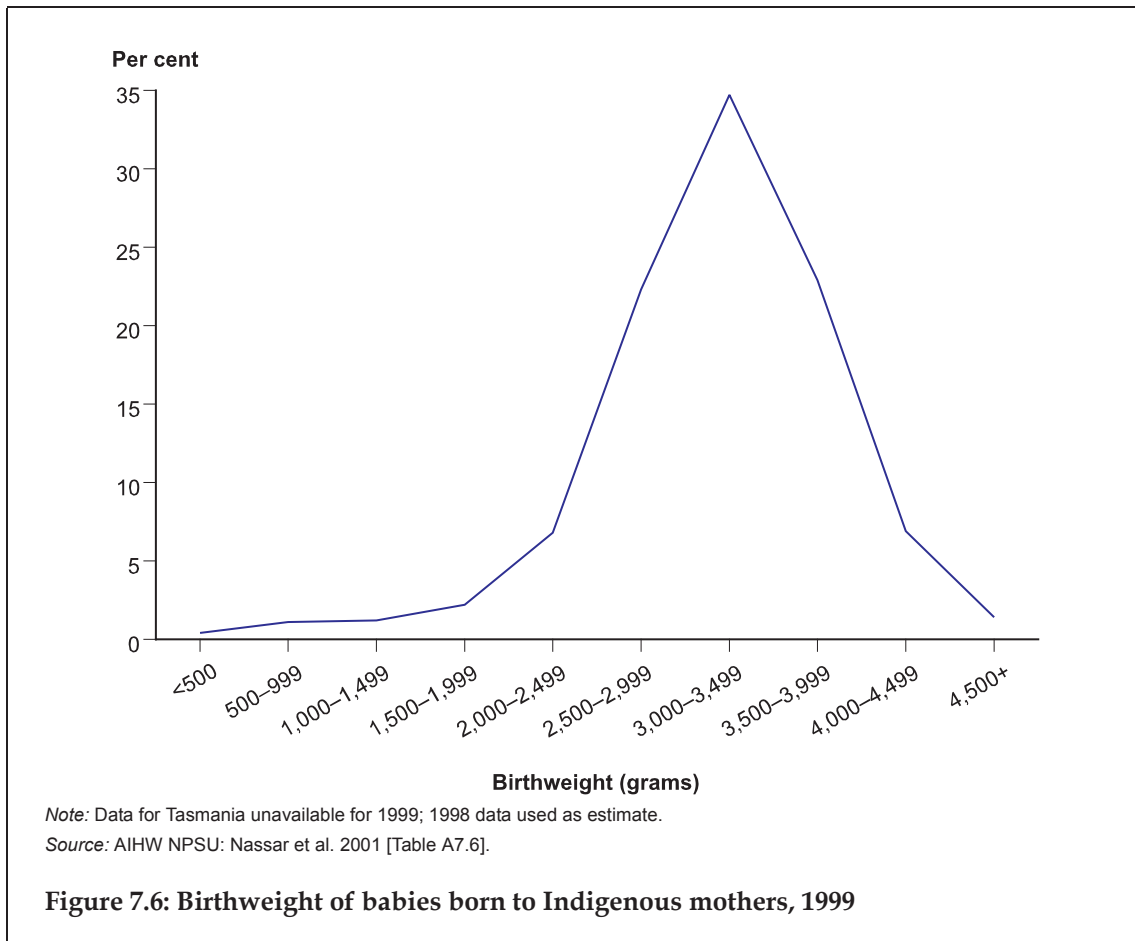
In 1999, the mean birthweight of live births in Australia was 3,373 grams. The mean birthweight was slightly lower (3,360 g) when all births (live births and stillbirths) were included (AIHW NPSU: Nassar et al. 2001). The distribution of babies' birthweight in 1999 is shown in Figure 7.5.



- In 1999, approximately 7% of all babies (17,208 births) were born weighing less than 2,500 grams (including very and extremely low birthweight babies). Of all births, 2% were of babies of very low birthweight (<1,500 g) and 1% of extremely low birthweight (<1,000 g).
- The majority of births (93%) were of babies weighing 2,500 grams or more. Of all births, 170,316 babies or 66% weighed between 3,000 and 3,999 grams.

Birthweight of babies born to Indigenous mothers

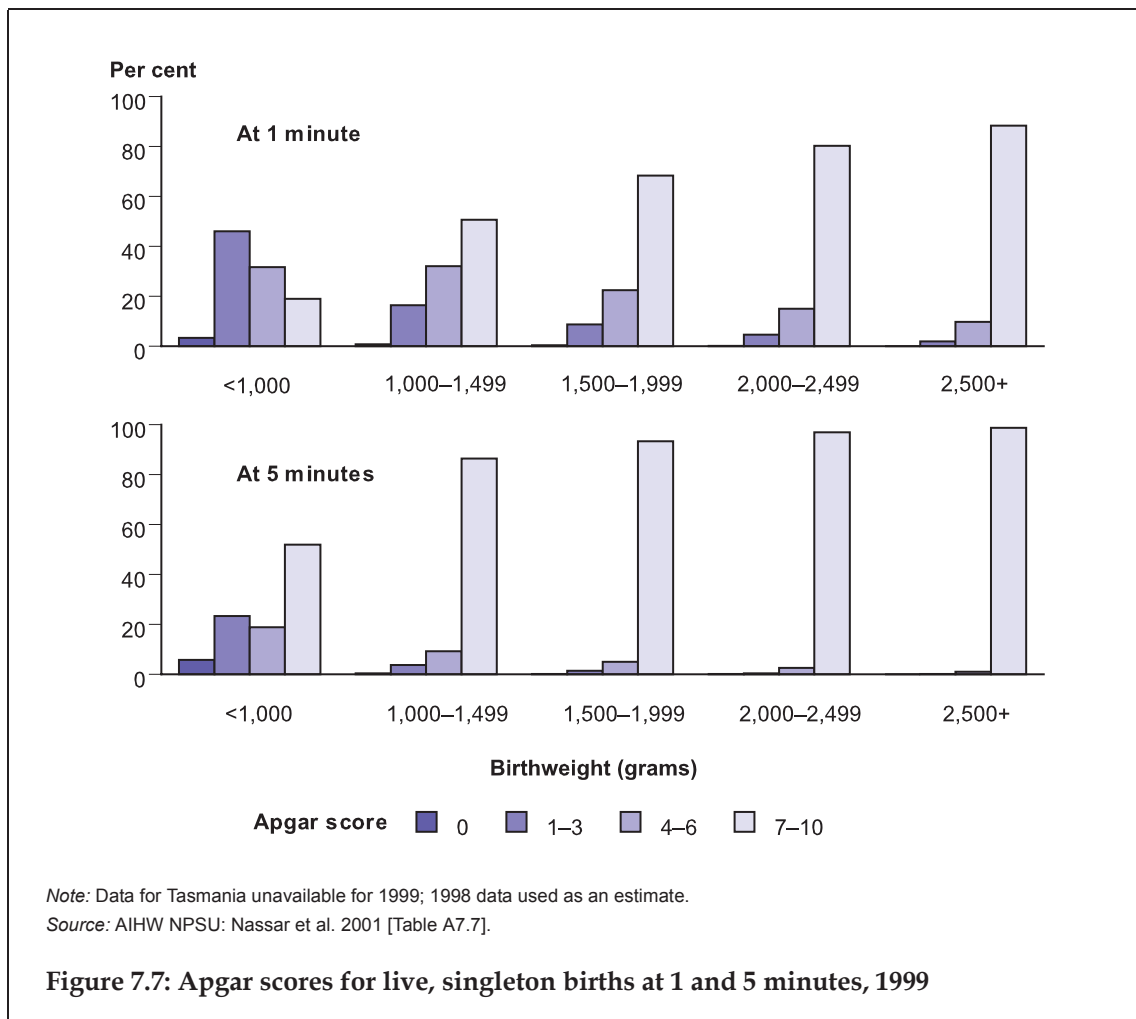
In 1999, 8,930 babies were born to Indigenous mothers. The mean birthweight of all babies of Indigenous mothers in 1999 was 3,149 grams. This was 211 grams less than the Australian average of 3,360 grams in 1999.



- The majority of babies born to Indigenous mothers in 1999 (79%) were born weighing between 2,500 and 3,999 grams.
- A relatively high proportion (1,154 or 13%) weighed less than 2,500 grams at birth—almost double the proportion of low birthweight babies nationally.
- The remaining 8% weighed over 4,000 grams.

Apgar score

The Apgar score is a numerical score that is calculated in the first and fifth minute after birth. The score represents the sum of five two-point measures and is used as an assessment tool to test a baby’s condition. In general, the higher the score, the better the condition of the baby. The five characteristics that make up the Apgar score are heart rate, breathing, colour, muscle tone and reflex irritability. Apgar scores are generally higher for babies 5 minutes after birth than 1 minute after birth. Apgar scores of singleton, live babies born in 1999 are presented in Figure 7.7.



- After 1 minute, almost half (49%) of babies who had an extremely low birthweight (less than 1,000 g) had a low Apgar score (between 0 and 3), compared with only 2% of babies weighing 2,500 grams or more.
- After 5 minutes, scores tended to improve, with almost all babies weighing 2,500 grams or more scoring 7-10 (99%). Just over half (52%) of extremely low birthweight babies scored between 7 and 10 on the Apgar scale after 5 minutes.

Conditions originating in the perinatal period

Hospitalisations

A large proportion (35%) of all infant hospitalisations is for conditions originating in the perinatal period. The indicator for hospitalisations for perinatal conditions is the number of hospitalisations of infants for conditions originating in the perinatal period