

About

The health of both mothers and babies can have important lifelong implications. In 2019, there were 303,054 babies born to 298,567 mothers in Australia. Explore the characteristics and health of mothers and their babies through interactive data visualisations, and in-depth information and trends on the antenatal period, labour and birth, and outcomes for babies at birth.

This web report also provides information on stillbirths, neonatal and maternal deaths, including causes, maternal characteristics, timing and investigations.

Cat. no: PER 101

Findings from this report:

- The birth rate has declined from 64.6 per 1,000 women in 2009 to 57.6 in 2019
- In 2019, 298,567 women gave birth to 303,054 babies
- Every day in Australia, 6 babies are stillborn and 2 die within 28 days of birth (neonatal death)
- More than 30% of perinatal deaths were caused by a congenital anomaly

The data in this report are based on final 2019 data from the National Perinatal Data Collection (NPDC), the National Maternal Mortality Data Collection and the National Perinatal Mortality Data Collection.

For the first time, an early release of preliminary 2020 NPDC data is also being made available within 12 months of the relevant reporting period (these data tables are available under 'Data'). Please note that the preliminary 2020 data include data from 6 of 8 jurisdictions, totals in the preliminary 2020 data are not comparable with the final 2019 data used throughout this report. Final 2020 data and a full update of the *Australia's mothers and babies* web report will be released in mid-2022.

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Summary

Birth rate is falling and mothers are older

In 2019, the rate of women aged 15-44 giving birth was slightly lower than a decade ago (57.6 per 1,000 women in 2019 compared with 64.6 per 1,000 in 2009). The average age of women who gave birth has increased from 30.0 years in 2009 to 30.8 in 2019.

Most mothers access antenatal care and fewer mothers are smoking

In 2019, 77% of women who gave birth accessed antenatal care in the first trimester of their pregnancy, and 96% had 5 or more visits. The proportion of women who report smoking at any time during pregnancy has fallen from 13.7% in 2010 to 9.3% in 2019.

One in 3 mothers gave birth by caesarean section

The rate of women giving birth by caesarean section has continued to rise, from 32% in 2009 to 36% in 2019.

Cardiovascular disease the most common cause of maternal death

In 2019, the maternal mortality rate was 6.4 deaths per 100,000 women (17) giving birth. In the decade from 2010 to 2019, cardiovascular disease was the most common cause of death. During this period there were 200 women reported to have died during pregnancy, or within 42 days of the end of pregnancy, with a maternal mortality rate of 6.7 deaths per 100,000 women giving birth.

Rates of pre-term birth and low birthweight are stable

There has been little change in the proportion of pre-term (ranged from 8.2% to 8.6% between 2009 and 2019), and low birthweight babies (ranged from 6.2% to 6.6% between 2009 and 2019).

Congenital anomaly the most common cause of perinatal death

In 2019, 9.6 per 1,000 babies (2,897) died in the perinatal period, and congenital anomaly was the most common cause of perinatal death. Of these deaths, just over 75% were stillbirths (2,183) and just under 25% (714) were neonatal deaths.

Positive trends for Indigenous mothers

There were improvements over the past decade in antenatal care attendance in the first trimester (from 49% in 2012 to 67% in 2019), smoking at any time during pregnancy (from 50% in 2009 to 43% in 2019) and a small decrease in the proportion of babies born to Indigenous mothers who were small for gestational age (from 14.4% in 2013 to 13.7% in 2019).

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Demographics of mothers and babies

This section provides a snapshot of mothers and babies in Australia—how many there were, where they lived, what country they came from and how old they were, and how these factors have changed over time.

Key demographics and statistics

A snapshot of mothers and babies in Australia.

Maternal age

Mother's age in completed years at the birth of her baby.


Geography

Distribution of mothers by state and territory, remoteness area, SA3 and Primary Health Network.

Maternal country of birth

The country where a mother was born.

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Demographics of mothers and babies

Key demographics and statistics



Mothers

30.8 years

average maternal age

1 in 5 mothers

lived in low socio-economic areas

4.8% of mothers

were Indigenous

2 in 3 mothers

were born in Australia

1.5% of mothers

had a multiple birth



Babies

39 weeks

was the median gestational age

0.7% of babies

were stillborn

6.0% of babies

were Indigenous

Babies sex:

49% were female and 51% were male

2.9% of babies

were multiple births

In Australia, the number of mothers and babies has increased over time, from 294,547 mothers and 299,227 babies in 2009 to 298,567 mothers and 303,054 babies in 2019.

However, the rate of women giving birth has decreased from 65 per 1,000 women in 2009 to 58 per 1,000 women in 2019.

Birth rates also decreased over time for states and territories. Overall, the greatest decreases were for the Northern Territory (from 73 per 1,000 women in 2009 to 63 per 1,000 women in 2019), followed by Queensland (67 to 58) and New South Wales (65 to 57). The smallest decreases were for Western Australia (65 to 63) and South Australia (62 to 57).

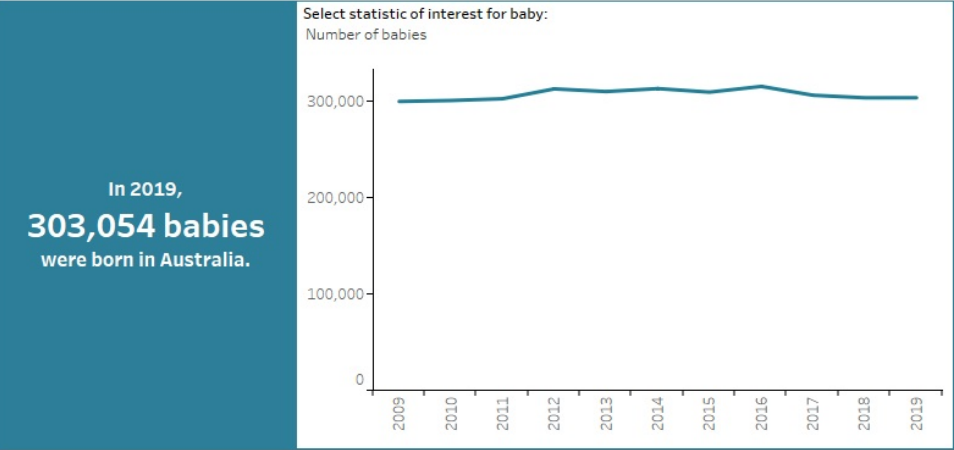
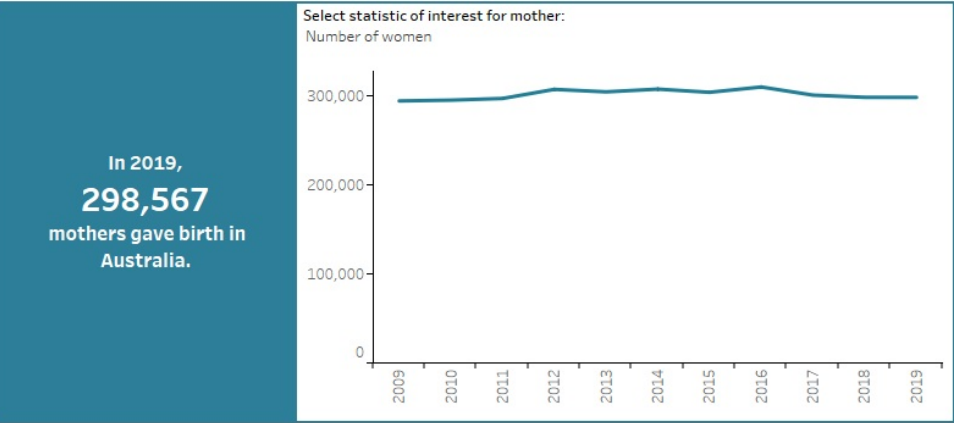
Many of the characteristics of mothers and babies in Australia are similar from year to year.

However, there are some interesting recent trends, including the rising average age of mothers and rate of caesarean section births, and the falling rate of mothers who smoke during pregnancy. These, and some key trends for babies, can be explored in the graph below.

Hover over the line graph below to see the results for a specific year.

The figure shows a range of statistics for mothers and babies, between 2009 and 2019. Over this period, the number of mothers was between 294,547 and 310,247 and the number of babies was between 299,227 and 314,814. In 2019, there were 298,567 mothers and 303,054 babies.

Key statistics for mothers and babies, 2009 to 2019



Source: Source: AIHW analysis of National Perinatal Data Collection

For information on the liveborn ratio of male to female babies see [National Perinatal Data Collection annual update data table 3.2.](#)

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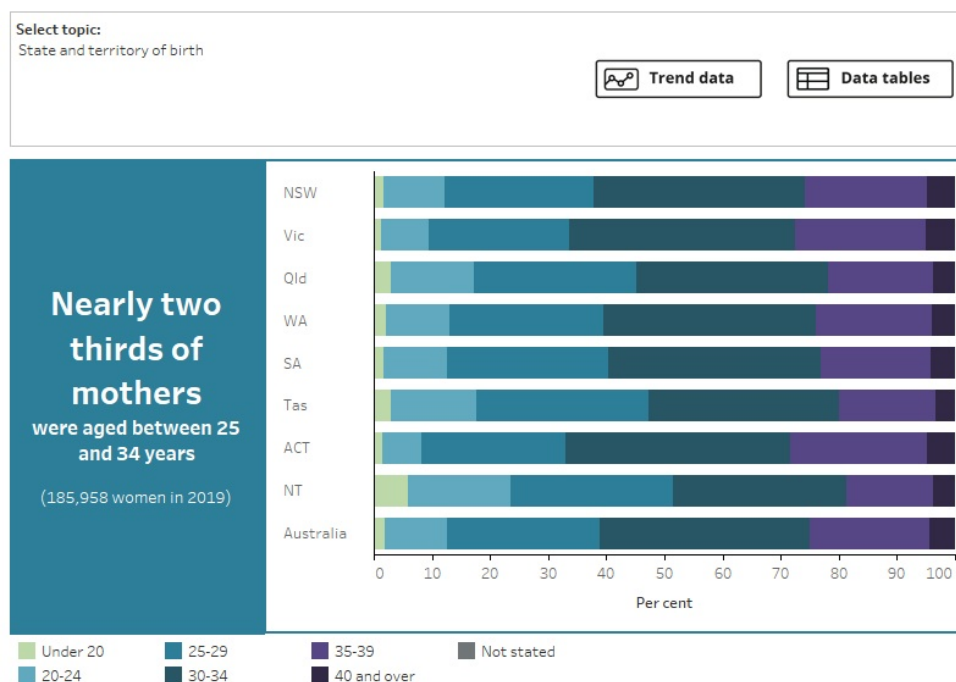
Demographics of mothers and babies

Maternal age

The average age of mothers has been rising over time, for both first-time mothers (from 27.9 years in 2009 to 29.4 in 2019) and those who have given birth previously (from 31.0 years in 2009 to 31.9 in 2019). The highest proportion of mothers were aged between 30 and 34 (more than one-third (36%) of all mothers).

The figure shows a bar chart for maternal age group by a range of topics for 2019 and a line graph for topic trends between 2009 and 2019. In 2019, 185,958 women were aged between 25 and 34 years.

Women who gave birth, by maternal age group and state and territory of birth, 2019



Notes:

1. Data are by state/territory of birth.
2. In 2019, 14.0% of women who gave birth in the ACT were non-ACT residents (proportion calculated after excluding records where state/territory of usual residence was 'Not stated'). Care must be taken when interpreting percentages.

Source: AIHW analysis of National Perinatal Data Collection
n.p. Not publishable due to small numbers, confidentiality or for reliability reasons.

The proportion of mothers teenage mothers (aged under 20) has decreased over time (4.0% in 2009 compared with 1.9% in 2019), and the proportion of mothers aged 40 and over has increased (4.0% in 2009 compared with 4.5% in 2019).

Mothers aged 29 or under were more likely than those aged 30 and over to be public patients and to give birth in public hospitals.

Three in five Indigenous mothers were aged between 20 and 29 (60%), with most aged 20-24 (31%). The proportion of Indigenous teenage mothers (aged under 20) has been falling over time, from 20% in 2009 to 11% in 2019, with a corresponding increase in those aged 25-29 (from 24% to 29%).

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Demographics of mothers and babies

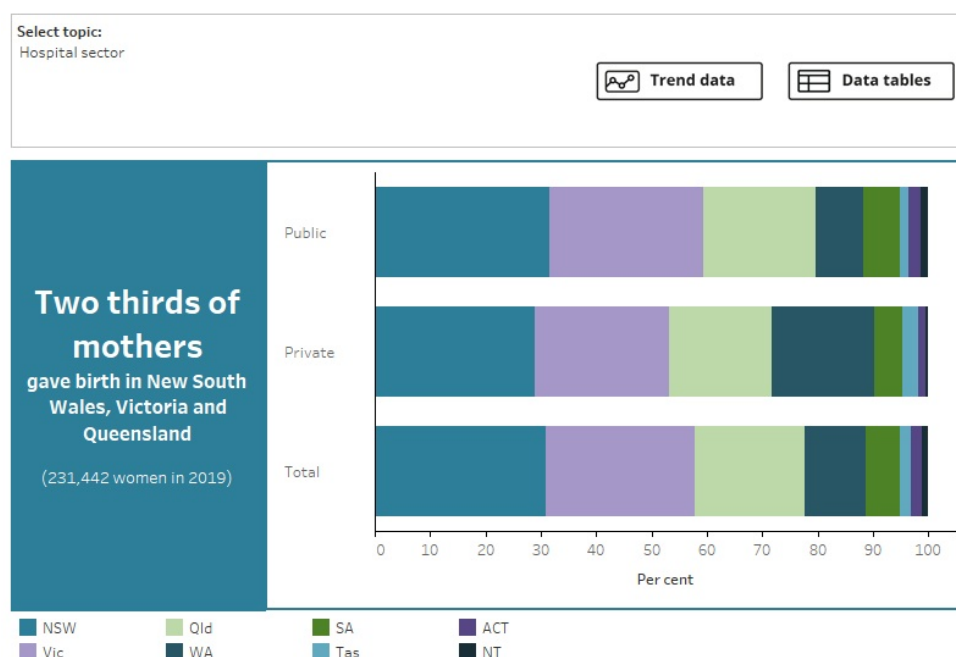
Geography

Where mothers live, and where they gave birth, can impact on their access to services. The distribution of mothers who gave birth across the states and territories generally followed the distribution of the Australian population, with the largest proportion and number of mothers in New South Wales.

The below graph presents data by state or territory where a mother gave birth, with the exception of the topics remoteness and socioeconomic status, which are based on state of the mother's usual residence.

The figure shows a bar chart for state and territory of birth or state and territory of mother's usual residence by a range of topics for 2019 and a line graph for topic trends between 2009 and 2019. In 2019, 231,442 women gave birth in New South Wales, Victoria or Queensland.

Women who gave birth, by state and territory and hospital sector, 2019



Notes:

1. Data are by state/territory of birth.
2. Includes women who gave birth in hospital only (excludes birth centres attached to hospitals).
3. For WA, some private hospitals admit public women; hence, the number of women who elected private status might be lower than the number of women admitted to private hospitals. Care must be taken when interpreting these numbers.

Source: AIHW analysis of National Perinatal Data Collection

n.p. Not publishable due to small numbers, confidentiality or for reliability reasons.

Understanding different patterns between states and territories is important for planning health service delivery. For example, the following groups were overrepresented as a proportion of women who gave birth:

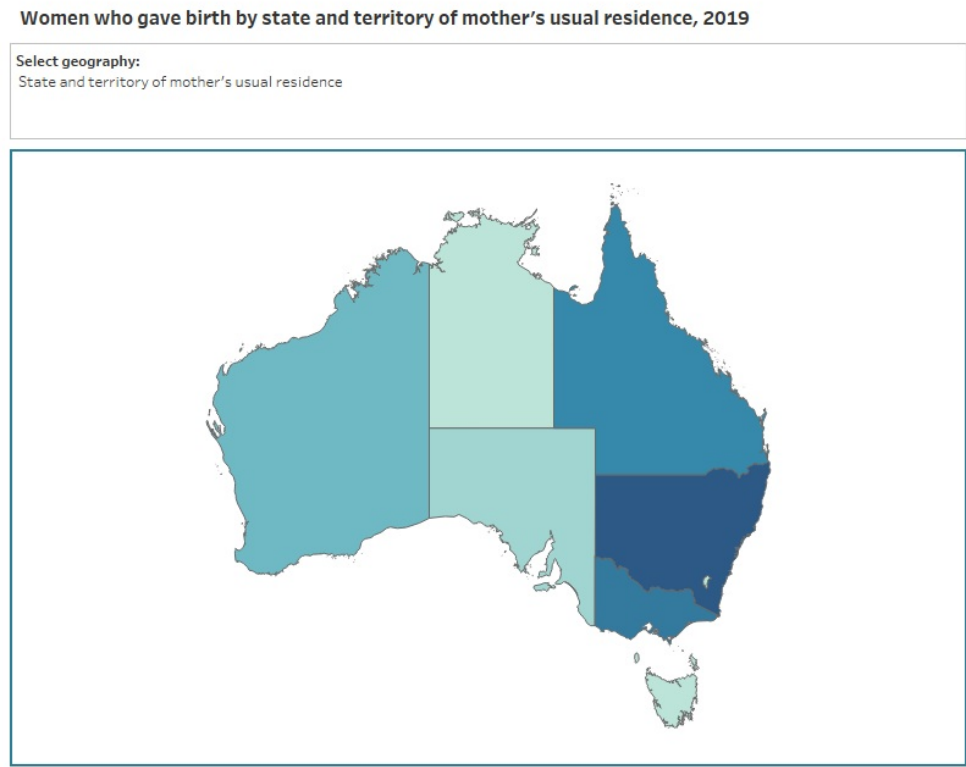
- teenage mothers (aged under 20) in the Northern Territory and Tasmania (mothers from the Northern Territory accounted for 1.2% of mothers overall compared with 3.7% of teenage mothers and Tasmanian mothers accounted for 1.9% of mothers overall compared with 3.0% of teenage mothers)
- older mothers (aged 40 or more) in New South Wales and Victoria (mothers from New South Wales accounted for 31% of mothers overall compared with 33% of older mothers and Victorian mothers accounted for 26% of mothers overall and 29% of older mothers)
- Indigenous mothers in the Northern Territory (mothers from the Northern Territory accounted for 1.2% of mothers overall compared with 8.4% of Indigenous mothers).

Factors such as the socioeconomic status and remoteness of the area in which the mother lives, can also be explored. Most mothers lived in *Major cities* and gave birth in their state or territory of usual residence. Relative to their contribution to all women who gave birth:

- Tasmanian mothers were more likely to live in the lowest socioeconomic areas (Tasmanian mothers accounted for 1.9% of mothers overall and 4.5% of mothers in the lowest socioeconomic areas)
- mothers in the Australian Capital Territory were more likely to live in the highest socioeconomic areas (mothers from the Australian Capital Territory accounted for 1.8% of mothers overall and 6.1% of mothers in the highest socioeconomic areas)

- mothers in the Northern Territory and Western Australia were more likely to live in *Remote* and *Very remote* areas (mothers from the Northern Territory accounted for 1.2% of mothers overall, 17.5% of mothers in *Remote* areas and 27.7% of mothers in *Very remote* areas and Western Australian mothers accounted for 11% of mothers overall, 33% of mothers in *Remote* areas and 32% of mothers in *Very remote* areas).

The figure shows a map of Australia with the distribution of mothers by state and territory of the mother’s usual residence, Primary Health Network, remoteness area or Statistical Area Level 3 for 2019.



Source: AIHW analysis of National Perinatal Data Collection
 n.p. Not publishable due to small numbers, confidentiality or for reliability reasons.

For information on births by state and territory see [National Perinatal Data Collection annual update data table 1.1.](#)

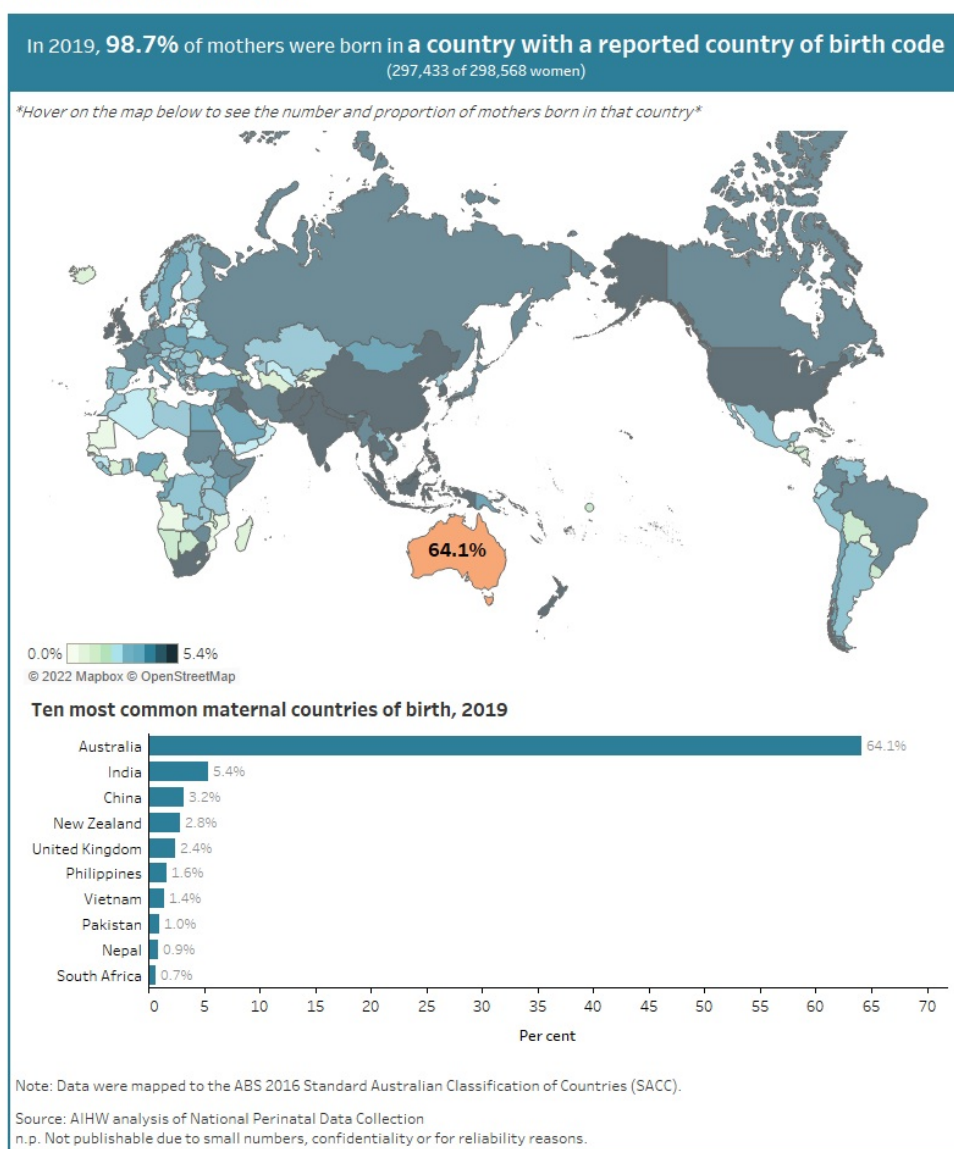
Demographics of mothers and babies

Maternal country of birth

The maternal country of birth may influence the health and wellbeing of both the mother and the baby, for a variety of complex cultural and societal reasons.


The figure shows a world map of Australia with the number and proportion of mothers who were born in each country maternal and a bar chart with the ten most common countries of birth for 2019. In 2019, 64.1% of mothers were born in Australia.

Maternal country of birth, 2019



Nearly 2 in 3 (64.1%) mothers were born in Australia. Of those mothers who were not born in Australia, the most common countries of birth were India (5.4%), China (3.2%) and New Zealand (2.8%).

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Antenatal period

The antenatal period covers the time from conception until birth. This section looks at the duration of pregnancy at the mother's first antenatal visit, the number of antenatal visits and maternal history and health, including previous caesarean section, smoking status, alcohol consumption, body mass index (BMI) and maternal medical conditions.

Antenatal care

Antenatal care is a planned visit between a pregnant woman and a midwife or doctor to assess and improve the wellbeing of the mother and baby throughout pregnancy.

Previous caesarean section

Caesarean section describes a method of birth in which the baby is removed directly from the uterus through an incision in the mother's abdomen.

Smoking during pregnancy

Smoking status is reported by the mother in the first 20 weeks of pregnancy, after 20 weeks of pregnancy or at any time during pregnancy.

Alcohol consumption during pregnancy

Alcohol consumption is reported by the mother in the first 20 weeks of pregnancy and after 20 weeks of pregnancy

Body mass index

The most commonly used method of assessing whether a person is normal weight, underweight, overweight or obese.

Medical conditions

Medical conditions include hypertension and diabetes, both pre-existing and conditions which are diagnosed during pregnancy.

Antenatal period

Antenatal care

Antenatal care is a planned visit between a pregnant woman and a midwife or doctor to assess and improve the wellbeing of the mother and baby throughout pregnancy. Antenatal care is associated with positive maternal and child health outcomes. It does not include visits where the sole purpose is to confirm the pregnancy.

Antenatal care is associated with positive maternal and child health outcomes—the likelihood of receiving effective health interventions is increased through attending antenatal care.

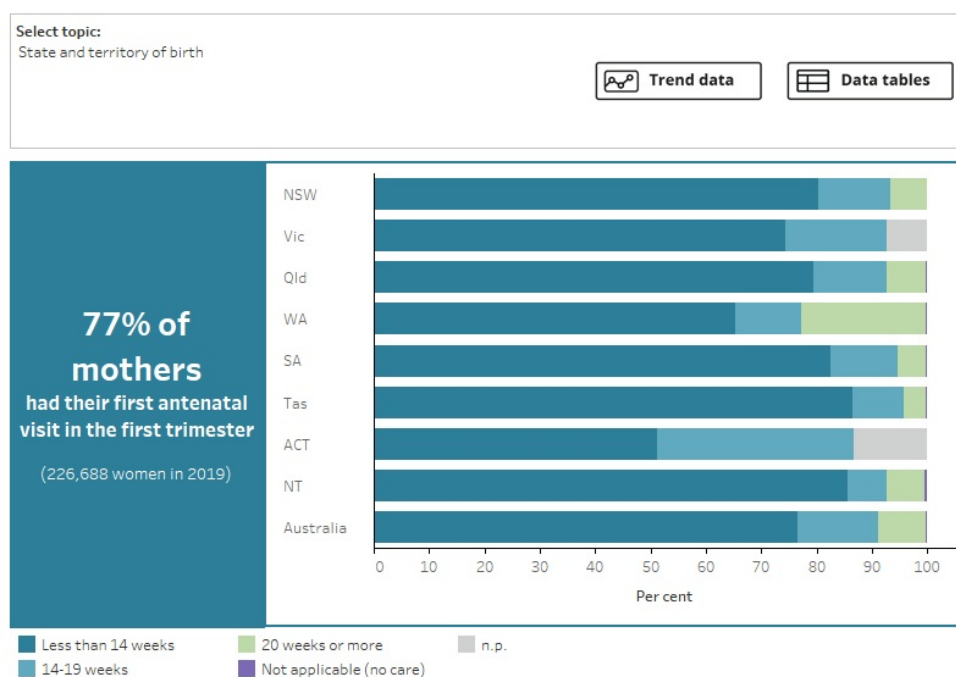
Duration of pregnancy at first antenatal visit

The proportion of women receiving antenatal care in the first trimester (before 14 weeks gestational age) is the most widely reported indicator. Regular antenatal care in the first trimester is associated with better maternal health in pregnancy, fewer interventions in late pregnancy and positive child health outcomes.

The Australian Pregnancy Care Guidelines (DoH 2020) recommend that a woman has her first antenatal visit within the first 10 weeks of pregnancy. In 2019, 55% of women attended antenatal care within the first 10 weeks of pregnancy.

The figure shows a bar chart for duration of pregnancy at first antenatal visit by a range of topics for 2019 and a line graph for topic trends between 2012 and 2019. In 2019, 226,688 women, or 77%, had their first antenatal visit in the first trimester.

Women who gave birth, by duration of pregnancy at first antenatal visit and state and territory of birth, 2019



Notes:

1. Percentage calculated after excluding records with 'Not stated' values. Care must be taken when interpreting percentages.
2. Due to differences in definitions and methods used for data collection, care must be taken when comparing across jurisdictions.
3. For WA, gestational age at first antenatal visit is reported by birth hospital; therefore, data may not be available for women who attend their first antenatal visit outside the birth hospital. This particularly affects hospitals without antenatal care services onsite.
4. For ACT, first antenatal visit is often the first hospital antenatal clinic visit. In many cases, earlier antenatal care provided by the woman's general practitioner is not reported.

Source: AIHW analysis of National Perinatal Data Collection

n.p. Not publishable due to small numbers, confidentiality or for reliability reasons.

The majority of women attend antenatal care in the first trimester, nationally (77%) and across all states and territories. Some mothers were less likely to have an antenatal visit in the first trimester, including those:

- who were aged under 20 (65%)
- who smoked during the first 20 weeks of pregnancy (69%) and after 20 weeks (67%)
- who were born overseas (74%)
- who had a parity of 4 or more (63%).

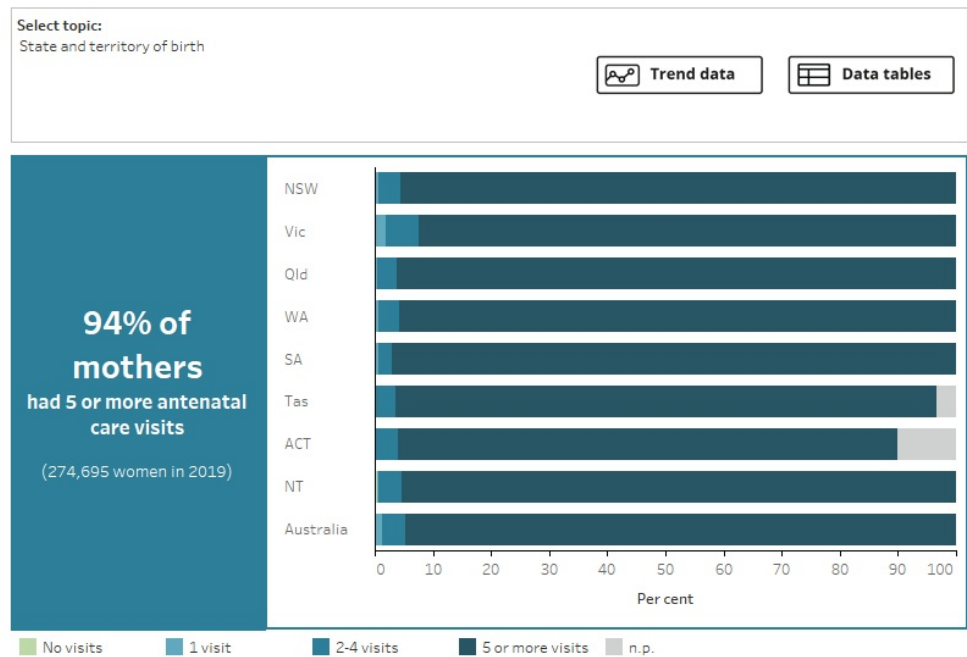
For related information see National Core Maternity Indicator [Antenatal care in the first trimester](#)

Number of antenatal visits

The Australian Pregnancy Care Guidelines (DoH 2020) recommend that first-time mothers with an uncomplicated pregnancy have 10 antenatal care visits during pregnancy (7 visits for subsequent uncomplicated pregnancies). In 2019, 85% of women attended 7 or more antenatal care visits and 57% attended 10 or more antenatal care visits.

The figure shows a bar chart for number of antenatal by a range of topics for 2019 and a line graph for trends between 2012 and 2019. In 2019, 274,695 women, or 94%, had 5 or more antenatal care visits.

Women who gave birth, by number of antenatal visits and state and territory of birth, 2019



Notes:

1. Because of differences in definitions and methods used for data collection, care must be taken when comparing across jurisdictions.

2. In 2019, 14.0% of women who gave birth in the ACT were non-ACT residents (proportion calculated after excluding records where state/territory of usual residence was 'Not stated'). Care must be taken when interpreting percentages. The ACT uses broader inclusion criteria for these conditions, and data are collected from multiple sources.

Source: AIHW analysis of National Perinatal Data Collection

n.p. Not publishable due to small numbers, confidentiality or for reliability reasons.

More than 9 in 10 (94%) mothers had at least 5 or more antenatal visits during their pregnancy. This proportion was slightly less among teenage mothers (aged under 20) (91%) and mothers who smoked in the first 20 weeks of pregnancy (89%) and after 20 weeks (88%).

The proportion of mothers who had 5 or more antenatal visits decreased as the number of previous pregnancies increased (from 96% among mothers who had had no previous pregnancies to 87% among mothers who had had four or more previous pregnancies).

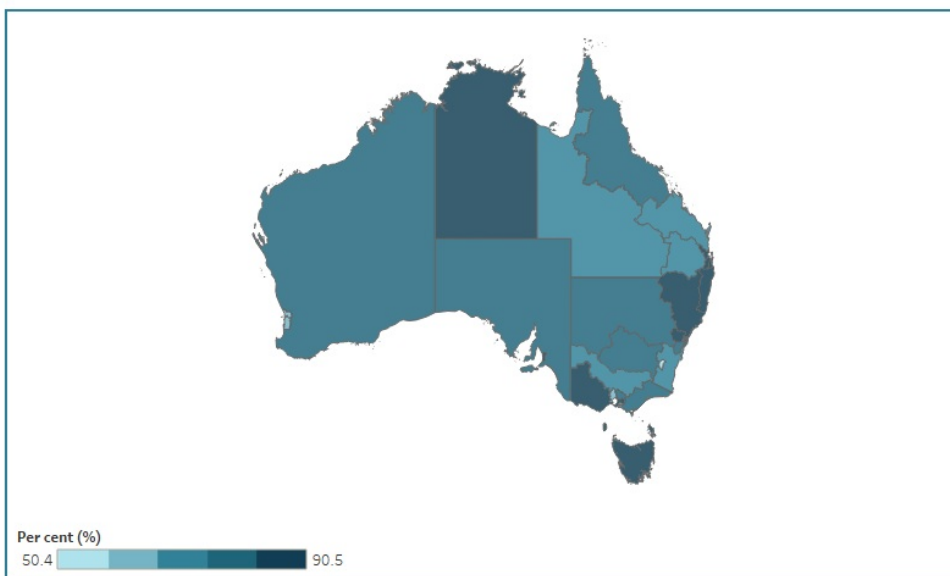
Antenatal care and Primary Health Network area

The figure shows a map of Australia with the distribution mothers who had at least one antenatal care visit in the first trimester by Primary Health Network area for 2019. The map can also alternate between displays of the distribution of mothers who attended five antenatal visits or more and by the years 2013 to 2019.

Per cent of women who had at least one antenatal visit in the first trimester, by Primary Health Network area, 2019

Select year:
2019

Select group:
At least one antenatal visit in the first trimester



Notes:

1. Percentage calculated after excluding records with 'Not stated' values. Care must be taken when interpreting percentages.
2. Data are by place of mother's usual residence. Because of differences in definitions and methods used for data collection, care must be taken when comparing across jurisdictions.
3. For WA, gestational age at first antenatal visit is reported by birth hospital; therefore, data may not be available for women who attend their first antenatal visit outside the birth hospital. This particularly affects hospitals without antenatal care services onsite.
4. For ACT, first antenatal visit is often the first hospital antenatal clinic visit. In many cases, earlier antenatal care provided by the woman's general practitioner is not reported.
5. Between 2013 and 2016, Primary Health Network (PHN) derived from Statistical Area Level 2 (SA2) of the ABS 2011 Australian Statistical Geography Standard (ASGS) (or Statistical Local Area for jurisdictions for which SA2 was not available). From 2017, PHN derived from SA2 of the ABS 2016 ASGS. PHN only calculated where geographic area of usual residence was provided. Excludes mothers not usually resident in Australia and those whose state or territory of usual residence was 'Not stated'.
6. Data may not add to the total due to rounding.

Source: AIHW analysis of National Perinatal Data Collection

The proportion of mothers attending an antenatal care visit in the first trimester and the proportion of mothers attending at least 5 or more antenatal visits varied across Primary Health Network (PHN) areas.

The proportion of mothers who attended an antenatal care visit in the first trimester ranged from 50% (in the Australian Capital Territory) to 90.5% (in Western Victoria) across PHN areas.


A high proportion of mothers attended 5 or more antenatal visits across all PHN areas—ranging from 86% in the Australian Capital Territory to 98% in Brisbane North.

For more information on antenatal care by Primary Health Network area see [National Perinatal Data Collection annual update data tables 5.1 and 5.2](#).

References

DoH (Department of Health) 2020. [Clinical Practice Guidelines: Pregnancy Care](#). Canberra: DoH. Viewed 13 April, 2021.

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Antenatal period

Previous caesarean section

Caesarean section describes a method of birth in which the baby is removed directly from the uterus through an incision in the mother's abdomen. This procedure is generally performed when vaginal delivery is likely to pose a risk to the health of the mother or baby, or in scenarios such as stalled labour or unsuccessful vaginal delivery.

The figure shows a bar chart for multiparous women who gave birth and had a previous caesarean section by range of topics for 2019. The figure also shows a line graph of trends in proportion of multiparous women by number of previous caesarean section and a range of topics over 2012 to 2019. In 2019, 52,687 women, or 32%, had previously given birth by caesarean section.

Multiparous women who gave birth by previous caesarean section and state and territory of birth, 2019



Note: Data excludes Vic.


Source: AIHW analysis of National Perinatal Data Collection
n.p. Not publishable due to small numbers, confidentiality or for reliability reasons.

The majority of mothers who had a previous caesarean section had a repeat caesarean section (77%). Having had a previous caesarean section was the most common main reason for having a caesarean section.

Of mothers who have previously given birth and had a caesarean section, 23.7% had had one previous caesarean section, 5.7% had had two previous caesarean sections, and 1.6% had had three or more. The number of previous caesarean sections differed little by remoteness or socioeconomic status of the mother's usual residence.

For related information see National Core Maternity Indicator [Women having their second birth vaginally whose first birth was by caesarean section](#)

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Antenatal period

Smoking during pregnancy

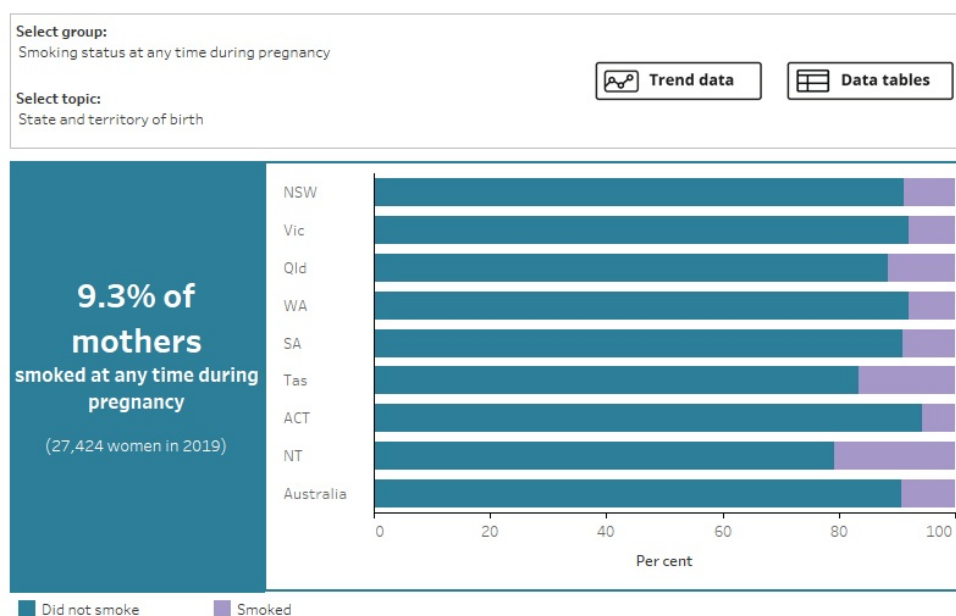
Smoking during pregnancy is the most common preventable risk factor for pregnancy complications and supporting women to stop smoking during pregnancy can reduce the risk of adverse outcomes for mothers and their babies.

Smoking is associated with poorer perinatal outcomes, including low birthweight, being small for gestational age, pre-term birth and perinatal death.

Support to stop smoking is widely available through antenatal clinics.

The figure shows proportions of women who smoked at any time during pregnancy, smoked in the first 20 weeks of pregnancy or smoked after 20 weeks of pregnancy by a range of topics for 2019. The figure also shows a line graph of trends for women who gave birth between 2011 and 2019 by smoking status. In 2019, 30,224 mothers, or 10%, smoked at any time during pregnancy.

Women who gave birth, by smoking status at any time during pregnancy and state and territory of birth, 2019



Notes:

1. Mother's tobacco smoking status during pregnancy is self-reported.
2. Percentage calculated after excluding records with 'Not stated' values. Care must be taken when interpreting percentages.
3. Data are by state/territory of birth. Because of differences in definitions and methods used for data collection, care must be taken when comparing across jurisdictions.
4. For WA, 'Smoked' includes occasional smoking. 'Did not smoke' includes 'Not determined' average number of tobacco cigarettes smoked per day in first 20 weeks of pregnancy and after 20 weeks of pregnancy. For WA, smoking status was determined at multiple locations and times and is therefore difficult to report accurately at time of birth.

Source: AIHW analysis of National Perinatal Data Collection

The most recent data shows that almost 1 in 10 mothers (9.3%) report smoking at any time during pregnancy, a rate that has been gradually falling since data became available in 2009 (14.6%). Teenage mothers (aged under 20) were the most likely to smoke (33%), followed by mothers aged 20-24 years (21%).

About 1 in 5 women who reported smoking during the first 20 weeks of pregnancy did not continue to smoke after 20 weeks.

Some women may smoke before knowing they are pregnant, and stop once they find out they are pregnant. According to the 2019 National Drug Strategy Household Survey, around 1 in 5 (22%) women smoked before they knew they were pregnant, and 1 in 10 (11%) smoked after they found out they were pregnant (AIHW 2020).


As the number of previous pregnancies increased, so did the proportion of mothers who smoked, with nearly 1 in 3 mothers (30%) who had 4 or more previous pregnancies reporting smoking during pregnancy. Mothers living in *Very remote* areas (35.2%) or in the lowest socioeconomic areas (17.7%) also had higher rates of smoking than mothers in *Major cities* (6.8%) and the highest socioeconomic areas (2.8%), respectively. These differences were apparent even after adjusting for maternal age.

For related information see National Core Maternity Indicator [Smoking during pregnancy](#)

References

AIHW (Australian Institute of Health and Welfare) 2020. [National Drug Strategy Household Survey 2019](#). Drug statistics series no. 32. Cat. no. PHE 270. Canberra: AIHW. Viewed 13 April, 2021.

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Antenatal period

Alcohol consumption during pregnancy

The consumption of alcohol is widespread within Australia and entwined with many social and cultural activities. Alcohol consumption in pregnancy can lead to poorer perinatal outcomes including low birthweight, being small for gestational age, pre-term birth and fetal alcohol spectrum disorder (FASD) (NHMRC 2020).

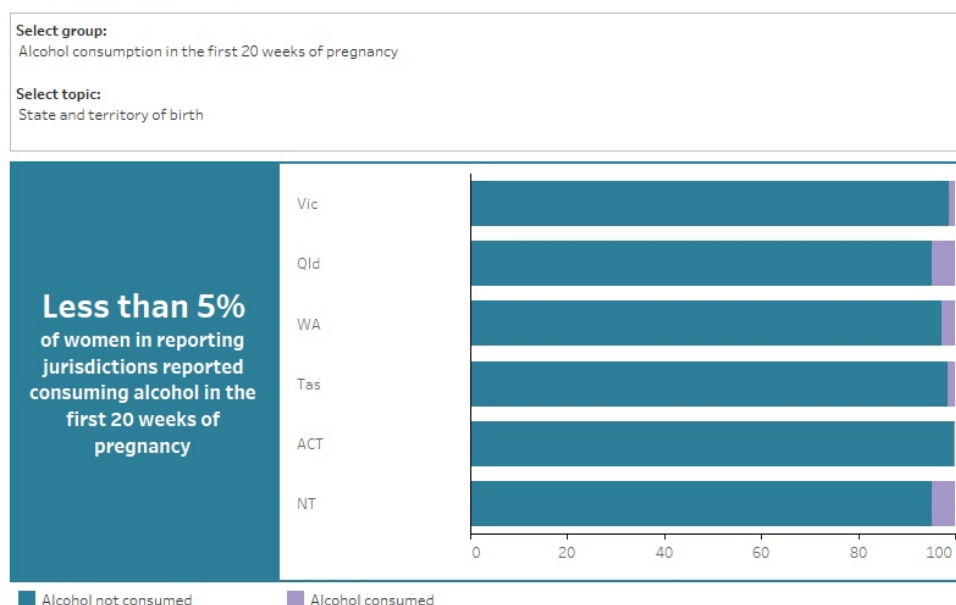
FASD refers to a range of adverse physical, learning and behavioural effects after exposure to alcohol during pregnancy, with issues occurring into childhood and adult life (NHMRC 2020).

The National Health and Medical Research Council (NHMRC) advises that women who are pregnant or planning a pregnancy should not drink alcohol (NHMRC 2020). Support to address alcohol consumption is widely available through antenatal clinics.

Data on maternal consumption of alcohol during pregnancy were available for the first time in 2019. Data exclude New South Wales and South Australia.

The figure shows proportions of women by alcohol consumption status in the first twenty weeks of pregnancy by a range of topics including state and territory of birth, indigenous status and maternal age. In 2019, less than 5% of women in reporting jurisdictions reported consuming alcohol in the first 20 weeks of pregnancy.

Women who gave birth, by alcohol consumption in the first 20 weeks of pregnancy and state and territory of birth, 2019



Notes:

1. Mother's alcohol consumption status during pregnancy is self-reported.
2. Because of differences in definitions and methods used for data collection, care must be taken when comparing across jurisdictions.
3. Data excludes NSW and SA.
4. Qld supplied data on alcohol consumption status before 20 weeks of pregnancy for births from 1 July 2019. Qld and WA supplied data on alcohol consumption status after 20 weeks of pregnancy for births from 1 July 2019.
5. Percentage calculated after excluding records with 'Not stated' values. Care must be taken when interpreting percentages.
6. Data are by state/territory of birth. Because of differences in definitions and methods used for data collection, care must be taken when comparing across jurisdictions.

Source: Source: AIHW analysis of National Perinatal Data Collection

The vast majority of women did not report consuming alcohol in the first 20 weeks of pregnancy or after 20 weeks—ranging from 95% to 100% for the 6 jurisdictions reported in 2019.

The proportion of women who did report consuming alcohol in the first 20 weeks decreased after 20 weeks of pregnancy (from a range of 0.3% to 4.9% in the first 20 weeks, down to a range of 0.1% to 1.7% after 20 weeks).

Women were more likely to consume alcohol in the first 20 weeks of pregnancy if they were:


- Teenage mothers (aged under 20) (3.5%)
- Indigenous (9.1%)
- Lived in *Remote* (5.9%) or *Very remote* (9.2%) areas

Women were also more likely to consume alcohol after 20 weeks of pregnancy if they were Indigenous and lived in *Remote* or *Very remote* areas.

References

NHMRC (National Health and Medical Research Council) 2020. [Australian guidelines to reduce health risks from drinking alcohol](#). Canberra: NHMCR. Viewed 18 January 2021. Canberra: NHMCR. Viewed 18 January 2021.

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Antenatal period

Body mass index

Obesity in pregnancy contributes to increased risks of illness and death for both mother and baby. Pregnant women who are obese have an increased risk of thromboembolism, gestational diabetes, pre-eclampsia, post-partum haemorrhage (bleeding) and wound infections. They are also more likely to deliver via caesarean section. Babies of mothers who are obese have higher rates of congenital abnormality, pre-term birth, stillbirth and neonatal death than babies of mothers who are not obese (RCOG 2018).

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

Data on maternal BMI were available for mothers in all states and territories for the first time in 2016. However, data collection methods vary between jurisdictions, so care must be taken when making comparisons.

The figure shows a bar chart for body mass index by a range of topics for 2019 and a line graph of topic trends between 2012 and 2019. In 2019, 138,445 women, or nearly half of mothers, were overweight or obese.

Women who gave birth, by body mass index and state and territory of birth, 2019



Notes:

1. Percentage calculated after excluding records with 'Not stated' values. Care must be taken when interpreting percentages.
2. Data are by state/territory of birth. BMI source data and methods used for data collection in states and territories are not uniform. Care must be taken when comparing across jurisdictions.
3. For Qld and Tas, mother's height and weight at conception were self-reported.
4. For SA and NT, BMI was calculated from mother's height and weight measured at the first antenatal visit.

Source: AIHW analysis of National Perinatal Data Collection

In 2019, nearly half (47.5%) of mothers were overweight or obese. The proportion of mothers who were overweight or obese was highest among mothers aged 40 or over (52.5%).

The proportion of overweight or obese mothers increased with the number of previous pregnancies. Nearly 2 in 5 (39%) mothers who had 4 or more previous pregnancies were obese compared with about 1 in 5 (21%) mothers with only one previous pregnancy.

Mothers who were overweight or obese were more likely to have a caesarean section birth (53.8%), than have a non-instrumental vaginal birth (45.4%).

References

RCOG (Royal College of Obstetricians and Gynaecologists) 2018. Care of women with obesity in pregnancy. Green-top Guideline No. 72. London: RCOG. Viewed 18 January 2021.

Antenatal period

Maternal medical conditions

Diabetes and hypertension (high blood pressure) are significant sources of maternal illness and death. Pregnant women with pre-existing or gestational diabetes or pre-existing or gestational hypertension disorders have increased risk of developing adverse outcomes in pregnancy.

Please note that data collection methods for diabetes and hypertension vary across states and territories, and data exclude Victoria.

Diabetes

Diabetes affecting pregnancy can be pre-existing (that is, type 1 or type 2) or may arise as a result of the pregnancy (gestational diabetes) (AIHW 2019). It can have short-term and long-term implications for both mothers and their babies and the type and severity of complications may differ according to type of diabetes experienced in pregnancy (AIHW 2019).

Monitoring diabetes during pregnancy is important as it provides information on the impact of diabetes during pregnancy and its complications, identifies groups at higher risk and assists with the planning, monitoring and provision of services (AIHW 2019).

The figure shows a bar chart of maternal diabetes status by a range of topics in 2019 and a line graph of topic trends between 2014 and 2019. In 2019, 33,867 women, or 11%, had gestational diabetes.

Women who gave birth, by diabetes status and state and territory of birth, 2019



Notes:

1. Because of differences in definitions and methods used for data collection, care must be taken when comparing across jurisdictions.
2. In 2019, 14.0% of women who gave birth in the ACT were non-ACT residents (proportion calculated after excluding records where state/territory of usual residence was 'Not stated'). Care must be taken when interpreting percentages. The ACT uses broader inclusion criteria for these conditions, and data are collected from multiple sources.

Source: AIHW analysis of National Perinatal Data Collection

Since 2014, the proportion of women with gestational diabetes has been increasing (8.3% in 2014 compared with 13.5% in 2019).

In 2019, older mothers were more likely to have gestational diabetes (17.8% among mothers aged 40 and over compared with 5.0% for those aged under 20) or pre-existing diabetes (including types 1 and type 2 diabetes) (1.7% among mothers aged 40 and over compared with 0.4% for those aged under 20).

Pre-existing and gestational diabetes increased with the number of previous pregnancies (for example, from 11% among mothers with no previous pregnancies to 15% among mothers with four or more previous pregnancies). However, this pattern may be affected by maternal age, as women who have had more pregnancies are likely to be older on average than those with fewer pregnancies.

Hypertension

Hypertension is a leading cause of illness and death for mothers and babies (Queensland Clinical Guidelines 2015). Complications of hypertension that can affect the mother include cerebral injury, liver and kidney failure and those which can affect the baby include being born pre-term, being small for gestational age and being admitted to the special care nursery (Queensland Clinical Guidelines 2015). The figure shows a bar chart of women who gave birth by hypertension status by a range of topics for 2019 and a line graph of topic trends between 2014 and 2019. In 2019, 7,420 women, or 2%, had gestational hypertension.

Women who gave birth, by hypertension status and state and territory of birth, 2019



Notes:
1. Because of differences in definitions and methods used for data collection, care must be taken when comparing across jurisdictions.
2. In 2019, 14.0% of women who gave birth in the ACT were non-ACT residents (proportion calculated after excluding records where state/territory of usual residence was 'Not stated'). Care must be taken when interpreting percentages. The ACT uses broader inclusion criteria for these conditions, and data are collected from multiple sources.

Source: AIHW analysis of National Perinatal Data Collection
n.p. Not publishable due to small numbers, confidentiality or for reliability reasons.

The proportion of women with gestational hypertension has remained stable at about 3-4% since 2014.

In 2019, older mothers were more likely than younger age groups to have hypertensive disorders (both pre-existing and gestational); for example, 4.4% of mothers aged 40 and over had gestational hypertension compared with 3.1%-3.4% across younger age groups.

First-time mothers (4.4% in 2019) were more likely to have gestational hypertension than those who had given birth previously (ranging from 2.3% for mothers with one previous pregnancy to 2.9% for mothers with four or more). Mothers born in Australia (3.8%) were also more likely to have gestational hypertension than mothers born overseas (2.2%).

References

AIHW (Australian Institute of Health and Welfare) 2019. [Diabetes in pregnancy 2014-2015](#). Bulletin no. 146. Cat. no. CDK 7. Canberra: AIHW.

Queensland Clinical Guidelines 2015. [PDF Hypertensive disorders of pregnancy](#). MN15.13-V7-R20. Brisbane: Queensland Health. Viewed 18 January 2019.



Labour and birth

This section looks at key aspects of the labour and birthing process, including the onset of labour, place of birth, method of birth, Robson classification of caesarean sections, analgesia and anaesthesia administration, presentation and perineal status.

Place of birth

Place of birth includes births that occurred in hospitals, birth centres and at home.

Onset of labour

Onset of labour refers to the manner in which labour started. Labour can occur spontaneously or may be induced by medical or surgical intervention.

Method of birth

Method of birth refers to how the baby was delivered, this may be vaginally or by caesarean section.

Analgesia

Analgesia is used to relieve pain during labour.

Anaesthesia

Anaesthesia is used to relieve pain during operative delivery, that is, a caesarean section or instrumental vaginal birth.

Presentation

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

Perineal status

Perineal status refers to the state of the perineum following vaginal birth.

Labour and birth

Place of birth

Almost all births in Australia took place in hospitals (97%), in conventional labour wards. Of mothers who gave birth in hospital 3 in 4 (75%) did so in a public hospital. A small proportion of mothers gave birth elsewhere, including birth centres (2.3%), at home (0.3%), or in other settings (such as before arrival at hospital) (0.6%).

Home births are slightly more common mothers who have had 3 or more previous births (0.4%-0.5%), and are least common among first-time mothers (0.2%).

The figure shows a bar chart of the proportion of women who gave birth by place of birth and a range of topics for 2019 and a line graph of topic trends between 2019 and 2019. In 2019, 288,760 women, or 97%, gave birth in a hospital.

Women who gave birth, by place of birth and state and territory of birth, 2019



Notes:

1. 'Other' place of birth includes births that occur at a home other than that intended (unplanned home births); home births without a midwife or other medical professional in attendance (free births); births at a community health centre or babies born before arrival at hospital. In the NT, the majority of these births occurred in remote community health centres.
2. For multiple births, the place of birth of the first-born baby was used.

Source: AIHW analysis of National Perinatal Data Collection


n.p. Not publishable due to small numbers, confidentiality or for reliability reasons.

There was a trend toward shorter postnatal stays between 2009 and 2019: 22% of mothers were discharged less than 2 days after giving birth in 2019 (17% in 2009), and 13% of mothers stayed 5 or more days (20% in 2009).

Mothers were most likely to be discharged between 2 and 4 days after giving birth (63% in 2009 and 66% in 2019). Data are based on mothers who gave birth in hospitals and were discharged to home, and excludes data from Western Australia.

For more information on place of birth see [National Perinatal Data Collection annual update data tables 2.22 and 2.23](#).

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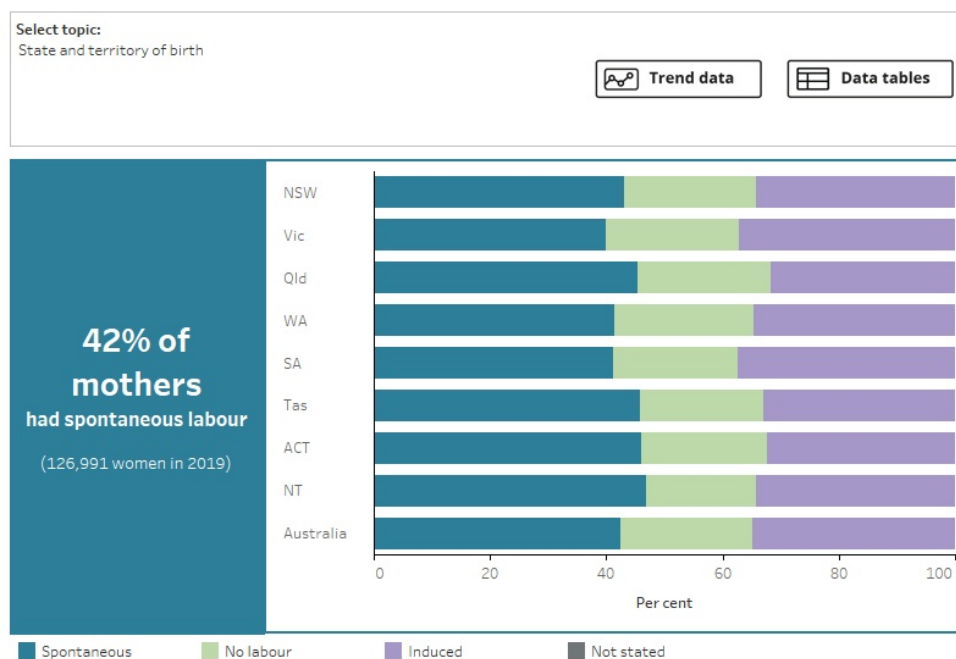
Labour and birth

Onset of labour

Labour can occur spontaneously or may be induced by medical or surgical intervention. If there is no labour, a caesarean section is performed.

The figure shows a bar chart of the proportion of women who had spontaneous labour, induced labour or no labour by a range of topics for 2019 and a line graph of topic trends from 2009 to 2019. In 2019, 126,991 women, or 42%, had spontaneous labour.

Women who gave birth, by onset of labour and state and territory of birth, 2019



Note: 'Induced' may include cases where induction of labour was attempted but labour did not result.

Source: AIHW analysis of National Perinatal Data Collection

In 2019, about 2 in 5 (42.5%) mothers who gave birth had a spontaneous labour, around 1 in 3 (35%) had induced labour and 1 in 5 had no labour (23%).

Labour onset varied by maternal age group. Teenage mothers (aged under 20) were the most likely to have spontaneous labour (55%), and mothers aged 40 or over were the most likely to have no labour onset (43%).

Onset of labour varied considerably by the number of babies born from a single pregnancy, with women who had a multiple pregnancy being more likely to have no labour (57%) than women with a singleton pregnancy (22%).

The rate of spontaneous labour has fallen (from 56% in 2009 to 42.5% in 2019) with corresponding increases in the rates of induced labour (from 25% to 35%) and no labour (from 18% to 23%).

For related information see National Core Maternity Indicator [Induction of labour](#)

Induction type and reason


For mothers whose labour was induced, a combination of medical and/or surgical types of induction were most commonly used. Data excludes Western Australia.

In 2019, the main reasons for inducing labour were diabetes (14%), pre-labour rupture of membranes (10%) and prolonged pregnancy (8%).

Augmentation of labour

Once labour starts, it may be necessary to intervene to speed up or augment the labour. Labour was augmented for 17% of mothers in 2019 (30% of mothers with spontaneous onset of labour). The augmentation rate was higher among first-time mothers, at 42% of those with spontaneous labour onset, compared with 21% of mothers who had given birth previously. Data excludes Western Australia.

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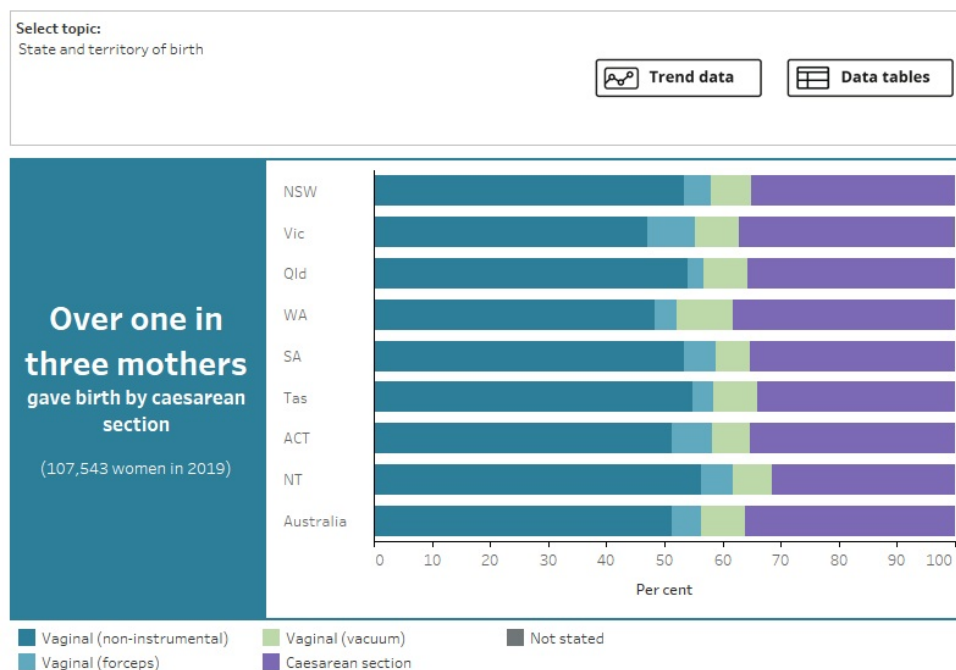
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Labour and birth

Method of birth

The figure shows a bar chart of the proportion of women who gave birth by method of birth by a range of topics for 2019 and a line graph of topic trends from 2009 to 2019. In 2019, 107,543 women, or 36%, gave birth by caesarean section in 2019.

Women who gave birth, by method of birth and state and territory of birth, 2019



Notes:

1. For multiple births, the method of birth of the first-born baby was used.
2. For NSW, WA (prior to 2016) and the NT, 'Non-instrumental vaginal' includes all women who had a vaginal breech birth, whether or not instruments were used. For the remaining jurisdictions, vaginal breech births are included only where instruments were not used.
3. In 2019 14.0% of women who gave birth in the ACT were non-ACT residents (proportion calculated after excluding records where state/territory of usual residence was 'Not stated'). Care must be taken when interpreting percentages. For example, 34.2% of ACT resident women had a caesarean section in 2019 compared with 41.2% of non-ACT residents who gave birth in the ACT.

Source: AIHW analysis of National Perinatal Data Collection

n.p. Not publishable due to small numbers, confidentiality or for reliability reasons.

In 2019, almost two in 3 women (64%) in Australia had vaginal births, while the remainder (36%) had a caesarean section birth. Mothers who had caesarean sections include all those who had no labour onset as well as those who required a caesarean section after labour started. For multiple births, women are categorised by the method of birth of the first-born baby.

Non-instrumental vaginal births were more common for women whose babies were born at term (52%) or post-term (50%), who were teenage mothers (aged under 20) (67%) and who were underweight (57%) or normal weight (53%).

Caesarean sections were more common among women whose babies were pre-term (50%), who were aged 40 and over (55%) and who were overweight (38%) and obese (44%).

Instrumental vaginal birth (both forceps and vacuum extraction) decreased with increasing parity and was much more common among women who had not previously given birth (10.1% for forceps and 13.1% for vacuum extraction) compared with women with a parity of 4 or more (0.5% for forceps and 1.5% for vacuum extraction).

The proportion of instrumental vaginal births assisted by forceps decreased with increasing remoteness (from 5.6% for *Major cities* to 2.5% for *Very remote* areas), and were more common among mothers whose babies were born post-term (7.7%, compared to 5.3% for mothers whose babies were born at term) and mothers who lived in the highest socioeconomic areas (5.8%, compared to 4.1% for mothers who lived in the lowest socioeconomic areas).

The proportion of instrumental vaginal births assisted by vacuum extraction was higher for women who gave birth in private hospitals (10.3%, compared with 6.8% for public hospitals) and mothers who lived in the highest socioeconomic areas (8.7%, compared to 6.0% for mothers who lived in the lowest socioeconomic areas).

Internationally, the caesarean section rate has been increasing in most Organisation for Economic Cooperation and Development (OECD) countries, including Australia, and Australia's rate of 34 per 100 live births is higher than the OECD average of 28 per 100 live births (OECD 2019).

While caesarean section is the most appropriate delivery method for many conditions and complications that can affect the mother and/or baby, the benefits need to be weighed against the risks (ACSQHC 2018). Risks to the mother include postoperative infection, haemorrhage and complications during future pregnancies. Risks to the baby include increased rates of asthma and obesity, and breathing difficulties and developmental issues in babies born by caesarean section at less than 39 weeks gestation (ACSQHC 2018).

One in 4 (25%) mothers had a primary caesarean section (that is, caesarean sections to mothers with no previous history of caesarean section). This rate was higher for first-time mothers (37%) and lower for mothers who had previously given birth (12%).

Having had a previous caesarean section was the most common main reason for having a caesarean section.

For related information see National Core Maternity Indicators:

- [Caesarean section](#)
- [Non-instrumental vaginal birth](#)
- [Instrumental vaginal birth](#)
- [Women having their second birth vaginally whose first birth was by caesarean section](#)

Robson classification of caesarean sections

In 2015, the World Health Organization (WHO) recommended that, rather than using a population-based estimate of caesarean section rate, the Robson 10 group classification system (Robson classification) be used to evaluate and compare caesarean section rates between groups of women (ACSQHC 2018; WHO RHR 2015).

The Robson classification allocates women into 10 mutually exclusive groups based on obstetric characteristics, such as the number of previous pregnancies, onset of labour, whether there has been a previous caesarean section, and the baby's gestational age (WHO 2018; WHO RHR 2015). This can provide a more detailed understanding of the relatively high caesarean section rate in Australia and can be used to inform targeted intervention.

Hover over the graph to see the definition of each Robson group.

The figure contains three bar charts displaying the number of women in each Robson classification group who gave birth in 2019, the number of women in each Robson classification group who gave birth by caesarean section in 2019 and the per cent of women in each Robson classification group who gave birth by caesarean section in 2019.



First-time mothers with a breech pregnancy (baby is delivered buttocks or feet first) (Robson group 6) were most likely to have a caesarean section (93%), followed by mothers who have previously given birth with a breech pregnancy (88.5%, Robson group 7) and those with singleton pregnancies near term who had had one or more previous caesarean sections (86%, Robson group 5).

References

- ACSQHC (Australian Commission on Safety and Quality in Health Care) 2018. [The Second Australian Atlas of Healthcare Variation](#). Sydney: ACSQHC. Viewed 3 January 2018.
- OECD (Organisation for Economic Co-operation and Development) 2019. [Health at a glance 2019: OECD indicators](#). Paris: OECD Publishing. Viewed 13 April 2021.
- WHO (World Health Organization) 2018. [Robson classification: implementation manual](#). Geneva: WHO. Viewed 10 May 2018.
- WHO RHR (Department of Reproductive Health and Research) 2015. [WHO statement on caesarean section rates](#). WHO/RHR/15.02. Geneva: WHO. Viewed 21 November 2018.

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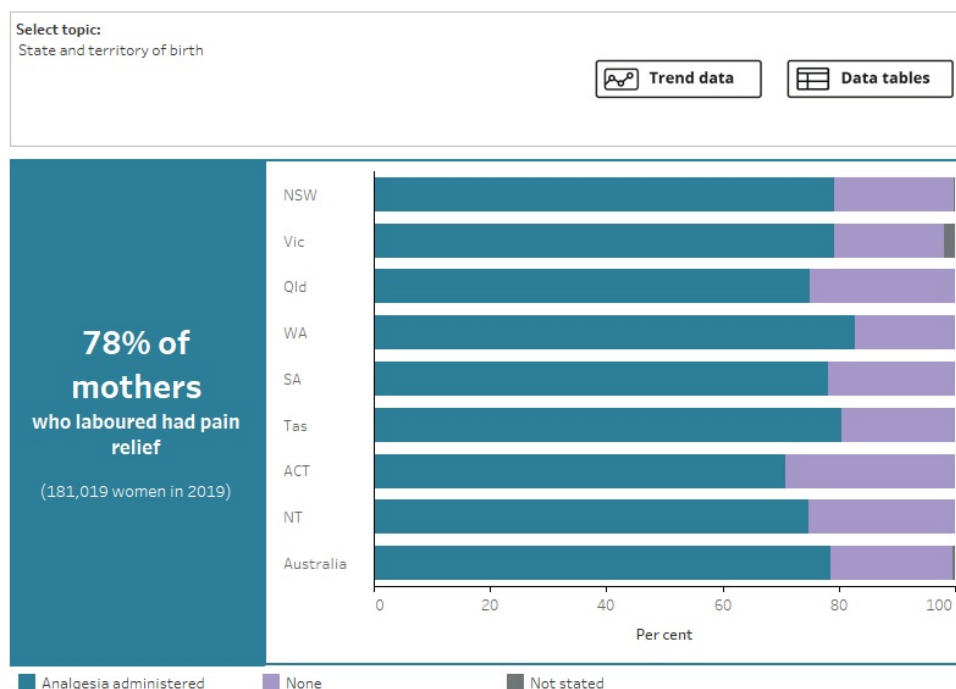
Labour and birth

Analgesia

Analgesia is used to relieve pain during labour. Data are therefore limited to mothers who had labour, whether spontaneous or induced (note that some mothers who labour may go on to have a caesarean section and receive anaesthesia rather than analgesia). More than one type of analgesic can be administered.

The figure shows a bar chart of the proportion of women who had labour by analgesia administration status by a range of topics in 2019 and a line graph displaying topic trends over the period from 2010 to 2019. In 2019, 181,019 women, or 78%, who laboured had pain relief.

Women who laboured, by analgesia administration status and state and territory of birth, 2019



Note: Only women who had a spontaneous or induced labour are included.

Source: AIHW analysis of National Perinatal Data Collection


Around 4 in 5 (78%) women who had labour in Australia received pain relief. In 2019, the most common types were nitrous oxide (inhaled) (53%), followed by epidural or caudal analgesic (32%) and systemic opioids (10%).

More than 9 in 10 women who had an instrumental vaginal birth received pain relief (96% for vaginal births assisted with forceps and 92% for vaginal births assisted with vacuum extraction). Additionally, women who gave birth in a private hospital were more likely to receive pain relief (84%) than women who gave birth in a public hospital (79%).

Compared with mothers who had pain relief, mothers who did not have pain relief were more likely to:

- be aged 40 or more (27%)
- have given birth before (from 26% for mothers with one previous pregnancy to 40% for mothers with four or more previous pregnancies)
- be Indigenous (age-standardised) (23%).

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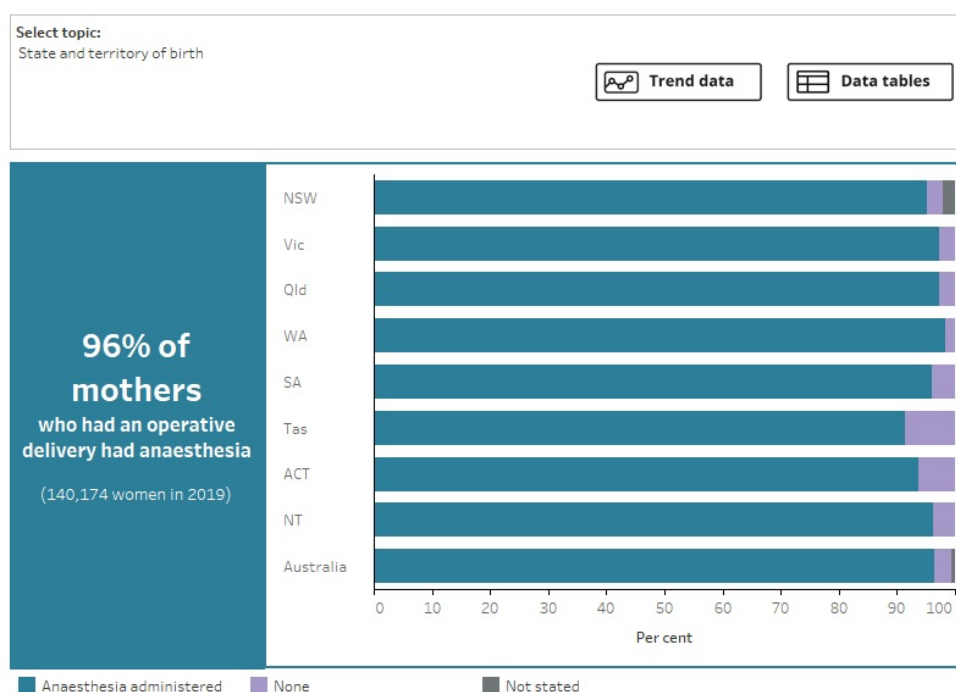
Labour and birth

Anaesthesia

Anaesthesia is used to relieve pain during operative delivery, that is, a caesarean section or instrumental vaginal birth. All women who have a caesarean section receive anaesthesia, except in the rare case of post-mortem delivery. More than one type of anaesthetic can be administered.

The figure shows a bar chart of women who had an instrumental vaginal birth or caesarean section by anaesthesia administration status and a range of topics for 2019. The figure also shows a line graph of the trends of anaesthesia administration by topics between 2010 and 2019. In 2019, 140,174 women, or 96%, who had an operative delivery had anaesthesia.

Women who had an instrumental vaginal or caesarean section birth, by anaesthesia administration status and state and territory of birth, 2019



Note: Only women who had an instrumental vaginal birth (includes forceps and vacuum extraction) or a caesarean section are included.

Source: AIHW analysis of National Perinatal Data Collection
n.p. Not publishable due to small numbers, confidentiality or for reliability reasons.

In 2019, most mothers who had a caesarean section had a regional anaesthetic (69% spinal, 18% epidural or caudal) and 5.5% had a general anaesthetic (note that some mothers had both).

Most mothers who had an instrumental vaginal birth had an anaesthetic. A regional anaesthetic was most common (62% epidural or caudal and 3.6% spinal), followed by a local anaesthetic to the perineum (23%).

Women who had a vaginal instrumental birth using forceps (93%) were more likely to have anaesthesia administered than women who had a vacuum extraction (86%).

First-time mothers were slightly more likely to have anaesthesia administered than women who had given birth before (for example, 3.6% of first-time mothers had no anaesthesia, compared with 2.0% of mothers who had previously given birth 4 or more times).

For related information see National Core Maternity Indicator [General anaesthetic for women giving birth by caesarean section](#)

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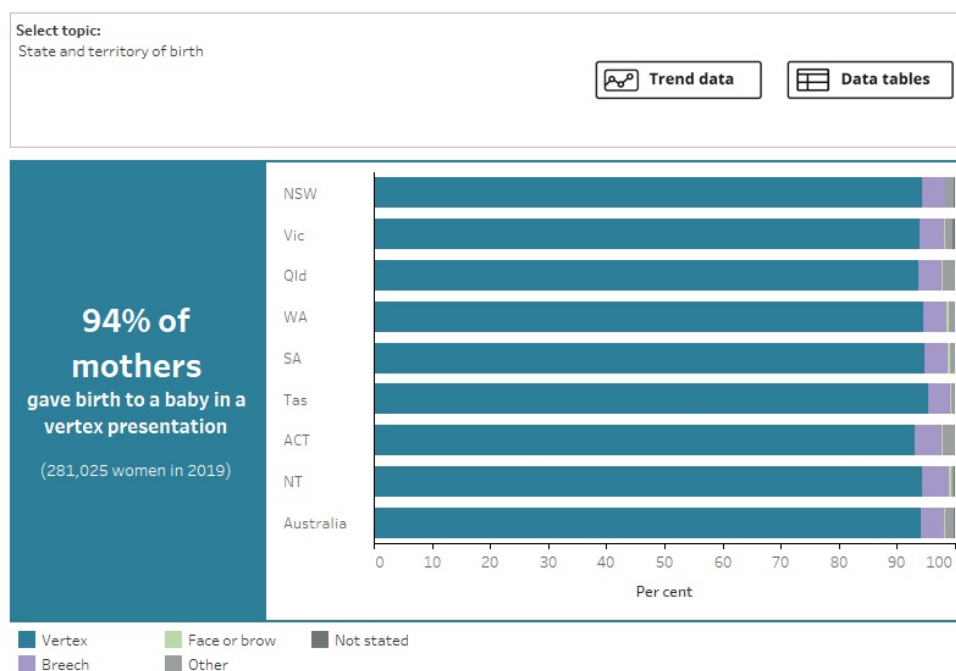
Labour and birth

Presentation

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

The figure shows a bar chart of the proportion of women who gave birth by presentation and a range of topics for 2019 and a line graph of topic trends between 2009 and 2019. In 2019, 281,025 women, or 94%, gave birth to a baby in a vertex presentation.

Women who gave birth, by presentation and state and territory of birth, 2019



Notes:

1. For multiple births, the presentation of the first-born baby was used.
2. 'Other' presentation includes shoulder/transverse and compound presentations.
3. In 2019, 14.0% of women who gave birth in the ACT were non-ACT residents (proportion calculated after excluding records where state/territory of usual residence was 'Not stated'). Care must be taken when interpreting percentages. For example, the percentage of breech presentation for ACT residents who gave birth in the ACT was 4.2%, and 6.8% for non-ACT residents who gave birth in the ACT.

Source: AIHW analysis of National Perinatal Data Collection

n.p. Not publishable due to small numbers, confidentiality or for reliability reasons.

More than 9 in 10 (94%) women gave birth to babies in a vertex (head first) presentation. Mothers with one, two, and three previous pregnancies (95% for all groups) were slightly more likely to have a vertex presentation than first time mothers (93%) and mothers with four or more previous pregnancies (94%).


Less than 1 in 10 (4.1%) of mothers had a baby in the breech position (buttocks or feet first). A higher proportion of mothers aged 40 and over (6.7%) had babies in a breech presentation than did younger mothers (for example, 3.0% each for both mothers aged under 20 and those aged 20-24).

Only 0.7% of mothers who had a baby in the breech position had a non-instrumental vaginal birth, compared with 10.4% of mothers who had a caesarean section.

Women who had a multiple birth were more likely to have a baby in a breech presentation (23%, compared with 75% of mothers with a baby in the vertex presentation), based on the presentation of the first born baby.

For information on presentation for babies see [National Perinatal Data Collection annual update data tables 3.13 and 3.15](#).

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Labour and birth

Perineal status

Perineal status refers to the state of the perineum after vaginal birth. Perineal status is categorised as intact, first degree laceration, second degree laceration, third or fourth degree laceration, episiotomy or other type of perineal laceration, rupture or tear. An episiotomy is an incision of the perineum and vagina to enlarge the vulval orifice. Data are specific to women who gave birth vaginally.

The figure shows a bar chart of the perineal status for the number per 100 women who gave birth vaginally by a range of topics for 2019. The figure also shows a line graph of topic trends from 2014 to 2019. In 2019, 42,250 women who gave birth vaginally had an intact perineum.

Women who gave birth vaginally, by perineal status and state and territory of birth, 2019



Notes:

1. Only women who gave birth vaginally are included.
2. Both an episiotomy and a laceration could be recorded; therefore, the sum of the components is greater than the total number of women who gave birth vaginally.
3. For multiple births, the perineal status after the birth of the first-born baby was used.
4. For NSW and WA, unspecified perineal tear and vulval or perineal haematoma are included in 'Other'.

Source: AIHW analysis of National Perinatal Data Collection

n.p. Not publishable due to small numbers, confidentiality or for reliability reasons.

Almost 1 in 4 (22%) mothers had an intact perineum. Where the perineum was not intact, second degree lacerations were most common (30%), followed by first degree lacerations (21%). Only a small proportion of women had a third or fourth degree laceration (less than 3%).

Around 1 in 4 (24%) mothers had an episiotomy, noting that women could be recorded as having both an episiotomy and some degree of laceration.

Internationally, Australia's rate of third and fourth degree lacerations was higher than the average for Organisation for Economic Co-operation and Development (OECD) countries in 2017 or nearest year for both non-instrumental and instrumental vaginal births:

- 2.5 per 100 non-instrumental vaginal births compared with the OECD average of 1.4
- 6.8 per 100 instrumental vaginal births compared with the OECD average of 5.5 (OECD 2019).

Variation between countries is likely to be affected by differences in clinical practice and reporting (ACSQHC 2018).

For related information see National Core Maternity Indicators:


- [Episiotomy](#)
- [Third and fourth degree tears](#)

References

ACSQHC (Australian Commission on Safety and Quality in Health Care) 2018. [The Second Australian Atlas of Healthcare Variation](#). Sydney: ACSQHC. Viewed 3 January 2018.

OECD (Organisation for Economic Co-operation and Development) 2019. [Health at a glance 2019: OECD indicators](#). Paris: OECD Publishing. Viewed 13 April 2021.

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Baby outcomes

This section looks at outcomes for the baby after birth, including gestational age, birthweight, birthweight adjusted for gestational age, Apgar score at 5 minutes after birth, resuscitation, baby's hospital length of stay and admission to special care nurseries or neonatal intensive care units.

Gestational age

Gestational age is the duration of pregnancy in completed weeks.

Birthweight

The first weight of the baby taken within an hour of birth.

Birthweight adjusted for gestational age

Allows for differentiation in a baby's growth status and maturity to be taken into account.

Apgar score at 5 minutes

Numerical score taken 5 minutes after birth to indicate the baby's condition.

Active resuscitation method

Active measures taken shortly after birth to assist the baby's ventilation and heartbeat or to treat depressed respiratory effort or correct metabolic disturbances.

Baby length of stay in hospital

Length of a baby's stay in hospital after birth in days.

Admission to a special care nursery or neonatal intensive care unit

Admission to special care nursery or neonatal intensive care unit occurs if babies require more specialised medical care and treatment than is available on the postnatal ward.

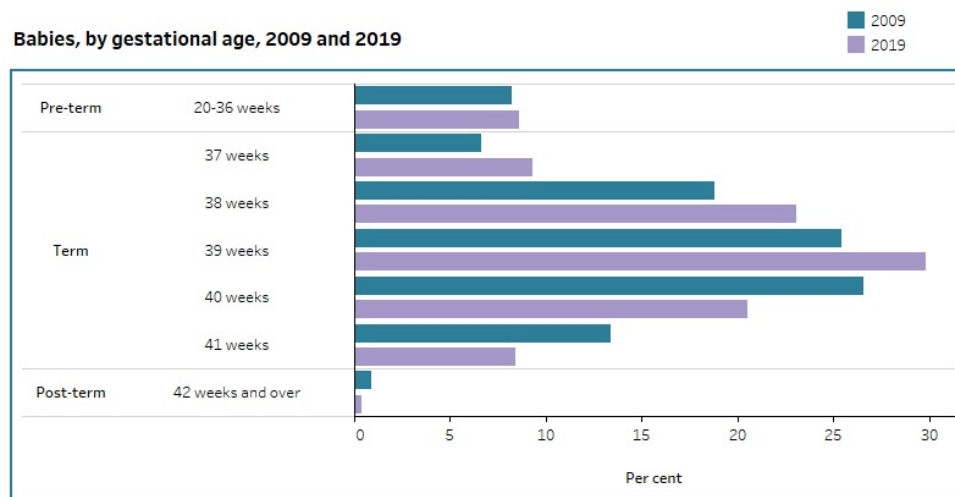
Baby outcomes

Gestational age

Gestational age is the duration of pregnancy in completed weeks. The gestational age of a baby has important implications for their health, with poorer outcomes generally reported for those born early. Gestational age is reported in 3 categories: pre-term (less than 37 weeks gestation), term (37 to 41 weeks) and post-term (42 weeks and over).

The figure shows a grouped bar chart comparing the distribution of babies by gestational age in 2009 and 2019.

Babies, by gestational age, 2009 and 2019



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

Source: AIHW analysis of National Perinatal Data Collection

Over time, the proportion of babies born between 20 and 36 weeks remained steady (8.2% in 2009 compared with 8.6% in 2019), while the proportion born between 37 and 39 weeks increased (for example, babies born at 38 weeks increased from 19% in 2009 to 23% in 2019) and the proportion born from 40 weeks onwards decreased (for example, babies born at 40 weeks decreased from 27% in 2009 to 21% in 2019). The figure shows a bar chart of the proportion of babies by gestational age by a range of topics for 2019 and a line graph of topic trends between 2009 and 2019. In 2019, 8.6% or 25,933 babies were born pre-term.

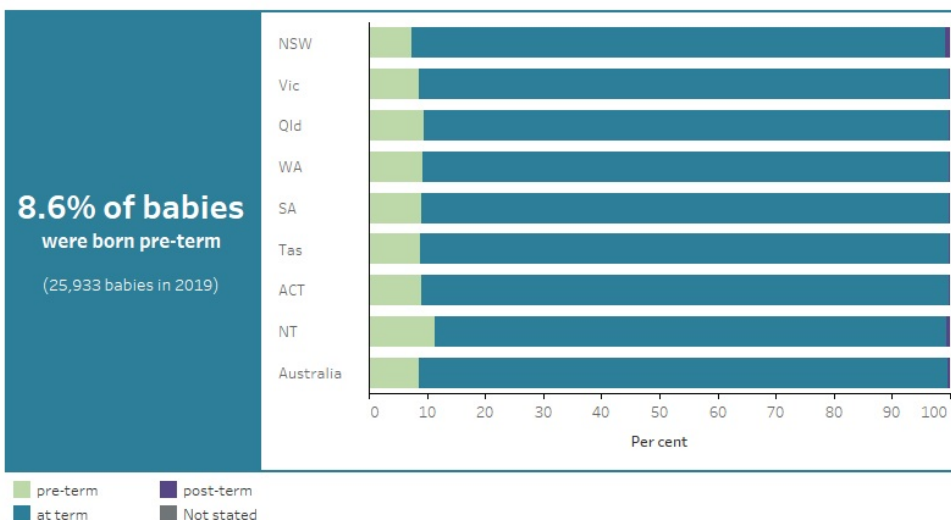
Babies, by gestational age and state and territory of birth, 2019

Select topic:

State and territory of birth

 Trend data

 Data tables



Notes:

1. Pre-term births may include a small number of births of less than 20 weeks gestation.
2. Many women travel from interstate (and overseas) to Vic to have a termination of pregnancy undertaken. This may result in a higher pre-term birth rate in Vic.
3. Births in Qld and WA may include late termination of pregnancy.
4. In 2019, 14.0% of women who gave birth in the ACT were non-ACT residents (proportion calculated after excluding records where state/territory of usual residence was 'Not stated'). Care must be taken when interpreting percentages. For example, the proportion of..

Source: AIHW analysis of National Perinatal Data Collection

n.p. Not publishable due to small numbers, confidentiality or for reliability reasons.

The vast majority of babies (91%) in Australia are born at term (37-41 weeks). This is similar across the states and territories and has been stable over time.


Almost 1 in 10 babies (8.6%) were born pre-term and of these the majority were born between 32 and 36 completed weeks.

Babies born to mothers who smoked at any point during pregnancy were more likely to be born pre-term (12.8%) than babies born to mothers who had not smoked (8.0%).

Most singleton babies were born at term (93%), while twins and babies of other multiple births were more likely to be born pre-term (65% for twins and 98% for other multiples).

For more information on gestational age see [National Perinatal Data Collection annual update data tables 3.5 and 3.6](#).

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Baby outcomes

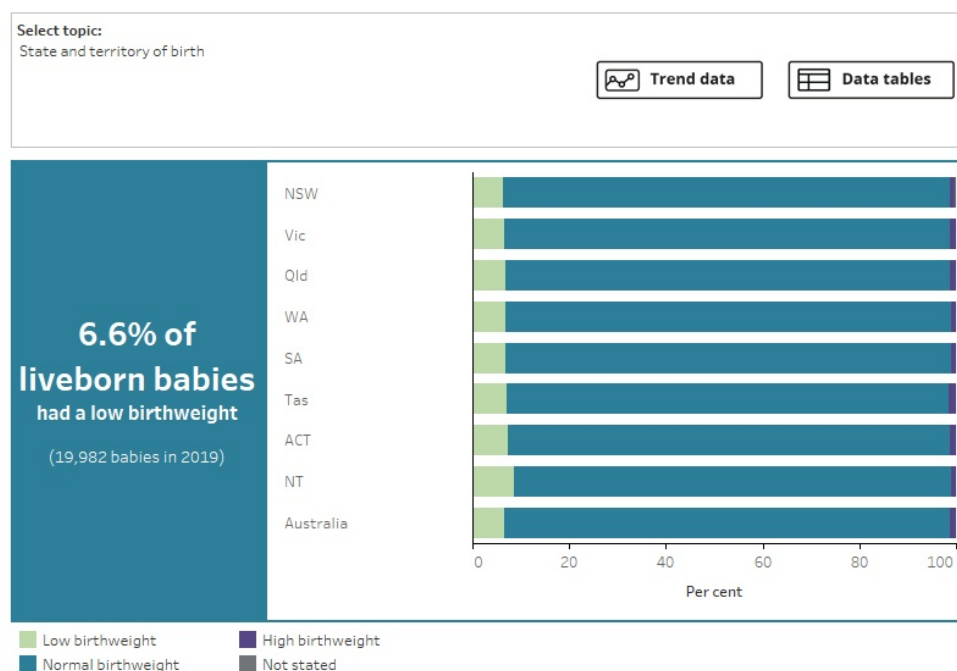
Birthweight

Birthweight is an important indicator of an infant's health. Nine in ten babies (92%) were born with a normal birthweight (birthweight between 2,500 and 4,499 grams). Around 1% of babies are high birthweight (birthweight of 4,500 grams or more).

Low birthweight (birthweight less than 2,500 grams) has been associated with increases in illness and death in infancy and into adulthood. In 2019, 7.2% of all babies were low birthweight—6.6% of liveborn babies and 84% of stillborn babies.

The figure shows a bar chart of the proportion of liveborn babies by birthweight by a range of topics for 2019. The figure also shows a line graph of trends within birthweight categories by a range of topics over 2009 to 2019. In 2019, 6.6% or 19,982 liveborn babies had a low birthweight.

Liveborn babies, by birthweight and state and territory of birth, 2019



Notes:

1. Includes liveborn babies only.
2. In 2019, 14.0% of women who gave birth in the ACT were non-ACT residents (proportion calculated after excluding records where state/territory of usual residence was 'Not stated'). Care must be taken when interpreting percentages.

Source: AIHW analysis of National Perinatal Data Collection
n.p. Not publishable due to small numbers, confidentiality or for reliability reasons.

14.6% of liveborn low birthweight babies weighed less than 1,500 grams and 6.4% of liveborn low birthweight babies weighed less than 1,000 grams.

Pre-term birth is closely linked with low birthweight—over two thirds (68%) of liveborn low birthweight babies were pre-term (gestational age before 37 completed weeks) and more than half (57%) of pre-term babies were of low birthweight.

The proportion of liveborn low birthweight babies was higher among babies born to mothers who lived in the lowest socioeconomic areas (8.0%) than babies born to mothers who lived in the highest socioeconomic areas (5.6%).

Internationally, the proportion of low birthweight babies in Australia in 2017 or nearest year (6.5%) was equal to the OECD average (6.5%), with Australia ranked equal 19th of 36 OECD countries (OECD 2019).


For more information on birthweight see [National Perinatal Data Collection annual update data tables 3.9 and 3.10](#).

For related information see National Core Maternity Indicator [Small babies among births at or after 40 weeks of gestation](#)

References

OECD (Organisation for Economic Co-operation and Development) 2019. [Health at a glance 2019: OECD indicators](#). Paris: OECD Publishing. Viewed 13 April 2021.

Last updated 8/11/2021 v43.0

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Baby outcomes

Birthweight adjusted for gestational age

A baby may be small due to being born early (pre-term) or be small for gestational age, which indicates a possible growth restriction within the uterus. Poor fetal growth is associated with increased risk of stillbirth and with fetal distress during labour, and may make babies more likely to develop long-term health conditions later in life.

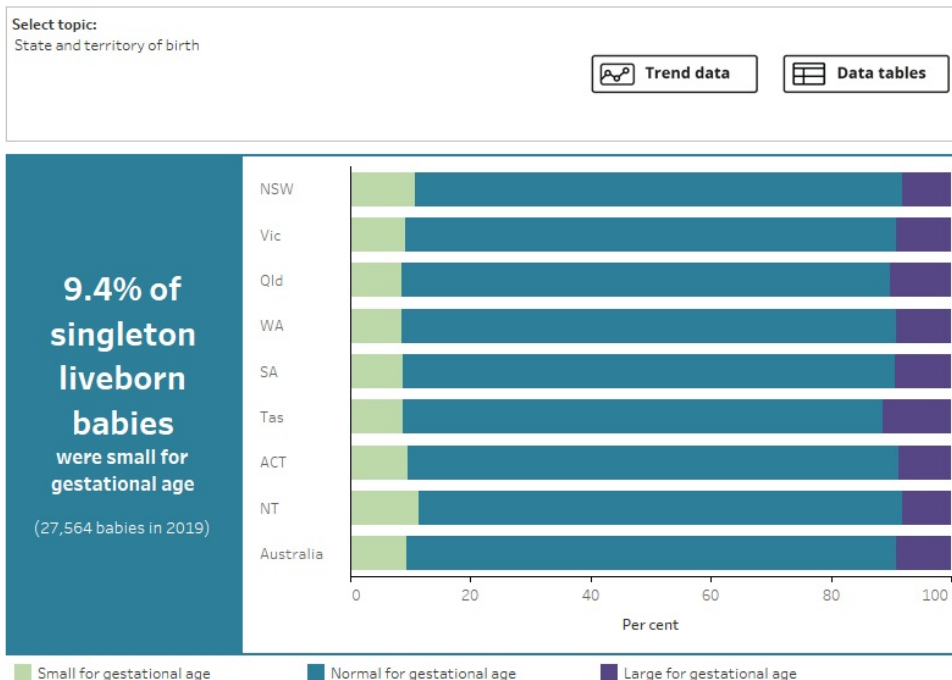
Adjusting birthweight for gestational age allows for differences in a baby's growth status and maturity to be taken into account when examining their health at birth.

Babies are defined as being small for gestational age if their birthweight is below the 10th percentile for their gestational age and sex, and babies are defined as large for gestational age if their birthweight is above the 90th percentile for their gestational age and sex, as determined by national percentiles.

Data on birthweight adjusted for gestational age is limited to liveborn singleton babies. Australian birthweight percentiles for liveborn singleton babies are available in the [data tables](#).

The figure shows a bar chart of the proportion of singleton liveborn babies by birthweight adjusted for gestational by a range of topics for 2019 and a line graph of topic trends from 2013 to 2019. In 2019, 9.4% or 27,564 babies were small for gestational age.

Liveborn singleton babies, by birthweight adjusted for gestational age and state and territory of birth, 2019



Notes:

1. Includes liveborn singleton babies only. Excludes those with not stated values for gestational age, birthweight or sex.
2. In 2019, 14.0% of women who gave birth in the ACT were non-ACT residents (proportion calculated after excluding records where state/territory of usual residence was 'Not stated'). Care must be taken when interpreting percentages.

Source: AIHW analysis of National Perinatal Data Collection

Babies were more likely to be small for gestational age if they were:

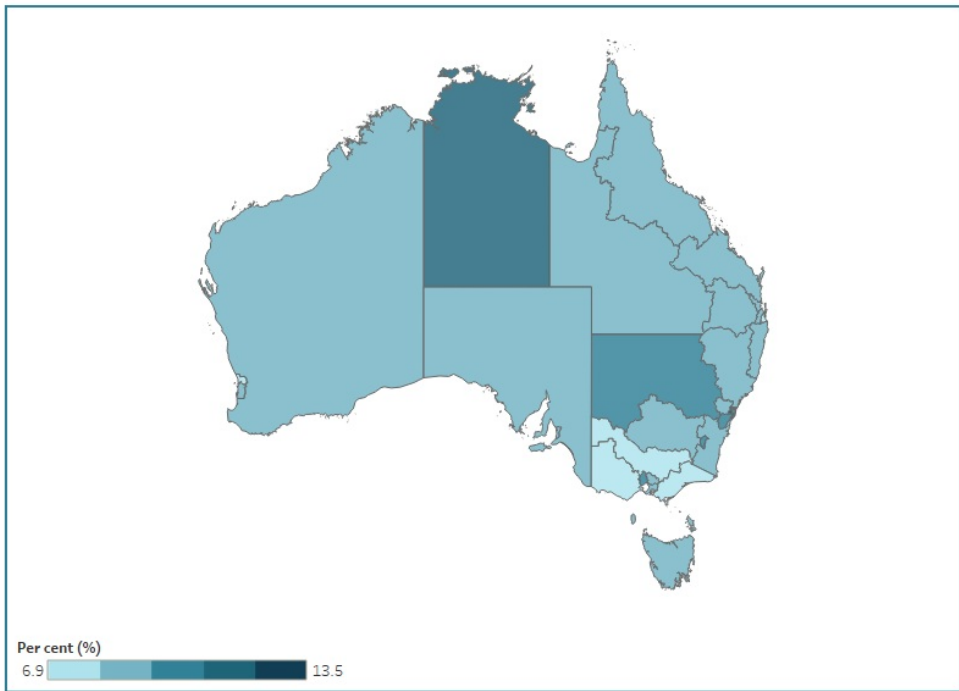
- Indigenous (13%)
- born to Indigenous mothers (14%)
- born to mothers who live in *Very remote* areas (13%)
- born to underweight mothers (19%)
- born to teenage mothers (aged under 20) (13%)
- born to mothers who smoked (17%)
- born to mothers who lived in the lowest socioeconomic areas (11%).

The figure shows a map of the distribution small for gestational age liveborn babies by Primary Health Network area for the years 2013 to 2019.

Per cent of liveborn singleton babies who were small for gestational age, by Primary Health Network area, 2019

Select year:

2019



Notes:

1. Includes liveborn singleton babies only. Excludes those with 'Not stated' values for gestational age, birthweight or sex.
2. Between 2013 and 2016, Primary Health Network (PHN) derived from Statistical Area Level 2 (SA2) of the ABS 2011 Australian Statistical Geography Standard (ASGS) (or Statistical Local Area for jurisdictions for which SA2 was not available). From 2017, PHN derived from SA2 of the ABS 2016 ASGS. PHN only calculated where geographic area of usual residence was provided. Excludes mothers not usually resident in Australia and those whose state or territory of usual residence was 'Not stated'.
3. Data may not add to the total due to rounding.

Source: AIHW analysis of National Perinatal Data Collection

For more information on liveborn babies who were small for gestational age by Primary Health Network area see [National Perinatal Data Collection annual update data table 5.6](#).

For related information see National Core Maternity Indicator [Small babies among births at or after 40 weeks of gestation](#)

Baby outcomes

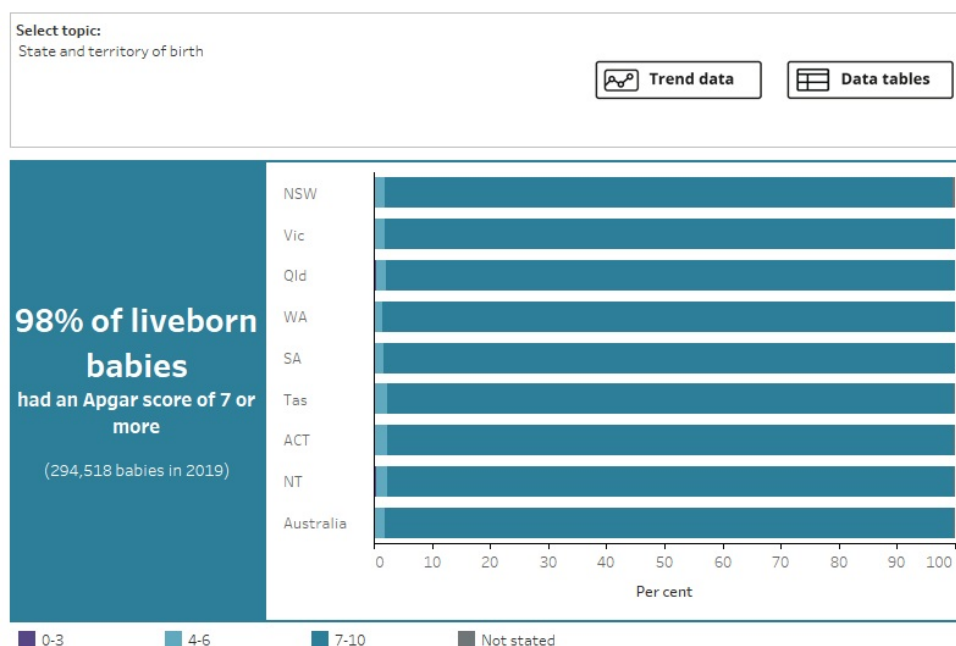
Apgar score at 5 minutes

Apgar scores are clinical indicators of a baby's condition shortly after birth. The score is based on 5 characteristics of the baby: 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 that the baby is adapting well to the environment, while a score of less than 7 indicates complications for the baby. Data on Apgar scores is limited to liveborn babies.

The figure shows a bar chart of the proportion of liveborn babies by Apgar score at 5 minutes by a range of topics for 2019. The figure also shows a line graph of topic trends between 2009 and 2019. In 2019, 98% or 294,518 liveborn babies had an Apgar score of 7 or more.

Liveborn babies, by Apgar score at 5 minutes and state and territory of birth, 2019



Notes:

1. Includes liveborn babies only.
2. In 2019, 14.0% of women who gave birth in the ACT were non-ACT residents (proportion calculated after excluding records where state/territory of usual residence was 'Not stated'). Care must be taken when interpreting percentages.

Source: AIHW analysis of National Perinatal Data Collection

n.p. Not publishable due to small numbers, confidentiality or for reliability reasons.

In Australia, almost all liveborn babies had an Apgar score of 7 or more (98%) and this has been consistent over time.


Babies who had a higher proportion of Apgar scores less than 7 included:

- low birthweight babies (7.9%)
- pre-term babies (7.9%)
- babies who were part of a multiple birth (8.3%)
- babies with a breech presentation (5.2%).

Babies with an Apgar score of less than 7 had an increased likelihood of requiring resuscitation and admission to the special care nursery or neonatal intensive care unit.

For related information see National Core Maternity Indicator [Apgar score of less than 7 at 5 minutes for birth at or after term](#)

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Baby outcomes

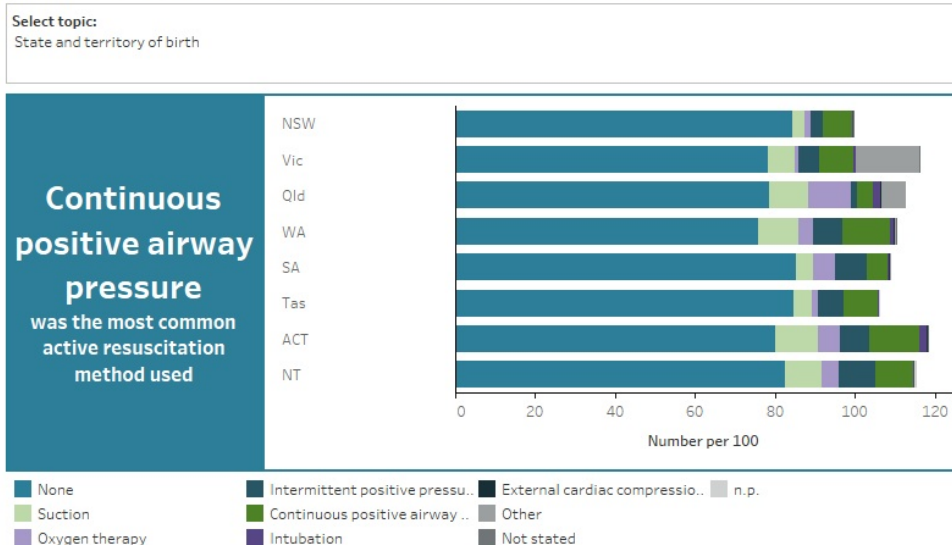
Active resuscitation method

Resuscitation is undertaken to establish independent breathing and heartbeat or to treat depressed respiratory effect and to correct metabolic disturbances. Active resuscitation methods range from less advanced methods like suction or oxygen therapy to more advanced methods, such as external cardiac massage and ventilation.

Data are for liveborn babies only. Due to a change in reporting of resuscitation method, data are for 2019 only.

The figure shows a bar chart of the active resuscitation method for the number per 100 liveborn babies by a range of topics for 2019. In 2019, between 75 and 85 per 100 liveborn babies did not require active resuscitation immediately after birth.

Liveborn babies, by active resuscitation method and state and territory of birth, 2019



Notes:

1. Includes liveborn babies only.
2. Because of differences in definitions and methods used for data collection, care must be taken when comparing across jurisdictions.
3. Qld supplied data on continuous positive airway pressure (CPAP) for births from 1 July 2019.
4. For Qld, 'Intubation' includes suction for meconium via ETT and IPPV via ETT for births prior to 1 July 2019, and for births from 1 July 2019 includes suction for meconium via ETT, IPPV via ETT and Intubation.
5. More than 1 type of active resuscitation method could be recorded; therefore, the sums of individual categories are greater than the total numbers of liveborn babies, and percentages add to more than 100%.
6. In 2019, 14.0% of women who gave birth in the ACT were non-ACT residents. Care must be taken when interpreting percentages.

Source: AIHW analysis of National Perinatal Data Collection

n.p. Not publishable due to small numbers, confidentiality or for reliability reasons.

Where resuscitation was required, 6 of 8 jurisdictions reported continuous positive pressure ventilation (CPAP) as the most commonly used method and external cardiac compressions as the least common method.

Babies who required resuscitation were more likely to:

- have an Apgar score of less than 7
- be of low birthweight
- be born pre-term
- be born as part of a multiple birth.

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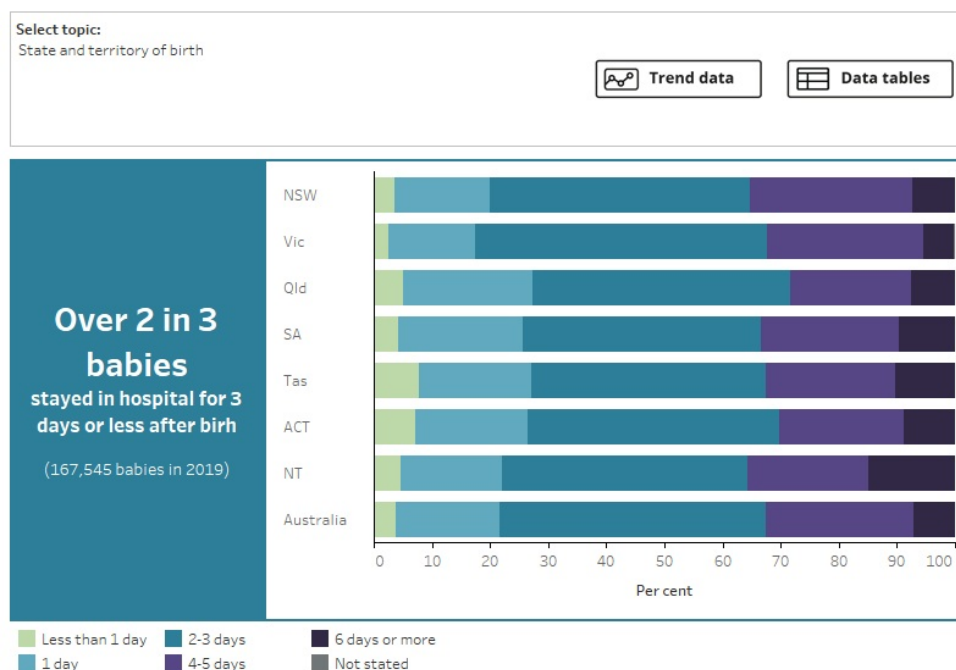
Baby outcomes

Baby length of stay in hospital

Over time, babies' length of stay in hospital after birth has generally been getting shorter. Data are for liveborn babies only, and exclude Western Australia.

The figure shows the proportion of babies by length of stay in hospital by a range of topics for 2019. The figure also shows a line graph of trends in length of stay by topics over the period of 2010 to 2019. In 2019, 167,545 babies stayed in hospital for 3 days or less after birth.

Liveborn babies, by hospital length of stay and state and territory of birth, 2019



Notes:

1. Includes liveborn babies born in hospital only (excludes birth centres attached to hospitals).
2. Only babies who were discharged home are included. For multiple births, the place of birth of the first-born baby was used for all subsequent babies.
3. Data excludes WA.
4. In 2019, 14.0% of women who gave birth in the ACT were non-ACT residents (proportion calculated after excluding records where state/territory of usual residence was 'Not stated'). Care must be taken when interpreting percentages.

Source: AIHW analysis of National Perinatal Data Collection

n.p. Not publishable due to small numbers, confidentiality or for reliability reasons.

The proportion of stays of 3 days or less has risen and stays of 4 days or more has fallen (for example, stays of 1 day have increased from 12.5% in 2009 to 18% in 2019, whereas stays of 4 to 5 days have decreased from 34% in 2009 to 25% in 2019).

A number of factors influence a baby's length of stay in hospital, including birthweight and gestational age: babies who had a low birthweight or who were born pre-term (58% and 59%, respectively) were much more likely to stay in hospital for 6 days or more, compared with term babies (3.6%) and normal birthweight babies (4.4%).

Babies who stayed in hospital for 6 or more days were more likely to be:

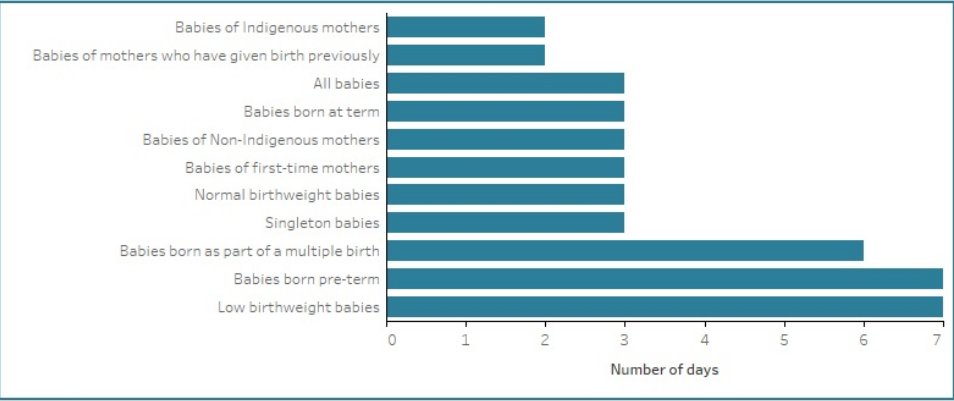
- Indigenous (11%)
- born to Indigenous mothers (11.5%)
- born in a private hospital (10%)
- born to mothers aged 40 or older (11%)
- born to mothers who smoked (11%)
- born by caesarean section (11.5%)
- part of a multiple birth (51% for twins, 96% for other multiples)
- born to mothers from *Very remote* areas (16%)
- babies who had an Apgar score of less than 7 (34% for an Apgar score of 0-3 and 25% for a score of 4-6).

It is important to note that many of these factors are potentially interrelated, for example, older mothers are more likely to give birth in private hospitals.

Some groups of babies also have a longer median length of stay in hospital, which is reflected in the graph below.

The figure shows the median length of stay for different groups of babies measured in number of days for 2019. In 2019, babies born pre-term and low birthweight babies have the longest median length of stay in hospital (both 7 days).

Median length of stay for selected babies born in hospital and discharged home, 2019



Notes:


- 1. Includes liveborn babies born in hospital only (excludes birth centres attached to hospitals) and discharged home only.
- 2. Excludes data where babies length of stay in hospital was 'Unknown duration' or 'Not stated'.
- 3. For multiple births, the place of birth of the first-born baby was used for all subsequent babies.
- 4. Data excludes WA.

Source: AIHW analysis of National Perinatal Data Collection

For information on maternal length of stay see [National Perinatal Data Collection annual update data tables 2.53, 2.54 and 2.55.](#)

For information on mode of separation of the baby see [National Perinatal Data Collection annual update data table 3.21.](#)

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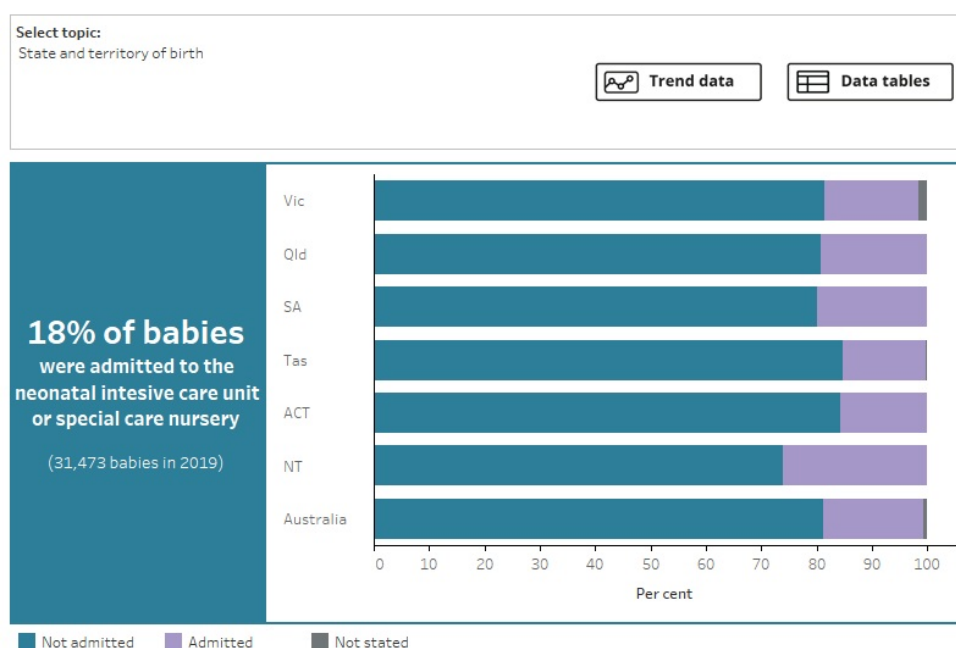
Baby outcomes

Admission to a special care nursery or neonatal intensive care unit

Babies are admitted to a special care nursery (SCN) or neonatal intensive care unit (NICU) if they require more specialised medical care and treatment than is available on the postnatal ward. Data are limited to liveborn babies who were born in hospital and discharged home, and may not include babies who were transferred between hospitals and then admitted to an SCN or NICU. Data exclude New South Wales and Western Australia.

The figure shows the proportion of liveborn babies by admission status to a special care nursery or neonatal intensive care unit by a range of factors for 2019. The figure also shows a line graph of trends in admission status between 2010 and 2019. In 2019, 18% or 31,473 liveborn babies were admitted to the neonatal intensive care unit or special care nursery.

Liveborn babies, by admission to SCN/NICU and state and territory of birth, 2019



Notes:

1. Includes liveborn babies only.
2. Babies who were transferred between hospitals and subsequently admitted to an SCN or NICU may not be included as 'admitted' in these data.
3. 'Current' data excludes NSW and WA.
4. In 2019, 14.0% of women who gave birth in the ACT were non-ACT residents (proportion calculated after excluding records where state/territory of usual residence was 'Not stated'). Care must be taken when interpreting percentages.

Source: AIHW analysis of National Perinatal Data Collection

n.p. Not publishable due to small numbers, confidentiality or for reliability reasons.

Almost one in five (18%) babies required admission to SCN or NICU. Babies were more likely to require admission if they were born pre-term (80%), Indigenous (25%), of low birthweight (78%) or part of a multiple birth (68% for twins, 99% for other multiples).

Mothers were more likely to have a baby admitted to SCN or NICU if they were aged under 20 (23%), or 40 or older (21.5%), were Indigenous (26%), smoked during pregnancy (25%) or gave birth by caesarean section (25%).

The admission rate was also slightly higher among babies whose mothers lived in the lowest socioeconomic areas (20%) compared with those whose mothers lived in the highest socioeconomic areas (15.5%).

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Baby outcomes

Preliminary perinatal deaths

The data presented in this section are from the National Perinatal Data Collection, and are preliminary data only. 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. The AIHW has established a separate National Perinatal Mortality Data Collection to obtain complete information on these deaths. The latest report from this collection is titled *Stillbirths and neonatal deaths* and is available as a web article within this web report.

A stillbirth is the death of a baby before birth, at a gestational age of 20 weeks or more, or of a birthweight of 400 grams or more. A neonatal death is the death of a liveborn baby within 28 days of birth. Perinatal deaths include both stillbirth and neonatal deaths.

Stillbirths and neonatal deaths may include late termination of pregnancy (20 weeks or more gestation). Stillbirths and perinatal death rates are calculated using all live births and stillbirths in the denominator. Neonatal mortality rates are calculated using live births only.

Figure: Definition of perinatal deaths

20 weeks of gestation	Labour	Birth			28 days
Prior to labour and/or birth	During labour and/or birth	First 24 hours	1-7 days	8-27 days	
Antepartum	Intrapartum	Very early neonatal	Early neonatal	Late neonatal	
Stillbirths		Neonatal deaths			
Perinatal deaths					

Note: at least 20 weeks gestation and/or 400 grams of birthweight

Chart: aihw.gov.au

This section looks at stillbirths and neonatal mortality rates for state and territory of birth, Indigenous babies and babies born to Indigenous mothers.

Visualisation not available for printing

Over time, stillbirth and neonatal mortality rates have remained largely unchanged at between 7 and 8 in 1,000 births and between 2 and 3 in 1,000 livebirths, respectively.

Last updated 26/10/2021 v16.0

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Focus population groups

This section explores key statistics for specific population groups—Indigenous mothers and babies, teenage mothers, older mothers, and mothers who have multiple births and their babies. It uses the data visualisations and accompanying text to tell the story of each group, so no comparison is made with other populations.

Indigenous mothers and babies

Indigenous status of the mother, babies born to Indigenous mothers and Indigenous status of the baby using crude rates.

Teenage mothers

Teenage mothers are those who gave birth when aged less than 20.


Older mothers

Older mothers are mothers who gave birth aged 40 or more.

Mothers who have multiple births and their babies

Multiple births are births of more than one baby from a single pregnancy, and include twins, triplets and higher order multiples.

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Focus population groups

Indigenous mothers and babies

Although a range of data by Indigenous status has been presented in other sections, this section provides more in-depth information on Aboriginal and/or Torres Strait Islander (respectfully hereafter Indigenous) mothers, babies born to Indigenous mothers and Indigenous babies. All data are based on crude rates, as opposed to the age-standardised rates presented in other sections.

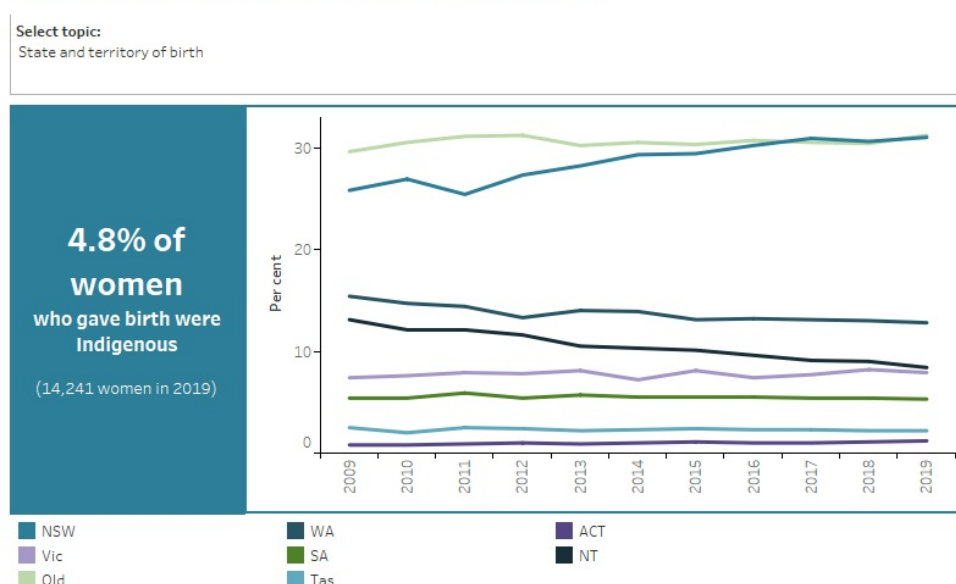
The topics explored for Indigenous mothers are state and territory of birth, maternal age, onset of labour and method of birth, timing and number of antenatal visits, smoking status, remoteness of usual residence and socio-economic status. The topics for Indigenous babies and babies of Indigenous mothers are gestational age, birthweight, birthweight adjusted for gestational age, Apgar score at 5 minutes, active resuscitation method, hospital length of stay and admission to special care nurseries (SCN) or neonatal intensive care units (NICU).

Indigenous mothers

In 2019, Indigenous mothers accounted for 4.8% (14,241) of women who gave birth.

The figure shows a line graph of trends in proportion of Indigenous mothers by a range of topics including state and territory of birth, remoteness area and maternal age between 2009 and 2019. In 2019, 4.8% of women who gave birth were Indigenous.

Indigenous mothers by state and territory of birth, 2009 to 2019



Notes:

1. Data are by state/territory of birth.
2. Between 2009 and 2019, 13–16% of women who gave birth in the ACT were non-ACT residents (proportion calculated after excluding records where state/territory of usual residence was 'Not stated'). Care must be taken when interpreting percentages. For example, 30.5% of Aboriginal and/or Torres Strait Islander women who gave birth in the ACT in 2019 were non-ACT residents.

Source: AIHW analysis of National Perinatal Data Collection

There have been improvements in outcomes for Indigenous mothers in recent years, with:

- a notable increase in the proportion of Indigenous mothers attending an antenatal visit in the first trimester (from 49% in 2012 to 67% in 2019)
- an increase in the proportion of Indigenous mothers attending 5 or more antenatal visits (from 77% in 2012 to 88% in 2019)
- a decrease in the proportion of Indigenous mothers who reported smoking in the first 20 weeks of pregnancy (from 48% in 2011 to 42% in 2019) and after 20 weeks of pregnancy (from 42% in 2011 to 37% in 2019).

The proportion of Indigenous mothers who report smoking at any time during pregnancy has fallen (from 50% in 2009 to 43% in 2019), and of those who smoked, the rate of smoking cessation during pregnancy was around 1 in 10. This is based on Indigenous mothers who reported smoking in the first 20 weeks of pregnancy and not smoking after 20 weeks of pregnancy.

The proportion of Indigenous teenage (aged under 20) mothers who gave birth has been gradually decreasing from 20% in 2009 to 11% in 2019.

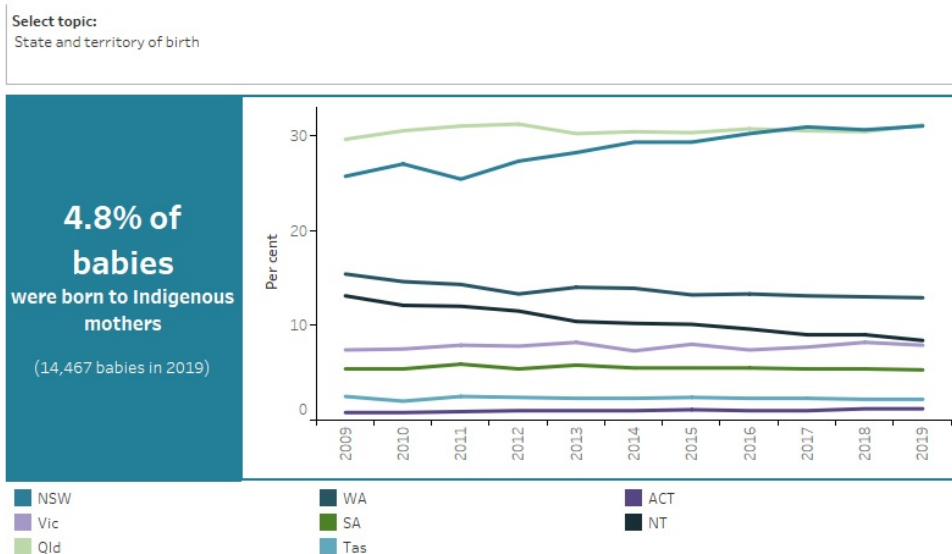
Around 3 in 5 (62%) Indigenous mothers had a non-instrumental vaginal birth, and fewer than 1 in 3 (30%) gave birth by caesarean section. The majority of Indigenous mothers had 5 or more antenatal visits (almost 9 in 10 or 88%).

Babies of Indigenous mothers

In 2019, babies born to Indigenous mothers accounted for 4.8% (14,467) of all births.

The figure shows a line graph of trends in the proportion of babies of Indigenous mothers by a range of topics including active resuscitation method, birthweight and gestational age between 2009 and 2019. In 2019, 4.8% of babies were born to Indigenous mothers.

Babies of Indigenous mothers by state and territory of birth, 2009 to 2019



Note: Data are by state/territory of birth.

Source: AIHW analysis of National Perinatal Data Collection

The majority of babies of Indigenous mothers were born at term (born from 37 to 41 weeks) and with a normal birthweight (both 87%). A high proportion of babies of Indigenous mothers had a normal birthweight adjusted for gestational age (77%).

Increasing the proportion of Aboriginal and Torres Strait Islander babies with a healthy birthweight to 91% by 2031, is one of the targets in the [National Agreement on Closing the Gap](#).

Babies of Indigenous mothers most commonly had a hospital stay of 2-3 days (45%), with 25% having a stay of 1 day and 12% having a stay of 6 days or more.

Almost all babies (97%) had an Apgar score of 7-10 at 5 minutes after birth, indicating that they have adapted well post-birth.

Indigenous babies

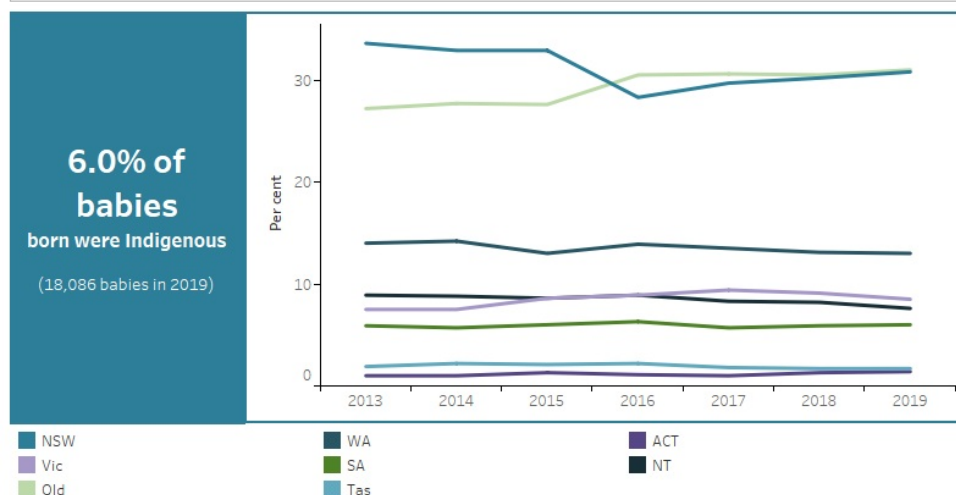
In 2019, Indigenous babies accounted for 6.0% (18,086) of all births.

The figure shows a line graph of trends in the proportion of Indigenous babies by a range of topics including active resuscitation method, birthweight and gestational age between 2013 and 2019. In 2019, 6.0% of babies were Indigenous.

Indigenous babies by state and territory of birth, 2013 to 2019

Select topic:

State and territory of birth



Source: AIHW analysis of National Perinatal Data Collection

Whilst the outcomes for Indigenous babies and babies of Indigenous mothers are very similar there were some differences.

Remoteness area

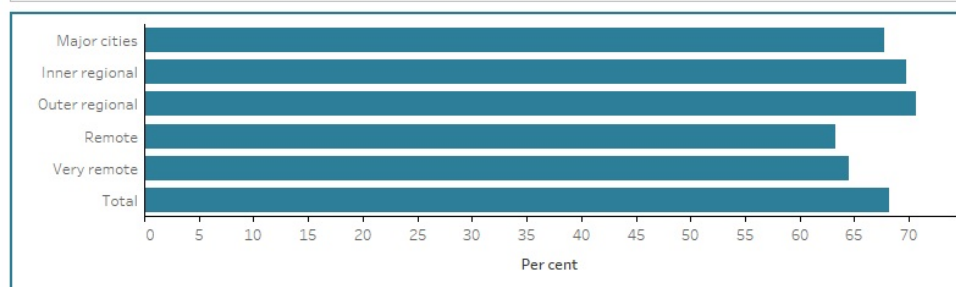
Remoteness area can have an effect on several key statistics for Indigenous mothers and babies. For example, Indigenous mothers who live in *Very remote* areas are more likely to smoke. These and other statistics can be explored in the graph below.

The figure shows proportions of Indigenous mothers and babies of Indigenous mothers by remoteness area for the topics of antenatal care, smoking status and low birthweight for 2019.

Key statistics of Indigenous mothers and their babies by remoteness area, 2019

Select group:

Antenatal visit in the first trimester



Notes:

1. Remoteness area derived by applying ABS 2016 Australian Statistical Geography Standard (ASGS) to area of mother's usual residence. Remoteness area only calculated where geographic area of usual residence was provided. Excludes mothers not usually resident in Australia and those whose state or territory of usual residence was 'Not stated'.

2. Data may not add to the total due to rounding.

3. Percentage calculated after excluding records with 'Not stated' values. Care must be taken when interpreting percentages.

Source: AIHW analysis of National Perinatal Data Collection

It is important to note that despite improvements, Indigenous mothers and babies continue to experience poorer health outcomes than non-Indigenous mothers and babies in some areas, and that there are complex interactions between maternal and perinatal health outcomes and the determinants of health, including both social determinants and health risk factors.

For more information on Indigenous babies and babies born to Indigenous mothers see [National Perinatal Data Collection annual update data tables 3.4 and 3.11](#).

Last updated 8/11/2021 v76.0

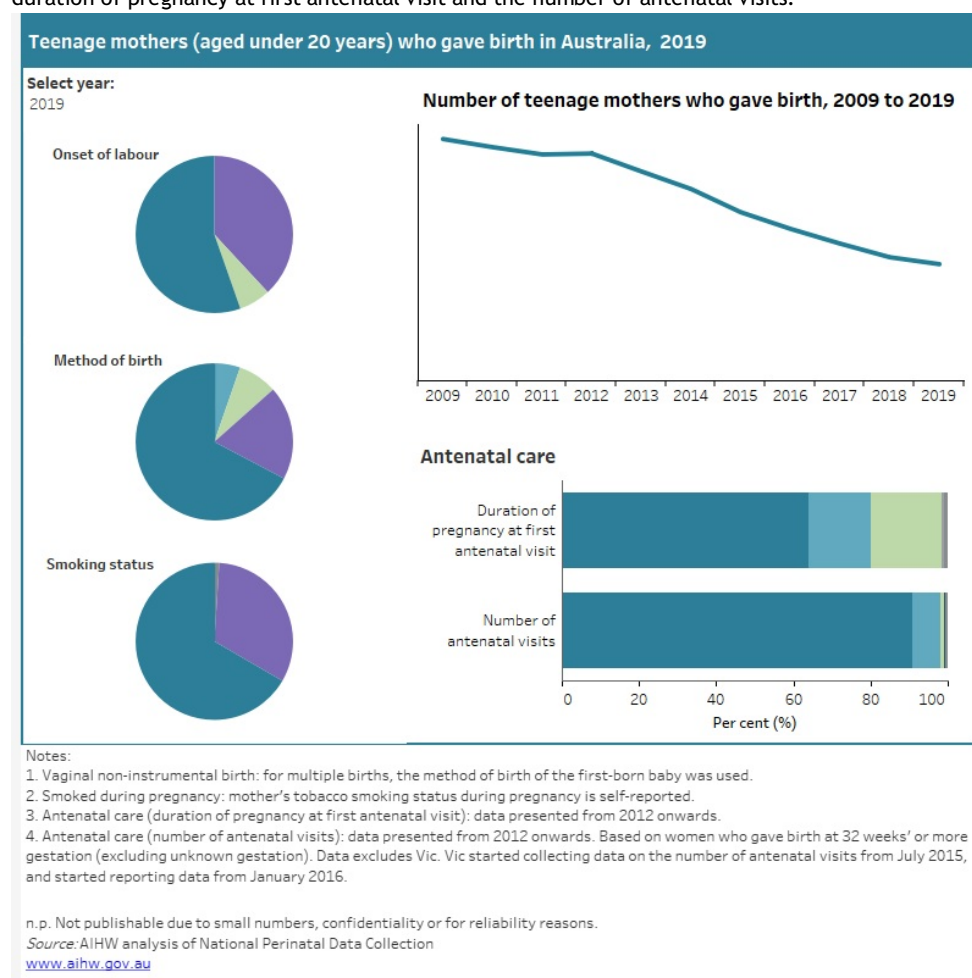
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Focus population groups

Teenage mothers

Teenage mothers are those who gave birth when they were aged under 20. This section looks at the onset of labour and method of birth, smoking status, and timing and number of antenatal care visits for teenage mothers.

The figure shows different charts displaying key statistics on teenage mothers (aged under 20) who gave birth in Australia in 2019. Three pie charts show proportions of teenage mothers by onset of labour, method of birth and smoking status. A line graph shows the number of teenage mothers who gave birth over the period of 2009 to 2019. Two segmented bar charts show proportions of teenage mothers by duration of pregnancy at first antenatal visit and the number of antenatal visits.



The number of teenage mothers in Australia has fallen steadily over time, from 11,767 (4.0%) in 2009 to 5,678 (1.9%) in 2019.

Many teenage mothers access antenatal care in the first trimester (64%) and have more than 5 antenatal visits (91%). In particular, the rate of antenatal visits in the first trimester has been rising over time.

Teenage mothers have high smoking rates, with 32% smoking during pregnancy in 2019, however this rate has fallen over time (from 37% in 2009).

Although teenage mothers are more likely to have spontaneous onset of labour, this rate has fallen over time (from 70% in 2009 to 55% in 2019) with a corresponding increase in induced labour onset (from 25% in 2009 to 38% in 2019). Because spontaneous and induced labour are most commonly associated with vaginal delivery, this means that the rate of vaginal births and caesarean sections has remained largely stable.

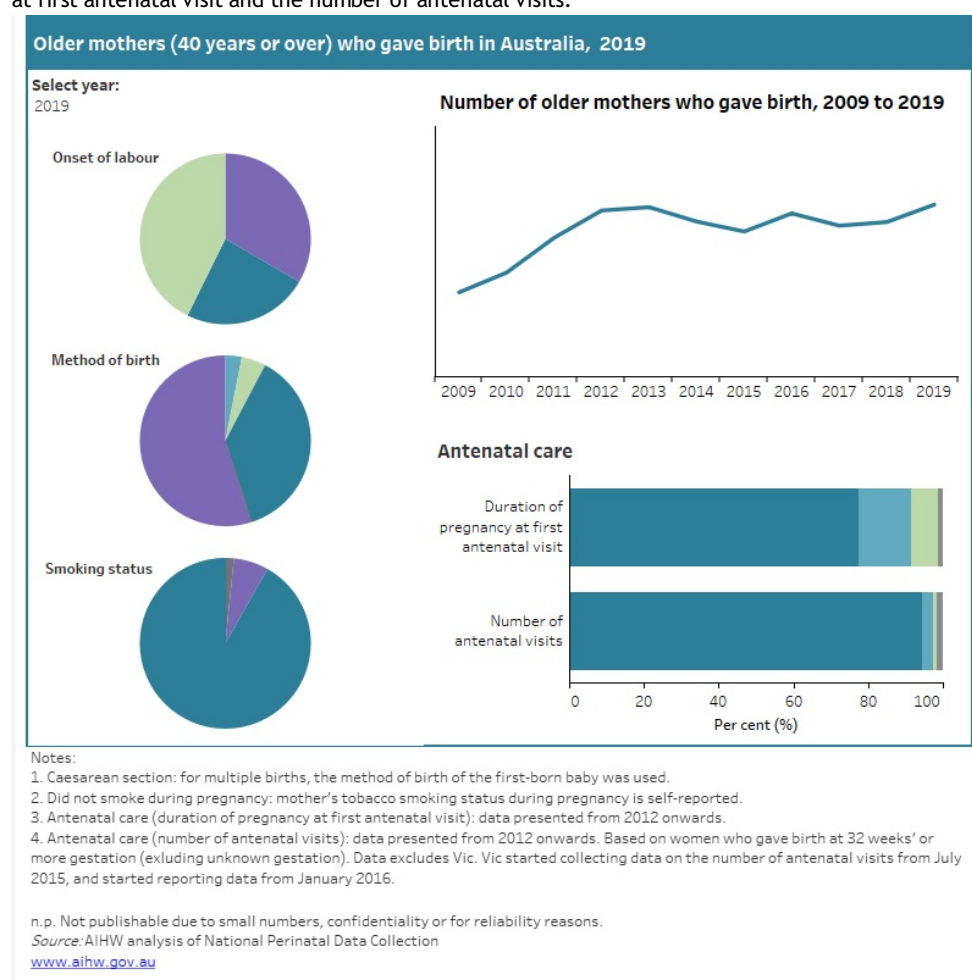
It is important to note that teenage mothers experience significant differences in relation to maternal characteristics, health behaviours and outcomes—and perinatal outcomes—when compared to the overall population of Australian mothers and babies. These differences can be explored when viewing 'maternal age' at the chapter or topic level throughout this report.

Focus population groups

Older mothers

Older mothers are those who gave birth aged 40 or more. This section looks at key topics in relation to older mothers including, onset of labour and method of birth, smoking status and timing and number of antenatal care visits.

The figure shows different charts displaying key statistics on older mothers (aged 40 years or over) who gave birth in Australia in 2019. Three pie charts show proportions of older mothers by onset of labour, method of birth and smoking status. A line graph shows the number of older mothers who gave birth from 2009 to 2019. Two segmented bar charts show proportions of older mothers by duration of pregnancy at first antenatal visit and the number of antenatal visits.



The number of older mothers has fluctuated over time, although the trend shows an overall increase, from 11,687 (4.0%) in 2009 to 13,440 (4.5%) in 2019.

Most older mothers access antenatal care in the first trimester (77%) and almost all older mothers have more than 5 antenatal visits (94%).

Over time, the most common onset of labour type for older mothers has become no labour (43% in 2019, up from 34% in 2009 when spontaneous was the most common onset of labour among older mothers), with a corresponding caesarean section rate of over 1 in 2 (55% in 2019) older mothers who gave birth.

Older mothers are unlikely to smoke during pregnancy, with 6.6% of older mothers reporting that they smoke in 2019. This rate has fallen over time (11% in 2009).

It is important to note that older mothers experience significant differences in relation to maternal characteristics, health behaviours and outcomes—and perinatal outcomes—when compared to the overall population of Australian mothers and babies. These differences can be explored when viewing 'maternal age' at the chapter or topic level throughout this report.

Focus population groups

Mothers who have multiple births and their babies

Multiple births are births of more than one baby from a single pregnancy, and include twins, triplets and higher order multiples.

This section looks at mothers who have multiple births by maternal age, timing of first antenatal visit, onset of labour and method of birth. Topics for babies of multiple births are birthweight, gestational age, Apgar score at 5 minutes, admission to special care nurseries (SCN) or neonatal intensive care units (NICU) and length of hospital stay.

The number of multiple births in Australia each year is small, and has remained relatively stable at around 2-3% of all births (from 9,285 (3.1%) of births in 2009 to 8,915 (2.9%) of births in 2019).

In 2019, of this small proportion, almost all multiple births (98%) were twins, while the remaining 2% were other multiples (that is, triplets, quadruplets or higher).

The figure shows a line graph of trends in the proportion of women who had a multiple birth by a range of topics including Indigenous status (mother), remoteness area and socioeconomic status from 2009 to 2019. In 2019, 4,428 women had a multiple birth.

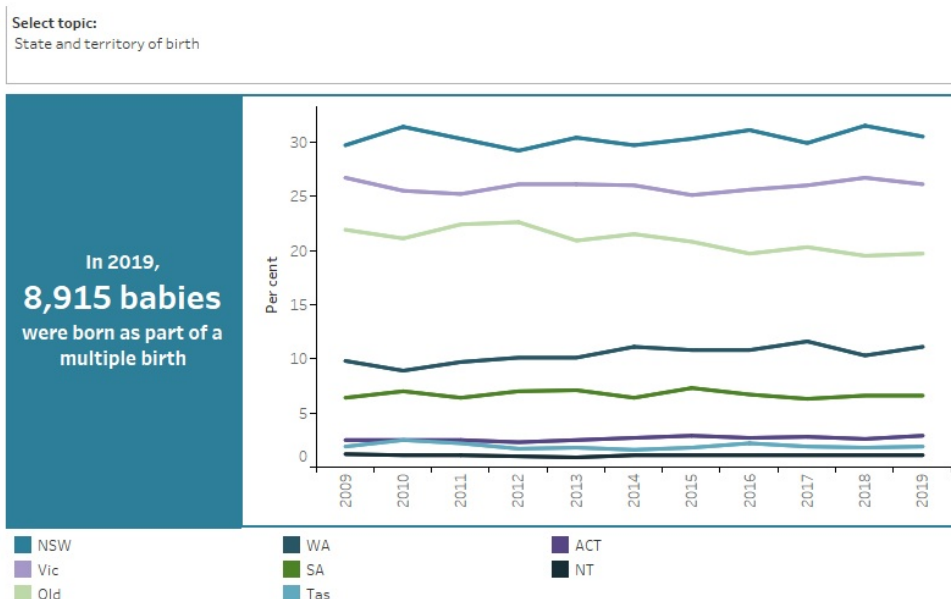
Visualisation not available for printing

Most mothers of multiples attended an antenatal visit in the first trimester (81%) and had 5 or more antenatal visits (94%).

Over half of mothers had no labour, and this proportion has increased over time (47% in 2009 compared with 57% in 2019). Mothers of multiples therefore had a high rate of caesarean sections (71%).

The figure shows a line graph of trends in the proportion of babies who were born as part of a multiple birth by a range of topics including admission to SCN/NICU, gestational age and presentation over 2009 to 2019. In 2019, 8,915 babies were born as part of a multiple birth.


Babies born as part of a multiple birth by state and territory of birth, 2009 to 2019



Source: AIHW analysis of National Perinatal Data Collection
n.p. Not publishable due to small numbers, confidentiality or for reliability reasons.

The vast majority of babies from multiple births had an Apgar score of 7-10 at 5 minutes (95%), indicating that they have adapted well post-birth. More than half of babies in multiple births were born low birthweight (56%) or pre-term (66%), including babies who were both low birthweight and pre-term. As a result, 68% of multiple births were admitted to SCN or NICU, and 51% had hospital stays of 6 days or more.

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Australia's mothers and babies:

Stillbirths and neonatal deaths

Web article | Last updated: 18 Nov 2021 | Topic: [Mothers & babies](#) | Part of [Australia's mothers and babies](#) |

Citation

AIHW

Australian Institute of Health and Welfare (2021) [Stillbirths and neonatal deaths](#), AIHW, Australian Government, accessed 09 May 2022.

In 2019, in Australia, 2,897 babies died in the perinatal period. Three-quarters (2,183) were stillbirths and the remaining 714 were neonatal deaths. This web report provides information related to these deaths, including causes, maternal characteristics, timing and investigations.

Click through the headings below for more information:

Overview of perinatal deaths

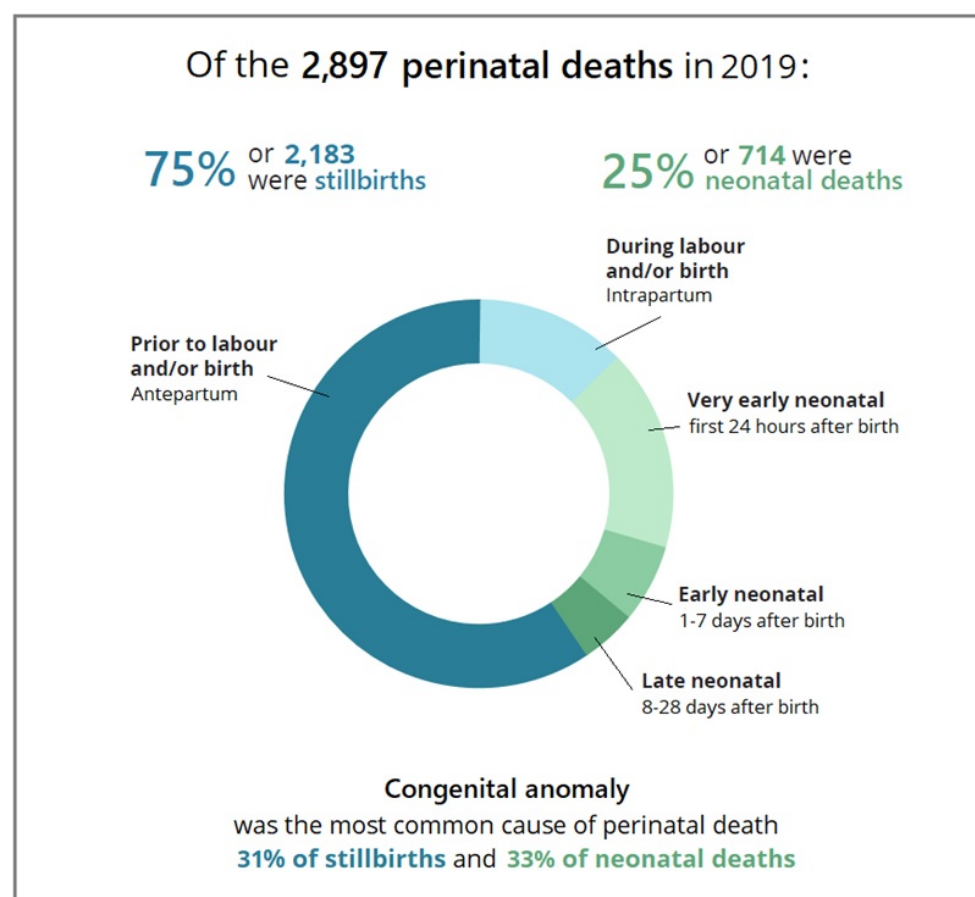
Australia is one of the safest places in the world for a baby to be born, yet death occurring within the perinatal period (from 20 weeks of gestation to 28 days after birth) is not uncommon. Every day in Australia, 6 babies are stillborn and 2 die within 28 days of birth (neonatal death).

In 2019, there were:

- 303,054 babies born to 298,567 women
- 2,897 perinatal deaths (less than 1% of babies born). Of these deaths, just over 75% were stillbirths (2,183) and 25% (714) were neonatal deaths
- 9.6 perinatal deaths per 1,000 births (7.2 stillbirths per 1,000 births and 2.4 neonatal deaths per 1,000 live births).

Although perinatal mortality rates have remained relatively unchanged since 2000, two categories have decreased over the period:

- neonatal deaths of babies born at 23 weeks' gestation or more
- stillbirths occurring at 28 weeks' gestation or more.



International comparison using the WHO definition

The data visualisation below displays perinatal mortality rates in Australia using two different definitions - the Australian and the World Health Organization (WHO) definitions.

The standard definition used for stillbirths in Australia is a fetal death prior to birth of a baby born at 20 weeks gestation or more, and/or weighing 400 grams or more.

This differs from the international definition, where stillbirths are defined as those occurring in the third trimester—born at 28 weeks' gestation or more, and/or weighing 1,000 grams or more (WHO 2018).

Neonatal deaths are all registered deaths occurring within 28 days of birth. In Australia, registered deaths are those born at 20 weeks' gestation or more, and/or weighing 400 grams or more. As a result, the reporting of neonatal deaths is the same for both the Australian and WHO definitions.

The WHO definition of stillbirth results in reporting of babies who are larger and more mature than the definition applied in Australia. This means Australian perinatal mortality rates reported using the WHO definitions are lower than those reported using Australian definitions.

Using the WHO definitions (stillbirths from the third trimester and all neonatal deaths):

- The rate of stillbirths in Australia has decreased from 3.8 per 1,000 births in 2000 to 2.6 per 1,000 births in 2019.
- The rate of neonatal deaths in Australia is the same using both Australian and WHO definitions, and has decreased from 2.9 per 1,000 live births in 2000 to 2.4 per 1,000 live births in 2019.

The stacked continuous line graph shows that perinatal mortality rates in Australia, using the Australian definitions, have decreased from 10.1 perinatal deaths per 1,000 total births in 2000 to 9.6 perinatal deaths per 1,000 total births in 2019. The rate of stillbirths in Australia has held steady, with 7.2 per 1,000 births in both 2000 and 2019, while the rate of neonatal deaths in Australia has decreased from 2.9 per 1,000 live births in 2000 to 2.4 per 1,000 live births in 2019.

The graph also allows you to use the WHO definitions of perinatal death. When these definitions are used, the graph shows that perinatal mortality rates have decreased from 6.7 perinatal deaths per 1,000 total births in 2000 to 5.0 perinatal deaths per 1,000 total births in 2019. The rate of stillbirths has decreased from 3.8 to 2.6 per 1,000 births over the same period, while the rate of neonatal deaths has decreased from 2.9 to 2.4 per 1,000 live births in 2019.

The underlying data for this data visualization are also available in the Excel spreadsheet located on the Data page.

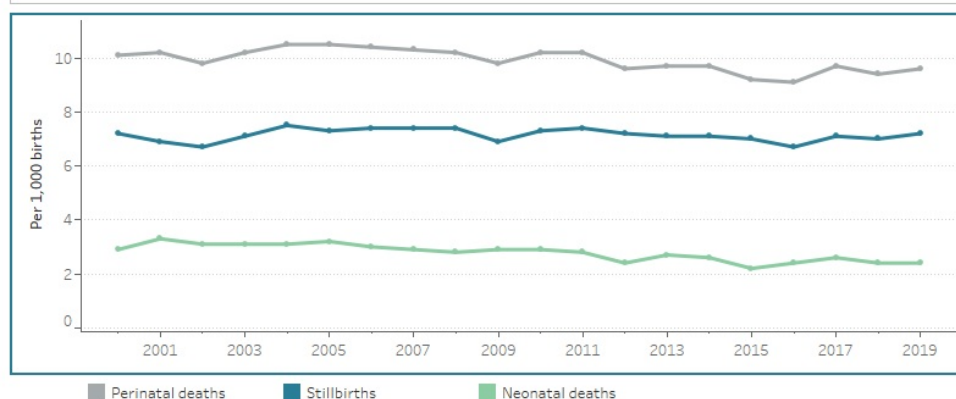
Perinatal mortality rates

Australian definitions, 2000–2019

Select definitions:

Australian definitions

Data tables



Notes:


1. Total births comprise live births and stillbirths collected by the National Perinatal Data Collection. The sum of stillbirths and live births may not add up to total births.
2. The rate is the number of deaths per 1,000 births. Stillbirth and perinatal mortality rates were calculated using total births (live births and stillbirths). Neonatal mortality rates were calculated using live births.
3. Data from the Northern Territory for 2000 to 2002 and from Victoria in 2009 are not available so have been excluded from both the numerator (number) and denominator.

Source: AIHW analysis of the NPMDC and NPDC.
<http://www.aihw.gov.au>

Perinatal death data reported by the Australian Bureau of Statistics (ABS) are not directly comparable with the National Perinatal Mortality Data Collection (NPMDC) and National Perinatal Data Collection (NPDC) data.

ABS data are sourced from state and territory registrars of Births, Deaths and Marriages. NPMDC and NPDC data are sourced from midwives and other staff, who collect information from mothers and perinatal administrative and clinical record systems. For more information on the NPMDC and NPDC and definitions used for reporting perinatal deaths please refer to the [Technical Notes—Definitions used in reporting](#).

References

- WHO 2018.  [Global reference list of 100 core health indicators, 2018.](#)

Maternal characteristics

Key demographics

This section presents data on maternal and medical characteristics, as supplied to the National Perinatal Data Collection (NPDC), which have been commonly associated with stillbirth or neonatal death.

While these characteristics are more commonly found in women with pregnancies resulting in stillbirth and neonatal death, they are characteristics that are numerically associated with perinatal death and it is not implied that they are the cause of perinatal deaths.

In 2019, there were:

- 9.6 perinatal deaths per 1,000 births (2,897 deaths)
- 7.2 stillbirths per 1,000 births (2,183 deaths)
- 2.4 neonatal deaths per 1,000 live births (714 deaths).

Perinatal mortality rates were higher among babies born to:

- women who were aged under 20, 20-24 and 40 and over (18.4, 11.1, and 15.1 deaths per 1,000 births, respectively)
- Aboriginal and Torres Strait Islander women (14.8 deaths per 1,000 births)
- women who lived in *Very remote* areas (19.6 deaths per 1,000 births)
- women living in the most disadvantaged areas of Australia (quintiles 1 and 2; 11.1, and 9.8 deaths per 1,000 births, respectively).

Detailed data can be found in TAB3 of the [supplementary data tables](#)

The horizontal bar charts in this data visualisation display the rate of stillbirths and neonatal deaths by different maternal demographic characteristics. The first view shows the difference in rates by state or territory of birth. The rate of stillbirths ranged between 5.6 deaths per 1,000 births in Tasmania to 11.1 deaths per 1,000 births in the Northern Territory. The neonatal death rates ranged from 1.4 per 1,000 live births in Western Australian to 3.9 per 1,000 live births in the Northern Territory.

The difference in rates by remoteness shows that rates neonatal death increase with increasing remoteness. The rate of neonatal death increased from 2.2 per 1,000 live births in Major cities to 5.1 per 1,000 live births in Very remote areas. The rate of stillbirths ranged from 6.3 deaths per 1,000 births in Remote areas to 14.6 deaths per 1,000 births in Very remote areas.

The difference in rates by mother's country of birth shows that rates of stillbirth and neonatal death are similar for mothers born in Australia or born overseas. The rate of stillbirths was 7.0 deaths per 1,000 births for mothers born in Australia and 7.5 deaths per 1,000 births for mothers born overseas. The rate of neonatal death was 2.2 deaths per 1,000 live births for mothers born in Australia and 2.7 deaths per 1,000 live births for mothers born overseas

The difference in rates by mother's Indigenous shows that rates of stillbirth and neonatal death are higher for Aboriginal and Torres Strait Islander mothers. The rate of stillbirths was 10.4 deaths per 1,000 births for Indigenous mothers and 7.1 deaths per 1,000 births for non-Indigenous mothers. The rate of neonatal death was 4.4 deaths per 1,000 live births for Indigenous mothers and 2.3 deaths per 1,000 live births for non-Indigenous mothers.

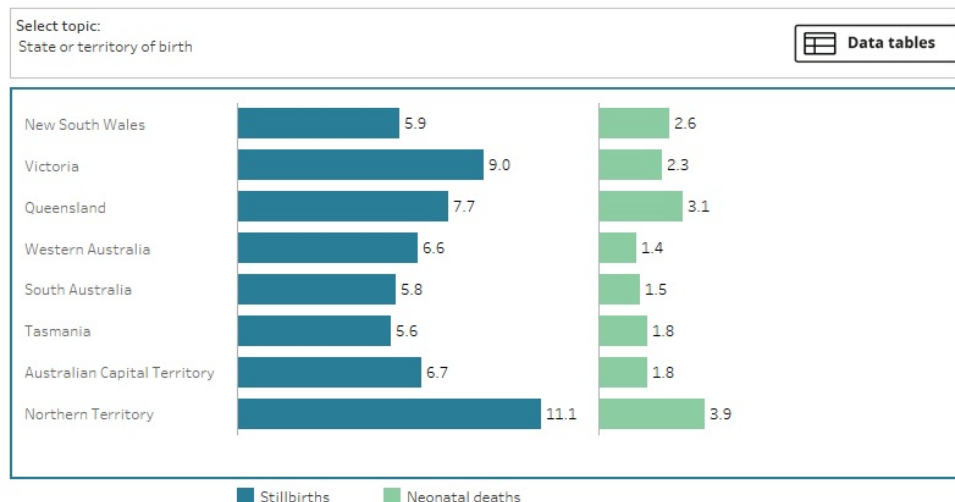
The difference in rates by socioeconomic status shows that rates of stillbirth and neonatal death increase with increasing disadvantage. The rate of stillbirths increased from 6.5 deaths per 1,000 births in the least disadvantaged areas of Australia to 8.3 deaths per 1,000 births in the most disadvantaged areas. The rate of neonatal death increased from 1.8 per 1,000 live births in the least disadvantaged areas of Australia to 2.9 per 1,000 live births in the most disadvantaged areas.

The difference in rates by maternal age group shows that rates of stillbirth and neonatal death are highest for the youngest and oldest mothers. The rate of stillbirths was highest for mothers under 20, 13.5 per 1,000 births, followed by mothers aged 40 or over, 11.4 stillbirths per 1,000 births. The rate of neonatal death was highest for mothers under 20, 5.0 per 1,000 live births, followed by mothers aged 20-24 and mothers aged 40 or over, 3.7 per 1,000 live births.

The difference in rates by state or territory of mother's usual residence show that the range of stillbirths ranged between 5.8 deaths per 1,000 births for mothers from South Australia to 11.7 deaths per 1,000 births for mothers from the Northern Territory. Neonatal death rates ranged from 1.3 per 1,000 livebirths for mothers from Western and South Australia to 4.2 per 1,000 live births for mothers from the Northern Territory.

The underlying data for this data visualization are also available in the Excel spreadsheet located on the Data page.

Perinatal mortality rates by state or territory of birth, 2019



Notes:

1. The rate is the number of deaths per 1,000 births. Stillbirth and perinatal mortality rates were calculated using total births (live births and stillbirths). Neonatal mortality rates were calculated using live births.
2. The perinatal mortality rate for Victoria includes terminations due to maternal psychosocial indications. The stillbirth rate for Victoria differs from that reported in the Victorian Consultative Council on Obstetric and Paediatric Mortality and Morbidity (CCOPMM) annual report due to differences in scope for inclusion. See the notes section for more information.
3. In 2019, 14% of women who gave birth in the ACT were non-ACT residents (proportion calculated after excluding records where state/territory of usual residence was 'Not stated'). These women are often transferred to the ACT requiring access to maternity services for high-risk pregnancies.

Source: AIHW analysis of the NPMDC and NPDC.

<http://www.aihw.gov.au>

Country of birth

There was little overall difference in perinatal mortality rates for babies of women born in Australia compared to babies of women born overseas. The highest rates of perinatal death were among babies of women whose country of birth was in:

- North Africa
- Polynesia (excludes Hawaii)
- Melanesia.

Detailed country of birth data can be found in TAB3 of the [supplementary data tables](#).

Baby characteristics

Birthweight and gestational age are interrelated and birthweight is generally expressed in relation to gestational age using population percentiles (refer to the [Technical notes—Methods](#) for more information on percentiles).

Gestational age and birthweight

A baby may be small due to being pre-term (born early), or due to being small for gestational age (either because it is small due to genetic factors, or because it is the subject of a growth restriction within the uterus). Poor fetal growth is associated with increased risk of perinatal death and with fetal distress during labour, and these babies are more likely to develop long-term health conditions later in life.

Adjusting birthweight for gestational age allows for differences in a baby's growth status and maturity to be taken into account when examining their health outcomes at birth.

Babies are defined as being small for gestational age if their birthweight is below the 10th percentile for their gestational age and sex, as determined by national percentiles. Babies are defined as large for gestational age if their birthweight is above the 90th percentile for their gestational age and sex.

In 2019:

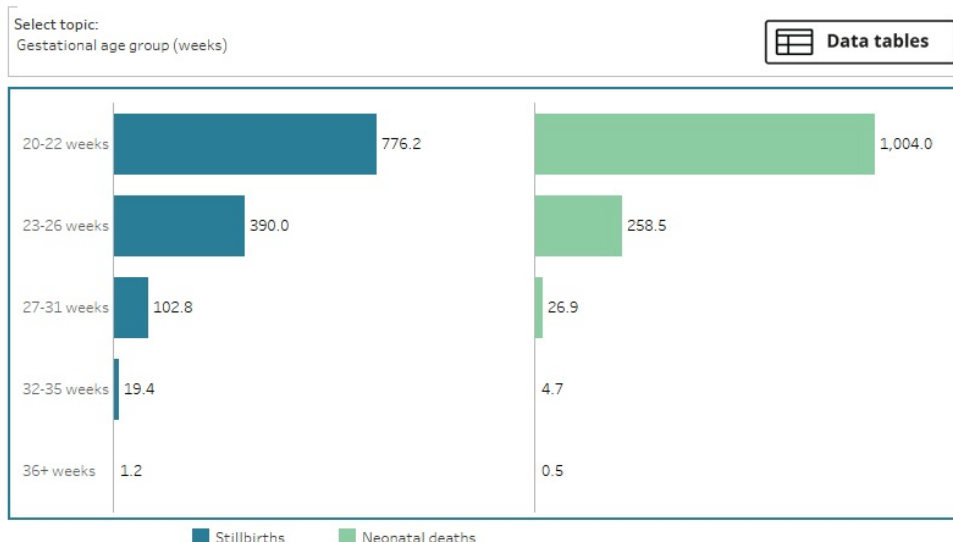
- Nearly 2 in 5 perinatal deaths (38.9%) occurred before 22 completed weeks' gestation
- Rates of perinatal death decreased rapidly from 28 weeks' gestation and were lowest among babies born at term (37-41 weeks).

The highest rates of perinatal death were among:

- Babies born at less than 22 weeks' gestation (998.2 deaths per 1,000 births)
- Babies born in the second trimester (less than 28 weeks' gestation; 691.8 deaths per 1,000 births)
- Babies born with a birthweight less than 2,500 grams (108.8 deaths per 1,000 births)
- Babies who were small for gestational age (birthweight below the 10th percentile for their age and sex; 23.4 deaths per 1,000 births)
- Multiple births (32.0 deaths per 1,000 births).

Detailed data can be found in TAB4 of the [supplementary data tables](#)

Perinatal mortality rates by gestational age group (weeks), 2019



Notes:

1. Total births comprise live births and stillbirths collected by the National Perinatal Data Collection (NPDC). The sum of stillbirths and live births may not add up to total births and the number of neonatal deaths may be slightly higher than the number of live births. These are due to occasional discrepancies between the NPDC and the National Perinatal Mortality Data Collection (NPMDC).
2. Clinical groups refers to intervals of gestational ages identified as being of clinical significance by members of the National Maternal and Perinatal Mortality Advisory Group (NMPMAG).
3. 20-22 weeks may include a small number of births of less than 20 weeks' gestation where birthweight was 400 grams or more.

Source: AIHW analysis of the NPMDC and NPDC.

<http://www.aihw.gov.au>

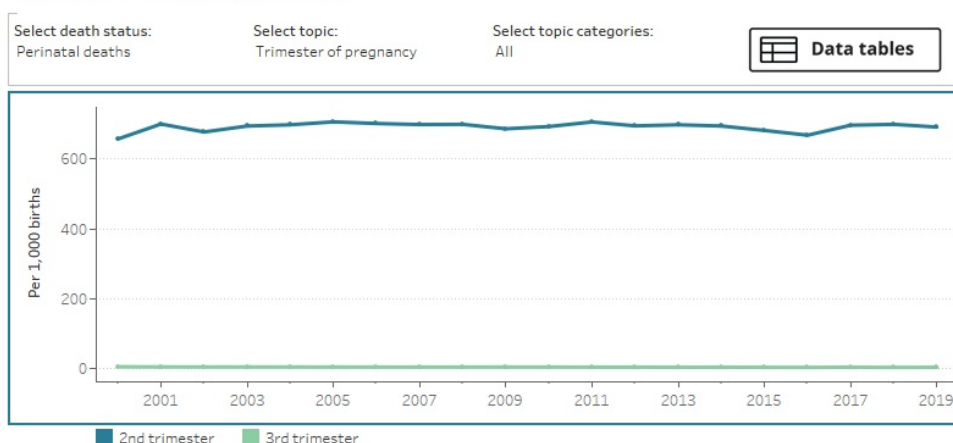
Gestational age trend

While perinatal mortality rates have been holding relatively steady for babies born before 28 weeks' gestation, they have been gradually decreasing among babies born after 28 weeks' gestation.

Stillbirths occurring after 28 weeks of gestation, or in the third trimester of pregnancy, are known as late gestation stillbirths. Evidence indicates that these stillbirths are the most likely to be preventable (Flenady et al. 2016). The rate of late gestation stillbirths in Australia has decreased from 3.7 per 1,000 births in 2000 to 2.5 per 1,000 births in 2019.

Neonatal deaths in both the second and third trimesters of pregnancy have decreased over this period, with deaths in the third trimester decreasing from 1.2 per 1,000 births to 0.8 per 1,000 births in 2019.

Perinatal mortality rates by trimester of pregnancy, 2000–2019



Notes:

1. The rate is the number of deaths per 1,000 births. Stillbirth and perinatal mortality rates were calculated using total births (live births and stillbirths). Neonatal mortality rates were calculated using live births.
2. Total births comprise live births and stillbirths collected by the National Perinatal Data Collection. The sum of stillbirths and live births may not add up to total births.
3. Data from the Northern Territory for 2000 to 2002 and from Victoria in 2009 are not available so have been excluded from both the numerator (number) and denominator.
4. While the 2nd trimester is defined clinically as 14-27 weeks of gestation, the scope of the National Perinatal Mortality Data Collection is limited to perinatal deaths occurring from 20 weeks of gestation. 2nd trimester also includes births prior to 20 weeks that are 400 grams or more birthweight.

Source: AIHW analysis of the NPMDC and NPDC.

<http://www.aihw.gov.au>

References

Flenady, V., Wojcieszek, A.M., Middleton, P., Ellwood, D., Erwich, J.J., Coory, M., Khong, T.Y., Silver, R.M., Smith, G.C., Boyle, F.M. and Lawn, J.E (2016) 'Stillbirths: recall to action in high-income countries'. *The Lancet*, 387:691-702, doi:[10.1016/S0140-6736\(15\)01020-X](https://doi.org/10.1016/S0140-6736(15)01020-X)

Timing, causes and investigation of perinatal deaths

Timing of perinatal deaths

In 2019, where the timing of perinatal deaths was stated:

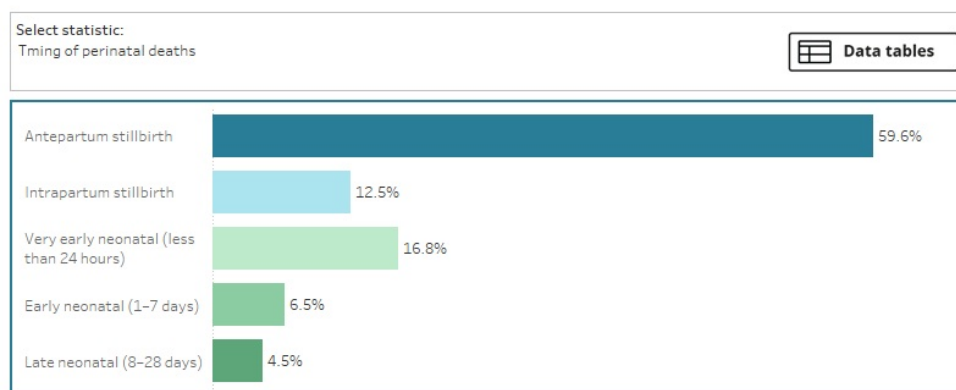
- Nearly three in five (59.6%) perinatal deaths and the majority (82.7%) of stillbirths occurred before the onset of labour (antepartum death)
- Three in five (60.4%) neonatal deaths occurred within the first 24 hours following birth (very early neonatal death) and were more common with decreasing gestational age
- Early neonatal deaths (1-7 days) (38.9%) and late neonatal deaths (8-28 days) (42.1%) were more common among babies born from 36 weeks' gestation.

Detailed data can be found in TAB6 of the [supplementary data tables](#).

Intrapartum stillbirths (those occurring during labour and birth) and neonatal deaths within the first 24 hours after birth are often considered together as, in many cases, the process leading to the death is a continuum that may lead to death before or after the birth occurs.

Timing of perinatal deaths

2019



Notes:

1. Excludes records where timing of stillbirth or neonatal death is not stated.
2. 20-22 weeks includes births prior to 20 weeks that are 400 grams or more birthweight.

Source: AIHW analysis of the NPMDC and NPDC.
<http://www.aihw.gov.au>

Causes of perinatal death

Causes of perinatal deaths are classified according to the Perinatal Society of Australia and New Zealand (PSANZ) Perinatal Mortality Classification System, version 3.2, as part of each state or territory's perinatal mortality review process.

The PSANZ Perinatal Mortality Classification System incorporates a Perinatal Death Classification (PSANZ-PDC) and an additional Neonatal Death Classification (PSANZ-NDC).

The PSANZ-PDC system classifies all perinatal deaths (stillbirths and neonatal deaths) by the single most important factor which led to the chain of events that resulted in the death (refer to [Technical notes—Definitions used in reporting](#) for cause of death classifications).

In 2019:

The most commonly classified causes for all **perinatal deaths** were:

- Congenital anomaly (31.7%)
- Spontaneous preterm birth (13.6%)
- Unexplained antepartum death (11.5%).

The most commonly classified causes of **stillbirths** were:

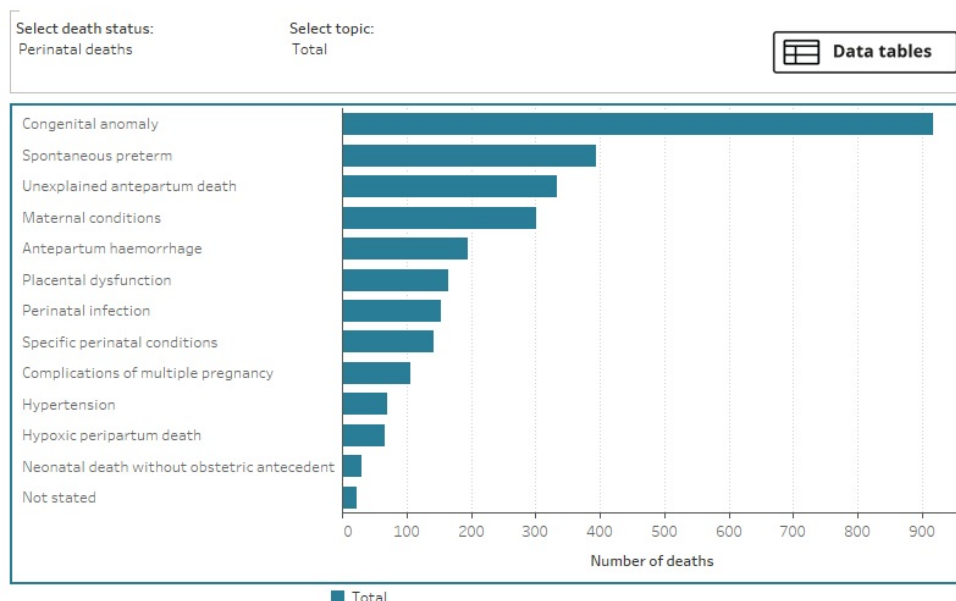
- Congenital anomaly (31.3%)
- Unexplained antepartum death (15.3%)

- Maternal conditions (13.0%).

The most commonly classified causes of **neonatal deaths** were:

- Congenital anomaly (32.8%)
- Spontaneous preterm birth (29.0%)
- Antepartum haemorrhage (10.4%).

PSANZ-PDC cause of perinatal deaths
by total for death status, 2019



Notes:

The category of unexplained antepartum death includes deaths of normally-formed fetuses prior to the onset of labour where no identified predisposing factors are considered likely to have caused the death and deaths where insufficient information was available to allow more specific classification of the cause of death.

Source: AIHW analysis of the NPMDC and NPDC.

<http://www.aihw.gov.au>

In 2019, **congenital anomaly** was the most commonly classified cause of perinatal death. This remained true across almost all deaths, regardless of maternal or gestational age, plurality, baby's birthweight percentile or the timing of death. The only exceptions to this were for:

- **Late gestation stillbirths.** Unexplained antepartum death was the most commonly classified cause of death for stillbirths occurring at 32-35 and 36+ weeks' gestation (25.0% and 26.8%, respectively).
- **Early gestation neonatal deaths.** Spontaneous preterm birth was the most commonly classified cause for neonatal deaths occurring at 20-22 and 23-26 weeks' gestation (both 42.9%).
- **Babies born to mothers aged under 20.** Maternal conditions were the most commonly classified cause of perinatal death for babies born to mothers aged under 20 (30.4%). Maternal conditions refers to deaths where a medical condition (e.g. diabetes) or a surgical condition (e.g. appendicitis) or an injury in the mother (including complications or treatment of that condition) is the cause.
- **Multiple births.** Complications of multiple pregnancy was the most commonly classified cause for multiples (37.3%), followed by spontaneous preterm birth (21.1%).
- **Neonatal deaths in babies considered appropriate for gestational age (AGA).** Spontaneous preterm birth was the main classified cause of neonatal deaths for babies considered appropriate birthweight for their gestational age (34.4%).

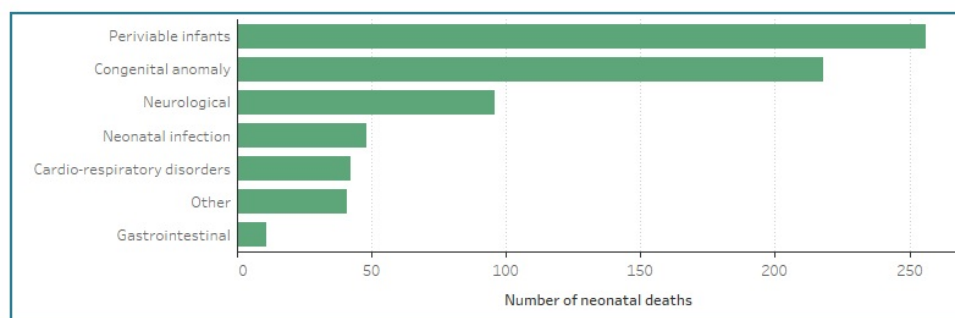
Causes of neonatal deaths

The PSANZ-NDC is an additional classification system applied only to neonatal deaths to identify the single most significant condition present in the neonatal period that caused the baby's death.

In 2019, the most commonly classified conditions causing neonatal deaths were:

- Periviable infants (infants deemed too immature for resuscitation or continued life support; 35.9%)
- Congenital anomaly (30.5%)
- Neurological conditions (13.4%).

PSANZ-NDC cause of neonatal deaths 2019

[Data tables](#)


Notes:

1. Excludes 2 neonatal deaths where PSANZ-NDC cause was 'not stated'.

Source: AIHW analysis of the NPMDC and NPDC.

<http://www.aihw.gov.au>

Investigation following perinatal death

Autopsy

The National Perinatal Mortality Data Collection collects data on whether or not an autopsy was performed and, where applicable, the type of autopsy performed (a full autopsy, limited autopsy or external examination). For the purposes of this report, deaths where any of these autopsy types have been performed will be collectively treated as deaths where an 'autopsy' has been performed.

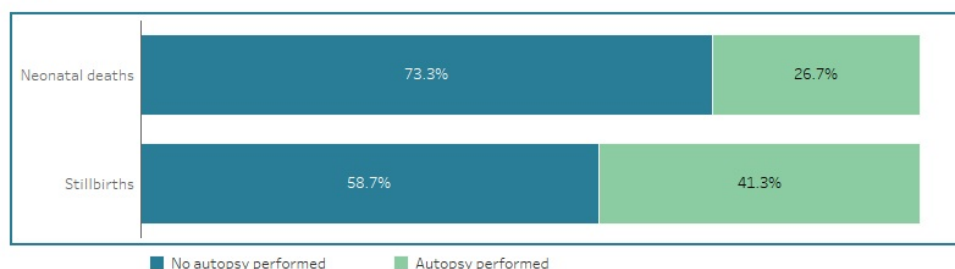
The purpose of an autopsy is to accurately identify the cause(s) of death. Autopsy results contribute to clinical audit and assist with identification of factors contributing to the death, and may be critical when clinicians consider providing parents with advice regarding the risk of a future perinatal death (RCOG 2010). Perinatal autopsy examinations require written consent from the parent(s) following informed discussion.

In 2019, there were 2,897 perinatal deaths, 2,661 of which (2,029 stillbirths and 632 neonatal deaths) had a stated autopsy status.

Of deaths where autopsy status was stated, there were:

- 1,006 (37.8%) perinatal deaths that had an autopsy performed
- 837 (41.3%) stillbirths and 169 (26.7%) neonatal deaths that had an autopsy performed.

Autopsy of perinatal deaths 2019

[Data tables](#)


Notes:

1. Autopsy performed includes full and limited autopsies, external examinations and records where an autopsy was performed but type is unknown.

2. Proportions exclude 'Not stated' values from the denominator.

Source: AIHW analysis of the NPMDC and NPDC.

<http://www.aihw.gov.au>

References


RCOG (Royal College of Obstetricians and Gynaecologists) (2010) *Late Intrauterine Fetal Death and Stillbirth: Green top guideline No.55*, RCOG, accessed 7 October 2021.

Due to differences in reporting cycles, preliminary data on perinatal deaths are available from the National Perinatal Data Collection for a portion of the calendar year and are available in the [Preliminary perinatal deaths](#) section of this web report.

Explore articles

- [Maternal deaths](#)
- [Stillbirths and neonatal deaths](#)

Last updated 11/04/2022 v143.0

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Australia's mothers and babies:

Maternal deaths

Web article | Last updated: 18 Nov 2021 | Topic: [Mothers & babies](#) | Part of [Australia's mothers and babies](#) |

Citation

AIHW

Australian Institute of Health and Welfare (2021) [Maternal deaths](#), AIHW, Australian Government, accessed 09 May 2022.

On this page:

- [Maternal deaths in Australia](#)
- [Maternal mortality over time](#)
- [Causes of maternal deaths](#)
- [Timing of maternal deaths](#)
- [Characteristics of women who died](#)

In Australia, where childbirth is safe for most women, maternal death is rare. All maternal deaths are reviewed by health professionals to determine the likely cause and whether the pregnancy contributed to the death.

Maternal death is the death of a woman while pregnant or within 42 days of the end of pregnancy, irrespective of the duration and outcome of the pregnancy, from any cause related to or aggravated by the pregnancy or its management but not from accidental or incidental causes.

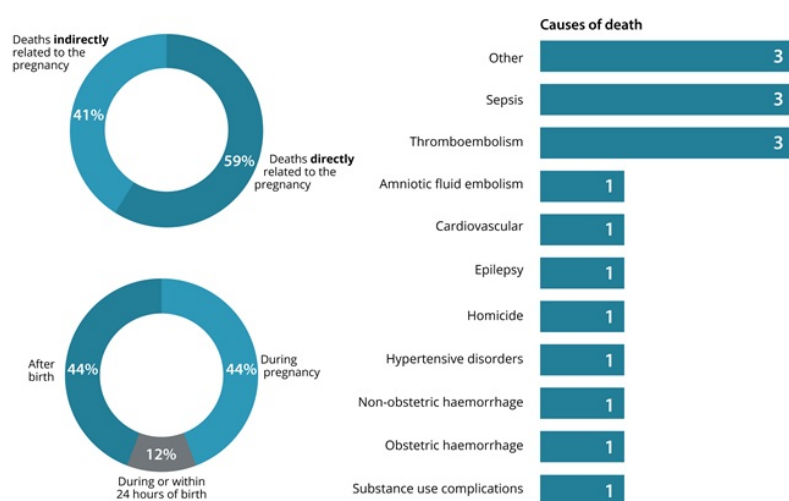
Maternal deaths are divided into two categories, **direct** and **indirect**. Direct maternal deaths are those resulting from obstetric complications of pregnancy or its management. Indirect maternal deaths are those resulting from diseases or conditions that were not due to a direct obstetric cause, but were aggravated by the physiologic effects of pregnancy. Deaths considered to be causally unrelated to pregnancy are classified as **coincidental** (see below for more information on these deaths).

Coincidental deaths are defined as those that are reported to have occurred during pregnancy or within 42 days of the end of pregnancy, but are considered to be causally unrelated to pregnancy. Unlike direct and indirect maternal deaths, coincidental deaths are excluded from analysis and MMR calculations.

There were 41 coincidental deaths in Australia from 2010-2019. The most common causes of these deaths were motor vehicle trauma and cancer. For more information visit [data tables 1 & 2](#).

Figure 1: Maternal deaths in Australia, 2019

In 2019, there were 17 maternal deaths, or 6 deaths per 100,000 women giving birth



Note: Data not available from Western Australia for 2019

Maternal mortality over time

The incidence of maternal death is expressed as the **maternal mortality ratio (MMR)**. The MMR is calculated using direct, indirect and not classified maternal deaths (excluding coincidental deaths and deaths awaiting classification) and expressed as per 100,000 women giving birth. Between 2010 and 2019, the MMR in Australia was relatively stable, ranging from between 5.0 to 8.4 per 100,000 women giving birth.

Fluctuations appear to reflect the normal variability that might be expected with rare events such as maternal deaths. The data visualisation shows a bar chart of the maternal mortality ratio by year for the period 2010 to 2019. In 2019, the maternal mortality ratio was 6.4 per 100,000 women giving birth.

Visualisation not available for printing

For more information on maternal mortality ratio over time see [National Maternal Mortality Data Collection annual update table 1](#).

Causes of maternal deaths

The most frequent causes of maternal death reported in Australia between 2010 and 2019 were complications of pre-existing cardiovascular disease and non-obstetric haemorrhage (mostly haemorrhage within the brain and haemorrhage from a ruptured aneurysm of the splenic artery).

The most frequent causes of direct maternal death between 2010 and 2019 were thromboembolism and obstetric haemorrhage. The data visualisation shows a bar chart of the number of direct and indirect maternal deaths by cause of death for the period 2010 to 2019. During this period, cardiovascular disease was the leading cause of maternal death, with 28 deaths.

Visualisation not available for printing

For more information on causes of maternal death see [National Maternal Mortality Data Collection annual update table 2](#).

Timing of maternal deaths

Understanding the timing of maternal deaths is important for identifying periods of critical risk. Between 2010 and 2019 one third (33%) of maternal deaths occurred in women who were reported to be pregnant at the time of their death, and of these women 2 in 5 (40%) died during the first trimester of pregnancy (less than 14 weeks of pregnancy).

In the same period, 1 in 5 (21%) maternal deaths were reported to have occurred during the birth process or within 24 hours of giving birth, and nearly half (46%) of all maternal deaths occurred after birth, with 3 in 5 (61%) deaths occurring within 1 to 13 days of giving birth. These proportions do not include maternal deaths following or due to miscarriage or termination of pregnancy as the timing of death was not adequately reported for these cases.

The data visualisation shows a bar chart of the number of direct and indirect maternal deaths by timing of death for the period 2010 to 2019. During this period, most deaths occurred after birth, with 76 deaths.

Visualisation not available for printing

For more information on timing of maternal death see [National Maternal Mortality Data Collection annual update table 3](#).

Characteristics of women who died

This section presents some demographic characteristics of the women who died from 2012-2019. It should be noted that not all demographic information was available for all women who died. Caution should be used when interpreting these data, due to the small number of maternal deaths in Australia, and even smaller numbers when these deaths are broken down by characteristics.

The data visualisation shows a bar chart of the maternal mortality ratio for the maternal characteristics of age, Indigenous status, smoking status, parity and remoteness for the period 2012 to 2019. During this period, the maternal mortality ratio for women aged under 20 was 17.2 per 100,000 women giving birth.

Visualisation not available for printing

Maternal age

Women aged under 20 had the highest MMR, followed by those aged 40 or more (18.8 and 12.5 per 100,000 women giving birth). The lowest MMR was for women in the 20 to 24 age group, followed by women in the 30 to 34 age group (2.0 and 4.8 per 100,000 women giving birth).

Maternal Indigenous status

Between 2012 and 2019, the MMR for Aboriginal and Torres Strait Islander women was 17.5 per 100,000 women giving birth. In the same period, the MMR for non-Indigenous women was 5.5 per 100,000 women giving birth.

Parity

Parity refers to a woman's number of previous pregnancies, excluding the current pregnancy, carried to a viable gestational age (usually 20 weeks). The rate of maternal death increased with parity, from an MMR of 4.8 and 4.7 per 100,000 women giving birth for women with a parity of none and 1 respectively, increasing up to 11.7 for women with a parity of 3 and 16.8 for women with a parity of 4 or more.

Smoking status

The rate of maternal deaths was higher in women who reported smoking during the first 20 weeks of pregnancy than in women who reported that they did not smoke during the first 20 weeks of pregnancy (16.9 compared to 3.5 per 100,000 women giving birth). As the number of maternal deaths with an unknown smoking status is relatively high (33% of data from included jurisdictions), caution should be used when interpreting these data.

Remoteness


Women who lived in *Remote* and *Very Remote* areas had the highest MMR, followed by women who lived in *Inner Regional* areas (10.8 and 8.6 per 100,000 women giving birth). The lowest MMR was for women who lived in *Major Cities* (5.5 per 100,000 women giving birth). The rate of maternal death in areas other than *Major Cities* should be treated with caution due to the small numbers.

For more information on timing of characteristics women who died see [National Maternal Mortality Data Collection annual update tables 4 to 8](#).

Explore articles

- [Maternal deaths](#)
- [Stillbirths and neonatal deaths](#)

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Technical notes

Data sources

National Perinatal Data Collection

The National Perinatal Data Collection (NPDC) began in 1991 and is a national population-based cross-sectional collection of data on pregnancy and childbirth. The NPDC collects national information on the pregnancy and childbirth of mothers, and the characteristics and outcomes of their babies. A standard de-identified extract is provided from states and territories to the Australian Institute of Health and Welfare (AIHW) on an annual basis to form the NPDC.

The NPDC supports a range of reports and products, including:

- *Australia's mothers and babies*
- National Core Maternity Indicators reports and data visualisations
- *Indigenous mothers and their babies* reports
- other specialist reports, indicator-based reports and customised data requests.

Detailed information on completeness, accuracy and other aspects of data quality for the NPDC is in the [data quality statement](#).

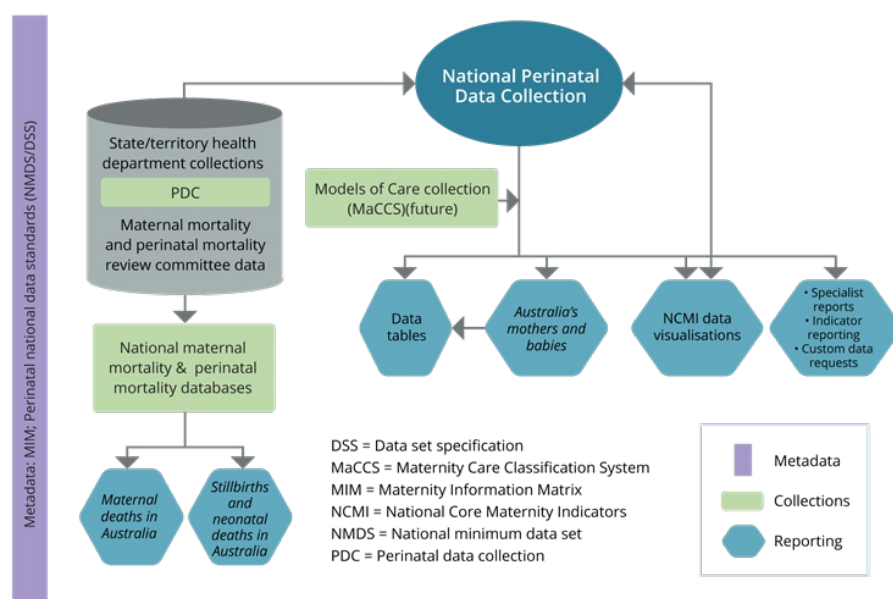
Collection of perinatal data by states and territories

Perinatal data are collected after each birth, usually by midwives or other birth attendants using information obtained from mother, 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 departments to form the state or territory perinatal data collection. See the section on State and territory perinatal data collections 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.

Collation of national perinatal data

A standardised extract of electronic data from each state and territory collection is provided to the Australian Institute of Health and Welfare (AIHW) annually. 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.

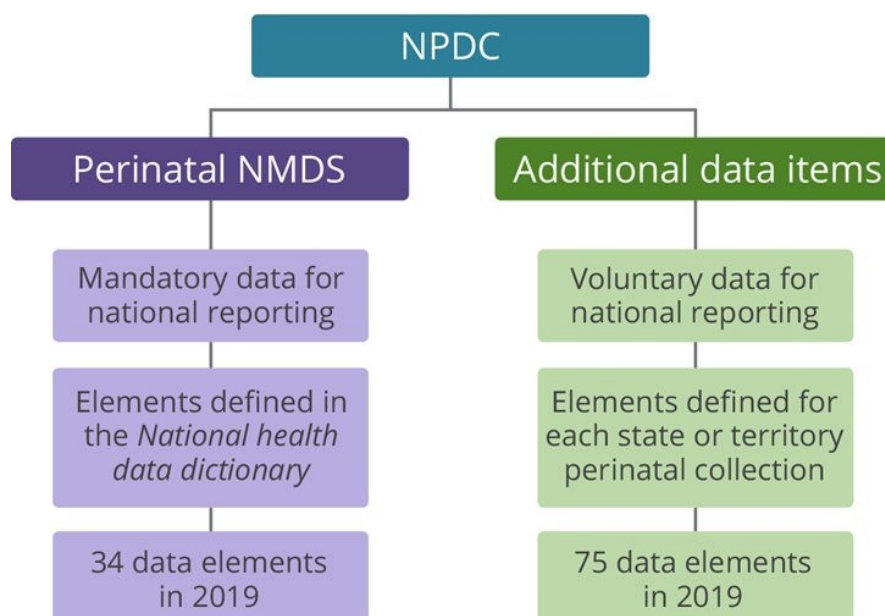
Overview of maternal and perinatal data collections and national reporting outputs



Structure of the National Perinatal Data Collection

Data supplied for the NPDC consist of the Perinatal national minimum data set (Perinatal NMDS) and additional data items.

Structure of the National Perinatal Data Collection



The Perinatal NMDS was first specified in 1997 and is 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. See the section on Perinatal national minimum data set items for a list of the data items supplied for the NPDC from the Perinatal NMDS. The Perinatal NMDS was first specified in 1997 and is 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. See the section on Perinatal national minimum data set items for a list of the data items supplied for the NPDC from the Perinatal NMDS.

Each state and territory collects more information than is specified in the Perinatal 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. Freebirths may be included in the NPDC if they are in scope of the data collection, and the mother or baby present to hospital following birth, or the birth is registered with the Registry of Births, Deaths and Marriages. However, this differs by state and territory.

The Australian *National health data dictionary* 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 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 (products of conception recognisable as a deceased fetus). In Victoria and 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. South Australian data may not include all terminations of pregnancy for psychosocial reasons after 20 weeks’ gestation where birthweight was not recorded.

Care is needed when comparing Australian birth statistics with those from 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 is more restrictive than the World Health Organization 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 and the AIHW, 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 NMDS items, develops existing perinatal data items in METeOR (AIHW's Metadata Online Registry) and contributes to the development of new perinatal data items.

References

COAG (Council of Australian Governments) 2012. National Healthcare Agreement 2012. Intergovernmental agreement on federal financial relations. Canberra: COAG. Viewed 31 March 2020.

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

National Maternal Mortality Data Collection

This report is compiled from data held by the AIHW in the National Maternal Mortality Data Collection (NMMDC). Data are provided by states and territories and contain information on the deaths of women reported to have died while pregnant or within 42 days of the end of pregnancy between 2006 and 2019.

Due to its health and privacy legislation, only limited summary data on maternal deaths from 2006-2018 were supplied by Western Australia. As these data provided are already aggregated, rather than provided by case, they cannot be included in the NMMDC but are included in analysis where possible.

Detailed information on completeness, accuracy and other aspects of data quality for the NMMDC is in the [data quality statement](#).

National Perinatal Mortality Data Collection

The National Perinatal Mortality Data Collection (NPMDC) is a population-based cross-sectional collection of data regarding the deaths of babies in hospitals and in the community, and includes all neonatal deaths and stillbirths of a baby at least 20 weeks' gestation or at least 400 grams birthweight, during pregnancy, birth or within 28 days of birth.

The NPMDC commenced with the 2013 birth cohort and builds on information collected in the NPDC. Common identifier fields in the NPDC and NPMDC allow demographic information regarding perinatal death records in the NPMDC to be retrieved from the NPDC for reporting.

There are 33 voluntary data items collected in the NPMDC which are supplied by state and territory health authorities using a standard de-identified extract to the Australian Institute of Health and Welfare (AIHW) on an annual basis. Data specifications supplied to jurisdictions for collection are included in the related data tables.

Detailed information on completeness, accuracy and other aspects of data quality for the NPMDC is in the [data quality statement](#).

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Technical notes

Perinatal national minimum data set items

Table 1: Perinatal NMDS 2018-19 data items

Data element name	METeOR identifier
Birth event—anaesthesia administered indicator, yes/no code N	495466
Birth event—analgesia administered indicator, yes/no code N	495381
Birth event—birth method, code N	672856
Birth event—birth plurality, code N	668881
Birth event—birth presentation, code N	673120
Birth event—labour onset type, code N	495690
Birth event—setting of birth (actual), code N	668814
Birth event—state/territory of birth, code N	270151
Birth event—type of anaesthesia administered, code N[N]	422383
Birth event—type of analgesia administered, code N[N]	471867
Birth—Apgar score (at 5 minutes), code NN	289360
Birth—birth order, code N	669962
Birth—birth status, code N	269949
Birth—birth weight, total grams NNNN	668986
Episode of admitted patient care—separation date, DDMMYYYY	270025
Establishment—organisation identifier (Australian), NNX[X]NNNNN	269973
Female (mother)—postpartum perineal status, code N[N]	630080
Female (pregnant)—number of cigarettes smoked (per day after 20 weeks of pregnancy), number N[NN]	365445
Female (pregnant)—tobacco smoking indicator (after 20 weeks of pregnancy), yes/no code N	673229
Female (pregnant)—tobacco smoking indicator (first 20 weeks of pregnancy), yes/no code N	673237
Female—caesarean section at most recent previous birth indicator, code N	673248
Female (pregnant)—number of antenatal care visits, total N[N]	669982
Female—parity, total pregnancies N[N]	501710
Person—area of usual residence, statistical area level 2 (SA2) code (ASGS 2016) N(9)	659725
Person—country of birth, code (SACC 2016) NNNN	659454
Person—date of birth, DDMMYYYY	287007
Person—Indigenous status, code N	602543
Person—person identifier, XXXXXX[X(14)]	290046
Person—sex, code N	635126
Pregnancy—estimated duration (at the first visit for antenatal care), completed weeks N[N]	673258
Product of conception—gestational age, completed weeks N[N]	669039

Note: Implementation start date 1 July 2018; implementation end date 30 July 2019.


Table 2: Perinatal NMDS 2019-20 data items

Data element name	METeOR identifier
Birth event—actual setting of birth, code N	695103
Birth event—anaesthesia administered indicator, yes/no code N	495466
Birth event—analgesia administered indicator, yes/no code N	495381
Birth event—birth method, code N	672856
Birth event—birth plurality, code N	668881
Birth event—birth presentation, code N	673120
Birth event—labour onset type, code N	495690
Birth event—setting of birth (actual), code N	668814
Birth event—state/territory of birth, code N	270151
Birth event—type of anaesthesia administered, code N[N]	422383
Birth event—type of analgesia administered, code N[N]	471867
Birth event—labour induction method, code N[N]	695355
Birth—Apgar score (at 5 minutes), code NN	289360
Birth—birth order, code N	669962
Birth—birth status, code N	269949
Birth—birth weight, total grams NNNN	668986
Episode of admitted patient care—separation date, DDMMYYYY	270025
Establishment—organisation identifier (Australian), NNX[X]NNNNN	269973
Female (mother)—postpartum perineal status, code N[N]	630080
Female (pregnant)—number of cigarettes smoked (per day after 20 weeks of pregnancy), number N[NN]	365445
Female (pregnant)—tobacco smoking indicator (after 20 weeks of pregnancy), yes/no code N	673229
Female (pregnant)—tobacco smoking indicator (first 20 weeks of pregnancy), yes/no code N	673237
Female—caesarean section at most recent previous birth indicator, code N	673248
Female (pregnant)—number of antenatal care visits, total N[N]	669982
Female—parity, total pregnancies N[N]	501710
Person—area of usual residence, statistical area level 2 (SA2) code (ASGS 2016) N(9)	659725
Person—country of birth, code (SACC 2016) NNNN	659454
Person—date of birth, DDMMYYYY	287007
Person—Indigenous status, code N	602543
Person—person identifier, XXXXXX[X(14)]	290046
Person—sex, code N	635126
Pregnancy—estimated duration (at the first visit for antenatal care), completed weeks N[N]	673258
Product of conception—gestational age, completed weeks N[N]	669039
Product of birth—active resuscitation indicator, yes/no/not stated/inadequately described code N	695556
Product of birth—active resuscitation method, code N[N]	695568

Note: Implementation start date 1 July 2019; implementation end date 30 July 2020.

Source: METeOR.

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Technical notes

State and territory perinatal data collections

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Latest report

Centre for Epidemiology and Evidence 2021. New South Wales mothers and babies 2019. Sydney: NSW Ministry of Health.

Additional summary data from the NSW Perinatal Data Collection are available on [HealthStats NSW](#).

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Latest report

Consultative Council on Obstetric and Paediatric Mortality and Morbidity 2019. Victoria's mothers, babies and children 2019. Melbourne: Safer Care Victoria, Victorian Government.

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Website: [Queensland Health](#)

Latest report

Queensland Department of Health (Statistical Services Branch) 2020. Perinatal statistics Queensland 2018. Brisbane: Queensland Health.

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Latest reports

Ballestas T (on behalf of the Perinatal and Infant Mortality Committee of Western Australia) 2017. The 15th report of the Perinatal and Infant Mortality Committee of Western Australia, 2011-2013. Perth: Department of Health, Western Australia.

Gee V 2013. Perinatal, infant and maternal mortality in Western Australia, 2006-2010. Perth: Department of Health, Western Australia.

Hutchinson M, Joyce A & Peirce A 2019. Western Australia's mothers and babies, 2015: 33rd Annual report of the Western Australian Midwives' Notification System. Perth: Department of Health, Western Australia.

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Latest reports

Pregnancy Outcome Unit, Wellbeing SA 2019. Maternal and perinatal mortality in South Australia 2017. Adelaide: Pregnancy Outcome Unit, Wellbeing SA.

Pregnancy Outcome Unit, Wellbeing SA 2019. Pregnancy outcome in South Australia 2017. Adelaide: Pregnancy Outcome Unit, Wellbeing SA.

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Latest report

Tasmania Council of Obstetric and Paediatric Mortality and Morbidity 2020. Annual report 2018. Hobart: Tasmanian Government Department of Health.

Australian Capital Territory

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Latest report

Summary data from the ACT Maternal Perinatal Data Collection are available on HealthStats ACT.

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Latest report

Li L & O'Neil L 2019. Mothers and babies 2016: Northern Territory Midwives' Collection. Darwin: Northern Territory Department of Health.

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Technical notes

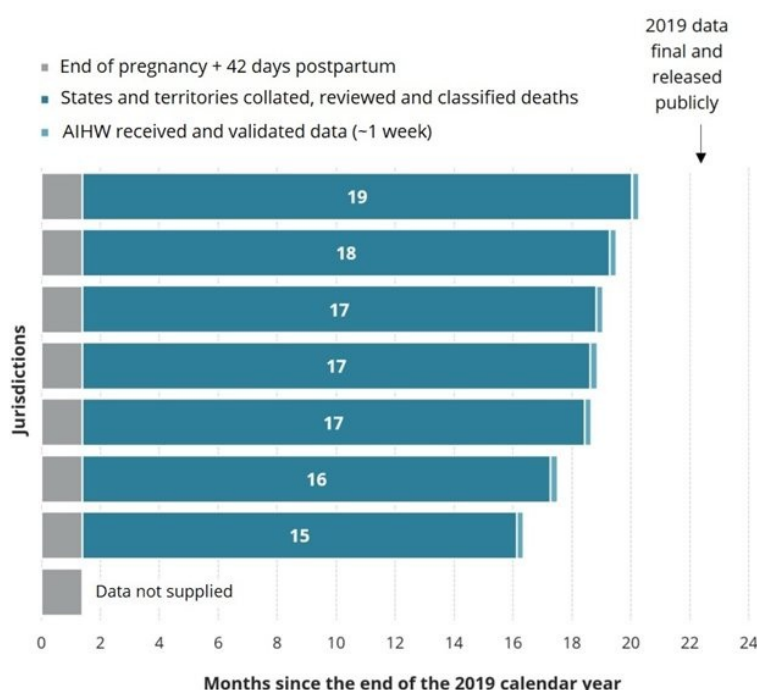
Data timeliness

National Maternal Mortality Data Collection

NMDC data are collected annually. Most jurisdictions need at least 12-18 months lead time to undertake post-mortem investigations, classification, data entry and validation as required after the end of a data collection period. Deaths subject to coronial inquiry may take longer to finalise.

Timelines for the reporting of 2019 maternal deaths data are outlined in Figure 1. These data were finalised and reported 22 to 23 months after the end of the collection period.

Figure 1: Months since the end of the 2019 calendar period and public reporting of National Maternal Mortality Data Collection, by jurisdiction



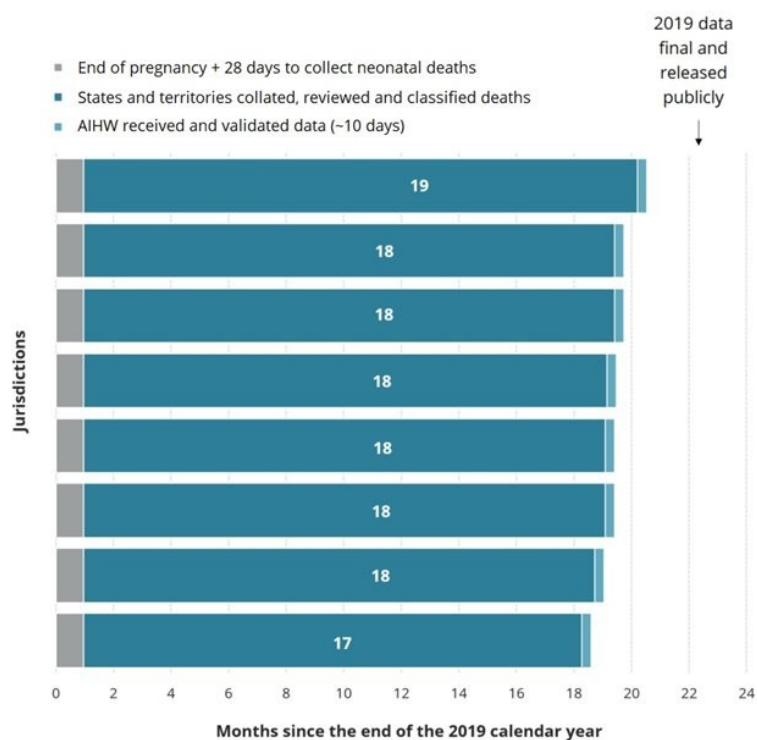
National Perinatal Mortality Data Collection

The NPMDC data cannot be finalised for a calendar year until all Jurisdictional Mortality Review Committee reports that apply to that period are complete. Jurisdictions coordinate and facilitate data collection procedures from service providers and the updating of records.


NPMDC data for 2019 was requested from states and territories on 26 June 2020 for submission to the AIHW by 14 August 2020. Data were received from 4 jurisdictions by this date. Data suppliers in some jurisdictions have given feedback that a request for data 17 months after the end of the collection period is unachievable as some data (particularly pertaining to PSANZ classification codes and contributory factors) are still waiting to be compiled at this stage.

Timelines for reporting perinatal deaths 2019 data are outlined in Figure 2. The NPMDC data for 2019 was finalised and reported 22 to 23 months after the end of the collection period.

Figure 2: Months since the end of the 2019 calendar period and public reporting of National Perinatal Mortality Data Collection, by jurisdiction



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Technical notes

Data quality and availability

Data availability

Some topics in this report may exclude data for selected states and territories for reasons including:

- changes in definitions or data collection methods in a state and territory that mean the data item is not comparable over time (trend analyses only)
- data are not currently collected by a state and territory, or are not collected in a format that is comparable with the specifications for the NPDC, NPMDC or the NMMDC
- data are not currently supplied by a state and territory for the NPDC, NPMDC or NMMDC. Data items that are not part of the Perinatal NMDS are not mandatory for provision to the NPDC, and there are currently no Perinatal NMDS items in the NPMDC.

NPDC, NPMDC and NMMDC exclusions are noted in footnotes under data visualisations, and are also available in the accompanying data tables. These exclusions apply to both the numerator and denominator for rate calculations, and the data presented are not representative of the jurisdictions excluded.

Detailed information on completeness for all NPDC data items used in the web report and data visualisations is available in the [National Perinatal Data Collection data availability resource interactive data visualisation tool](#). Note that this includes jurisdictions that provided data only.

National Perinatal Data Collection

Detailed information on completeness, accuracy and other aspects of data quality for the National Perinatal Data Collection (NPDC) is in the [data quality statement](#).

Tabulated data in this report are based on births in each state and territory in 2018 that meet the criteria for inclusion in the Perinatal NMDS. Due to data editing, subsequent updates of state and territory databases, and differences in scope for inclusion, the numbers may differ slightly from those in reports published by the states and territories.

Unless otherwise stated, the data in this report and related supplementary tables relate to the state or territory where births occurred in 2019 rather than to the state or territory of usual residence of the mother.

Due to rounding, percentage totals may not add to 100 and subtotals may not sum to the percentages for the categories.

Terminology

The terms ‘mothers’ or ‘women who gave birth’ have been used when referring to maternal characteristics, whereas ‘births’ refers to babies.

Quality of data for reporting Indigenous status

Indigenous status is a measure of whether a person identifies as being of Aboriginal and/or Torres Strait Islander origin. Indigenous status of the mother has been a mandatory data item for the Perinatal NMDS since its inception in 1997. Indigenous status of the baby was also added to the NMDS for collection for the first time in the 2012-13 reference year (from 1 July 2012).

This item, when used in conjunction with the mother’s Indigenous status, is a better baseline measure of health for all Indigenous children. However, the outcomes of babies of Indigenous mothers remain a key data resource for assessing antenatal care in pregnancy and other interventions before or during pregnancy, aimed at improving the health of mothers and babies.

Unless otherwise stated, data for babies are based on the Indigenous status of the mother.

Table 1 shows the relationship between Indigenous status of the mother and Indigenous status of the baby in 2019. The vast majority of all babies (96.6%) had the same Indigenous status as their mother while only a small proportion had a different Indigenous status recorded (3.3%). However, of the 18,086 babies reported as Indigenous in the NPDC in 2019 (6.0% of all babies), over one-quarter (26%) were born to non-Indigenous mothers.

Table 1: Births, by Indigenous status of the baby and mother, 2019

Indigenous status of the mother	Indigenous baby	Non-Indigenous baby	Not stated baby	Total
Indigenous mother	13,289 (4.4%)	1,053 (0.3%)	125 (0.0%)	14,467 (4.8%)

Non-Indigenous mother	4,782 (1.6%)	279,232 (92.1%)	2,878 (0.9%)	286,892 (94.7%)
Not stated mother	15 (0.0%)	1,410 (0.5%)	270 (0.1%)	1,695 (0.6%)
Total	18,086 (6.0%)	281,695 (93.0%)	3,273 (1.1%)	303,054 (100.0%)

Australian Capital Territory births

The Australian Capital Territory data contain a relatively high proportion of New South Wales residents who gave birth in the Australian Capital Territory. The proportion of mothers who gave birth in the Australian Capital Territory who were residents elsewhere was 14.0% in 2019.

When interpreting the data, it is important to note that these births to non-residents may include a disproportionate number of high-risk and multi-fetal pregnancies associated with poorer perinatal outcomes. This is because women with high risk pregnancies may be more likely to be transferred from smaller centres in New South Wales (that do not have the facilities to manage such births safely) to the Australian Capital Territory to give birth.

Therefore, percentages or rates such as those for pre-term births and perinatal deaths may be inflated for births that occur in the Australian Capital Territory. Reporting by state or territory of usual residence of the mother helps to address this issue.

National Maternal Mortality Data Collection

Detailed information on completeness for all data items in the NMMDC at the national level, for 2012 to 2019, is available in the interactive data visualisation below.

Definitions for the terms used to quantify completeness:

Supplied: supplied an appropriate value for a proportion of records for the data item during specified collection year/s

Not supplied or stated: proportion of values supplied as not stated or missing, where a jurisdiction has either supplied appropriate values for a portion of records or did not supply any value for all records for the data item during the specified collection year/s.

Due to its health and privacy legislation, only limited summary data on maternal deaths from 2006-2018 were supplied by Western Australia. As these data provided are already aggregated, rather than provided by case, they cannot be included in the NMMDC so have not been included in the data visualisation below, but are included in analysis where possible.

The data visualisation shows a bar chart of the availability of data items in the National Maternal Mortality Data Collection for the period 2012 to 2019.

Visualisation not available for printing

National Perinatal Mortality Data Collection

Detailed information on completeness for all data items in the NPMDC is available, at the national level, in the interactive data visualisation below for 2013 to 2019.

Definitions for the terms used to quantify completeness:

Supplied: supplied an appropriate value for a proportion of records for the data item during specified collection year/s

Not supplied or stated: proportion of values supplied as not stated or missing, where a jurisdiction has either supplied appropriate values for a portion of records or did not supply any value for all records for the data item during the specified collection year/s.

The data visualisation shows a bar chart of the availability of data items in the National Perinatal Mortality Data Collection for the period 2013 to 2019.

Visualisation not available for printing

Preliminary data on perinatal deaths

Preliminary data on perinatal deaths covered in this web report is from the National Perinatal Data Collection. The AIHW established the separate, enduring National Perinatal Mortality Data Collection to obtain complete information on these deaths.

Data on stillbirths and neonatal deaths are provided to the NPDC by jurisdictions as a subset of the larger cohort of all babies born in the same collection period. These preliminary data on stillbirths and neonatal deaths are made available to the public approximately 18 months after the end of the collection period.

Because these data are supplied to the AIHW often prior to completion of all Jurisdictional Mortality Review Committee reports, the data is not as comprehensive as that supplied to the NPMDC, particularly pertaining to PSANZ classification regarding the cause of death and contributory factors.

These preliminary data may also not include neonatal deaths for babies transferred to another hospital, re-admitted to hospital after discharge or who died at home after discharge.

Data provided to the NPMDC may vary from the preliminary data reported by the NPDC due to a variety of factors. Such factors include the inclusion of babies transferred to another hospital, re-admitted to hospital after discharge or who died at home after discharge; or cases where not enough detail was able to be provided by the jurisdiction to enable linkage of a particular death in the NPMDC back to the corresponding record in the NPDC.

Quality of data for reporting Indigenous status

Indigenous status is a measure of whether a person identifies as being of Aboriginal and/or Torres Strait Islander origin. Unless otherwise stated, data for babies are based on the Indigenous status of the mother. However, the outcomes of babies of Indigenous women remain a key data resource for assessing provision of antenatal care in pregnancy and other interventions before or during pregnancy.

Comparing NPMDC data with Victorian Consultative Council on Obstetric and Paediatric Mortality and Morbidity data

The stillbirth data for Victoria reported to the National Perinatal Mortality Data Collection differs to that reported by the Victorian Consultative Council on Obstetric and Paediatric Mortality and Morbidity (CCOPMM). For 2019, the CCOPMM annual report shows 508 stillbirths and an adjusted stillbirth rate of 6.4 per 1,000 births (CCOPMM 2021. [Victoria's Mothers Babies and Children 2019](#). Melbourne: Victorian Government). The difference is due to the following exclusions applied to the stillbirths reported by CCOPMM:

- Stillbirths resulting from terminations of pregnancy for psychosocial indications
- Stillbirths proven to have occurred at less than 20 weeks' gestation (for example, where a fetal death in utero diagnosed by ultrasound at 19 weeks' gestation), but where birth occurs at 20 weeks' gestation or more
- Stillbirths where a fetal death in utero is diagnosed at 20 weeks' gestation or more, but where the birthweight is less than 150 grams.

Comparing NPMDC data with ABS registrations of death data

Perinatal death data reported by the Australian Bureau of Statistics (ABS) are not directly comparable with the NPMDC and NPDC data contained in this report. Variation in the number of perinatal deaths reported by the ABS and NPMDC can be seen in the table below.

While the definitions of stillbirth (fetal death in ABS reporting) and neonatal death are the same, ABS data are sourced from state and territory registrars of Births, Deaths and Marriages. Data from the NPMDC and NPDC contained in this report are sourced from midwives, and other staff, who collect information from mothers and perinatal administrative and clinical record systems.

It is the responsibility of the parents to register a birth with Births, Deaths and Marriages, however some perinatal deaths may not be recorded when notifications are not registered by the parents. A delay in registrations is often seen, particularly for stillbirths, with the original date of death often being many years prior to the date of registration. This means the accuracy of the number of perinatal deaths reported by the ABS for a particular year often improves over time.


Table 1: Number of perinatal deaths reported by Australian Bureau of Statistics and the National Perinatal Mortality Data Collection, Australia, 2013-2019

Year	NPMDC Stillbirths	ABS Stillbirths	NPMDC Neonatal deaths	ABS Neonatal deaths
2013	2,194	1,781	822	763
2014	2,225	1,698	796	714
2015	2,149	1,718	688	707
2016	2,114	1,724	751	700
2017	2,174	1,760	800	744
2018	2,116	1,682	718	737
2019	2,183	1,686	714	727

Note: ABS stillbirths and neonatal deaths are reported by the year in which the death occurred (ABS 2019, Customised report).

For more information on perinatal deaths data collected by the ABS, visit the [perinatal deaths page at the Australian Bureau of Statistics](#).

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Technical notes

Definitions

Definitions used in reporting maternal deaths

Table: Definitions of maternal death

Type of death	Definition
Direct maternal deaths ^(a)	Those resulting from obstetric complications of the pregnant state (pregnancy, labour and puerperium) from interventions, omissions, incorrect treatment or from a chain of events resulting from any of the above
Indirect maternal deaths ^(a)	Those resulting from previous existing diseases or diseases that developed during pregnancy, and which were not due to a direct obstetric cause, but were aggravated by the physiologic effects of pregnancy
Maternal death, not further classified	Deaths considered to be related to the pregnancy or its management, but could not be further classified as either 'direct' or 'indirect'. These deaths are included in the maternal deaths total
Coincidental maternal deaths	Deaths from unrelated causes that happen to occur in pregnancy or the puerperium
Unclassified death	Maternal death from unspecified or undetermined cause occurring during pregnancy, labour and delivery, or the puerperium

(a) Definitions are from the *International statistical classification of diseases and related health problems*, 10th revision, volume 2, section 5.8.1.

Chart: aihw.gov.au

For more definitions of terms used in this report, see the [glossary](#).

Definitions used in reporting perinatal deaths

Various definitions are used for reporting and registering perinatal deaths in Australia. The National Perinatal Mortality Data Collection (NPMDC) collects data and reports using the following definitions:

Stillbirth: a fetal death prior to birth of a baby of 20 or more completed weeks of gestation or of 400 grams or more birthweight.

Neonatal death: the death of a live born baby of 20 or more completed weeks of gestation or of 400 grams or more birthweight within 28 days of birth.

Perinatal death: stillbirth or neonatal death of a baby from 20 or more completed weeks of gestation to 28 days following birth or of 400 grams or more birthweight.

Antepartum death: fetal death occurring prior to labour and/or birth.

Intrapartum death: fetal death occurring during labour and/or birth.

Very early neonatal death: death of a live born baby within the first 24 hours after birth.

Early neonatal death: death of a live born within 1-7 days after birth.

Late neonatal death: death of a live born within 8-28 days after birth.

Live birth: the birth of a baby who shows signs of life such as voluntary muscle movement, pulsating of the umbilical cord or presence of a heartbeat at birth, regardless of whether the placenta is still attached or the umbilical cord has been cut.

Terminations of pregnancy performed at 20 or more weeks of gestation may be included and recorded either as stillbirths or, in the unlikely event of showing evidence of life, as live births. There are variations in legislation regarding termination of pregnancy between states and territories, and recording of terminations is likely to be incomplete.

World Health Organization (WHO) definitions

To allow for international comparisons, the WHO recommendation regarding reporting perinatal mortality, taken from the 2006 [Neonatal and perinatal mortality: country, regional and global estimates report](#) has been used. The report recommends publication of rates of fetal death, neonatal death and perinatal mortality of babies weighing 1,000 grams or more, and/or born at 28 weeks' gestation or more.

Cause of death classification

The Perinatal Society of Australia and New Zealand (PSANZ) Perinatal Mortality Classification System is used in Australia and New Zealand to classify the causes of stillbirths and neonatal deaths. It includes the PSANZ Perinatal Death Classification (PSANZ-PDC) and PSANZ Neonatal Death Classification (PSANZ-NDC). The PSANZ-PDC system classifies all perinatal deaths by the single most important factor seen as the antecedent cause of death. In addition, for neonatal deaths, the PSANZ-NDC system is used to identify conditions occurring in the neonatal period which resulted in the death.

The PSANZ Perinatal Death Classification is an integral part of the PSANZ Perinatal Mortality Guidelines, developed for optimal standards in investigating, classifying and auditing of perinatal deaths.

From 2019, the National Perinatal Mortality Data Collection (NPMDC) collects data on causes of death that have been classified according to the [PSANZ classification system for stillbirths and neonatal deaths, version 4.3](#) (from 2013-2018, causes of death were in the NPMDC were classified according to the [PSANZ Perinatal Mortality Classification System, version 2.2](#)). The classification is recorded as part of each state and territory's perinatal mortality review process following completion of investigations and at the end of a multi-disciplinary review of the perinatal death.

The other classification system used in Australia to classify perinatal deaths is the International Statistical Classification of Diseases and Related Health Problems, Tenth Revision (ICD-10). This classification system is based on the registered cause/s of death on the Medical Certificate of Cause of Perinatal Death, assigned by the treating medical practitioner shortly after death without access to any subsequent investigations.

The National Maternal and Perinatal Mortality Clinical Expert Group (NMPMCEG) (formerly the National Maternal and Perinatal Mortality Advisory Group (NMPMAG)) has concluded that the PSANZ-PDC and PSANZ-NDC classifications are the most appropriate for national reviews. The ICD classification of cause of death has not been included in this report.

PSANZ-PDC primary classification groups

These are the 12 high-level groups used in reporting:

Congenital anomaly: deaths in which a congenital anomaly in the baby (whether structural, functional or chromosomal) is considered to have been of major importance in the cause of the death.

Perinatal infection: primary infections occurring in term and preterm neonatal and fetal deaths and secondary infections in term infants (such as Group B Streptococcus and Cytomegalovirus).

Hypertension: deaths where a hypertensive disorder in the baby's mother, such as pre-eclampsia or pre-existing high blood pressure, is considered to have led to the death.

Antepartum haemorrhage: all perinatal deaths where the primary factor leading to the death was bleeding from the placental bed in the woman's uterus.

Maternal conditions: deaths where a medical condition (e.g. diabetes) or a surgical condition (e.g. appendicitis) or an injury in the mother (including complications or treatment of that condition) is the cause.

Complications of multiple pregnancy: deaths of one or more babies in a multiple pregnancy related to the pregnancy being multiple, including complications of the fetal circulations interconnecting (Twin to twin transfusion syndrome) and umbilical cords becoming entangled where the babies are in only one amniotic sac.

Specific perinatal conditions: deaths of normally formed, appropriately grown babies, in which a specific perinatal condition, such as cord entanglement or a blood group incompatibility, was the main underlying cause.

Hypoxic peripartum deaths: deaths from acute or chronic inadequate oxygen supply from the placenta of normally formed babies, typically of >24 weeks' gestation or >600 grams birthweight.

Placental dysfunction or causative placental pathology: deaths where the placenta is demonstrated to have been poorly functioning, either by post-mortem microscopic examination of the placental or by ultrasound testing of placental and umbilical artery blood flow.

Spontaneous preterm labour or rupture of membranes: deaths of normally formed, appropriately grown preterm babies following spontaneous onset of preterm labour or spontaneous rupture of membranes, irrespective of whether labour was subsequently induced and mode of delivery.

Unexplained antepartum fetal death: deaths of normally formed fetuses prior to the onset of labour where no predisposing factors are considered likely to have caused the death.

Neonatal death without obstetric antecedent: includes Sudden Infant Death Syndrome (SIDS), postnatally acquired infection (such as Newborn Intensive Care Unit-acquired septicaemia from an intravenous line), accidental asphyxiation and other accidents, poisoning or violence.

PSANZ-NDC primary classification groups

The PSANZ-NDC classification system is applied only to neonatal deaths and classifies them by the most significant condition present in the baby, in the neonatal period, leading to the death.

Congenital anomaly: deaths in which a congenital anomaly in the baby (whether structural, functional or chromosomal) is considered to have been of major importance in the cause of the death.

Perivable infants: neonatal death in infants deemed too immature for resuscitation or continued life support beyond the delivery room (typically infants of gestational age ≤ 24 weeks or birthweight ≤ 600 grams).

Cardio-respiratory disorders: neonatal deaths in which a cardio-respiratory condition (such as respiratory distress syndrome or meconium aspiration syndrome) is considered to have been the major contributor to the death.


Infection: neonatal deaths in which infection is considered to have been the major contributor (such as early onset Group B Streptococcus sepsis, pneumonia).

Neurological: neonatal deaths in which asphyxial brain damage (hypoxic ischaemic encephalopathy) or intracranial haemorrhage was considered to have been the major contributor.

Gastrointestinal: primarily includes neonatal deaths related to necrotizing enterocolitis (a medical condition where a portion of the bowel dies).

Other: includes Sudden Infant Death Syndrome (SIDS), multisystem failure, trauma and treatment complications.

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Technical notes

Methods

Calculation of rates and ratios

Age-specific rates

An age-specific rate is defined as the number of events for a specified age group over a specified period (for example, a year) divided by the total population exposed to the event in that age group.

Age-standardised rates

Age-standardised rates enable comparisons to be made between populations that have different age structures. Direct standardisation, in which the age-specific rates are multiplied by a constant population, was used in this report. This effectively removes the influence of the age structure on the summary rate. The report states where age-standardised rates have been used.

All age-standardised rates in this report have used the June 2001 Australian female estimated resident population aged 15-44 years as the standard population. For more information refer to the [Metadata Online Registry for age-standardised rates](#).

Maternal mortality ratio

The incidence of maternal death is expressed as the maternal mortality ratio (MMR), which is calculated using direct and indirect deaths combined, and excludes coincidental deaths.

Although the most appropriate denominator for estimating maternal mortality would be the number of women at risk (the number of pregnant or recently pregnant women), this number is not available in Australia because the number of pregnancies ending before 20 weeks' gestation is unknown. In Australia, accurate population data are available for the number of women who gave birth to at least 1 baby (either a live birth or a stillbirth) of 20 weeks' completed gestation or more or birthweight of 400 grams or more and are held in the AIHW's National Perinatal Data Collection; this is the denominator number used when calculating the MMR in this report.

$$\text{MMR} = (\text{Number of direct and indirect maternal deaths}^{(a)}) / (\text{Number of women who gave birth}^{(a)}) \times 100,000$$

(a) For a defined place and time.

Perinatal mortality rates

Calculation of stillbirth rate

The stillbirth rate is calculated as the proportion of births in a specified population which are stillbirths. This proportion is expressed in relation to all births.

$$\text{Stillbirth rate} = \text{Number of stillbirths} \times 1,000 / \text{Total number of births}$$

Calculation of neonatal mortality rate

The neonatal mortality rate is calculated as the proportion of births in a specified population which are live born and subsequently die within 28 days of birth (neonatal deaths). This proportion is expressed in relation to all live births.

$$\text{Neonatal mortality rate} = \text{Number of neonatal deaths} \times 1,000 / \text{Number of live births}$$

Calculation of perinatal mortality rate

The perinatal mortality rate is calculated as the proportion of births in a specified population which are stillbirths or neonatal deaths (perinatal deaths). This proportion is expressed in relation to all births.

$$\text{Perinatal mortality rate} = \text{Number of perinatal deaths} \times 1,000 / \text{Total number of births}$$

Crude rates

A crude rate is defined as the number of events over a specified period (for example, a year) divided by the total population exposed to the event.

Rate ratio

Rate ratios presented in the National Perinatal Data Collection annual update data tables are calculated by dividing the proportion of the study population (for example, Indigenous Australians) with a particular characteristic by the proportion of the standard population (for example, non-Indigenous Australians) with the same characteristic.

A rate ratio of 1 indicates that the prevalence of the characteristic is the same in the study and standard populations. Rate ratios of greater than 1 indicate higher prevalence in the study population; rate ratios of less than 1 indicate higher prevalence in the standard population.

Geography

Geographic data are based on the usual residence of the mother. In 2018, the usual residence of the mother is based on Statistical Area Level 2 (SA2) of the Australian Bureau of Statistics Australian Statistical Geography Standard Edition 2016 for all states and territories.

Primary Health Network

Primary Health Networks (PHNs) have been established by the Department of Health to increase the efficiency and effectiveness of medical services and improve the coordination of care for patients.

Perinatal data at Statistical Area Level 2 (SA2) were linked to 2017 PHNs using Australian Bureau of Statistics correspondence files.

The relevant proportion for each PHN was then calculated, and categories were developed based on the median, interquartile ranges and 10th and 90th percentiles for the proportions at the PHN level. The categories were then adjusted to account for natural breaks in the distribution of the data and for easier interpretation (for example, a range with a maximum of 52.1% of mothers receiving antenatal care in the first trimester would be revised to a maximum of 50%). PHNs were allocated to categories based on unrounded proportions.

Remoteness

This report uses the Australian Statistical Geography Standard Remoteness Structure, which groups geographic areas into six classes of Remoteness Area based on their relative access to services using the Accessibility/Remoteness Index of Australia.

The six classes are: *Major cities*, *Inner regional*, *Outer regional*, *Remote*, *Very remote* and *Migratory*, see the *Australian Statistical Geography Standard (ASGS): Volume 5—Remoteness Structure*, July 2016 (ABS 2018a).

Socioeconomic status

The Socio-Economic Indexes for Areas (SEIFA) are measures of socioeconomic status (SES) that summarise a range of socioeconomic variables associated with disadvantage. Socioeconomic disadvantage is typically associated with low income, high unemployment and low levels of education.

The SEIFA index used in this report is the 2016 SEIFA Index of Relative Socioeconomic Disadvantage (IRSD) developed by the Australian Bureau of Statistics for use at Statistical Area Level 2.

Since the IRSD summarises only variables that indicate disadvantage, a low score indicates that an area has many low-income families, many people with little training and many people working in unskilled occupations; hence, this area may be considered disadvantaged relative to other areas. A high score implies that the area has few families with low incomes and few people with little or no training and working in unskilled occupations. These areas with high index scores may be considered less disadvantaged relative to other areas. It is important to understand that a high score reflects a relative lack of disadvantage rather than advantage and that the IRSD relates to the average disadvantage of all people living in a geographic area. It cannot be presumed to apply to all individuals living within the area.

Population-based Australian cut-offs for SEIFA quintiles have been used in this report. This method ranks the SEIFA scores for a particular geography (for example, Statistical Area Level 2) from lowest to highest, and the geographical areas are divided into 5 groups, such that approximately 20% of the population are in each group.

The most disadvantaged group is referred to as the *Lowest socioeconomic status (SES) areas* and the least disadvantaged group is referred to as the *Highest SES areas*.

See the *Census of Population and Housing: Socio-Economic Indexes for Areas (SEIFA), Australia, 2016* (ABS 2018b) for further information on SEIFA.

Statistical Area Level 3

Perinatal data at Statistical Area Level 2 (SA2) were linked to Statistical Area Level 3 (SA3) using Australian Bureau of Statistics correspondence files.

National Perinatal Data Collection annual update data tables 1.2 and 1.3

Annual change

The average annual change (slope estimate) is calculated using the ordinary least squares method of linear regression. The method calculates a straight line that best fits the data (the fitted linear regression line) and returns an equation that best describes the line.

The form of the straight-line equation is:

$$Y = a + bX$$

where:

b is the average annual change or 'slope' over the period

X is the independent or predictor variable (in the case of time trend analysis, this is the year)

a is the y-intercept

Y is the predicted value of the rate based on the fitted linear regression line.

Per cent change

Per cent change is determined by multiplying the average annual change (slope estimate) over the period by the number of data points less 1. This is then divided by the *Y* value calculated for the first year in the series (based on the fitted linear regression line) and multiplied by 100.

Statistical significance of trend data

For trend analyses, the 95% confidence intervals (CIs) for the standard error of the slope estimate (average annual change) were used to determine whether the apparent increases or decreases in the data are statistically significant at the $p < 0.05$ level. The formula used to calculate the CIs for the standard error of the slope estimate is:

$$95\% \text{ CI}(x) = x \pm 1.96 \times \text{SE}(x)$$

where:

x is the average annual change (slope estimate).

If the upper and lower 95% CIs do not include zero, it can be concluded that there is statistical evidence of an increasing or decreasing trend in the data over the study period.

Significant changes are denoted with a '**' against the per cent change statistics included in relevant tables.

Time trends

Linear regression has been used to determine changes in the observed rates over specified time periods. Regression modelling analyses the series of rates jointly rather than individually, thus accounting for volatility in observed rates over time and resulting in narrower confidence intervals around the set of predicted values than if the confidence limits were calculated around the rates separately.

Confidentiality

To maintain privacy and confidentiality of individuals, cells in the data tables are suppressed if there is a risk of disclosure of an attribute of an individual that was not already known. A cell in a table is considered identifiable if, as well as being able to identify the entity, other details are also revealed. It is AIHW policy that these cells need to be confidentialised, unless the attribute that would be disclosed is deemed to be non-sensitive in the context of the data being published.

Small numbers

Numbers of less than 5 have not been published (n.p.), in line with guidelines for protecting the privacy of individuals. Exceptions to this are small numbers in 'Other' and 'Not stated' categories. Consequential suppression of numbers has also been applied where required to prevent back-calculation of small numbers. However, all suppressed numbers have been included in the totals.

Per cents based on denominators of less than 100 have also been suppressed (n.p.) for reliability reasons.

Australian national birthweight percentiles by gestational age

Birthweight percentiles were calculated from data on all liveborn singleton babies born in Australia between 2004 and 2013 with a gestational age of 20-44 weeks.

Records with indeterminate sex were excluded from analysis. Records with missing or not stated data for sex, birthweight or gestational age were also excluded. Birthweight outliers were calculated and excluded using a method based on Tukey's box and whisker plots.

Gestational age is reported in completed weeks of gestation, calculated from the first day of the last menstrual period (LMP) or estimated by prenatal and/or postnatal assessment if the LMP date was missing. Birthweight is reported to the nearest 5 grams.

Small for gestational age is defined as babies with birthweight below the 10th percentile according to the national birthweight percentiles for 2004 to 2013.

Data used to assign percentile is supplied in the accompanying data [tables](#).

Robson 10 group classification system

The Robson 10 group classification system (Robson classification) categorises women who gave birth into 10 mutually exclusive groups (Table 3). In addition, groups 2 and 4 can be further broken down into subgroups. These subgroups are used to differentiate between women who were induced and who had a caesarean section before labour onset.

Table: Robson 10 group classification system

Group	Definition
1	First-time mother, singleton pregnancy, baby in cephalic (head first) presentation, ≥ 37 weeks gestation, spontaneous labour (not induced)
2	First-time mother, singleton pregnancy, baby in cephalic (head first) presentation, ≥ 37 weeks gestation, induced labour or caesarean section before labour

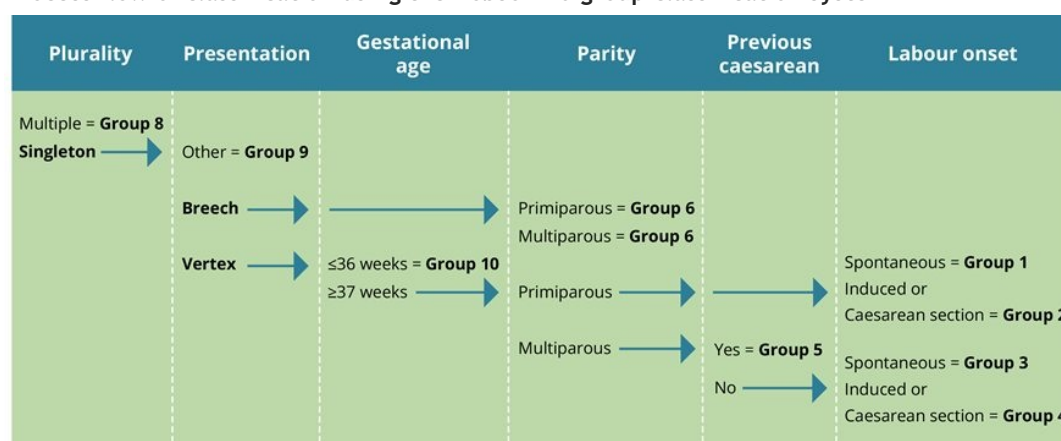
3	Mother has previously given birth without a previous caesarean scar, singleton pregnancy, baby in cephalic (head first) presentation, ≥ 37 weeks gestation, spontaneous labour (not induced)
4	Mother has previously given birth without a previous caesarean scar, singleton pregnancy, baby in cephalic (head first) presentation, ≥ 37 weeks gestation, induced labour or caesarean section before labour
5	Mother has previously given birth with a previous caesarean scar, singleton pregnancy, baby in cephalic (head first) presentation, ≥ 37 weeks gestation, induced labour or caesarean section before labour
6	First-time mother, singleton pregnancy, baby in breech (feet first) presentation
7	Mother has previously given birth with current singleton baby in breech (feet first) presentation
8	Multiple pregnancy, including women with previous caesarean scars
9	All women with a singleton pregnancy, baby in transverse (side on) or oblique lie, including women with previous caesarean scars
10	All women with a singleton pregnancy, baby in cephalic (head first) presentation, ≤ 36 weeks gestation, including women with previous caesarean scars

The Robson classification groups and subgroups were calculated from data on all women who gave birth in Australia for 2019. Data elements used for calculation of the groups and subgroups were parity, previous caesarean sections, onset of labour, birth plurality, gestational age, presentation at birth and method of birth.

Records for whom one or more of the following variables were not stated: parity, previous caesarean sections, onset of labour, birth plurality, gestational age and presentation at birth; were grouped into the 'Not applicable' category. The denominator of 'Number of women who gave birth' includes women with a 'not stated' method of birth.

The figure describes the process of categorising all women who gave birth into the 10 groups and the additional subgroups.

Process flow of classification using the Robson 10 group classification system




References

ABS (Australian Bureau of Statistics) 2018a. [Australian Statistical Geography Standard \(ASGS\): Volume 5—Remoteness Structure, July 2016](#). ABS cat. no. 1270.0.55.005. Canberra: ABS.

ABS 2018b. [Census of Population and Housing: Socio-Economic Indexes for Areas \(SEIFA\), Australia, 2016](#). ABS cat. no. 2033.0.55.001. Canberra: ABS.

AIHW (Australian Institute of Health and Welfare) 2019. [Australia's mothers and babies 2016—in brief](#). Perinatal statistics series no. 34. Cat. no. PER 97. Canberra: AIHW.

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Technical notes

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Technical notes

Abbreviations

AIHW	Australian Institute of Health and Welfare
ASGS	Australian Statistical Geography Standard
CI	confidence interval
IRSD	Index of Relative Socioeconomic Disadvantage
LMP	last menstrual period
NBEDS	national best endeavours data set
NMDS	national minimum data set
NMMDC	National Maternal Mortality Data Collection
NPDC	National Perinatal Data Collection
NPMDC	National Perinatal Mortality Data Collection
PHN	Primary Health Network
PSANZ-NDC	Perinatal Society of Australia and New Zealand Neonatal Death Classification
PSANZ-PDC	Perinatal Society of Australia and New Zealand Perinatal Death Classification
SA2	Statistical Area Level 2
SA3	Statistical Area Level 3
SACC	Standard Australian Classification of Countries
SEIFA	Socio-Economic Indexes for Areas
SES	socioeconomic status

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Notes

Amendments

9 Nov 2021 - An update was performed to replace data for smoking status in the ‘Smoking during pregnancy’ chapter and in other chapters where smoking status is a disaggregation.

2 Jun 2020 - A number of formatting issues in the data visualisations have been updated.

5 Aug 2019 - The key fact box within the data visualisation has been updated to show the latest data (2017) for the following pages:


- Smoking
- Place of birth
- Gestational age
- Birthweight
- Stillbirths and neonatal deaths

27 Nov 2019 - The Admission to a special care nursery or neonatal intensive care unit key fact in the data visualisation has been updated to read “1 in 5 babies” rather than “1 in 6 babies”.

Data quality statement

[National Perinatal Data Collection, 2019: Quality Statement](#)

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Data

[Preliminary data tables: National Perinatal Data Collection annual update 2020](#)

Data

[Download Preliminary data tables: National Perinatal Data Collection annual update 2020. Format: XLSX 501Kb](#) XLSX 501Kb

[Data tables: Australia's mothers and babies 2019](#)

Data

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[Data tables: National Perinatal Data Collection annual update 2019](#)

Data

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[Data tables: National Maternal Mortality Data Collection annual update 2019](#)

Data


[Download Data tables: National Maternal Mortality Data Collection annual update 2019. Format: XLSX 163Kb](#) XLSX 163Kb

[Data tables: National Perinatal Mortality Data Collection annual update 2019](#)

Data

[Download Data tables: National Perinatal Mortality Data Collection annual update 2019. Format: XLSX 221Kb](#) XLSX 221Kb

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Related material

Resources

[Australia's mothers and babies 2018 in brief](#)

Resource

[View](#)

[Stillbirths and neonatal deaths in Australia 2017 and 2018](#)

Resource

[View](#)

[Maternal deaths in Australia 2015-2017](#)

Resource

[View](#)

[Stillbirths and neonatal deaths in Australia](#)

Resource


[View](#)

[Maternal deaths in Australia](#)

Resource

[View](#)

Last updated 2/09/2021 v4.0

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Archived content

The data tables below show historical analysis of the National Perinatal Data Collection, National Maternal Mortality Data Collection and the National Perinatal Mortality Data Collection and were correct at the time of publication. Note data may have changed since the original publication date.

[Data tables: National Perinatal Data Collection data visualisations 2018](#)

Data

[Download Data tables: National Perinatal Data Collection data visualisations 2018. Format: XLSX 4.3Mb XLSX 4.3Mb](#)

[Data tables: National Maternal Mortality Data Collection annual update 2018](#)

Data

[Download Data tables: National Maternal Mortality Data Collection annual update 2018. Format: XLSX 169Kb XLSX 169Kb](#)

[Data tables: National Perinatal Mortality Data Collection annual update 2018](#)

Data

[Download Data tables: National Perinatal Mortality Data Collection annual update 2018. Format: XLSX 223Kb XLSX 223Kb](#)

[Data tables: National Perinatal Data Collection data visualisations 2017](#)

Data

[Download Data tables: National Perinatal Data Collection data visualisations 2017. Format: XLSX 3.9Mb XLSX 3.9Mb](#)

[Data tables: National Maternal Mortality Data Collection annual update 2017](#)

Data

[Download Data tables: National Maternal Mortality Data Collection annual update 2017. Format: XLSX 182Kb XLSX 182Kb](#)

[Data tables: National Perinatal Mortality Data Collection annual update 2017](#)

Data

[Download Data tables: National Perinatal Mortality Data Collection annual update 2017. Format: XLSX 206Kb XLSX 206Kb](#)

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