Australian Government
Australian Institute of Health and Welfare

Australia's mothers and babies 2013

in brief

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The Australian Institute of Health and Welfare is a major national agency which provides reliable, regular and relevant information and statistics on Australia's health and welfare. The Institute's mission is *authoritative information and statistics to promote better health and wellbeing*.

ISBN 978-1-74249-874-4 (PDF)

ISBN 978-1-74249-875-1 (Print)

ISSN 2205-5134 (PDF)

ISSN 1321-8336 (Print)

Suggested citation

Australian Institute of Health and Welfare 2015. Australia's mothers and babies 2013—in brief. Perinatal statistics series no. 31. Cat no. PER 72. Canberra: AIHW.

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Published by the Australian Institute of Health and Welfare.

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Contents

AIHW information on mothers and babies

Australia's mothers and babies 2013—in brief presents an overview of some of the key statistics and concepts from the National Perinatal Data Collection and includes links to sources for further information.

Detailed data tables, including state and territory data, are available online from the AIHW website <www.aihw.gov.au/publication-detail/?id=60129553770>.

The AIHW online perinatal data portal complements this report and is available at <www.aihw.gov.au/perinatal-data/>.

The National Core Maternity Indicators data portal also provides further detail on a set of key indicators endorsed by Australian Government and state and territory health departments and is available at <www.aihw.gov.au/ncmi/>.

The National Perinatal Data Collection

The National Perinatal Data Collection (NPDC) commenced in 1991 and is a collaborative effort by the AIHW and the states and territories.

Perinatal data are collected for each birth in each state and territory, most commonly by midwives. The data are collated by the relevant state or territory health department and a standard de-identified extract is provided to the AIHW on an annual basis to form the NPDC.

What is included in the NPDC?

The NPDC includes data elements that are mandatory for national reporting (29 data elements in 2013 that form the Perinatal National Minimum Data Set) as well as additional voluntary data items.

Which births are counted?

The NPDC includes both live and still births where gestational age is at least 20 weeks or birthweight is at least 400 grams, except in Western Australia, where births are included if gestational age is at least 20 weeks, or if gestation is unknown, birthweight is at least 400 grams.

See Section 5 for more information about the NPDC.

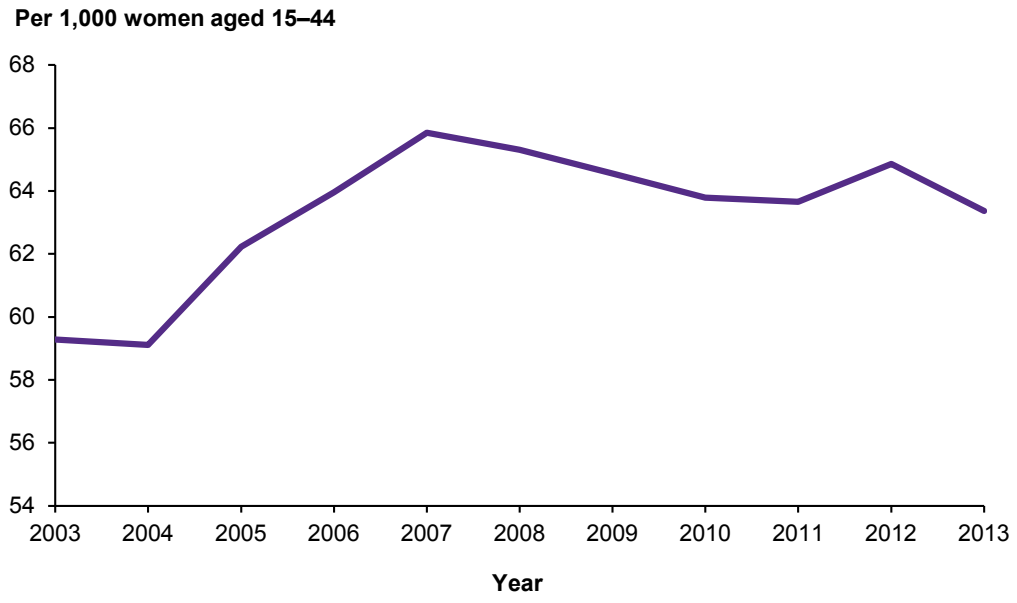
1 At a glance

Mothers at a glance

More women are giving birth than a decade ago

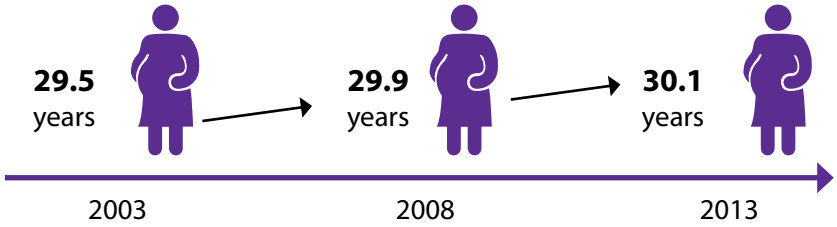
- 304,777 women gave birth in Australia in 2013—20% more than in 2003 (252,584 women).
- The rate of women giving birth increased from 59 per 1,000 women of reproductive age (15–44 years) in 2003 to 63 per 1,000 in 2013.
- Slightly fewer women gave birth in 2013 than in 2012 (307,474).

The rate of women of reproductive age giving birth, 2003 to 2013



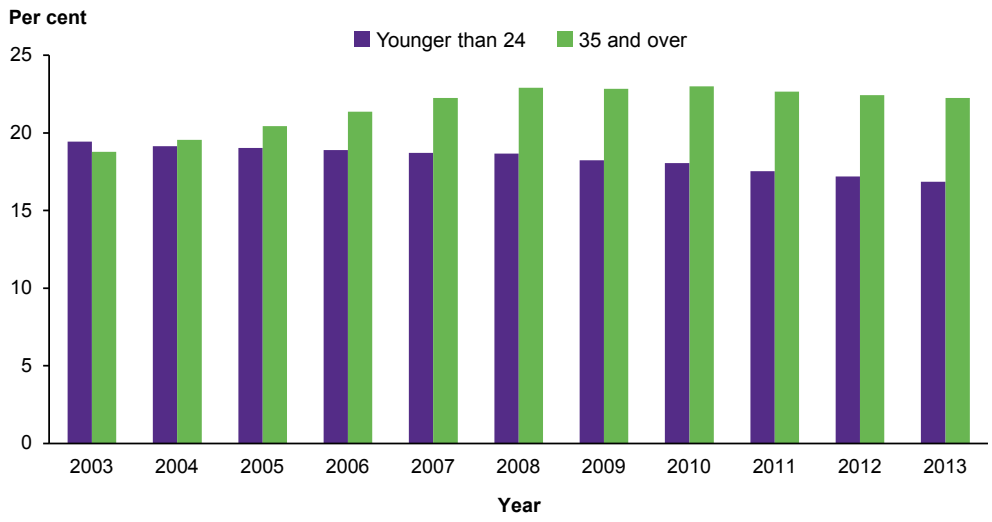
Women are giving birth later in life

- The average age of all women who gave birth was 30.1 years in 2013, compared with 29.5 in 2003.
- The average age has also increased for Aboriginal and Torres Strait Islander mothers, from 24.7 in 2003 to 25.3 in 2013.
- The proportion of mothers aged 35 and over has increased from 19% in 2003 to 22% in 2013, while the proportion of mothers aged less than 24 has decreased from 19% to 17%.
- The average age of first time mothers also increased, from 27.8 years in 2003 to 28.6 in 2013.



Average age of all mothers, 2003 to 2013

Trend in births to younger and older mothers in Australia, 2003–2013



Most mothers live in *Major cities* and were born in Australia

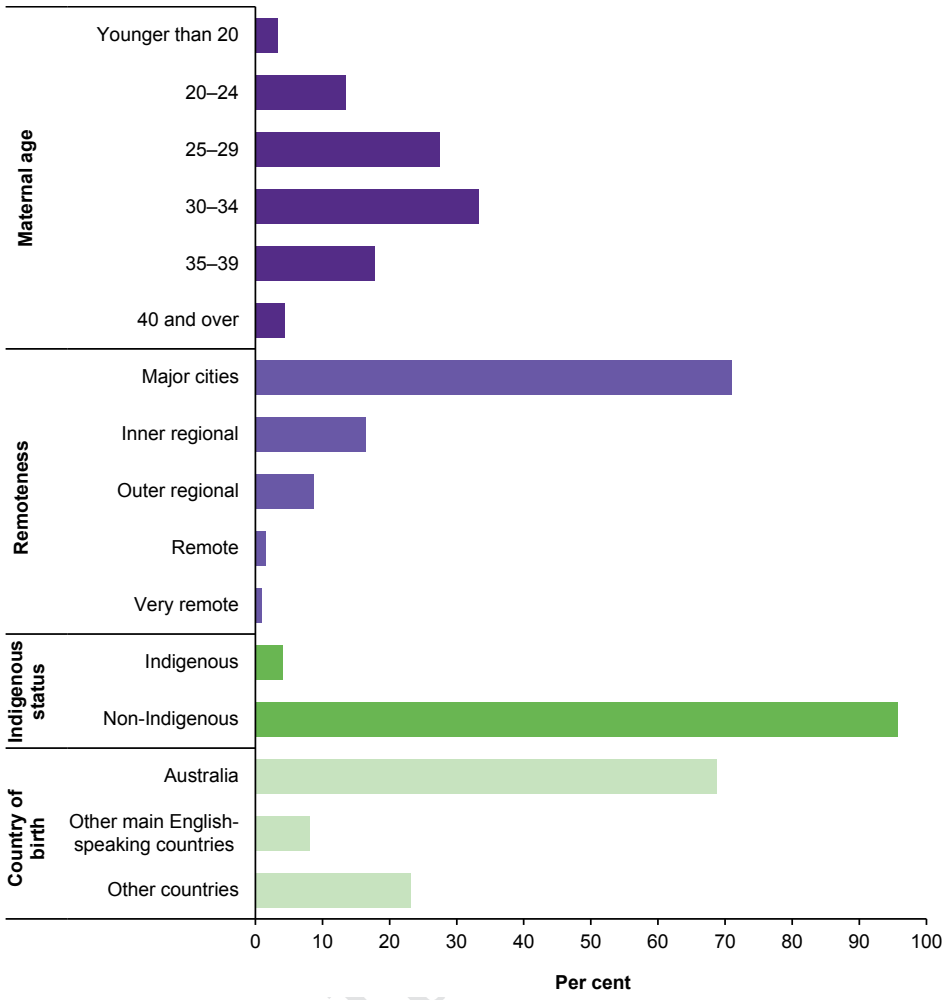
Most mothers lived in *Major cities* (71%) and most were born in Australia (69%)—similar to the proportions of all women of reproductive age in the population.

1 in 25 mothers are Aboriginal and/or Torres Strait Islander

Around 4.1% of all women who gave birth in 2013 were Indigenous, slightly higher than the proportion of Indigenous women of reproductive age in the population (3.3%).

Indigenous mothers were on average younger than non-Indigenous mothers (25.3 years compared with 30.3).

Characteristics of women giving birth in 2013



Find out more in the *Perinatal data portal: Overview and demographics*

Babies at a glance

More babies are being born

- There were 309,489 babies born in 2013—an increase of 20% from 256,925 in 2003.
- 307,277 were live births and 2,191 were stillbirths (less than 1%).
- The stillbirth rate of 7 deaths per 1,000 births has not changed substantially since 2003.

Baby boys slightly outnumber baby girls

Slightly more babies were male (51%) than female (49%). The sex ratio, defined as the number of male live born babies per 100 female live born babies, was 106.0.

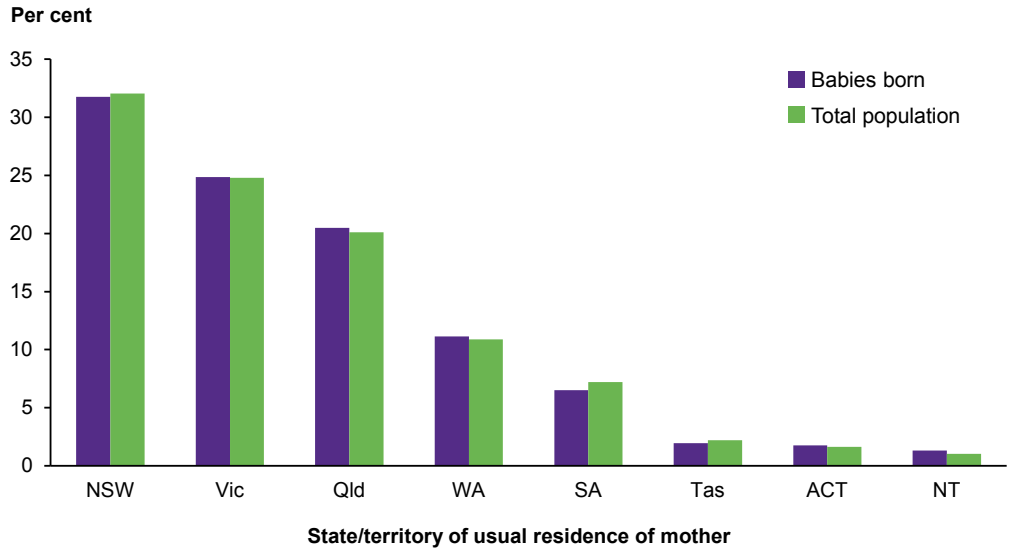
1 in 20 babies are Aboriginal and/or Torres Strait Islander

Around 1 in 20 babies (5.2% or 16,149) were Indigenous in 2013 (based on Indigenous status of the baby).

3 in 4 babies are born to mothers living in New South Wales, Victoria or Queensland

The proportion of babies born in each state and territory closely reflects the distribution of the total population in 2013 (based on the mother's state/territory of usual residence).

Babies by state/territory of usual residence of mother, 2013



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2 Mothers

Antenatal care

Almost all women attend antenatal care, but only two-thirds attend in the first trimester

Antenatal care is associated with positive maternal and child health outcomes—the likelihood of receiving effective health interventions is increased through attending antenatal visits. The World Health Organization recommends receiving antenatal care at least 4 times during pregnancy. The Australian Antenatal Guidelines (AHMAC 2012) recommend that the first antenatal visit occur within the first 10 weeks of pregnancy and that first-time mothers with an uncomplicated pregnancy attend 10 visits (7 visits for subsequent uncomplicated pregnancies).

Almost all women (99.8%) who gave birth in 2013 had at least 1 antenatal visit (excludes data from Victoria). The proportion of women decreased as the number of visits increased:

- 95% had 5 or more visits
- 87% had 7 or more visits
- 58% had 10 or more visits.

When very pre-term births (less than 32 weeks gestation) are excluded, the proportions are only slightly higher.

Regular antenatal care in the first trimester (before 14 weeks gestational age) is associated with better maternal health in pregnancy, fewer interventions in late pregnancy and positive child health outcomes. Nationally, in 2013:

- 43% of women attended at least 1 antenatal visit in the first 10 weeks of pregnancy
- 62% of women attended in the first trimester (less than 14 weeks)
- Around 1 in 8 women (13%) did not begin antenatal care until after 20 weeks gestation.

Time to first antenatal visit, by gestational age, 2013

Trend information on antenatal care is limited due to the relatively recent standardised collection of data:

- There has been little change in the proportion of women who attended 5 or more antenatal visits, from 95.0% in 2011 to 95.5% in 2013 (based on women who gave birth at 32 weeks gestation or more from New South Wales, Queensland, South Australia, Tasmania, the Australian Capital Territory and the Northern Territory).
- The proportion of mothers who had antenatal care in the first trimester of pregnancy decreased, from 69% in 2010 to 62% in 2013 (based on data from all states and territories).

Find out more in the *Perinatal data portal: Antenatal period*

Antenatal visits in the first trimester vary by socioeconomic status and Indigenous status

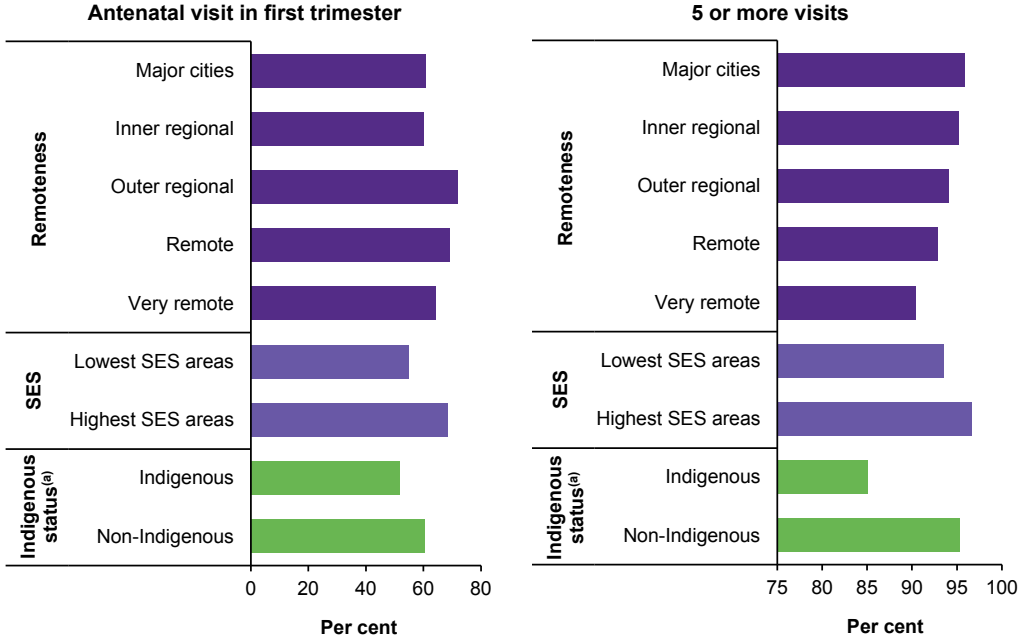
Women living in the lowest socioeconomic status (SES) areas began antenatal care later in pregnancy—just over half (55%) of women living in the lowest SES areas attended antenatal care in the first trimester compared with 68% in the highest SES areas.

The proportion of women attending 5 or more antenatal visits varied only slightly by remoteness and socioeconomic disadvantage (data exclude Victoria and very pre-term births):

- 96% of women living in *Major cities* compared with 90% in *Very remote* areas
- 97% of women living in the highest socioeconomic status (SES) areas compared with 94% in the lowest SES areas.

Indigenous women were less likely to attend either an antenatal visit in the first trimester (52% compared with 60% of non-Indigenous women) or to attend 5 or more visits (85% compared with 95% of non-Indigenous women) (age-standardised). See Section 4 for more information on Indigenous mothers.

Antenatal visits in the first trimester and 5 or more antenatal visits, by selected maternal characteristics, 2013

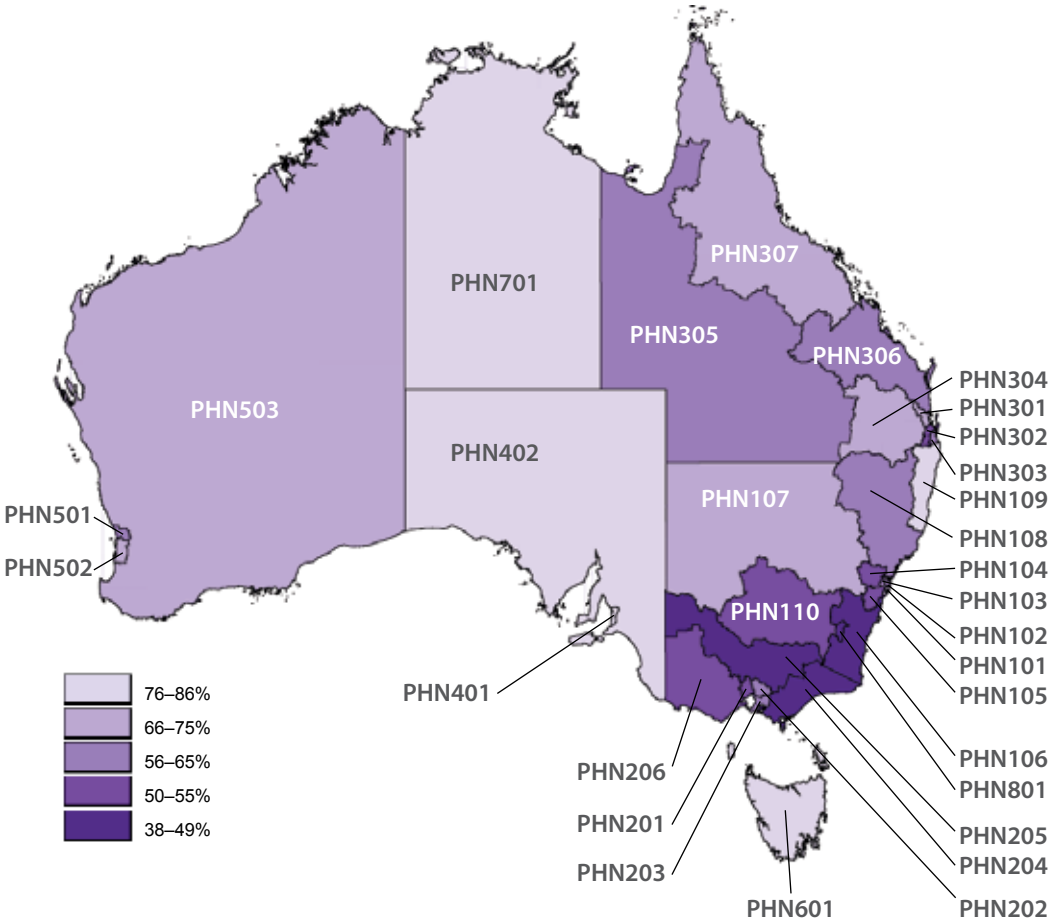


(a) Age-standardised percentages.
Note: Data on 5 or more antenatal visits exclude Victoria and very pre-term births (less than 32 weeks).

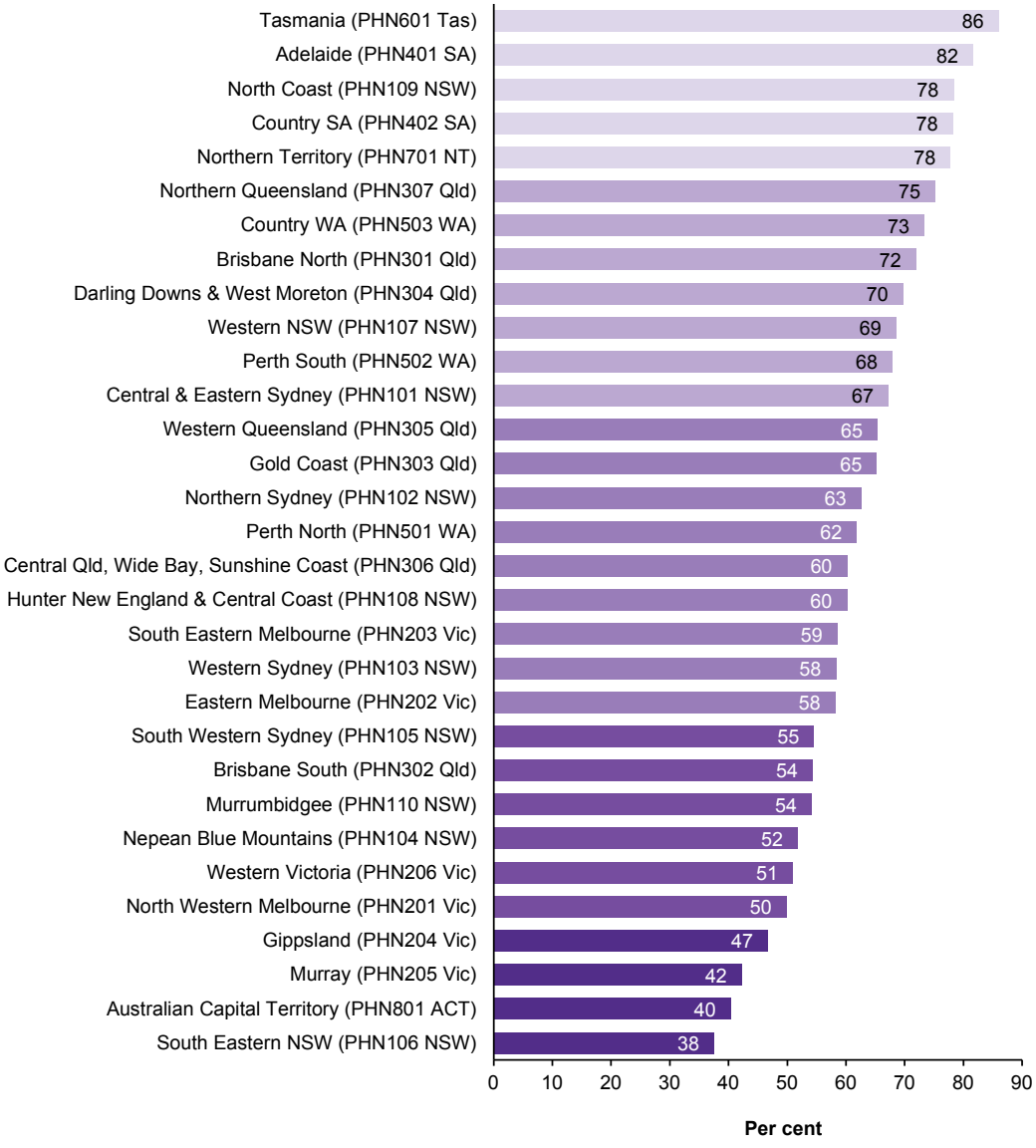
Attendance at antenatal care varies depending on where mothers live

In 2013, the proportion of mothers attending an antenatal visit in the first trimester of pregnancy (less than 14 completed weeks' gestation) varied across the 31 Primary Health Networks (PHNs) in Australia. The proportions ranged from 38% in the South Eastern New South Wales PHN to 86% in Tasmania, with a median of 62%.

Percentage of mothers attending an antenatal visit in the first trimester (less than 14 weeks), by Primary Health Network of usual residence, 2013



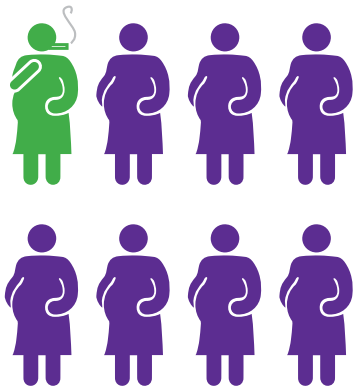
Percentage of mothers attending an antenatal visit in the first trimester (less than 14 weeks), by Primary Health Network of usual residence, 2013



Smoking during pregnancy

Fewer women are smoking during pregnancy

Tobacco smoking during pregnancy is the most common preventable risk factor for pregnancy complications, and is associated with poorer perinatal outcomes including low birthweight, being small for gestational age, pre-term birth and perinatal death.



One in 8 women (34,966 or 12%) who gave birth in 2013 smoked at some time during their pregnancy, a decrease from 15% in 2009.

Rates of smoking were slightly higher in the first 20 weeks of pregnancy (11%) compared with after 20 weeks of pregnancy (9%).

On average, women who smoked during pregnancy:

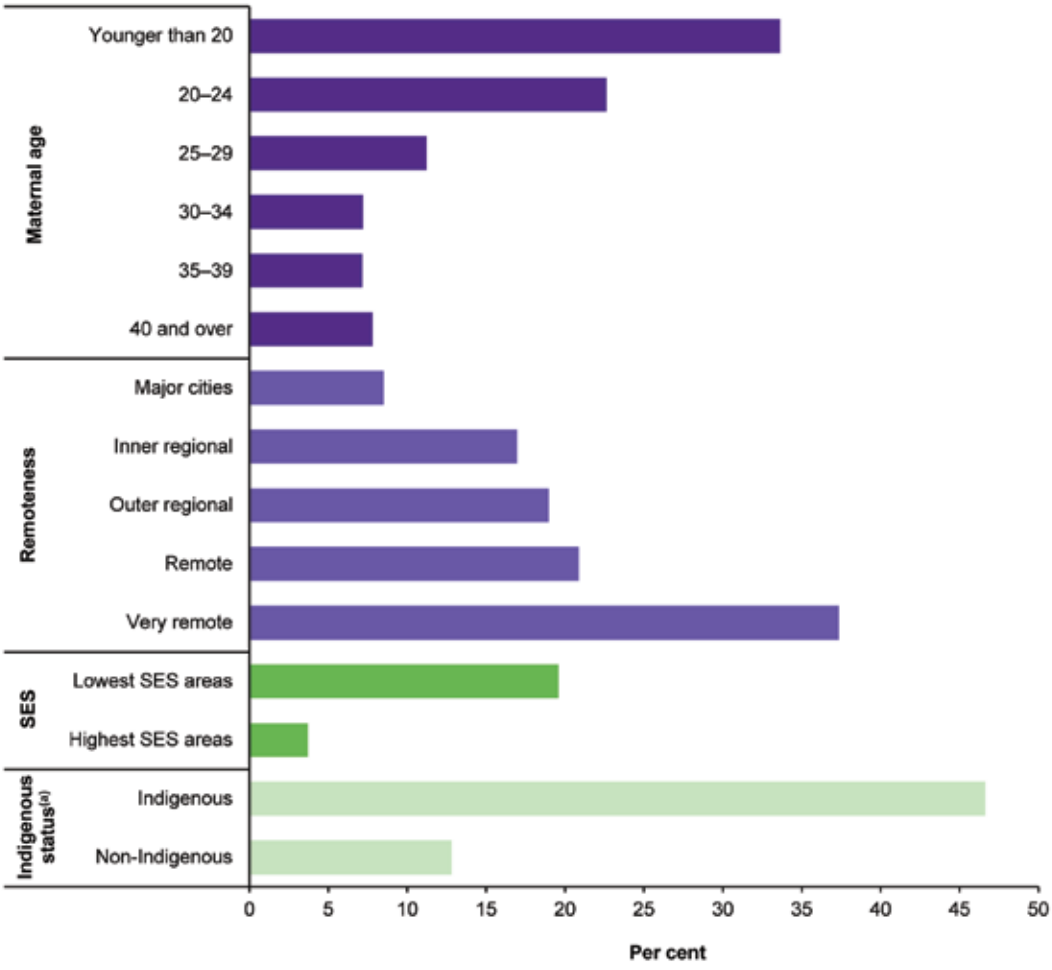
- attended their first antenatal visit later in pregnancy (15 weeks) than those who did not smoke (13 weeks)
- had one less antenatal care visit (9 visits) than women who did not smoke (10 visits).

These patterns were present even when considering differences due to socioeconomic status.

Some mothers were more likely than others to smoke in the first 20 weeks of pregnancy. Proportions were highest among the following women, noting that some may fall in more than one of these categories:

- younger mothers—more than one-third (34%) of mothers under 20 smoked in the first 20 weeks of pregnancy, a rate which falls to 7% for mothers aged 35–39 but increases slightly to 8% for mothers 40 and over
- mothers living in *Remote* and *Very remote* areas—around one-third (37%) of mothers in *Very remote* and one-fifth (21%) in *Remote* areas smoked, compared with 9% of women living in *Major cities*
- mothers living in the lowest socioeconomic status (SES) areas—one-fifth (20%) of mothers living in the lowest SES areas smoked, compared with 4% of mothers in the highest SES areas
- Indigenous mothers—almost half (47%) of Indigenous mothers smoked, compared with 13% of non-Indigenous mothers (age-standardised percentages).

Smoking in the first 20 weeks of pregnancy by selected maternal characteristics, 2013



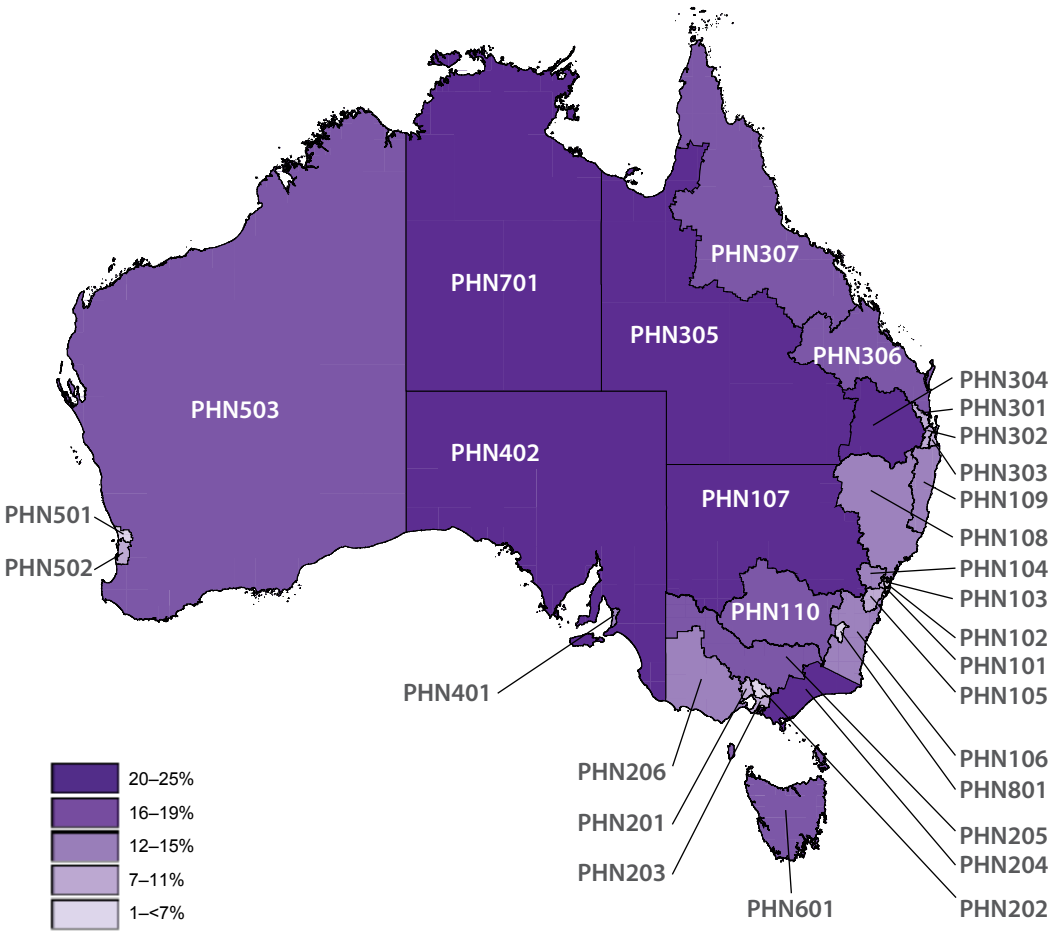
(a) Age-standardised percentages.

Find out more in the *Perinatal data portal: Antenatal period*

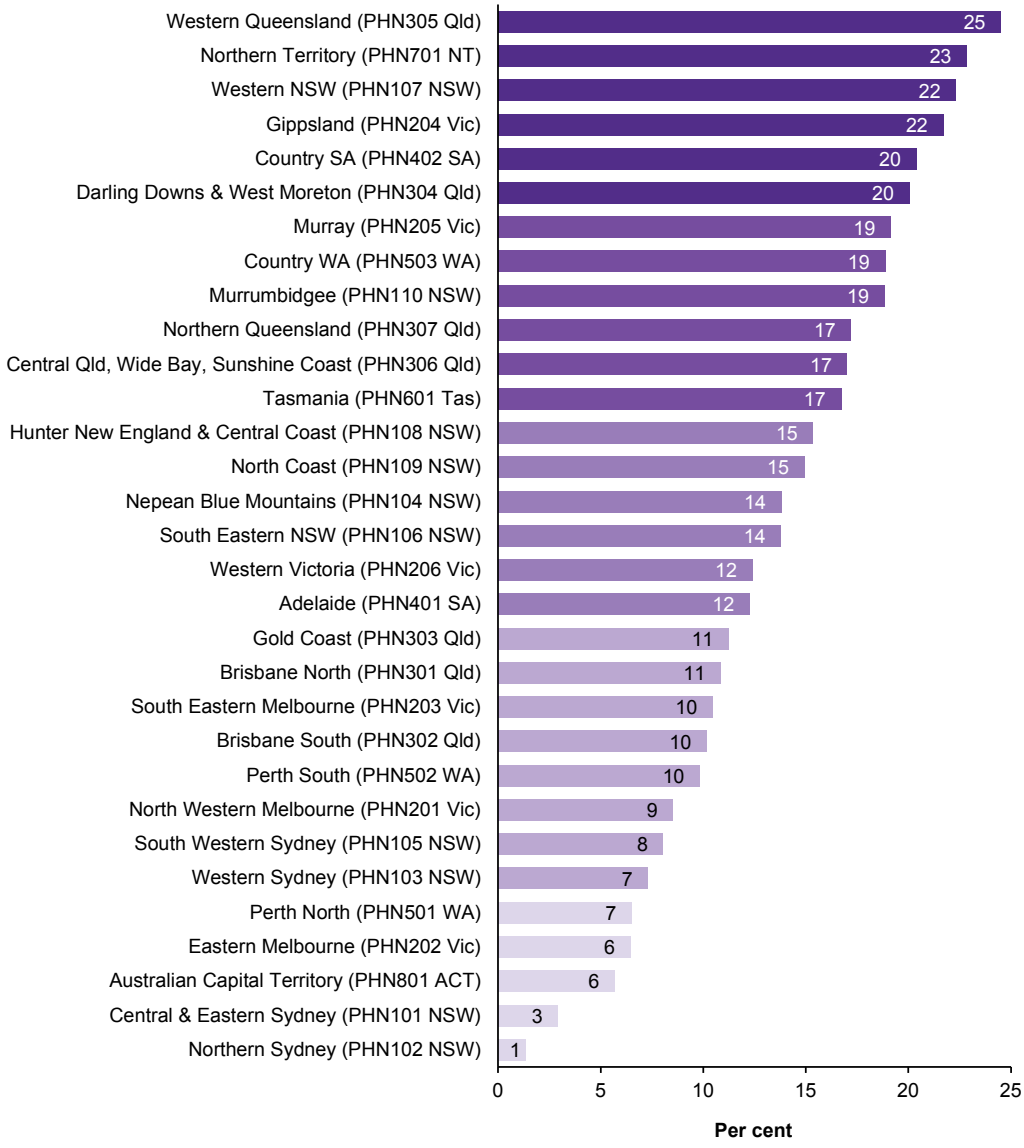
Rates of smoking during pregnancy vary across Primary Health Networks

In 2013, the proportion of women who smoked in the first 20 weeks of pregnancy varied across the 31 Primary Health Networks (PHNs) in Australia. The proportions ranged from 1.3% in the Northern Sydney PHN to 25% in Western Queensland, with a median of 14%.

Percentage of mothers smoking during the first 20 weeks of pregnancy, by Primary Health Network of usual residence, 2013



Percentage of mothers smoking during the first 20 weeks of pregnancy, by Primary Health Network of usual residence, 2013



1 in 5 smokers quit in pregnancy

Women who stop smoking during pregnancy can reduce the risk of adverse outcomes for themselves and their babies, and support for smoking cessation is widely available through antenatal clinics.

Of women who gave birth in 2013, around one-fifth (22%) of those who reported smoking during the first 20 weeks of pregnancy did not continue to smoke after 20 weeks of pregnancy.

On average, mothers who ceased smoking during pregnancy had attended their first antenatal visit earlier in their pregnancy (by 13.8 weeks) and attended more antenatal visits (9.6 visits), compared with mothers who reported smoking both before and after 20 weeks of pregnancy (15.4 weeks and 8.6 visits) (data on the number of antenatal visits excludes Victoria). These patterns were present even when considering differences due to socioeconomic status.

Some women may continue to smoke before knowing they are pregnant, and cease once they find out they are pregnant. According to data from the 2013 National Drug Strategy Household Survey, around 1 in 6 (17%) women smoked before they knew they were pregnant, and 1 in 10 (11%) continued smoking after they found out they were pregnant (AIHW 2014).

Maternal health

1 in 5 mothers are classified as obese

Some mothers may be at an increased risk of complications as a result of their health status at the start of pregnancy.

Obesity in pregnancy contributes to increased morbidity and mortality for both mother and baby. Pregnant women who are obese have an increased risk of thromboembolism, gestational diabetes, pre-eclampsia, post-partum haemorrhage, wound infections and caesarean section, and their babies have higher rates of congenital anomaly, stillbirth and neonatal death compared with pregnant women who are not obese (CMACE & RCOG 2010).

Body mass index (BMI) is a ratio of weight and height (kg/m^2). A normal range of BMI for non-pregnant women is 18.5 to 24.9. While increases in BMI are expected in pregnancy, a BMI of 30 or more at the first antenatal visit has been defined as obesity in pregnancy.

Data on maternal BMI was available for mothers in Victoria, Queensland, Western Australia, South Australia, Tasmania and the Australian Capital Territory in 2013. However, data collection methods vary considerably between jurisdictions. These data cover around two-thirds of women who gave birth in 2013.

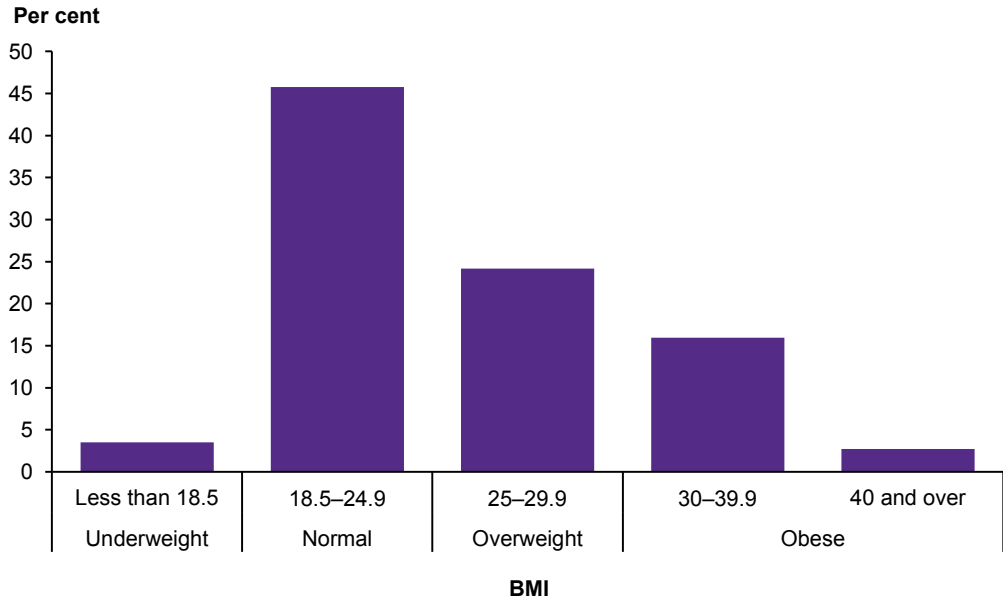
Among women who gave birth in these jurisdictions:

- one-fifth (19%) were classified as obese (with a BMI of 30 or more)
- one-quarter (24%) were overweight (BMI of 25–29)
- almost half (46%) were in the normal weight range (BMI of 18.5–24.9)
- 3% were underweight.

1 in 5 mothers are obese

A small number of mothers had pre-existing hypertension or pre-existing diabetes in 2013. This equates to a rate of 8 per 1,000 mothers with pre-existing hypertension and 10 per 1,000 with diabetes (excluding gestational diabetes) (note that data collection methods vary across jurisdictions and data exclude Western Australia and Victoria).

Women who gave birth, by body mass index, selected states and territories, 2013



Note: BMI data were available for Victoria, Queensland, Western Australia, South Australia, Tasmania and the Australian Capital Territory. BMI source data and methods used for collection in states and territories are not uniform.

Find out more in the *Perinatal data portal: Antenatal period*

Place of birth

Hospitals are the most common place of birth

Almost all births in Australia occur in hospitals, in conventional labour-ward settings. In 2013, 97% (296,611) of women gave birth in hospitals, while much smaller proportions gave birth in birth centres (2.0% or 6,085), at home (0.3% or 958) or in other settings including births occurring before arrival at hospital (0.3% or 984 women).

Of mothers who gave birth in hospital in 2013, most (72%) gave birth in public hospitals, with 28% giving birth in private hospitals. Two-thirds (67%) of women gave birth within 1 day of admission to hospital and 97% within 2 days of admission. The median length of stay after birth was 3.0 days.

There has been a trend toward shorter postnatal stays—in 2013, 20% of mothers were discharged less than 2 days after giving birth and 65% between 2 and 4 days, compared with 11% and 61% in 2003.

Regardless of place of birth, almost all babies were live born (more than 99%). The average birthweight of live born babies in hospital (3,350 grams) was lower than for those born in birth centres (3,540 grams) and at home (3,641 grams). The average gestational age was also slightly lower for babies born in hospital (38.7 weeks) compared with those born in birth centres (39.5) or at home (39.7). This may be due to the fact that babies who are expected to require a higher level of care are more likely to be delivered in hospital than in other settings, and are more likely to be of lower birthweight and pre-term.

Women giving birth at home are older and less likely to be first-time mothers

Women who gave birth in hospitals and birth centres were younger and more likely to be first-time mothers than those who gave birth at home:

- The average age of mothers who gave birth in birth centres was 29.9 years, with older average ages for mothers who gave birth in hospitals (30.1) or at home (32.0).
- Nearly half of mothers who gave birth in birth centres (45%) and in hospitals (44%) were aged under 30, compared with only 31% of mothers who gave birth at home.
- One-quarter (25%) of mothers who gave birth at home were first-time mothers, compared with higher proportions of mothers who gave birth in hospitals and birth centres (44% and 35%, respectively).

Of those who gave birth in hospitals, 21% came from the lowest socioeconomic status areas. By comparison, women in these areas made up 16% of those who gave birth in birth centres and 12% of those who gave birth at home.

Find out more in the *Perinatal data portal: Labour and birth*

Onset of labour

Spontaneous onset of labour decreases with maternal age

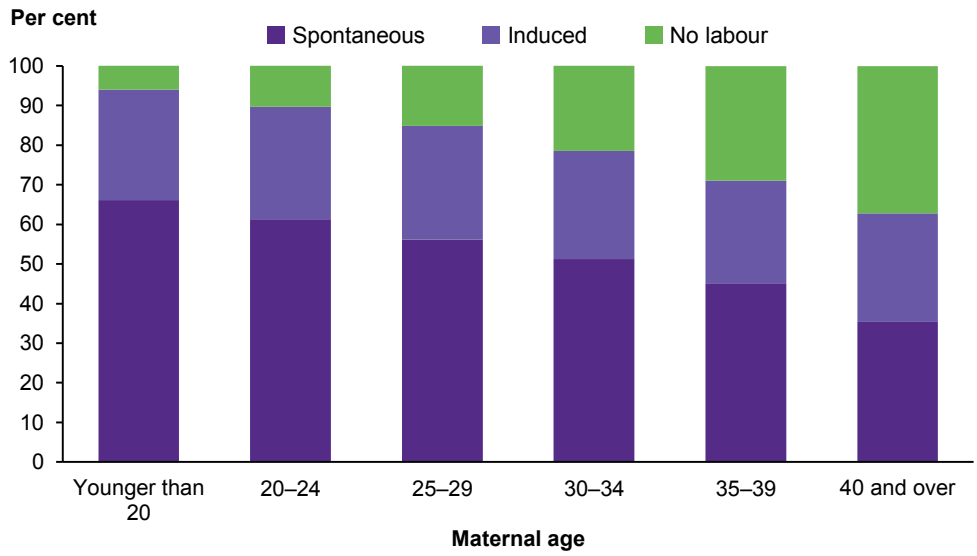
Onset of labour is categorised as spontaneous or induced, or as no labour (where a caesarean section was performed before labour started).

Overall, just over half of women who gave birth in 2013 (53% or 160,526) had a spontaneous labour, more than one-quarter an induced labour (28% or 84,109) and 1 in 5 had no labour onset (20% or 60,080).

However, labour onset varied considerably by maternal age. Younger mothers were the most likely to have spontaneous labour onset (66%) and the least likely to have no labour onset (6%). Conversely, mothers aged 40 and over were slightly less likely to have spontaneous labour onset than to have no labour onset (35% and 37%). There was little difference in the proportion of women with induced labour between the age groups (ranging between 26% and 29%).

There have been small changes over the decade to 2013 in the type of labour onset—a slight decrease in spontaneous labour (from 57% to 53%) and a corresponding increase in those with no labour onset (from 17% to 20%). Induction of labour has remained steady at around 26% of mothers.

Women who gave birth, by onset of labour and maternal age, 2013



Induction type and reason

For women who were induced, combined medical and surgical induction of labour was the most common type of induction (data excludes Western Australia).

Several jurisdictions (New South Wales, Queensland, South Australia, Tasmania and the Northern Territory) provided further information on the reason for induction of labour. Within these jurisdictions, prolonged pregnancy and premature rupture of membranes were the main reasons for induction (ranging between 16% and 24% and between 9% and 16%, respectively).

Augmentation of labour

Once labour starts, it may be necessary to intervene to speed up or augment the labour. Labour was augmented for 15% of all mothers in 2013, which was equivalent to 28% of mothers with spontaneous onset of labour (data excludes Western Australia).

Find out more in the *Perinatal data portal: Labour and birth*

Method of birth

Two-thirds of mothers had vaginal births, one-third had caesareans

In 2013, 204,860 women (67%) had a vaginal birth and 99,862 (33%) had a caesarean section.

Most vaginal births (82%) were non-instrumental. When instrumental delivery was required, vacuum extraction was more commonly used than forceps (11% and 7% respectively).

The overall rate of primary caesarean section (that is, caesarean sections to women with no previous history of caesarean sections) was 23%; this rate was higher for first-time mothers (34%) and lower for mothers who had previously given birth (10%).

The vast majority (85%) of women who had a previous caesarean section had a repeat caesarean section, while the remainder had a vaginal birth (12% had a non-instrumental vaginal birth and almost 4% had an instrumental vaginal birth).

Having had a previous caesarean section was the most common main reason for having a caesarean (based on data from Queensland, South Australia, Tasmania and the Northern Territory).

Perineal status after vaginal birth

Around one-quarter of mothers had an intact perineum after vaginal birth (27%) while almost half had either a first degree laceration or vaginal graze (23%) or a second degree laceration (26%). A small proportion of women had a third or fourth degree laceration (2%). Around 1 in 5 women had an episiotomy performed, some of whom also had a laceration.

Caesarean sections are more common among older mothers

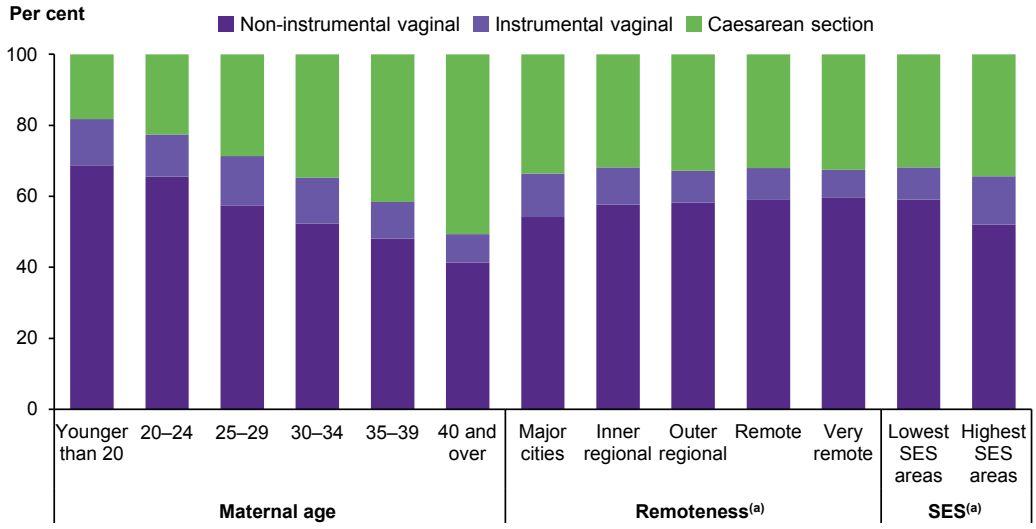
The likelihood of vaginal delivery (both non-instrumental and instrumental) and caesarean section differs by maternal age. Small differences were also evident by remoteness and socioeconomic status (SES) after accounting for differences in age structure across these areas.

Non-instrumental vaginal delivery decreased with age and increased slightly with each category of remoteness:

- Non-instrumental vaginal delivery progressively decreased with maternal age (from 69% for teenage mothers to 41% for mothers over 40).
- Fewer mothers living in *Major cities* had a non-instrumental vaginal delivery (54%) compared with mothers in *Very remote* areas (60%).
- Mothers living in the highest SES areas were less likely to have a non-instrumental vaginal delivery (52%) than those in the lowest SES areas (59%).

Instrumental vaginal delivery decreased with age (from 13% for teenage mothers to 8% for mothers over 40) and with increasing remoteness (from 12% in *Major cities* to 8% in *Very remote* areas). Instrumental vaginal delivery was more common among mothers living in the highest SES areas (14%) compared with the lowest SES areas (9%).

Women who gave birth, by method of birth and selected maternal characteristics, 2013



(a) Age-standardised percentages.

Caesarean sections increased with age, but differed little by remoteness and SES:

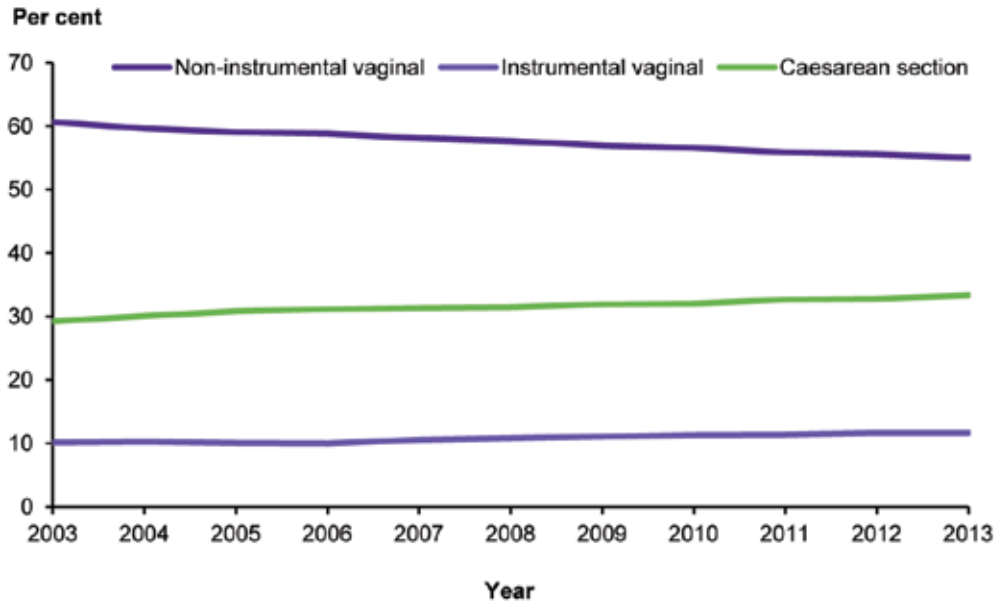
- Mothers older than 40 were around 3 times as likely to deliver by caesarean section compared with teenage mothers (51% and 18%).
- Remoteness of usual residence made little difference to the proportion of mothers giving birth by caesarean section (34% of those in *Major cities* compared with 33% of those in *Very remote* areas). SES also made little difference (34% of women living in the highest SES areas and 32% in the lowest SES areas).

Caesarean sections have increased over time

Since 2003, vaginal non-instrumental delivery has fallen 6 percentage points (decreasing from 61% in 2003 to 55% in 2013) whereas the caesarean section rate has increased by 5 percentage points (from 28% in 2003 to 33% in 2013). Vaginal delivery with instruments has remained relatively stable at around 12% throughout this period. These trends remain when changes in maternal age over time are taken into account.

Internationally, the caesarean section rate has been increasing in most Organisation for Economic Co-operation and Development (OECD) countries. The OECD average increased from a rate of 20 per 100 live births in 2000 to 28 per 100 in 2013. Australia's rate remained higher than the OECD average over this time and ranked 22nd out of 32 OECD countries in 2013 (when caesarean section rates are ranked from lowest to highest) (OECD 2015).

Women who gave birth, by method of birth, 2003 to 2013



Find out more in the *Perinatal data portal: Labour and birth*

Pain relief during labour and operative delivery

Almost 1 in 4 women did not use pain relief during labour

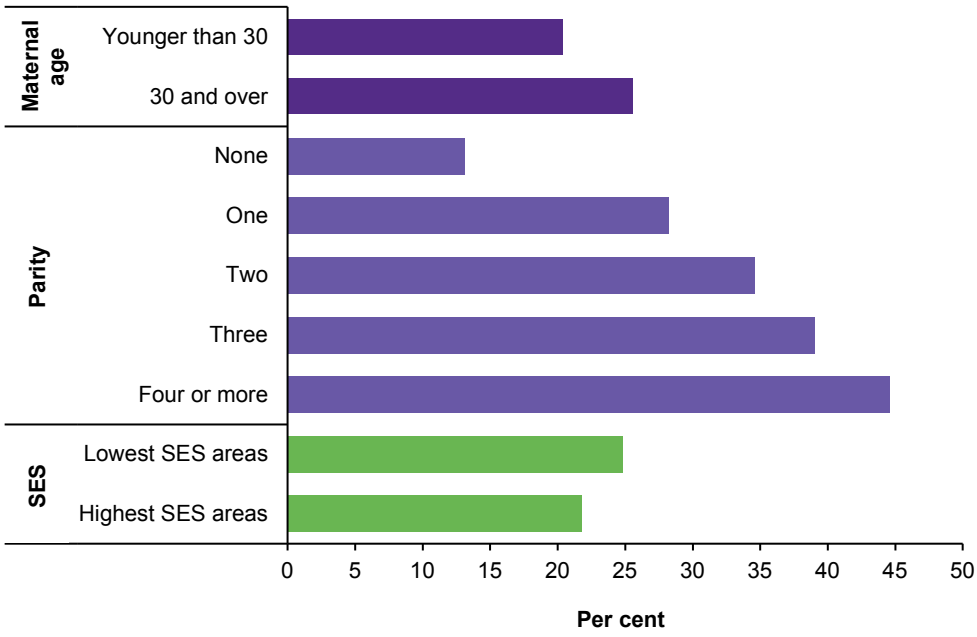
The types of analgesia or anaesthesia used during labour and delivery influence the effectiveness of pain relief, the extent to which a woman is able to actively participate in the birth and her mobility immediately after the birth. Analgesia is used to relieve pain during labour (spontaneous or induced), while anaesthesia is used for operative delivery (caesarean section or instrumental vaginal birth). More than 1 type of analgesic or anaesthetic may be administered to each woman.

Of the 244,635 women who had labour onset in 2013, around 3 in 4 received pain relief (77%). The most common types were nitrous oxide (inhaled) (54%), followed by regional analgesic (33%) and systemic opioids (20%).

Close to one-quarter (23%) of women who had labour onset did not receive any pain relief during labour. These women were more likely to be older, to have given birth before, and to live in the lowest socioeconomic status (SES) areas, compared with women who received pain relief.

3 in 4 women with labour onset received pain relief

Women who went into labour and did not receive pain relief, by selected maternal characteristics, 2013



All women who have a caesarean section receive a type of anaesthetic. In 2013, the vast majority (95%) of women who had a caesarean section had a regional anaesthetic and 6% had a general anaesthetic (note that some women may have had both).

Most women who had an instrumental vaginal delivery also received an anaesthetic (87%). Among these women, a regional anaesthetic was most common (61%), followed by a local anaesthetic to the perineum (28%).

Find out more in the *Perinatal data portal: Labour and birth*

Multiple pregnancies

Multiple pregnancies increase with maternal age and use of assisted reproductive technology

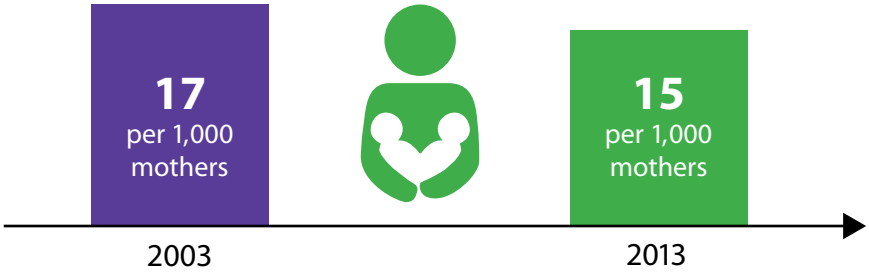
Over the decade to 2013, the number of multiple pregnancies increased slightly from 4,259 in 2003 to 4,629 in 2013; however, the rate decreased over this time from 17 per 1,000 mothers to 15 per 1,000 mothers.

In 2013, this represented 1.5% of all pregnancies. Almost all multiple pregnancies (98%) were twins, while a small proportion (2%) were other multiples (that is, triplets, quadruplets or higher).

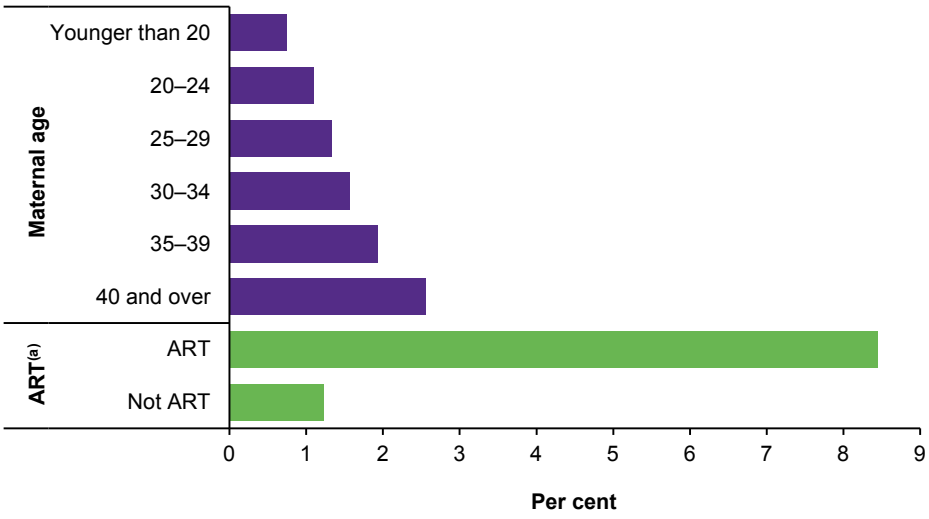
The proportion of multiple pregnancies increased with maternal age and use of assisted reproductive technology (ART):

- Less than 1% of mothers aged under 20 gave birth to multiples compared with 2.6% of mothers aged over 40. This is likely due to a higher use of ART among older mothers—the average age of women who received ART treatment was 34.3 years compared with 29.9 for women who did not.
- The proportion of multiple pregnancies among mothers who received ART was 7 times as high as for mothers who did not receive ART treatment (8.4% compared with 1.2%).

Data on whether pregnancy resulted from ART were available for Victoria, Queensland, Tasmania and the Australian Capital Territory, and 4.4% of women who gave birth in these jurisdictions in 2013 received ART. Detailed information on the use of ART in Australia is available from Macaldowie et al. (2014).



Women who gave birth to multiples, by selected characteristics, 2013



(a) Data available for Victoria, Queensland, Tasmania and the Australian Capital Territory.

3 Babies

Gestational age

Most babies are born at term and less than 1 in 10 are pre-term

Gestational age is the duration of pregnancy in completed weeks.

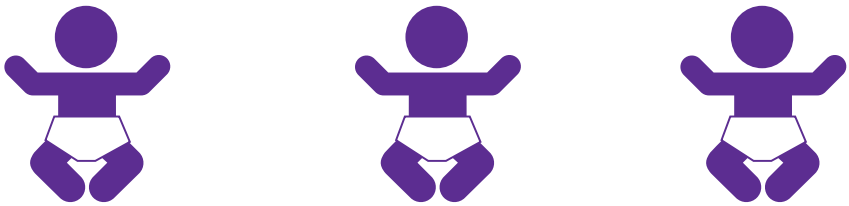
In 2013, the average gestational age for all babies was 38.7 weeks, with the vast majority (91%) born at term (37–41 weeks).

Average gestational age varied by birth status—38.7 weeks for live born babies, and considerably lower for stillborn babies (26.9 weeks).

Pre-term birth (before 37 completed weeks' gestation) is associated with a higher risk of adverse neonatal outcomes. Overall, 8.6% of babies were born pre-term in 2013, with most of these births occurring at gestational ages of between 32 and 36 completed weeks. The average gestational age for all pre-term births was 33.3 weeks.

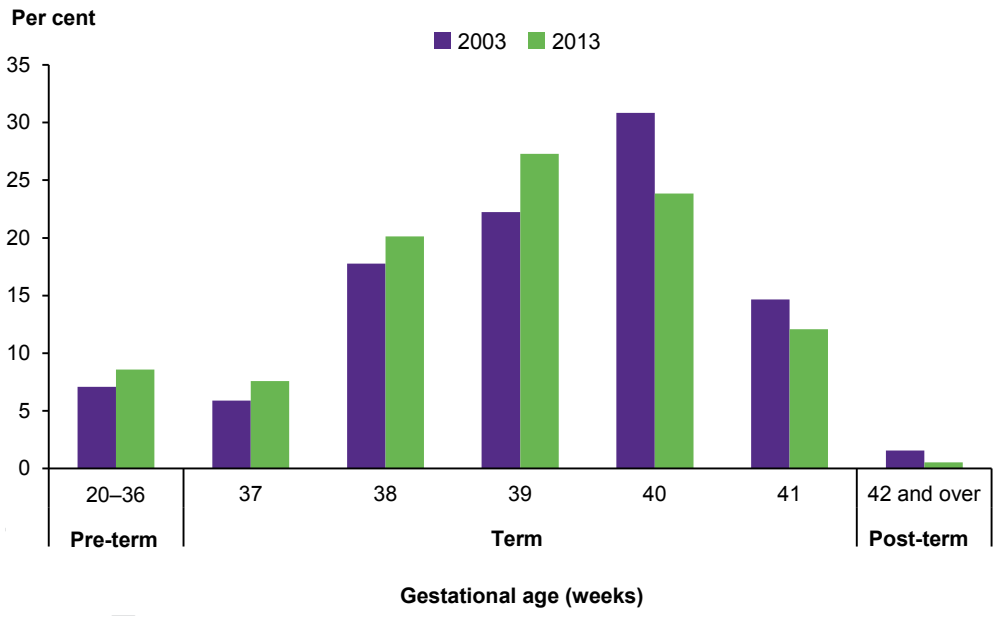
Most stillbirths were pre-term (84%) but only 8% of live births were pre-term. Conversely, the vast majority of live births (91% or 280,965) were born at term while only 15% of still births occurred at term. Less than 1% of all babies were born post-term (42 weeks and over).

Over the decade from 2003 to 2013, the proportion of babies born between 37 and 39 weeks increased, while the proportion born from 40 weeks onwards decreased.



Gestational age of babies

Babies, by gestational age, 2003 and 2013



Note: Pre-term births include a small number of births of less than 20 weeks gestation.

Pre-term births are more common to mothers who smoked

Mother's smoking status was associated with the baby's gestational age. Babies whose mothers smoked during pregnancy were 1.5 times as likely to be born pre-term (12%) as those whose mothers did not smoke during pregnancy (8%).

Other characteristics were also associated with increased likelihood of pre-term birth, noting that some babies may have more than one of these characteristics. These included:

- babies of Indigenous mothers—14% born pre-term compared with 8% of babies of non-Indigenous mothers
- babies born in multiple births—around 62% of twins and all (100%) of other multiples (triplets and higher) were pre-term, compared with 7% of singleton babies
- babies born to mothers usually residing in more remote areas—13% in *Very remote* areas compared with 8% in *Major cities*
- babies of younger (<20) and older (40 and over) mothers—10% and 12% were pre-term, compared with 8% of babies with mothers aged 20–39.

Birthweight

The vast majority of live born babies are in the normal birthweight range

A baby's birthweight is a key indicator of infant health and a determinant of a baby's chances of survival and health later in life.

In 2013, the mean birthweight of live born babies was 3,355 grams, with the vast majority of babies born in the normal birthweight range (92%); 6.4% (19,597) of babies were low birthweight; and a small proportion were high birthweight (1.6% or 4,790).

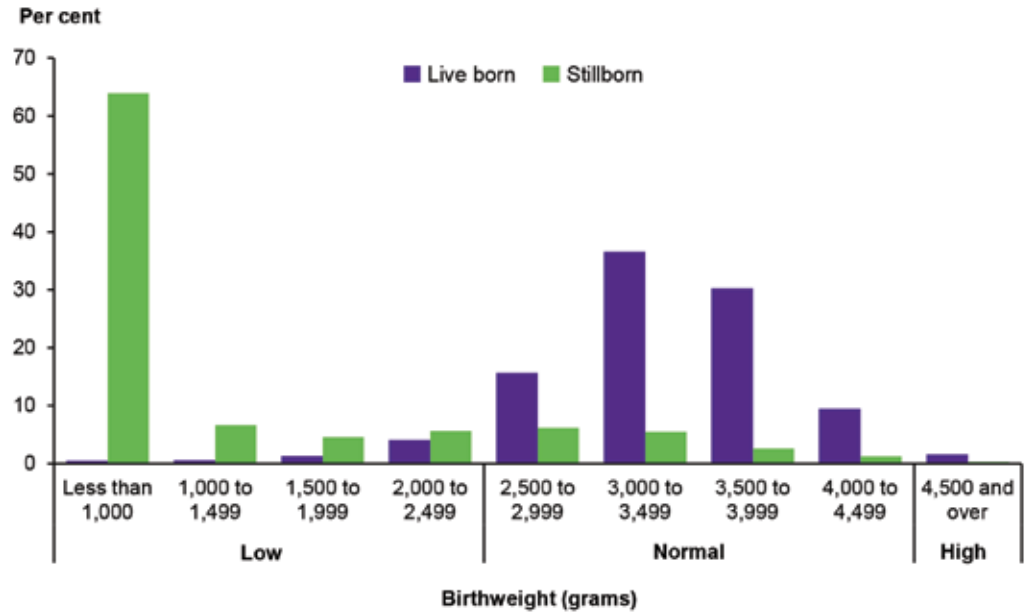
Birthweight ranges

High:	4,500 grams and over
Normal:	2,500 to 4,499 grams
Low:	less than 2,500 grams

(WHO 1992)

Birthweight differed markedly by birth status—the mean birthweight of stillborn babies (1,131 grams) being far lower than for live born babies (3,355 grams). Around 81% of all stillborn babies were low birthweight in 2013, and more than half (64%) were extremely low birthweight (under 1,000 grams).

Babies, by birthweight and birth status, 2013



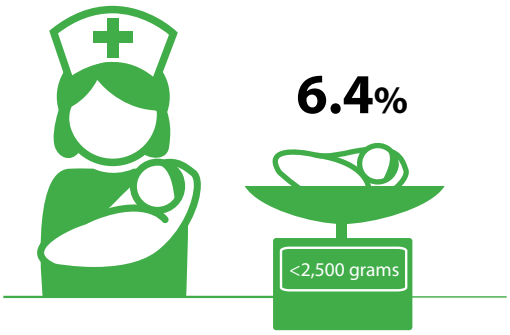
Low birthweight

1 in 16 live born babies are low birthweight

Babies are considered to be of low birthweight when their weight at birth is less than 2,500 grams. This section looks at low birthweight in more detail, and relates to live births only.

In 2013, 6.4% (19,597) of live born babies were of low birthweight. Of these babies:

- 16% or 3,102 were of very low birthweight (less than 1,500 grams)
- 7% or 1,351 were extremely low birthweight (less than 1,000 grams).

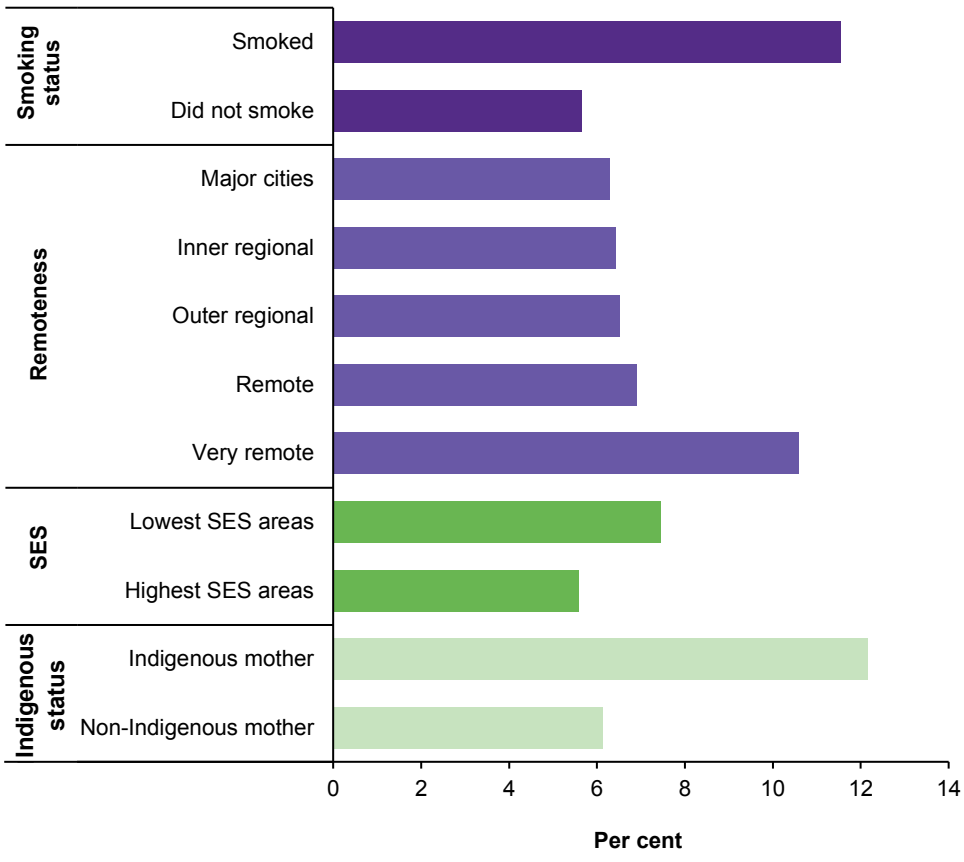


Between 2003 and 2013 there has been little change in the proportion of low birthweight babies, with the proportion remaining at between 6.1% and 6.4% over this time.

The proportion of low birthweight babies was higher among:

- female babies (6.9%) compared with male babies (5.9%)
- twins (56%) and other multiples (98%) compared with singletons (4.8%)
- babies born in public hospitals (7.0%) compared with private hospitals (4.8%)
- babies with mothers who smoked during pregnancy (12%) compared with babies whose mothers did not (5.7%)
- babies of Indigenous mothers (12.2%) compared with those of non-Indigenous mothers (6.1%) (see Section 4 for more information).

Low birthweight live born babies, by selected maternal characteristics, 2013



A baby may be low birthweight due to being born early (pre-term), or may be small for its gestational age (which indicates possible intrauterine growth restriction). More information on these babies is available from the *National Core Maternity Indicators data portal.*

Find out more in the *National Core Maternity Indicators data portal: Small babies*

Rates of low birthweight babies vary depending on where mothers live

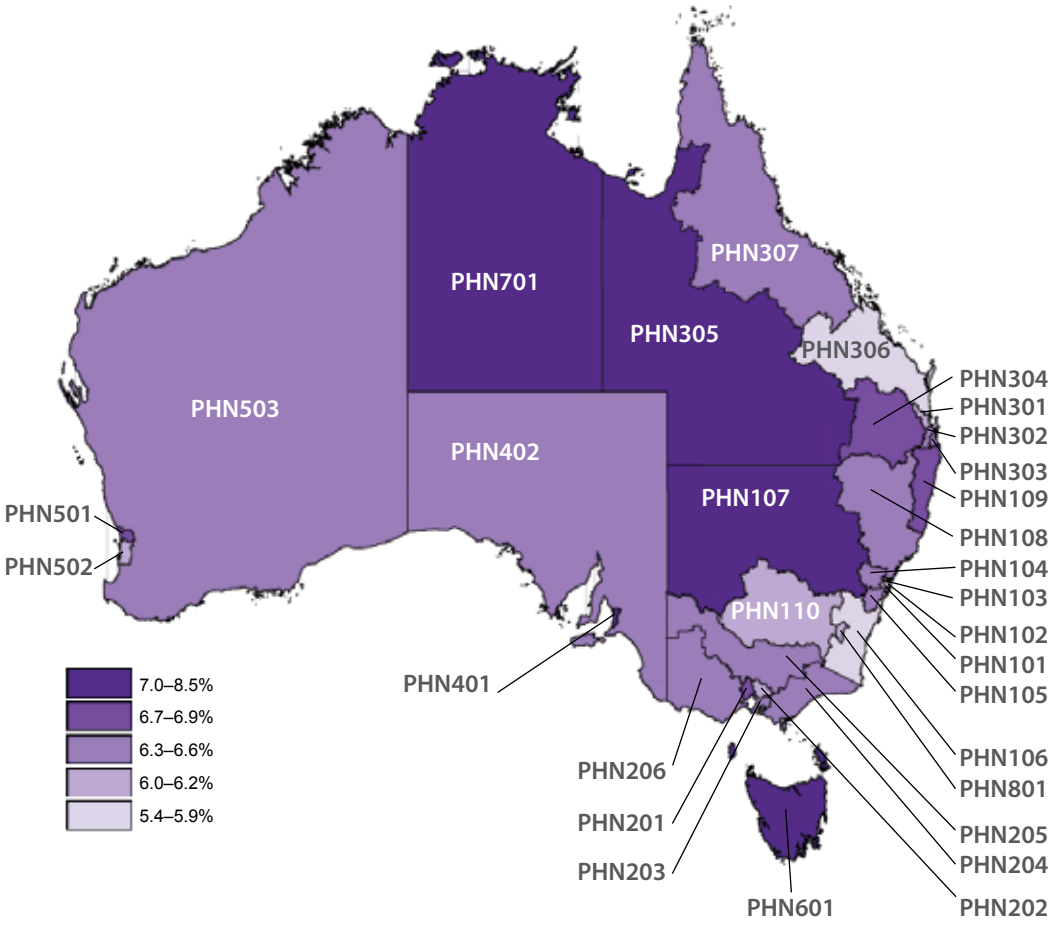
The proportion of live born low birthweight babies increased with remoteness and disadvantage:

- 6.3% of babies born to mothers living in *Major cities* were low birthweight, increasing to 10.6% in *Very remote* areas
- 5.6% of babies born to mothers living in the highest socioeconomic status (SES) areas were of low birthweight compared to 7.5% in the lowest SES areas.

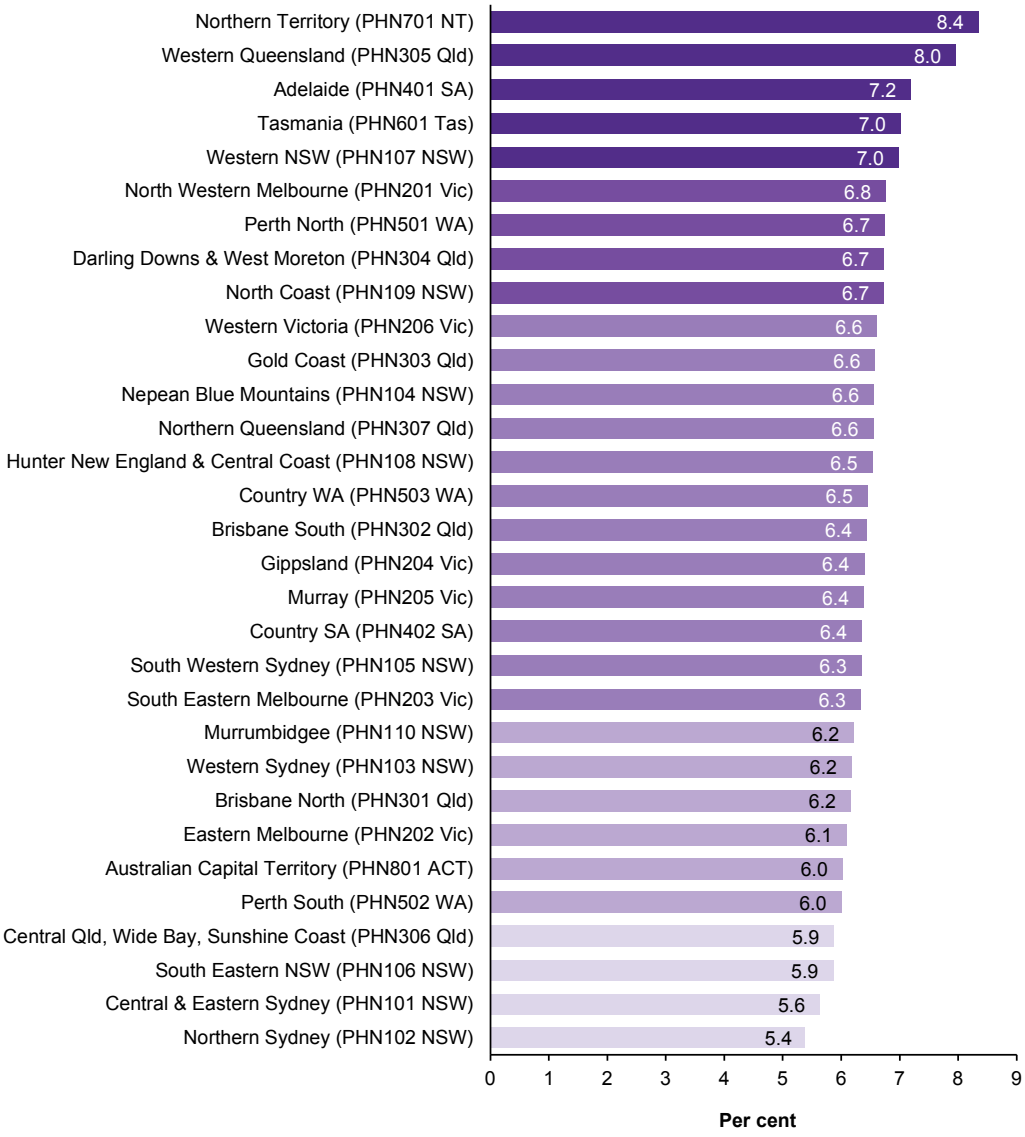
The proportion of live born babies of low birthweight varied across the 31 Primary Health Networks (PHNs) in Australia in 2013. The proportions ranged from 5.4% in the Northern Sydney PHN to 8.4% in the Northern Territory, with a median of 6.4%.

Internationally, the proportion of low birthweight babies in Australia in 2012 (6.2%) was lower than the Organisation for Economic Co-operation and Development (OECD) average (6.6%), with Australia ranked 15th out of 34 OECD countries (OECD 2015).

Percentage of live born low birthweight babies, by Primary Health Network of mother's usual residence, 2013



Percentage of live born low birthweight babies, by Primary Health Network of mother's usual residence, 2013



Baby presentation and method of birth

3 in 10 multiple births are non-vertex presentations

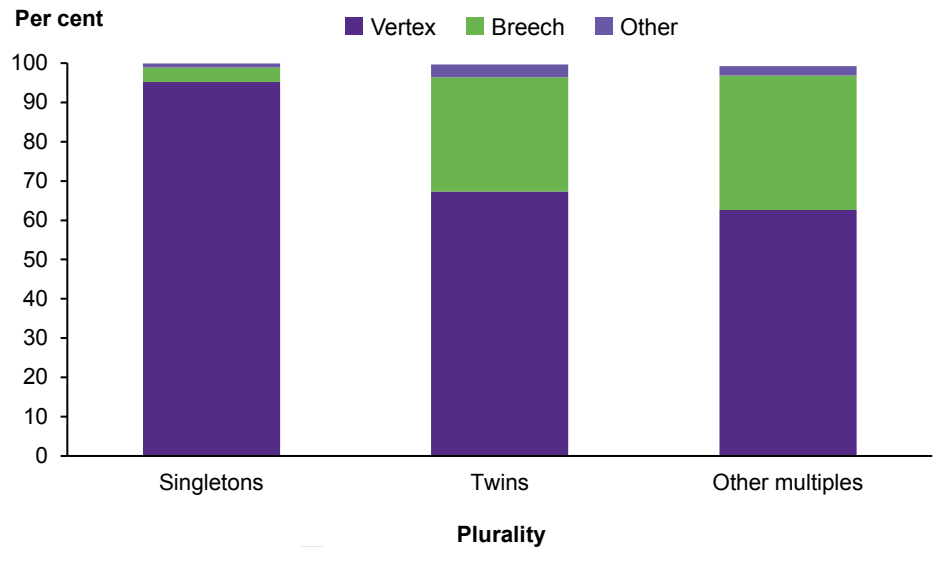
The presentation of the baby at birth refers to the anatomical part of the baby that is facing down the birth canal.

In 2013, the vast majority of babies (94% or 292,066) were in a vertex presentation at birth, in which the top of the head is facing down the birthing canal. Small proportions of babies had different (non-vertex) presentations:

- Around 1 in 25 babies (4.4% or 13,617) were in a breech presentation (where the baby exits buttocks or feet first)
- Around 1 in 100 babies (1.1% or 3,513) were in other presentations including face, brow, shoulder/transverse and compound presentations.

In 2013, multiple births were more than 6 times as likely to be in non-vertex presentation as singletons (32% compared with 5%). The proportion was greater for higher-order multiples (triplets and higher) (37%) than for twins (32%). Non-vertex presentation increased with birth order for multiple births, from 23% among babies who were born first to 42% among subsequent babies.

Babies, by presentation at birth and plurality, 2013



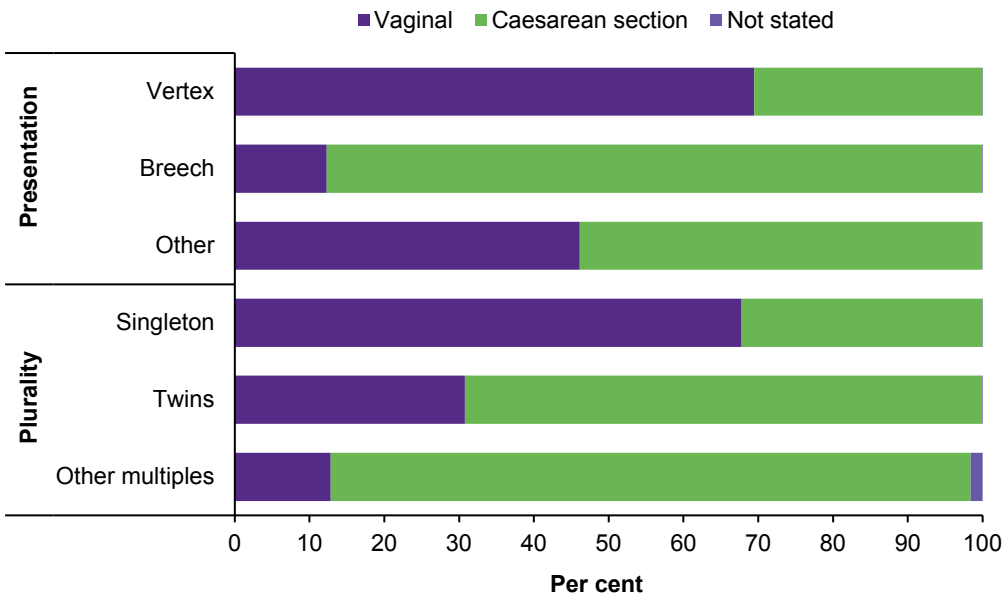
Note: 'Other' includes face, brow, shoulder/transverse and compound presentations.

A baby's presentation at birth can affect the method of birth. Most babies in a vertex presentation were delivered by vaginal birth (69%), with 31% delivered via caesarean section. Conversely, almost 9 in 10 babies (88%) presenting in breech position were delivered via caesarean section, with only 12% delivered by vaginal birth.

Baby's method of birth also varies by plurality. The likelihood of vaginal delivery decreases as plurality increases, from around two-thirds (68%) of singleton babies, to one-third (31%) of twins and 13% of other multiples. This pattern is reversed for caesarean sections, which are least common among singletons (32%) and most common among multiple births (69% of twins and 86% of other multiples).

See Section 2 for more information on method of birth for mothers, where the method of birth of the first-born baby in multiple births is used.

Babies, by method of birth and selected baby characteristics, 2013



Note: 'Other' presentation includes face, brow, shoulder/transverse and compound presentations.

Apgar scores

Apgar scores are highest among babies born at term

Apgar scores are clinical indicators of a baby's condition shortly after birth. The measure is based on the assessment of 5 characteristics of the baby including skin colour, pulse, breathing, muscle tone and reflex irritability. Each characteristic is given between 0 and 2 points, with a total score between 0 and 10 points.

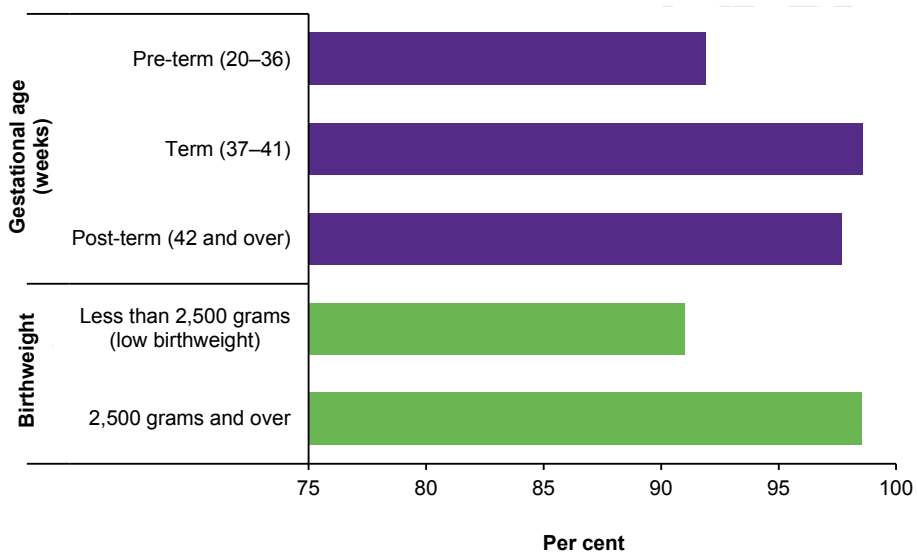
An Apgar score of 7 or more at 5 minutes after birth indicates the baby is adapting well to the environment, while a score of less than 7 indicates complications for the baby.

In 2013, almost all live born babies (98%) had an Apgar score of 7 or more and 1.8% had an Apgar score of 0 to 6. Apgar scores of 0–3 were recorded for just 0.3% of all live births and scores of 4–6 were recorded for 1.5% of live born babies.

Apgar scores differed by gestational age and birthweight:

- 92% of babies born pre-term had an Apgar score of 7 or more compared with 99% of babies born at term
- 91% of low birthweight babies (less than 2,500 grams) had an Apgar score of 7 or more compared with 99% of babies weighing 2,500 grams or more.

Live born babies, Apgar score of 7 or more at 5 minutes, by gestational age and birthweight, 2013



Find out more in the *National Core Maternity Indicators data portal: Apgar score*

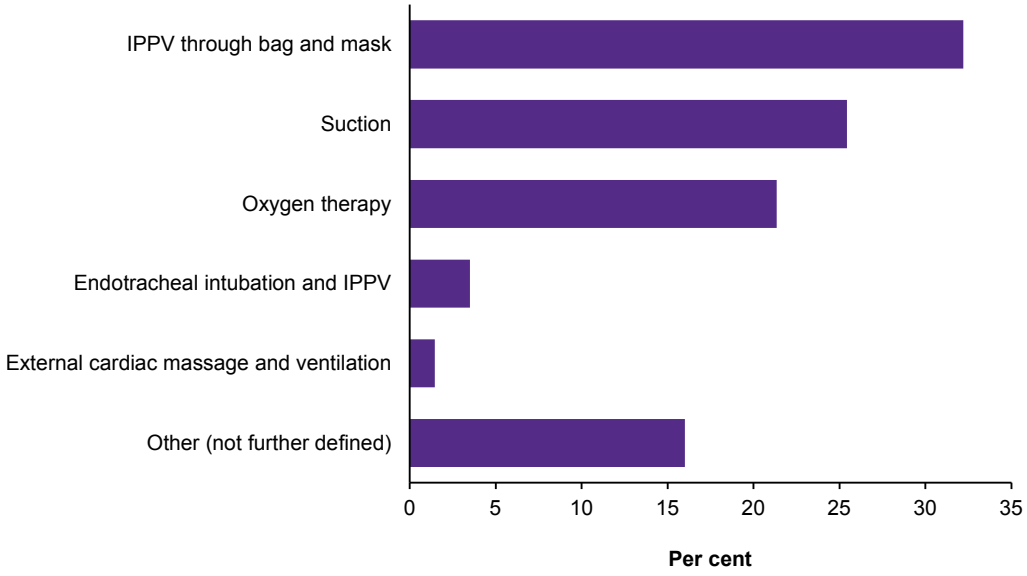
Resuscitation

1 in 5 live born babies require active resuscitation

Resuscitation is undertaken to establish independent respiration and heartbeat or to treat depressed respiratory effect and to correct metabolic disturbances. The types of resuscitation are hierarchical, with suction being the least severe and external cardiac massage and ventilation the most extreme. If more than 1 type of resuscitation is performed, the highest-order type in the hierarchy is the one to be coded.

More than one-fifth (22%) of live born babies required some form of active resuscitation immediately after birth in 2013 (excludes data from Western Australia). Around half (47%) of those requiring resuscitation received suction or oxygen therapy, and around one-third (36%) received ventilatory assistance by intermittent positive pressure ventilation (IPPV) through a bag and mask or via endotracheal incubation. Around 1% of babies who received resuscitation required external cardiac massage and ventilation.

Live born babies that received active resuscitation, by resuscitation measure, 2013



Note: Excludes data from Western Australia.

Hospital births and length of stay

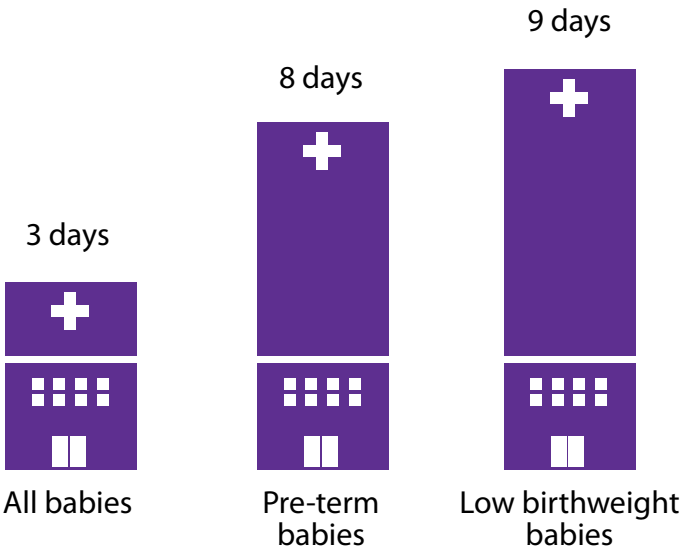
Twins and other multiples stay in hospital longer

The vast majority of babies are born in hospital (97% babies in 2013), and of these, most are discharged to home (96% or 256,367 babies in 2013). A small proportion of babies (3%) were transferred to another hospital and 1% were perinatal deaths (stillbirths or neonatal deaths occurring in the hospital of birth). Note that all data presented for this topic exclude data from Western Australia.

Among babies who were discharged to home, the median length of stay was 3 days with around 92% staying 5 days or less.

A number of factors influence a baby's length of stay in hospital, including birthweight and gestational age: low birthweight babies had a median stay of 9 days (compared with 3 days for normal birthweight babies) and pre-term babies had a median stay of 8 days (compared with 3 days for full-term babies).

As discussed in earlier sections, babies who are part of a multiple birth are more likely to be of low birthweight and to be born pre-term. This is reflected in the median length of stay in hospital, which was higher for twins (6 days) and for other multiples (33 days) than for singletons (3 days).



Median length of hospital stay

Admission to special care nurseries and neonatal intensive care units

Pre-term babies and multiple births more likely to be admitted to an SCN or NICU

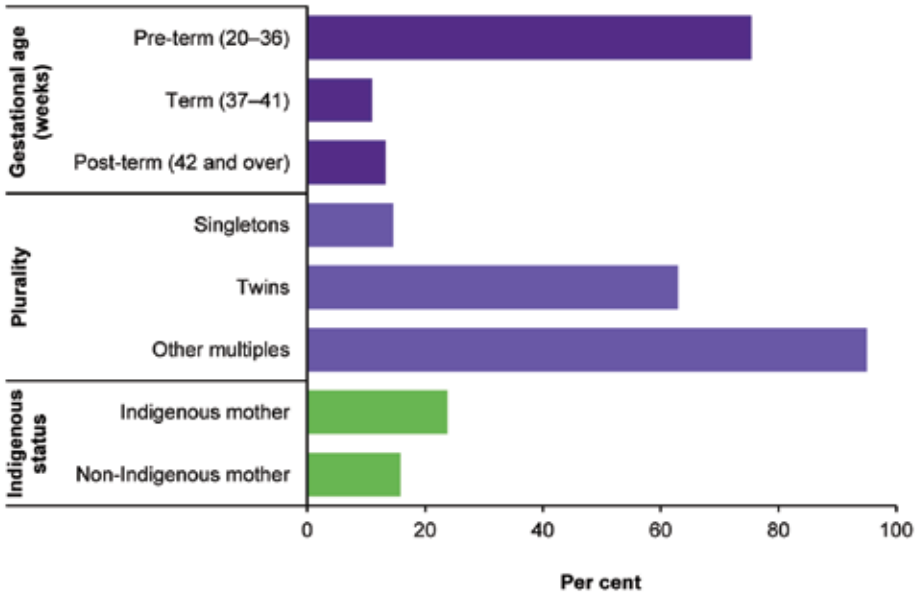
Some live born babies require more specialised treatment and care than is available on the postnatal ward. Of all live born babies, 16% (43,159) were admitted to a special care nursery (SCN) or neonatal intensive care unit (NICU). Note that babies who are transferred between hospitals (around 3% of all babies) and who are then admitted to an SCN or NICU may not be included in these data and data also exclude Western Australia and the Northern Territory.

Pre-term babies were more likely to be admitted to an SCN or NICU (75%) than babies delivered at term (11%) or post-term (13%). Most pre-term babies are of low birthweight, and 76% of low birthweight babies were admitted compared with 12% of normal birthweight babies and 25% of those with a high birthweight.

The majority of multiple births are pre-term, and twins and other multiples were therefore more likely to be admitted than singletons (63% and 95% compared with 15%).

Babies born to Indigenous mothers were 1.5 times as likely to be admitted to an SCN or NICU as those of non-Indigenous mothers.

Live born babies, by admission to a special care nursery or neonatal intensive care unit, by selected baby characteristics, 2013



Note: Excludes data from Western Australia and the Northern Territory.

Perinatal deaths

Gestational age and birthweight are the biggest predictors of perinatal death

Counting perinatal deaths

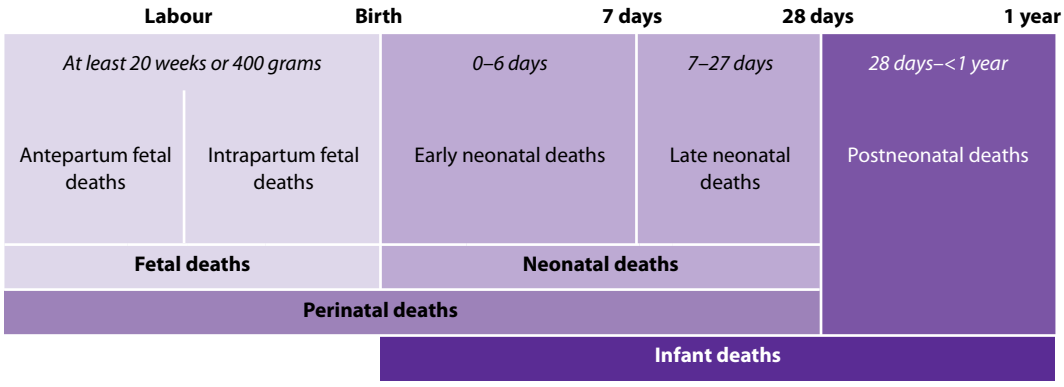
There are various definitions used for reporting and registering perinatal deaths in Australia. The National Perinatal Data Collection defines perinatal deaths as all fetal deaths (stillbirths) and neonatal deaths (deaths of live born babies aged less than 28 days) of at least 400 grams birthweight or at least 20 weeks gestation.

Fetal and neonatal deaths include late termination of pregnancy (20 weeks or more gestation) in Victoria and Western Australia.

Neonatal deaths may not be included for babies transferred to another hospital, re-admitted to hospital after discharge or who died at home after discharge.

Perinatal and fetal death rates are calculated using all live births and stillbirths in the denominator. Neonatal death rates are calculated using live births only.

Perinatal and infant death periods used by the National Perinatal Data Collection



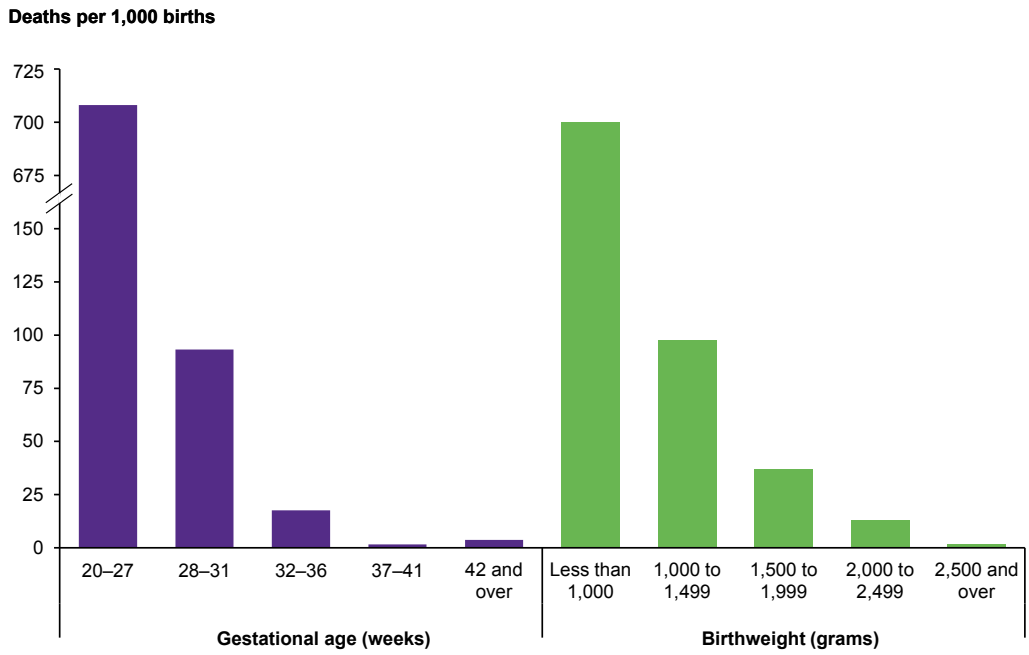
In 2013, there were 10 perinatal deaths for every 1,000 births, a total of 2,998 perinatal deaths. This included:

- 2,191 fetal deaths or 7 fetal deaths per 1,000 births
- 807 neonatal deaths, a rate of 3 neonatal deaths per 1,000 live births.

Perinatal death rates decreased dramatically as gestational age and birthweight increased:

- Gestational age—rates were highest among babies born at 20–27 weeks gestation (708 per 1,000 births) and lowest among babies born at term (37–41 weeks) (2 per 1,000 births).
- Birthweight—rates were highest among extremely low birthweight babies (less than 1,000 grams) (700 per 1,000 births) and lowest among babies with birthweight 2,500 grams or higher (2 per 1,000 births).

Perinatal deaths by gestational age and birthweight, 2013



Other factors were also associated with higher rates of perinatal death (although to a lesser extent than gestational age and birthweight), including:

- maternal age—babies born to mothers younger than 20 and over 40 had the highest rates of perinatal death (18 and 14 per 1,000 births respectively). Babies of mothers aged 30–34 had the lowest rate (8 per 1,000)
- maternal Indigenous status—perinatal death rates were twice as high among babies of Indigenous mothers (18 per 1,000 births) compared with non-Indigenous (9 per 1,000) (see Section 4 for more information)
- multiple births—twins and other multiples had perinatal death rates around 4 and 10 times that of singletons (34 and 92 deaths per 1,000 births compared with 9).

Patterns by these characteristics were similar for both fetal and neonatal deaths, noting that fetal death rates were consistently higher than neonatal death rates.

Congenital abnormalities are the leading cause of perinatal deaths

Classifying perinatal deaths

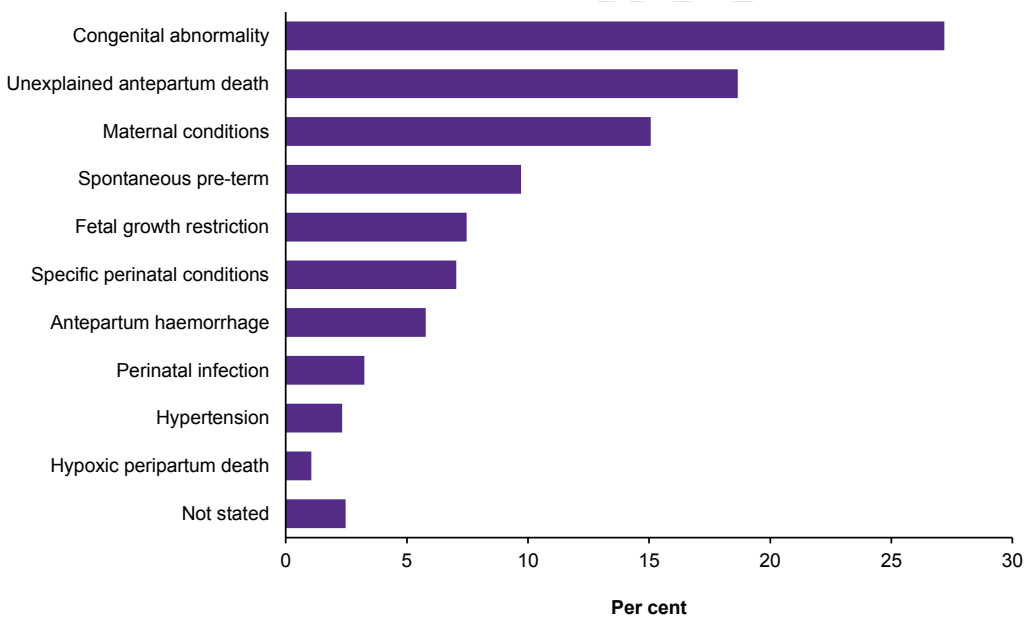
Causes of death for perinatal deaths are classified according to the Perinatal Society of Australia and New Zealand Clinical Practice Guideline for Perinatal Mortality Perinatal Death Classification (PSANZ-PDC).

Information about cause of death is based on data for 6 states and territories (Victoria, Queensland, South Australia, Tasmania, the Australian Capital Territory and the Northern Territory).

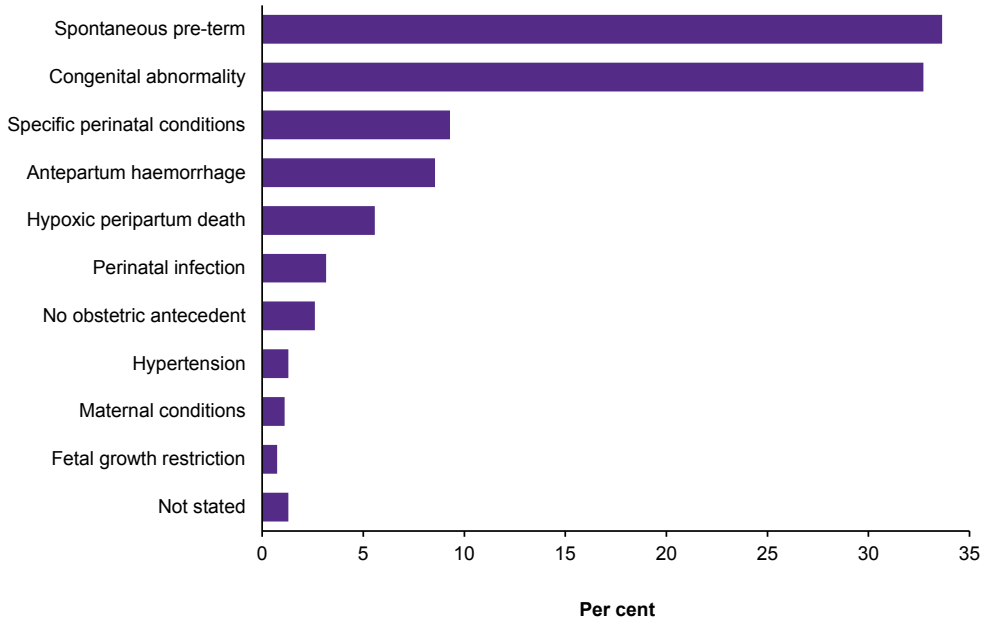
The most common cause of all perinatal deaths was congenital abnormalities (anomalies), accounting for almost 3 in 10 (29%) perinatal deaths. This was followed by spontaneous pre-term birth (16%) and unexplained antepartum death (14%).

However, the most common causes of death differed between fetal and neonatal deaths. While congenital abnormality was the leading cause of fetal deaths, spontaneous pre-term birth was the leading cause for neonatal deaths.

Fetal deaths, by cause of death (PSANZ-PDC), 2013



Neonatal deaths, by cause of death (PSANZ-PDC), 2013

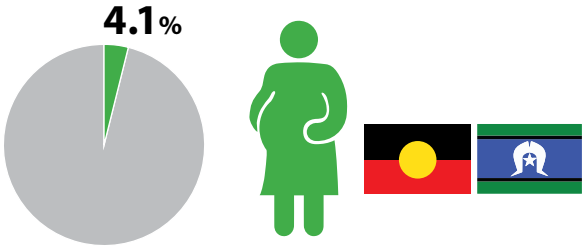


These patterns were influenced by gestational age, maternal age and plurality, for example:

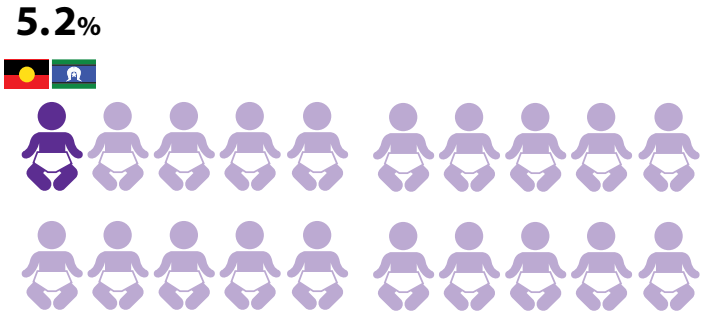
- perinatal deaths due to congenital abnormalities increased with increasing maternal age
- spontaneous pre-term birth decreased with increasing gestational age
- the most common cause of death among singleton babies was congenital abnormalities, while spontaneous pre-term birth and specific perinatal conditions were the most common causes of death among twins and other multiples
- most perinatal deaths of babies born to mothers younger than 20 were due to maternal conditions or spontaneous pre-term birth, while congenital abnormalities was the most common cause of perinatal death for babies whose mothers were 40 and over.

4 Aboriginal and Torres Strait Islander mothers and their babies

Although a range of data by Indigenous status has been presented in earlier sections, this section provides more in-depth information on Indigenous mothers and their babies.



In 2013, there were 12,380 women who gave birth who identified as being Aboriginal and/or Torres Strait Islander, representing 4.1% of all women who gave birth (based on the Indigenous status of the mother). Around 1 in 20 babies (5.2% or 16,149) were Aboriginal and/or Torres Strait Islander (based on the Indigenous status of the baby).



In general, Indigenous mothers have fewer interventions during labour and birth compared with non-Indigenous women. However, the maternal and perinatal outcomes of Indigenous mothers and their babies have consistently been shown to be poorer than those of non-Indigenous mothers (AIHW: Leeds et al. 2007).

Nevertheless, most Indigenous mothers and their babies are doing well and there have been some improvements in recent years. There have been small increases in the proportion of Indigenous mothers attending an antenatal visit in the first trimester and attending 5 or more antenatal visits, as well as a small decrease in the rate of smoking among Indigenous mothers during pregnancy.

Indigenous mothers

Indigenous mothers are more likely to be teenagers, and to live in remote or disadvantaged areas

Younger maternal age, remoteness and socioeconomic disadvantage are associated with increased risk of a number of poorer maternal and perinatal outcomes, as discussed in earlier sections.

Indigenous mothers, compared with non-Indigenous mothers, were:

- almost 7 times as likely to be teenage mothers (18% compared with 3%). Conversely, only 10% of Indigenous mothers were aged 35 and over compared with 23% of non-Indigenous mothers
- around 14 times as likely to live in *Remote* and *Very Remote* areas as non-Indigenous mothers (23% compared with 1.7%)
- 2.5 times as likely to live in the lowest socioeconomic status (SES) areas as non-Indigenous mothers. Around 1 in 2 Indigenous mothers lived in the lowest SES areas compared with 1 in 5 non-Indigenous mothers.

Indigenous mothers receive less antenatal care

On average, in 2013 Indigenous mothers attended 1 less antenatal visit than non-Indigenous mothers (9 and 10 visits respectively, data exclude Victoria and very pre-term births). Indigenous women were also more likely to attend antenatal care later in pregnancy than non-Indigenous women (the average duration of pregnancy at the first antenatal visit was 15 and 13 weeks respectively).

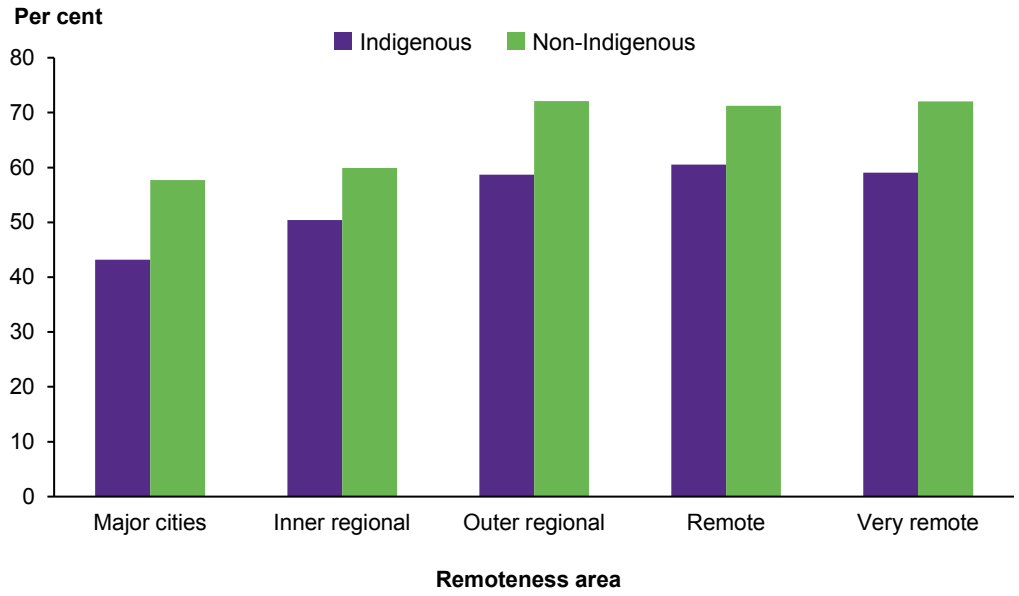
Fewer Indigenous mothers attended their first antenatal visit in the first trimester of pregnancy (less than 14 completed weeks)—over half (52%) of Indigenous mothers compared with 60% of non-Indigenous mothers (age-standardised).

The age-standardised proportion of mothers receiving antenatal care in the first trimester increased with remoteness for both Indigenous and non-Indigenous mothers:

- from 43% of Indigenous mothers in *Major cities* to 59% in *Very remote* areas
- from 58% of non-Indigenous mothers in *Major cities* to 72% in *Very remote* areas.

The proportion of Indigenous mothers who attended antenatal care in the first trimester increased slightly between 2010 (50%) and 2013 (52%). In comparison, there has been a decrease for non-Indigenous mothers over this time from 67% in 2010 to 60% in 2013, resulting in a narrowing of the gap between Indigenous and non-Indigenous mothers (age-standardised).

Antenatal visit in the first trimester (less than 14 completed weeks), by remoteness and Indigenous status (age-standardised), 2013



Indigenous mothers who gave birth at 32 weeks or more are also less likely to attend 5 or more antenatal visits than non-Indigenous mothers: 85% of Indigenous mothers had 5 or more visits compared with 95% of non-Indigenous mothers (age-standardised, excludes data from Victoria).

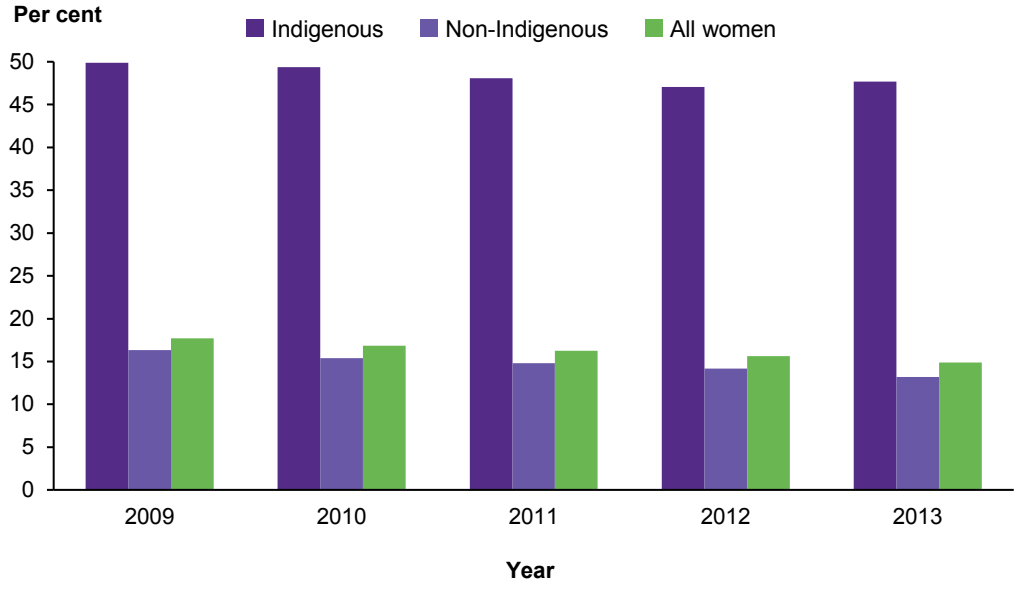
Between 2011 and 2013, the proportion of mothers attending 5 or more visits has increased slightly for both Indigenous and non-Indigenous mothers (from 84.8% to 86.3% for Indigenous mothers and from 95.1% to 95.5% for non-Indigenous mothers) (age-standardised, excludes data from Western Australia and Victoria).

Nearly half of Indigenous mothers smoke during pregnancy

Indigenous mothers accounted for 17% of mothers who smoked tobacco at any time during pregnancy in 2013, despite accounting for only around 4% of mothers. Almost 1 in 2 Indigenous mothers reported smoking during pregnancy (48% compared with 13% of non-Indigenous mothers [age-standardised]).

The age-standardised proportion of Indigenous women who smoked at any time during pregnancy has decreased from 50% in 2009 to 48% in 2013. There has been a similar trend for non-Indigenous mothers, with a decrease in the rate of smoking from 16% in 2009 to 13% in 2013. Consequently, the rate of smoking has decreased for all women between 2009 and 2013.

Maternal smoking at any time during pregnancy, by Indigenous status (age-standardised), 2009 to 2013



Note: Definitions and methods used for data collection differ by state and territories.

Smoking cessation rates were lower for Indigenous mothers in pregnancy

The age-standardised rate of smoking cessation during pregnancy among Indigenous mothers was 11%, which is less than half that of non-Indigenous mothers (25%) (based on mothers who reported smoking in the first 20 weeks of pregnancy and not smoking after 20 weeks of pregnancy).

Indigenous mothers were more likely to be obese and to have pre-existing health conditions

Indigenous mothers were:

- 1.6 times as likely to be obese as non-Indigenous mothers (33% compared with 20%) (age-standardised, excludes data from New South Wales and the Northern Territory)
- almost 3 times as likely to have pre-existing hypertension (2.5%) and almost 4 times as likely to have pre-existing diabetes (3.6%) compared with non-Indigenous mothers (less than 1% for pre-existing hypertension and 1% for diabetes) (age-standardised, excludes data from Western Australia and Victoria).

Indigenous mothers were more likely to have spontaneous labour onset

Spontaneous onset of labour was slightly more common among Indigenous mothers than non-Indigenous mothers (55% and 52%), while rates of labour induction were the same for both Indigenous and non-Indigenous mothers (28%). Rates of mothers with no labour were therefore lower for Indigenous mothers (17%) than for non-Indigenous mothers (20%) (age-standardised).

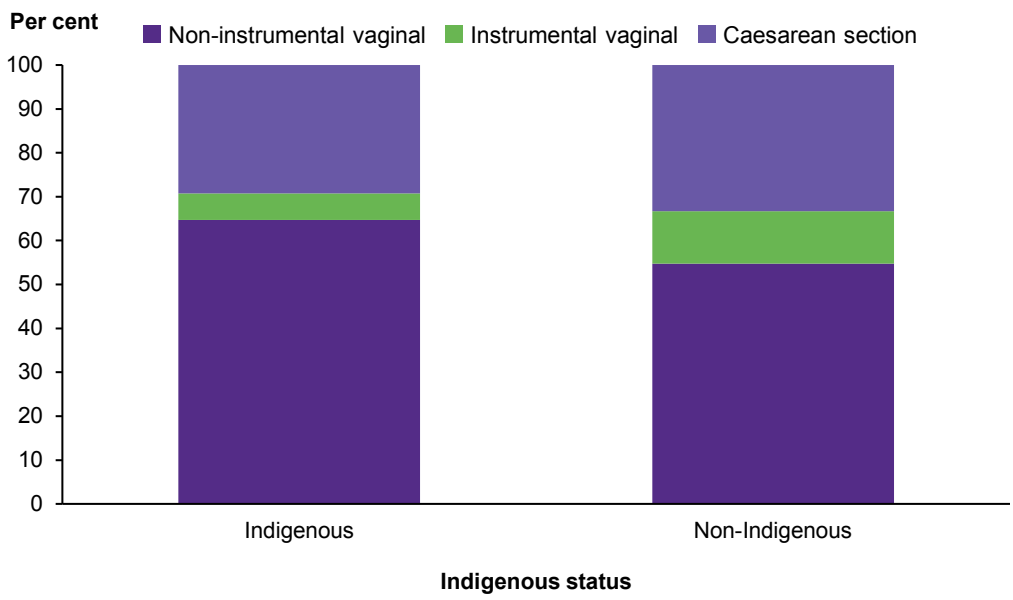
Indigenous mothers who had labour onset were slightly less likely to receive pain relief during labour compared with non-Indigenous women (72% compared with 77%, age-standardised).

Caesarean section rates were slightly lower for Indigenous women

Method of birth is influenced by maternal age, but even when controlling for differences in age structure between Indigenous and non-Indigenous mothers, some differences remain. Indigenous mothers were:

- more likely to have a non-instrumental vaginal birth (65%) than non-Indigenous mothers (55%)
- less likely to have an instrumental vaginal delivery (6%) or caesarean section (29%) than non-Indigenous mothers (12% and 33%, respectively).

Method of birth by Indigenous status (age-standardised), 2013



Find out more in the *Perinatal data portal*

Babies of Indigenous mothers

Babies of Indigenous mothers were 1.7 times as likely to be pre-term

In 2013, the average gestational age of babies of Indigenous mothers was 38.2 weeks, which was slightly lower than for those of non-Indigenous mothers (38.7 weeks).

Around 1 in 7 babies of Indigenous mothers (14%) were born pre-term, compared with 8% of babies of non-Indigenous mothers.

Babies of Indigenous mothers who smoked were almost 1.4 times as likely to be born pre-term as babies born to non-Indigenous mothers who smoked.

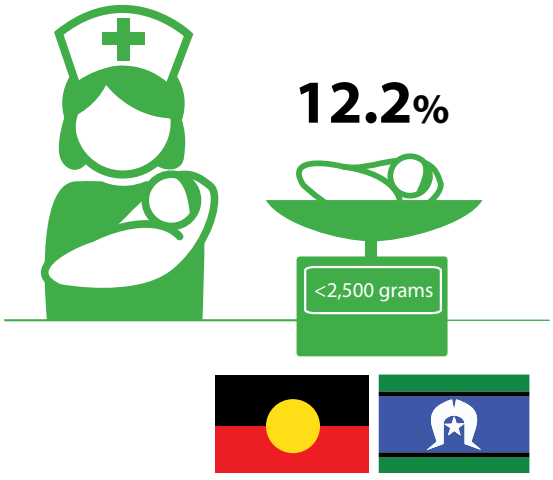
Low birthweight of babies with Indigenous mothers increases with remoteness

In 2013, the average live born baby of an Indigenous mother weighed 161 grams less than a baby of a non-Indigenous mother (3,200 grams and 3,361 grams, respectively).

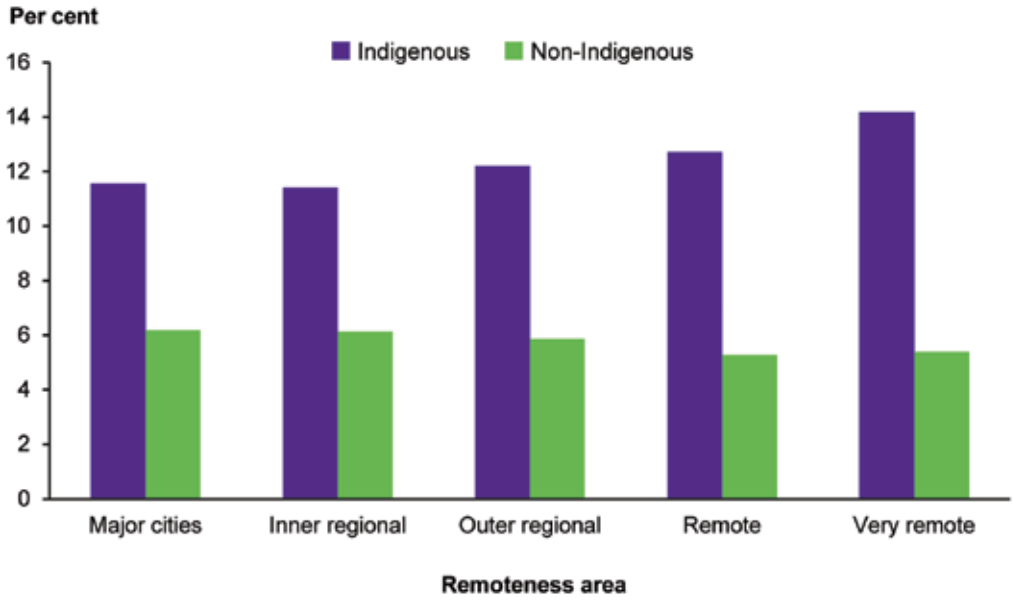
For live born babies with Indigenous mothers, 12.2% (1,507) were of low birthweight, compared with 6.1% (18,045) of babies with non-Indigenous mothers. Of these babies:

- 17.5% of babies of Indigenous mothers and 15.7% of babies of non-Indigenous mothers were of very low birthweight (less than 1,500 grams)
- 8.4% of babies of Indigenous mothers and 6.8% of babies of non-Indigenous mothers were of extremely low birthweight (less than 1,000 grams).

Low birthweight of babies of non-Indigenous mothers varies only slightly by remoteness, ranging from 5.3% of babies in *Remote* areas to 6.2% in *Major cities*. However, for babies of Indigenous mothers, the difference by remoteness is more noticeable, ranging from 11.6% of babies in *Major cities* to 14.2% in *Very remote* areas.



Low birthweight of live born babies, by Indigenous status of mother and remoteness, 2013



There has been little change in the proportion of low birthweight babies between 2003 and 2013. The proportion for babies with Indigenous mothers has remained between 11.8% and 13.2%, and the proportion of those with non-Indigenous mothers has remained between 5.9% and 6.2% over this time.

Babies of Indigenous mothers are more likely to be admitted to SCN or NICU

Apgar scores, use of resuscitation and admission to special care nurseries (SCN) or neonatal intensive care units (NICU) can give an indication of the health of newborn babies.

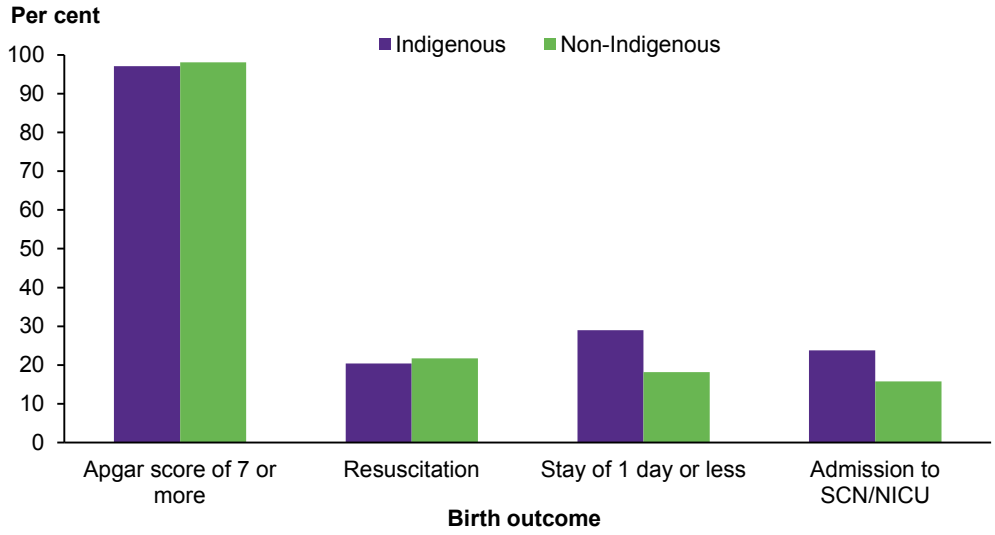
Live born babies to Indigenous mothers were more likely to be admitted to an SCN or NICU (24%) than babies of non-Indigenous mothers (16%) (excludes data from Western Australia and the Northern Territory).

Similar proportions of babies live born to Indigenous and non-Indigenous mothers:

- had an Apgar score at 5 minutes of 7 or more (97% and 98%, respectively)
- required some form of resuscitation (20% and 22%, respectively, excludes data from Western Australia).

Babies of Indigenous mothers, born in hospital and discharged home, had a shorter median length of stay (2 days) than those of non-Indigenous mothers (3 days). Almost 1 in 3 babies of Indigenous mothers (29%) stayed for 1 day or less, compared with around 1 in 5 babies (18%) of non-Indigenous mothers. However, babies of Indigenous mothers were 1.4 times as likely as those of non-Indigenous mothers to stay in hospital for 6 or more days (excludes data from Western Australia).

Live born babies, by Indigenous status of mother and selected birth outcomes, 2013



Note: Data for admission to SCN/NICU exclude Western Australia and the Northern Territory. Data for resuscitation and length of stay exclude Western Australia.

Higher rates of perinatal death among babies of Indigenous mothers

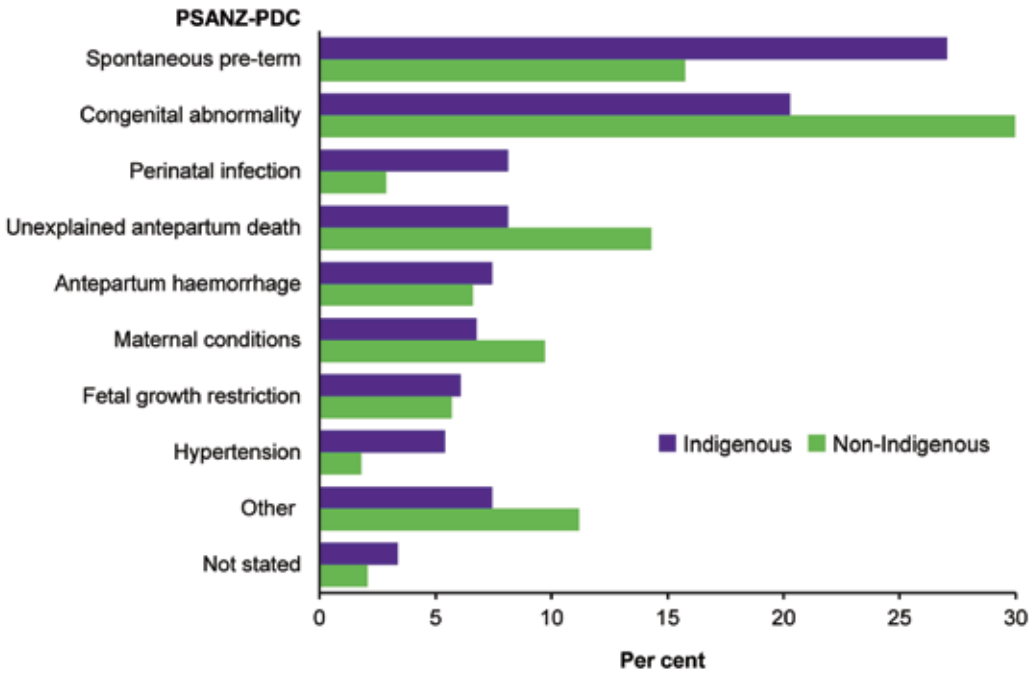
In 2013, there were 18 perinatal deaths for every 1,000 births among babies of Indigenous mothers—twice the rate for those of non-Indigenous mothers (9 per 1,000 births). This included:

- 11 fetal deaths per 1,000 births for babies with Indigenous mothers and 7 fetal deaths per 1,000 births for those with non-Indigenous mothers
- 7 neonatal deaths per 1,000 live births for babies of Indigenous mothers and 2 neonatal deaths per 1,000 live births for those with non-Indigenous mothers.

Data on cause of death are available for Victoria, Queensland, South Australia, Tasmania, the Australian Capital Territory and the Northern Territory. The most notable differences in cause of death between babies of Indigenous and non-Indigenous mothers in the perinatal period are for spontaneous pre-term births and congenital abnormalities:

- Around one-quarter (27%) of perinatal deaths of babies with Indigenous mothers are due to spontaneous pre-term birth, compared with 16% of babies with non-Indigenous mothers.
- Congenital abnormalities accounted for a smaller proportion of perinatal deaths among babies of Indigenous mothers (20%) compared with non-Indigenous (30%).

Perinatal deaths, by Indigenous status of mother and cause of death, 2013



Notes

1. 'Other' includes 'specific perinatal conditions', 'hypoxic peripartum death' and 'no obstetric antecedent'. See Perinatal deaths in Section 3 for more information on the PSANZ-PDC.
2. Includes Victoria, Queensland, South Australia, Tasmania, the Australian Capital Territory and the Northern Territory only.

5 About the National Perinatal Data Collection

The National Perinatal Data Collection (NPDC) commenced in 1991 and collects national information on the pregnancy and childbirth of mothers, and the characteristics and outcomes of their babies. The NPDC supports a range of reports and products, including:

- *Australia's mothers and babies* annual report
- *Perinatal data portal,* available at <www.aihw.gov.au/perinatal-data/>
- *National core maternity indicators* reports and data portal, available at <www.aihw.gov.au/ncmi/>
- *Indigenous mothers and their babies* reports
- other specialist reports, indicator-based reports and customised data requests.

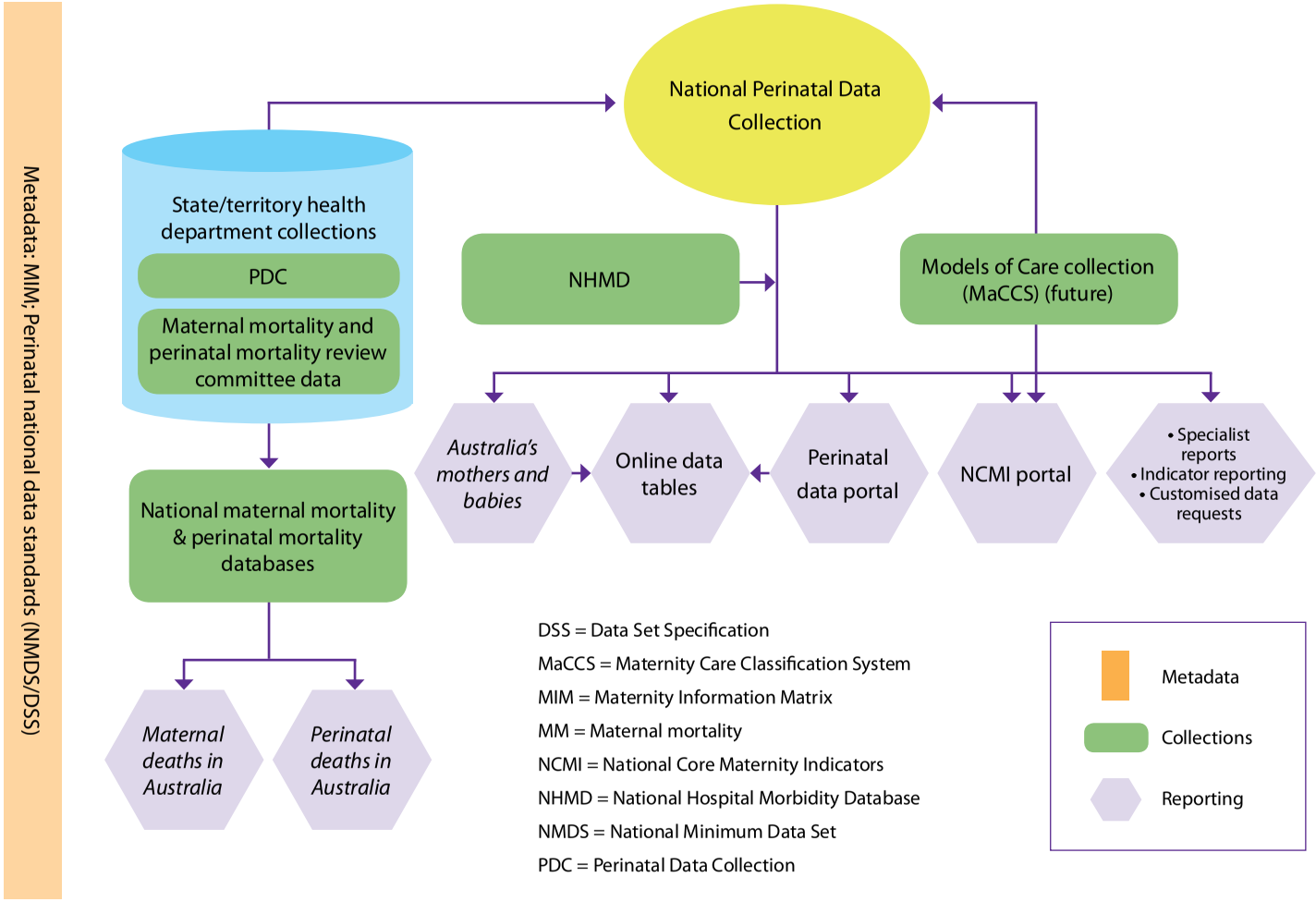
Collection of perinatal data by states and territories

Perinatal data are collected after each birth by midwives or other staff from clinical and administrative records and information systems, including records of antenatal care, the care provided during labour, and the delivery and care provided after the birth. Each state and territory has its own form and/or electronic system for collecting data, which are forwarded to the relevant state and territory health department to form the state or territory perinatal data collection. See Appendix B for state and territory contact details and the most recent state and territory perinatal reports, which contain more detailed information about data collection in each jurisdiction. The *Maternity Information Matrix* summarises data items from Australian national and state and territory data collections relevant to maternal and perinatal health, and is available at <maternitymatrix.aihw.gov.au/Pages/About-the-MIM.aspx>.

Collation of national perinatal data

A standardised extract of electronic data from each state and territory collection is provided to the AIHW on an annual basis. Records received from states and territories are anonymous: that is, they do not include any names or addresses, but do include a unique set of identification numbers so that the source record can be identified. Data are checked for completeness, validity and logical errors before inclusion in the national collection.

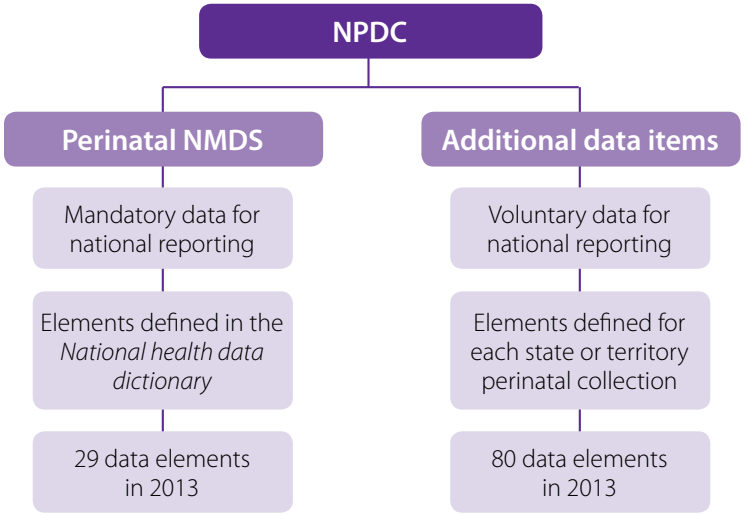
Overview of maternal and perinatal data collections and national reporting outputs



Structure of the National Perinatal Data Collection

Data supplied for the NPDC consist of the Perinatal National Minimum Data Set (NMDS) and additional data items.

Structure of the NPDC



The Perinatal NMDS was first specified in 1997 and remains an agreed data set for national reporting (COAG 2012). An NMDS is an agreed set of standardised data elements for mandatory supply by states and territories to support national reporting. Standardisation ensures that there is consistent meaning for data collected at different times or in different places. A list of the data items supplied for the NPDC from the Perinatal NMDS is at Appendix A. Compliance of data provided for the Perinatal NMDS is evaluated intermittently to assess data quality and adherence to standards (Donnolley & Li 2012).

Each state and territory collects more information than is specified in the NMDS, and the AIHW requests some of these additional items. These data items are at different stages in the process of standardisation. Some items have had national data standards developed, but have not yet been included as data elements in the Perinatal NMDS because they could not be implemented immediately in all jurisdictions.

In contrast, there are other data items—for which there are, as yet, no common definitions or categories for collecting the data or which are not collected in all jurisdictions—that are also provided to inform the future development of nationally standardised data.

Which births are counted?

This report presents information from the NPDC about births in Australia, including births in hospitals, in birth centres and in the community. The Australian *National health data dictionary* (NHDD) defines a 'live birth' as the complete expulsion or extraction from its mother of a baby, of any gestation, that shows signs of life; and a 'stillbirth' is the complete expulsion or extraction of a baby, of at least 20 weeks gestation or weighing at least 400 grams at birth (the weight expected of a baby at 20 weeks gestational age), which shows no signs of life.

The Perinatal NMDS and the NPDC require that either the birthweight or the gestational age conditions are met for both live births and stillbirths. This means that the very small number of live births occurring before 20 weeks gestation and weighing less than 400 grams are not included in the NPDC, although they may have been included in jurisdictional perinatal data collections. Data for babies not weighed at birth and whose gestational age and birthweight were not recorded are also not included in the NPDC, but may have been included in jurisdictional perinatal collections. Live births and stillbirths may include termination of pregnancy after 20 weeks. Stillbirths can include fetus papyraceous and fetus compressus. In Western Australia, data were included for both live births and stillbirths of at least 20 weeks gestation or, if gestation was unknown, the birthweight was at least 400 grams. In Victoria, stillbirths were of at least 20 weeks gestation unless gestation was missing and the baby weighed 400 grams or more. South Australian data may not include all terminations of pregnancy for psychosocial reasons after 20 weeks gestation.

Care is needed when comparing Australian birth statistics with those from other countries that have different gestational age or other criteria for defining live births and stillbirths. In many other countries, pregnancies must continue to 22, 24 or even 28 completed weeks of gestational age for a fetal death to be counted as a stillbirth. The inclusion in Australia of more births at lower gestations will affect the distributions of several key baby outcomes—in particular, rates of perinatal mortality, low birthweight, low Apgar scores (a measure of a baby's wellbeing at birth) and admission to a special care nursery or neonatal intensive care unit. For live births, the Perinatal NMDS and NPDC definition (above) is more restrictive than the World Health Organization (WHO) definition that specifies a live birth as a baby born showing signs of life irrespective of gestation (WHO 1992).

National Perinatal Data Development Committee

The National Perinatal Data Development Committee has a key role in improving data quality. The committee comprises representatives from each state and territory health authority, the AIHW, the Australian Bureau of Statistics and the National Perinatal Epidemiology and Statistics Unit, with temporary members invited as their expertise is required. The committee works in consultation with clinical reference groups. It improves data provision, revises existing Perinatal National Minimum Data Set items, develops existing perinatal data items in METeOR (AIHW's Metadata Online Registry) and contributes to the development of new perinatal data items.

Glossary

age-specific rate: a rate for a specific age group. The numerator and denominator relate to the same age group.

age standardisation: a method of removing the influence of age when comparing populations with different *age structures*. This is usually necessary because the rates of many diseases vary strongly (usually increasing) with age. The age structures of the different populations are converted to the same 'standard' structure, and then the disease rates that would have occurred with that structure are calculated and compared.

age structure: the relative number of people in each age group in a population.

antenatal: the period covering conception up to the time of birth. Synonymous with prenatal.

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

Apgar score: numerical score used to indicate the baby's condition at 1 minute and at 5 minutes after birth. Between 0 and 2 points are given for each of 5 characteristics: heart rate, breathing, colour, muscle tone and reflex irritability. The total score is between 0 and 10.

assisted reproductive technology: treatments or procedures that involve the in-vitro handling of human oocytes (eggs) and sperm or embryos for the purposes of establishing a pregnancy.

augmentation of labour: intervention after the spontaneous onset of labour to assist the progress of labour.

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

birth status: status of the baby immediately after birth (stillborn or live born).

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

breech presentation: a fetal presentation in which the buttocks are at the opening of the womb. In a frank breech, the legs are straight up in front of the body. In a complete breech the legs are folded, but the feet are above the buttocks. In an incomplete breech, the feet are below the buttocks.

caesarean section: a method of birth in which a surgical incision is made into the mother's womb via the abdomen to directly remove the baby.

diabetes (diabetes mellitus): a chronic condition in which the body cannot properly use its main energy source, the sugar glucose. This is due to a relative or absolute deficiency in insulin. Insulin, a hormone produced by the pancreas, helps glucose enter the body's cells from the bloodstream and then be processed by them. Diabetes is marked by an abnormal build-up of glucose in the blood and can have serious short- and long-term effects.

early neonatal death: death of a live born baby within 7 days of birth.

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

fetal death (stillbirth): death, before the complete expulsion or extraction from its mother, of a product of conception of 20 or more completed weeks of gestation or of 400 grams or more birthweight. Death is indicated by the fact that, after such separation, the fetus does not breathe or show any other evidence of life, such as beating of the heart, pulsation of the umbilical cord, or definite movement of voluntary muscles.

fetal death rate: number of fetal deaths per 1,000 total births (fetal deaths plus live births).

first degree laceration: graze, laceration, rupture or tear of the perineal skin during delivery that may be considered to be slight or that involves fourchette, labia, vagina or vulva.

forceps: handheld, hinged obstetric instrument applied to the fetal head to assist birth.

fourth degree laceration: perineal laceration, rupture or tear, as in third degree laceration, occurring during delivery and also involving anal mucosa or rectal mucosa.

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

high blood pressure/hypertension: definitions vary but a well-accepted one is from the World Health Organization: a systolic blood pressure of 140 mmHg or more or a diastolic blood pressure of 90 mmHg or more, or [the person is] receiving medication for high blood pressure.

Indigenous: a person of Aboriginal and/or Torres Strait Islander descent who identifies as an Aboriginal and/or Torres Strait Islander.

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

instrumental delivery: vaginal delivery using *forceps* or *vacuum extraction*.

intrapartum fetal death: fetal death occurring during labour.

intrauterine growth restriction: a fetus whose estimated weight is below the 10th percentile for its gestational age.

late neonatal death: death of a live born baby after 7 completed days and before 28 completed days.

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

low birthweight: weight of a baby at birth that is less than 2,500 grams.

maternal age: mother's age in completed years at the birth of her baby.

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

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

neonatal death: death of a live born baby within 28 days of birth.

neonatal mortality rate: number of neonatal deaths per 1,000 live births.

non-Indigenous: people who have indicated that they are not of Aboriginal or Torres Strait Islander descent.

parity: number of previous pregnancies resulting in live births or stillbirths, excluding the current pregnancy.

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

perinatal mortality rate: number of perinatal deaths per 1,000 total births (fetal deaths plus live births).

perineal status: the state of the perineum following birth. Perineal status is categorised as intact, *first, second, third, or fourth degree laceration, episiotomy,* or as another type of perineal laceration, rupture or tear.

plurality: the number of births resulting from a pregnancy.

postneonatal death: death of a live born baby after 28 days and within 1 year of birth.

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

presentation at birth: the part of the fetus that presents first at birth.

pre-term birth: birth before 37 completed weeks of gestation.

primary caesarean section: caesarean section to a mother with no previous history of caesarean section.

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

second degree laceration: perineal laceration, rupture or tear, as in first degree laceration, occurring during delivery and also involving pelvic floor, perineal muscles or vaginal muscles.

spontaneous labour: onset of labour without intervention.

stillbirth: see *fetal death (stillbirth)*.

teenage mother: mother younger than 20 at the birth of her baby.

third degree laceration: perineal laceration, rupture or tear, as in second degree laceration, occurring during delivery and also involving the anal floor, rectovaginal septum or sphincter not otherwise specified.

vacuum extraction: assisted birth using traction or rotation on a suction cap applied to the baby's head.

Abbreviations

ACT	Australian Capital Territory
AIHW	Australian Institute of Health and Welfare
BMI	body mass index
IPPV	intermittent positive pressure ventilation
NICU	neonatal intensive care unit
NMDS	national minimum data set
NSW	New South Wales
NT	Northern Territory
OECD	Organisation for Economic Co-operation and Development
PHN	Primary Health Network
PSANZ-PDC	Perinatal Society of Australia and New Zealand Clinical Practice Guideline for Perinatal Mortality Perinatal Death Classification
Qld	Queensland
SA	South Australia
SCN	special care nursery
SES	socioeconomic status
Tas	Tasmania
Vic	Victoria
WA	Western Australia
WHO	World Health Organization

References

ABS (Australian Bureau of Statistics) 2013a. Australian Statistical Geography Standard (ASGS): Volume 5—Remoteness Structure, July 2011. ABS cat. no. 1270.0.55.005. Canberra: ABS.

ABS 2013b. Census of Population and Housing: Socio-Economic Indexes for Areas (SEIFA), Australia, 2011. ABS cat. no. 2033.0.55.001. Canberra: ABS.

AIHW (Australian Institute of Health and Welfare): Leeds KL, Gourley M, Laws PJ, Zhang J, Al-Yaman F & Sullivan EA 2007. Indigenous mothers and their babies, Australia 2001–2004. AIHW cat. no. PER 38. Perinatal statistics series no. 19. Canberra: AIHW.

AIHW 2014. National Drug Strategy Household Survey detailed report: 2013. Drug statistics series no. 28. Cat. no. PHE 183. Canberra: AIHW.

AHMAC (Australian Health Ministers' Advisory Council) 2012. Clinical Practice Guidelines: Antenatal Care—Module 1. Canberra: Department of Health and Ageing.

CMACE & RCOG (Centre for Maternal and Child Enquiries & Royal College of Obstetricians and Gynaecologists) 2010. Management of women with obesity in pregnancy. Viewed 19 October 2015, <https://www.rcog.org.uk/globalassets/documents/guidelines/cmacercogjointguidelinemanagementwomenobesitypregnancya.pdf>.

COAG (Council of Australian Governments) 2012. National Healthcare Agreement 2012. Intergovernmental agreement on federal financial relations. Viewed 19 October 2015, <www.federalfinancialrelations.gov.au/content/national_agreements.aspx>.

Donnolley N & Li Z 2012. Perinatal National Minimum Data Set compliance evaluation 2006 to 2009. Perinatal statistics series no. 26. Cat. no. PER 54. Canberra: AIHW National Perinatal Epidemiology and Statistics Unit.

Hilder L, Zhichao Z, Parker M, Jahan S, Chambers GM 2014. Australia's mothers and babies 2012. Perinatal statistics series no. 30. Cat. no. PER 69. Canberra: AIHW.

Macaldowie A, Wang YA, Chughtai AA & Chambers GM 2014. Assisted reproductive technology in Australia and New Zealand 2012. Sydney: National Perinatal Epidemiology and Statistics Unit, the University of New South Wales.

OECD (Organisation for Economic Co-operation and Development) 2015. Health at a glance 2015: OECD indicators. Paris: OECD Publishing. Viewed 13 November 2015, <dx.doi.org/10.1787/health_glance-2015-en>.

SIMC (Statistical Information Management Committee) 2007. Guidelines for the use and disclosure of health data for statistical purposes. Canberra: AIHW.

WHO (World Health Organization) 1992. International Statistical Classification of Diseases and Related Health Problems. 10th Revision. Geneva: WHO.

Acknowledgments

This report was authored by Deanna Eldridge, Deanne Johnson and Kathryn Sedgwick of the Australian Institute of Health and Welfare (AIHW). The authors gratefully acknowledge contributions made by the following AIHW staff: Fadwa Al-Yaman, Mary Beneforti, Martin Edvardsson, Conan Liu, Jude Luzuriaga, Brett Nebe, Geoff Neideck, Deanna Pagnini and Charlotte Ramage. The authors would also like to thank Associate Professor Sharon Goldfeld for undertaking an external review of the report.

A large number of stakeholders provided valuable advice and input to the National Perinatal Data Collection and to this report, including the National Perinatal Epidemiology and Statistics Unit, the National Perinatal Data Development Committee and, in particular, the following staff from the state and territory health departments who provided data and reviewed this report:

- Lee Taylor, Tim Harrold and Kim Lim, Centre for Epidemiology and Evidence, NSW Ministry of Health.
- Vickie Veitch, Kirsty Anderson, Diana Stubbs and Gemma Wills, Clinical Councils Unit, Health Service Program, Department of Health and Human Services, Victoria.
- Sue Cornes, Joanne Ellerington, Vesna Dunne, Neil Gardiner and Ben Wilkinson, Health Statistics Unit, Department of Health, Queensland.
- Maureen Hutchinson and Alan Joyce, Maternal and Child Health Unit, Data Integrity Directorate, Department of Health, Western Australia.
- Wendy Scheil, Kevin Priest, Joan Scott and Britt Catcheside, Epidemiology Branch, Department of Health, South Australia.
- Peter Mansfield, Peggy Tsang and Cynthia Rogers, Health Information Unit, Department of Health and Human Services, Tasmania.
- Rosalind Sexton and Wayne Anderson, Epidemiology Section, ACT Health.
- Leanne O'Neil and Shu Qin Li, Health Gains Planning, Department of Health, Northern Territory.

The AIHW also acknowledges the time, effort and expertise contributed by all maternity staff in collecting and providing the data for the National Perinatal Data Collection.

Appendixes

Appendixes are available for download from the AIHW website on the *Australia's mothers and babies 2013—in brief* web page <www.aihw.gov.au/publication-detail/?id=60129553770>.

- Appendix A: Perinatal National Minimum Data Set items.
- Appendix B: State and territory perinatal data collections.
- Appendix C: Data quality, interpretation and methods.

Australia's mothers and babies 2013—in brief presents key statistics and trends on pregnancy and childbirth of mothers, and the characteristics and outcomes of their babies. This publication is designed to accompany the Perinatal data portal available online at <www.aihw.gov.au/perinatal-data/>.