Australian Government
Australian Institute of Health and Welfare

Australia's mothers and babies

Web report | Last updated: **13 Dec 2023** | Topic: Mothers & babies | Media release

About

The health of both mothers and babies can have important ongoing implications. In 2021, there were 315,705 babies born to 311,360 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.

The data in this report are based on final 2021 data from the National Perinatal Data Collection, the National Maternal Mortality Data Collection, and the National Perinatal Mortality Data Collection.

This year for the first time, *Australia's mothers and babies* includes a separate article on breastfeeding in Australia, focusing on breastfeeding duration and breastfeeding by state or territory, remoteness area and among Aboriginal and/or Torres Strait Islander (First Nations) mothers.

For the third time, an early release of preliminary 2022 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 2022 data include data from 5 of 8 jurisdictions, totals in the preliminary 2022 data are not comparable with the final 2021 data used throughout this report. Final 2022 data and a full update of the *Australia's mothers and babies* web report will be released in mid-2024.

Cat. no: PER 101

Findings from this report:

- Birth rate increased after a period of decline (from 56 per 1,000 women in 2020 to 61 per 1,000 in 2021)
- Average maternal age is increasing (from 30.0 years in 2011 to 31.1 in 2021)
- Fewer women are smoking during pregnancy (from 13% in 2011 to 8.7% in 2021)
- There were 9.6 perinatal deaths for every 1,000 births in 2021

Summary

The health of both mothers and babies can have important ongoing implications. In 2021, there were 315,705 babies born to 311,360 mothers in Australia.

Mothers' key facts

- **31.1 years** was the average maternal age
- **2.2%** of mothers lived in *Remote* or *Very remote* areas
- **5.0%** (15,437) of mothers were First Nations
- **around 2 in 3** mothers were born in Australia
- **1.4%** of mothers had a multiple birth.

Babies' key facts

- **39 weeks** was the median gestational age
- **7.2 per 1,000** babies were stillborn
- **6.1%** (19,155) of babies were First Nations
- babies' sex: **49%** were female and **51%** were male
- **2.7%** of babies were multiple births.

Other insights

Birth rate has rebounded but mothers are older

In 2021, the rate of women of reproductive age (aged 15 to 44 years) giving birth has increased to 61 per 1,000 women compared with a decreasing trend over the past decade (from 64 per 1,000 women in 2011 to 56 per 1,000 in 2020). The average age of women who gave birth has increased from 30.0 years in 2011 to 31.1 in 2021.

Most mothers access antenatal care and fewer mothers are smoking

In 2021, 80% of women who gave birth accessed antenatal care in the first trimester of their pregnancy, and 96% had 5 or more antenatal care visits. The proportion of women who reported smoking at any time during pregnancy has fallen from 13% in 2011 to 8.7% in 2021.

Around 1 in 3 mothers gave birth by caesarean section

The rate of women giving birth by caesarean section has risen, from 32% in 2011 to 38% in 2021.

More Aboriginal and Torres Strait Islander (First Nations) mothers are accessing antenatal care and fewer are smoking during pregnancy

There were improvements over the past decade in antenatal care attendance in the first trimester (from 50% in 2012 to 70% in 2021) and smoking at any time during pregnancy (from 50% in 2011 to 42% in 2021).

Rates of pre-term birth and low birthweight are stable

There has been little change in the proportion of pre-term births ranging between 8.3% in 2011 and 8.2% in 2021 with a peak of 8.7% reached most recently in 2018, and low birthweight babies remained steady at 6.3% between 2011 and 2021.

Cardiovascular disease is the most common cause of maternal death

In 2021, the maternal mortality rate was 5.8 deaths per 100,000 women giving birth (18 deaths). In the decade from 2012 to 2021, cardiovascular disease was the most common cause of death. During this decade there were 191 women reported to have died during pregnancy, or within 42 days of the end of pregnancy, with a maternal mortality rate of 6.3 deaths per 100,000 women giving birth.

Congenital anomaly is the most common cause of perinatal death

In 2021, 9.6 per 1,000 babies (3,016) died in the perinatal period, and congenital anomaly was the most common cause of perinatal death. Of these deaths, three-quarters were stillbirths (2,278) and the remainder (738) were neonatal deaths.

In this report

Demographics of mothers and babies

This section provides a snapshot of mothers and babies in Australia.

- Maternal country of birth

Antenatal period

The antenatal period covers the time from conception until birth.

- Antenatal care
- Smoking during pregnancy
- Antenatal period
- Alcohol consumption during pregnancy
- Maternal body mass index
- Maternal medical conditions

Labour and birth

This section looks at key aspects of the labour and birthing process.

- Place of birth
- Onset of labour
- Method of birth
- Analgesia
- Anaesthesia
- Labour and birth
- Presentation
- Perineal status

Baby outcomes

This section looks at outcomes for the baby after birth.

- Gestational age
- Birthweight
- Birthweight adjusted for gestational age
- Apgar score at 5 minutes
- Active resuscitation method
- Admission to a special care nursery or neonatal intensive care unit
- Baby outcomes
- Baby length of stay in hospital
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Focus population groups

This section explores key statistics for specific population groups.

- First Nations mothers and babies
- Mothers aged under 20 and their babies
- Mothers aged 35 and over and their babies
- Mothers who have multiple births and their babies
- Focus population groups

Stillbirths and neonatal deaths

This web article provides information related to stillbirths and neonatal deaths.

- Stillbirths and neonatal deaths

Maternal deaths

This web article provides information related to maternal deaths.

- Maternal deaths

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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 have changed over time.

Key statistics and trends

A snapshot of mothers and babies in Australia over time

Maternal age

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

Geography

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

Maternal country of birth

The country where a mother was born

Demographics of mothers and babies

Many of the demographics and characteristics of mothers and babies in Australia are similar from year to year. However, trends over time can reveal interesting patterns. This section presents long-term trends for key topics, from 1998 (or earliest available year of data) to 2021.

In 2021, there were 315,705 babies born to 311,360 mothers in Australia. The ratio of male babies was 105.4 per 100 females babies (51% males compared with 49% females).

The birth rate was 61 per 1,000 women of reproductive age (aged 15 to 44 years) in 2021, an increase from 56 per 1,000 in 2020.

The number of mothers and babies has fluctuated over time. Between 1998 and 2021:

- the number of mothers ranged from 311,360 to 250,071
- the number of babies ranged from 315,705 to 254,326.

Over time, the following notable changes were seen:

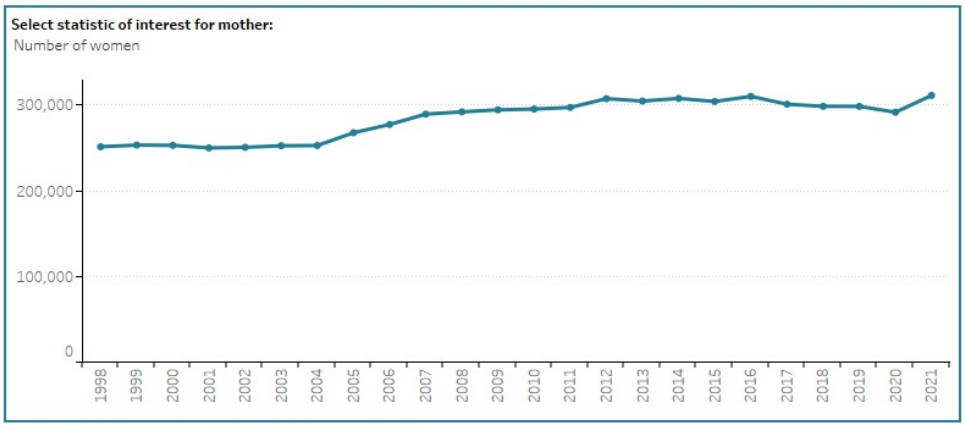
- an increase in the average age of first-time mothers (from 28.4 years in 2011 to 29.7 years in 2021)
- a decrease in smoking at any time during pregnancy (from 15% in 2009 to 8.7% in 2021)
- an increase in caesarean section births (from 29% in 2004 to 38% in 2021)
- an increase in induction of labour (from 26% in 1998 to 34% in 2021).

Select the topic of interest and hover over the line graph (Figure 1) to view data on selected maternal and baby trends from 1998 (or earliest available year of data).

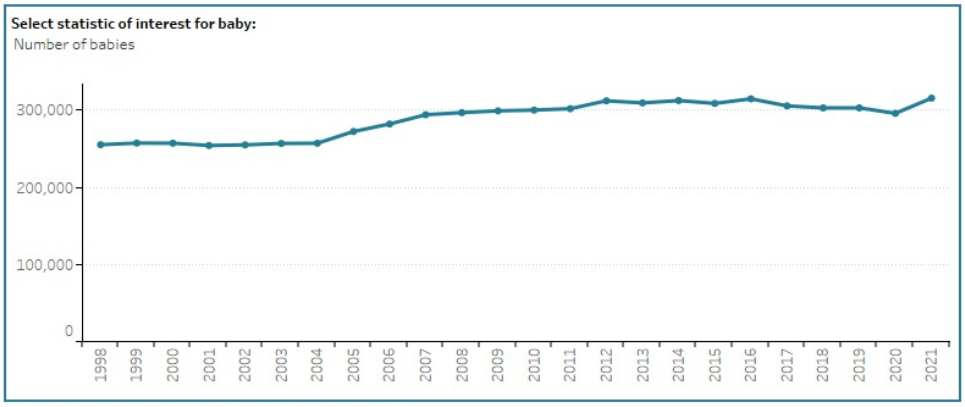
Figure 1: Key statistics of interest for mothers and babies

Bar chart shows maternal age group by selected topics and a line graph shows topic trends between 2011 and 2021.

Key statistics for mothers and babies



Source: AIHW analysis of National Perinatal Data Collection
https://www.aihw.gov.au/



Source: AIHW analysis of National Perinatal Data Collection
https://www.aihw.gov.au/

For more information on the liveborn ratio of male to female babies see National Perinatal Data Collection annual update data table 3.2.

Demographics of mothers and babies

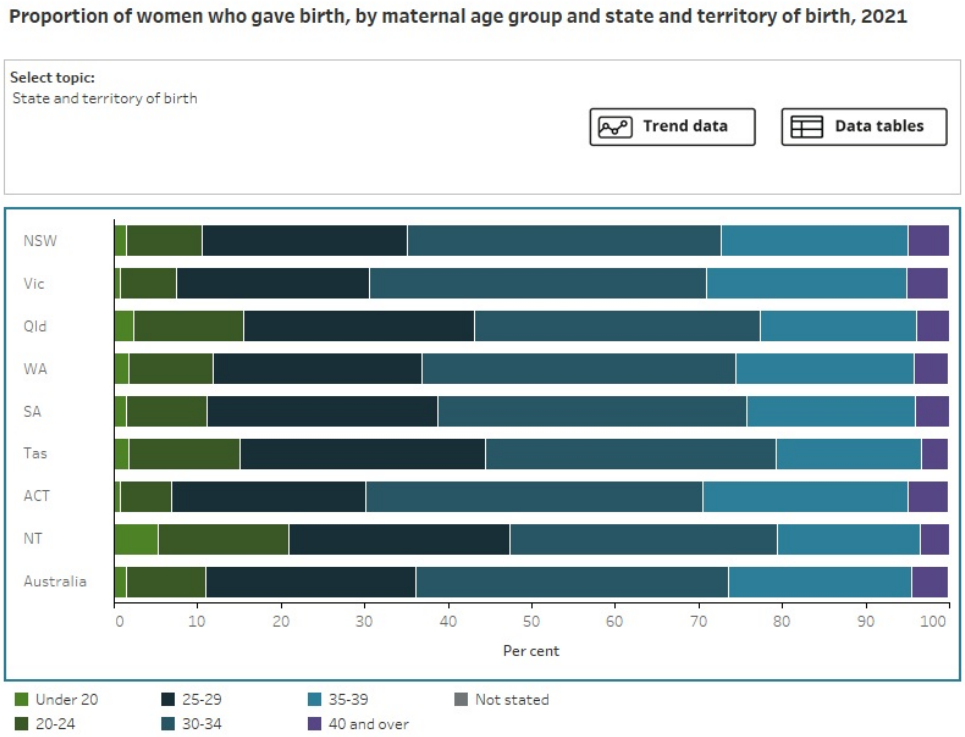
The age of mothers when they give birth can have important implications for their experience of pregnancy and birth. Whilst most mothers have normal pregnancies and healthy babies regardless of age, younger mothers (aged under 20) and older mothers aged over 40 have an increased risk of complications and adverse pregnancy outcomes (AIHW 2018; Cavazos-Rehg et al. 2015; Marozio et al. 2017).

The average age of mothers has been rising over time, from 30.0 in 2011 to 31.1 in 2021. Average maternal age has risen for both first-time mothers (from 28.4 years in 2011 to 29.7 in 2021) and those who have given birth previously (from 31.3 years in 2011 to 32.2 in 2021). The highest proportion of mothers were aged between 30 and 34 (more than one-third (38%) of all mothers).

Figure 1 presents data on the maternal age group of women who gave birth, by selected maternal characteristics, for 2021. Select the trend button to see how data has changed over an 11-year period.

Figure 1: Proportion of women who gave birth, by selected topic

Bar chart shows maternal age group by selected topics and a line graph shows topic trends between 2011 and 2021.



Notes:
1. Data are by state/territory of birth.
2. In 2021, about 15% 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
https://www.aihw.gov.au/

The proportion of teenage mothers (aged under 20) has decreased over time (3.7% in 2011 compared with 1.5% in 2021), and the proportion of mothers aged 35 and over has increased (23% in 2011 compared with 26% in 2021).

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.

Almost 3 in 5 First Nations mothers were aged between 20 and 29 (59%), with 30% aged 20–24. The proportion of First Nations teenage mothers (aged under 20) has been falling over time, from 19% in 2011 to 10% in 2021, with a corresponding increase in those aged 25–29 (from 25% to 30%) and 30–34 (from 15% to 19%).

For more information on maternal age see National Perinatal Data Collection annual update data table 2.1.

References

AIHW (Australian Institute of Health and Welfare) (2018) *Teenage mothers in Australia 2015*, AIHW, Australian Government, accessed 15 June 2022.

Cavazos-Rehg PA, Krauss MJ, Spitznagel EL, Bommarito K, Madden T, Olsen MA, Subramaniam H, Peipert JF and Bierut LJ (2015) 'Maternal age and risk of labor and delivery complications', *Maternal and Child Health Journal*, 19(6):1202–1211, doi:10.1007/s10995-014-1624-7.

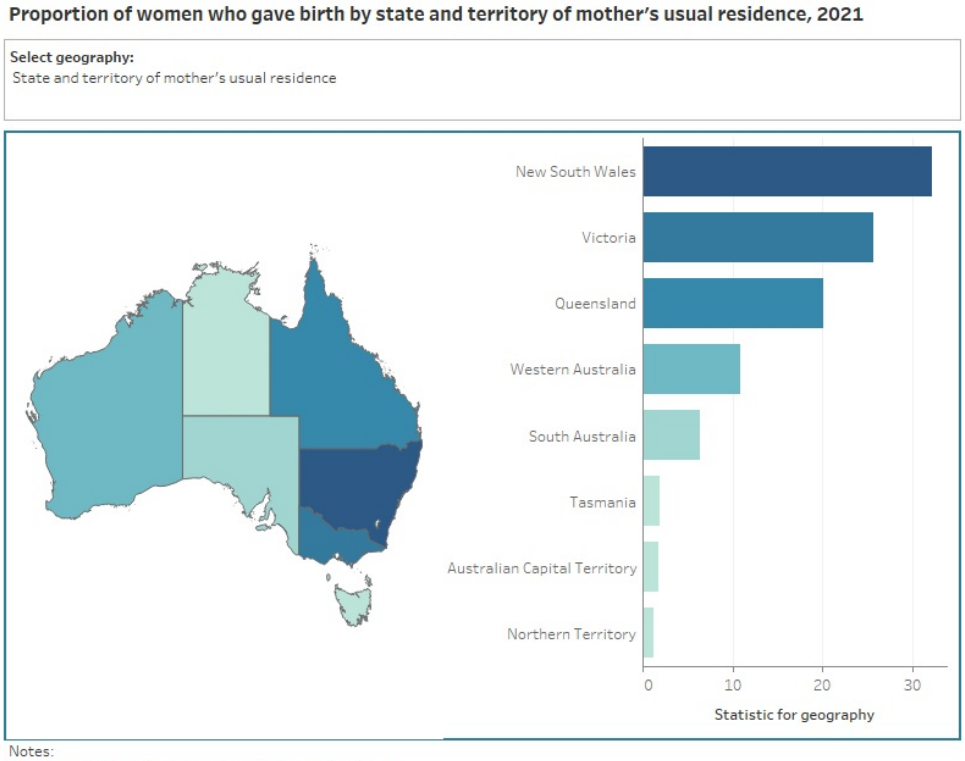
Marozio L, Picardo E, Filippini C, Mainolfi E, Berchialla P, Cavallo F, Tancredi A and Benedetto C (2019) 'Maternal age over 40 years and pregnancy outcome: a hospital-based survey', *Journal of Maternal-Fetal and Neonatal Medicine*, 32(10):1602–1608, doi:10.1080/14767058.2017.1410793.

Demographics of mothers and babies

Where mothers live can impact on their access to services. Figure 1 presents statistics for the usual place of residence of women who gave birth in 2021, by various geographies.

Figure 1: Women who gave birth, by selected geography

Map of proportion of women who gave birth across Australia grouped by various geographies.



Notes:
1. Data are by state/territory of mother's usual residence.
2. Excludes mothers not usually resident in Australia and those whose state or territory of usual residence was 'Not stated'.

Source: AIHW analysis of National Perinatal Data Collection
https://www.aihw.gov.au/

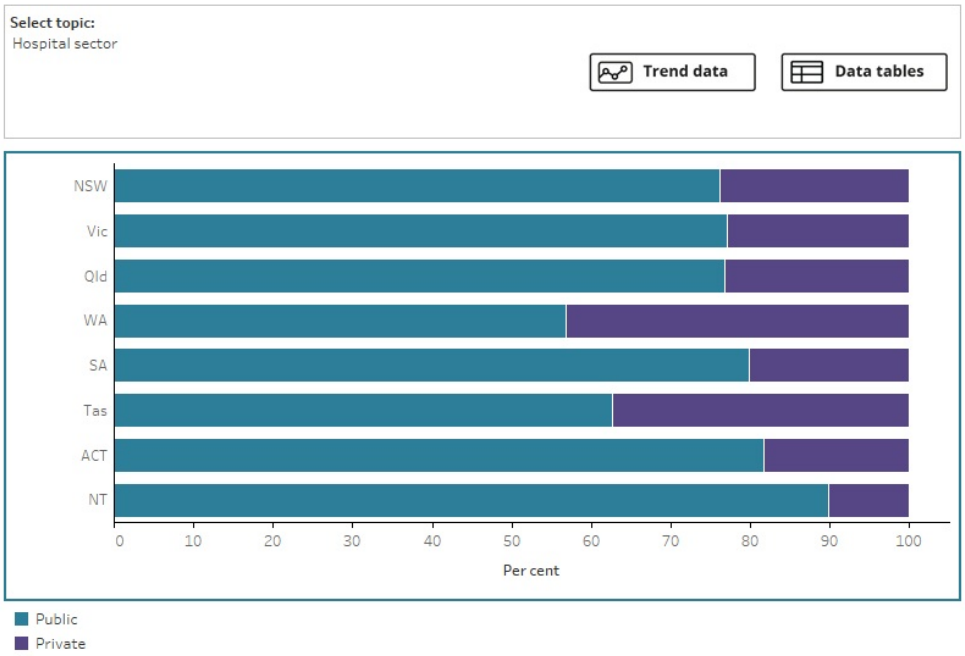
The birth rate of women of reproductive age (15 to 44 years) varies by state and territory, but overall birth rates have decreased over time for all jurisdictions. The greatest decrease in birth rate was seen for the Northern Territory (from 72 per 1,000 women in 2011 to 65 per 1,000 women in 2021) followed by Tasmania (65 to 58), Queensland (65 to 60), the Australian Capital Territory (65 to 61), New South Wales (64 to 61), South Australia (62 to 59), Victoria (62 to 60), and Western Australia (64 to 62).

Where a mother lives can differ from where she gives birth. Figure 2 presents data for 2021 by the state or territory where a mother gave birth (hospital sector, Indigenous status, maternal age, parity, and patient election status) and where she lived (remoteness area and socioeconomic status). Select the trend button to see how data has changed over an 11-year period (where available).

Figure 2: Proportion of women who gave birth, by state and territory and selected topic

Bar chart shows state or territory of residence or birth by selected topics and a line graph shows topic trends between 2011 and 2021.

Proportion of Women who gave birth, by state and territory and hospital sector, 2021



Notes:
1. Data are by state/territory of birth.
2. Includes women who gave birth in hospital only or, from 2021, whose first-born baby was born in hospital (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
https://www.aihw.gov.au/

Understanding differences between states and territories is important for planning health service delivery. In 2021, some characteristics differed by state and territory:

- 5.3% of births in the Northern Territory were teenage mothers (aged under 20) (compared with 0.8% of births in the Australian Capital Territory)
- 5.0% of births in Victoria were mothers aged 40 or more (compared with 3.2% of births in Tasmania)
- 33% of births in the Northern Territory were First Nations mothers (compared with 1.6% of births in Victoria)
- 4.6% of births in the Northern Territory were mothers with 4 or more previous pregnancies (compared with 1.8% of births in the Australian Capital Territory)
- Around 2 in 5 births in the Northern Territory were within *Remote* (20%) or *Very remote* (19%) areas (compared with less than 1% of births in Victoria or NSW).

It is also important to consider the socioeconomic status and remoteness area in which the mother lives (based on the mother's usual residence).

For more information on births by state and territory see National Perinatal Data Collection annual update data table 1.1.

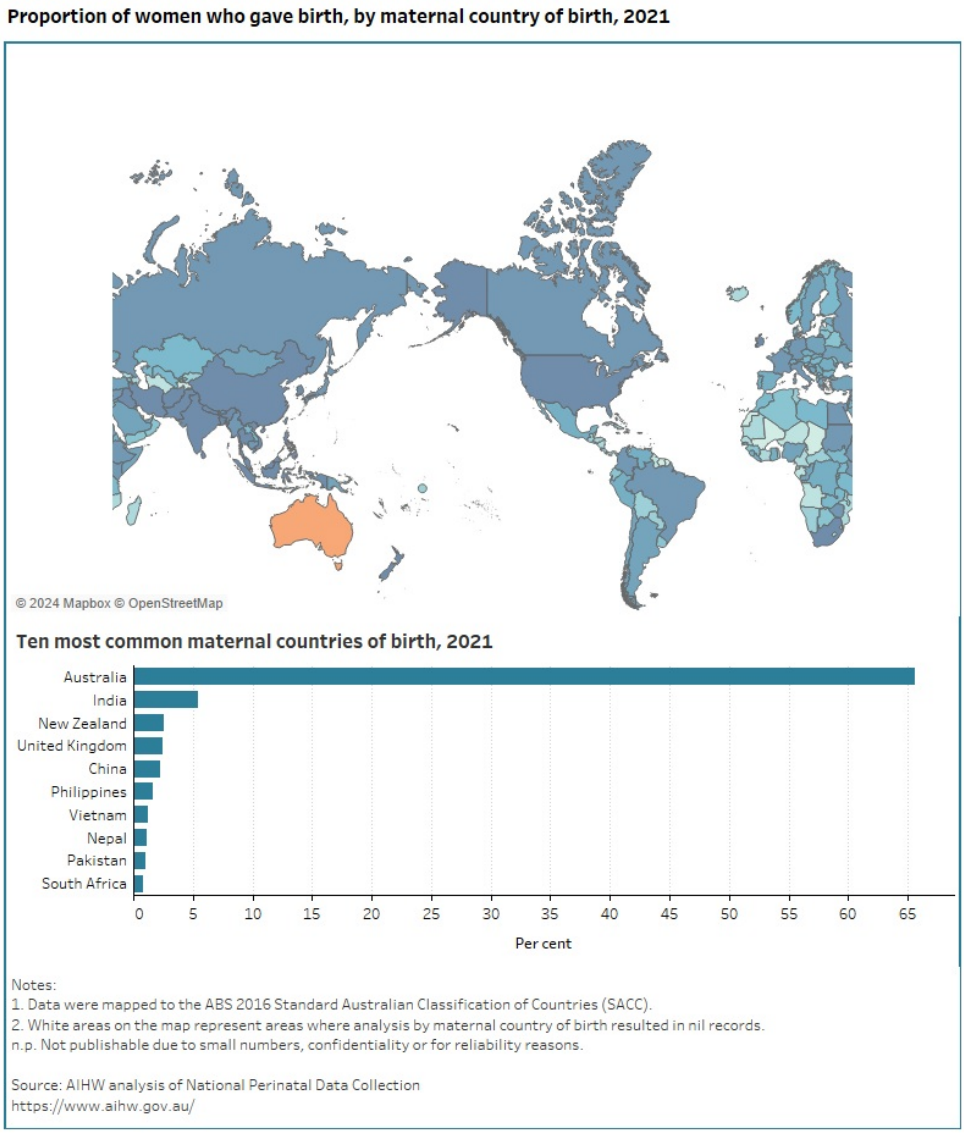
Demographics of mothers and babies

The maternal country of birth may influence the health and wellbeing of both the mother and the baby. For example, babies of mothers who were born in some regions (grouped maternal countries of birth) have been shown to have higher rates of stillbirth and neonatal morbidity (Berman et al. 2019; Berman et al. 2021; Davies-Tuck et al. 2017). Consideration of the mothers' country of birth during planning and delivery of maternity care will likely improve outcomes (Davies-Tuck et al. 2017).

Figure 1 presents data on maternal country of birth and the 10 most common maternal countries of birth in 2021. Hover or select the map to see the number and proportion of women who gave birth in each country.

Figure 1: Proportion of women who gave birth, by maternal country of birth

Map of the proportion of women who gave birth by their country of birth. After Australia the most common country of birth was India.



Around 2 in 3 (66%) mothers were born in Australia. After Australia, the most common countries of birth were India (5.4%), New Zealand (2.6%) and the United Kingdom (2.5%).

For more information on maternal country of birth see National Perinatal Data Collection annual update data table 2.7.

References

Berman Y, Ibiebele I, Patterson JA, Randall D, Ford JB, Nippita T, Morris JM, Davies-Tuck ML and Torvaldsen S (2019) 'Rates of stillbirth by maternal region of birth and gestational age in New South Wales, Australia 2004-2015', *Australian and New Zealand Journal of Obstetrics and Gynaecology*, 60(3):425–432, doi:10.1111/ajo.13085.

Berman Y, Ibiebele I, Randall D, Torvaldsen S, Nippita TA, Bowen J, Baldwin HJ, Todd SM, Morris JM, Ford JB and Patterson JA (2021) 'Rates of neonatal morbidity by maternal region of birth and gestational age in New South Wales, Australia 2003-2016', *Acta Obstetricia et Gynecologica Scandinavica*, 100(2):331–338, doi:10.1111/aogs.14012.

Davies-Tuck ML, Davey MA and Wallace EM (2017) 'Maternal region of birth and stillbirth in Victoria, Australia 2000-2011: a retrospective cohort study of Victorian perinatal data', *PLOS One*, 12(6):e0178727, doi:10.1371/journal.pone.0178727.

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, maternal 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

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

Maternal body mass index

The most commonly used method of assessing whether a person is healthy 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 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 – the likelihood of receiving effective health interventions is increased through attending antenatal care. It does not include visits where the sole purpose is to confirm the pregnancy.

Duration of pregnancy at first antenatal visit

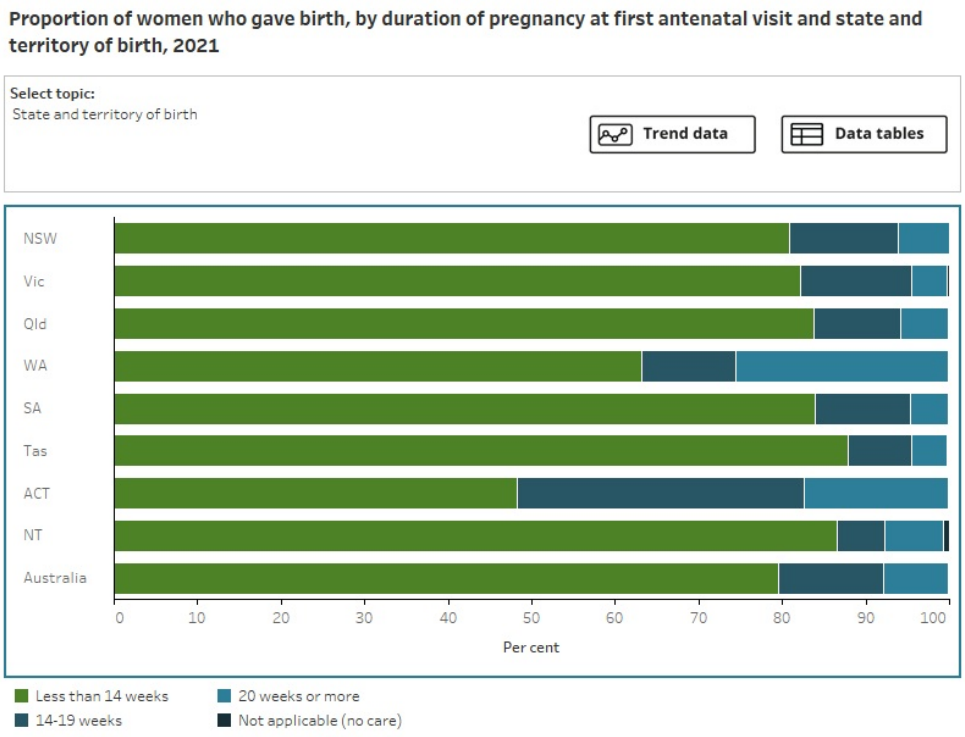
The proportion of women receiving antenatal care in the first trimester (before 14 weeks' gestational age) is the most widely reported indicator of antenatal care. Regular antenatal care in the first trimester is associated with better maternal health in pregnancy, fewer interventions in late pregnancy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

The Australian Pregnancy Care Guidelines (Department of Health and Aged Care 2020) recommend that a woman has her first antenatal visit within the first 10 weeks of pregnancy. In 2021, 60% of women attended antenatal care within the first 10 weeks of pregnancy.

Figure 1 presents data on the duration of pregnancy at the first antenatal care visit of women who gave birth, by selected maternal characteristics, for 2021. Select the trend button to see how data has changed over a 10-year period.

Figure 1: Proportion of women who gave birth, by duration of pregnancy at first antenatal visit and selected topic

Bar chart shows pregnancy duration at first antenatal visit by selected topics and a line graph shows topic trends between 2012 and 2021.



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
https://www.aihw.gov.au/

Most women attend antenatal care in the first trimester, nationally (80%) and across all states and territories. Some mothers were less likely to have an antenatal visit in the first trimester, including those who:

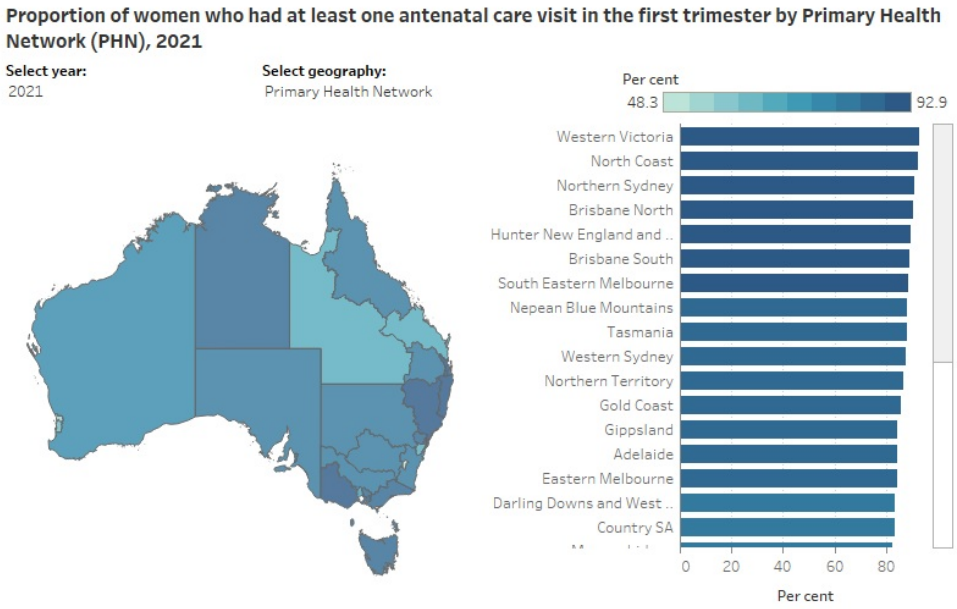
- had a parity of 4 or more (66%)
- were aged under 20 (69%)
- smoked during the first 20 weeks of pregnancy (73%) and after 20 weeks (70%)
- lived in *Remote* (73%) and *Very remote* areas (68%).

The proportion of mothers attending an antenatal care visit in the first trimester varied across Primary Health Network (PHN) areas and Statistical Area Level 3 (SA3).

Figure 2 presents the number and proportion of women who gave birth who had at least one antenatal visit in the first trimester, by PHN area or SA3, in 2021.

Figure 2: Proportion of women who had at least one antenatal care visit in the first trimester, by selected geography

Map shows proportion of women who had at least one antenatal visit in the first trimester by selected geographies and years.



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
https://www.aihw.gov.au/

In 2021, the proportion of mothers who attended an antenatal care visit in the first trimester ranged from 48% (in the Australian Capital Territory) to 93% (in Western Victoria) across PHN, and from 32% (in West Pilbara) to 98% (in Barwon – West) across SA3. It is important to note that in the ACT, first antenatal visit is often the first hospital clinic visit and in many cases, earlier antenatal care provided by the woman's general practitioner is not reported.

For more information on antenatal care in the first trimester by Primary Health Network area or Statistical Area Level 3 see National Perinatal Data Collection annual update data tables 5.1 and 5.7, respectively.

For related information see National Core Maternity Indicator Antenatal care in the first trimester.

For more information on duration of pregnancy at first antenatal visit see National Perinatal Data Collection annual update data table 2.13.

Number of antenatal visits

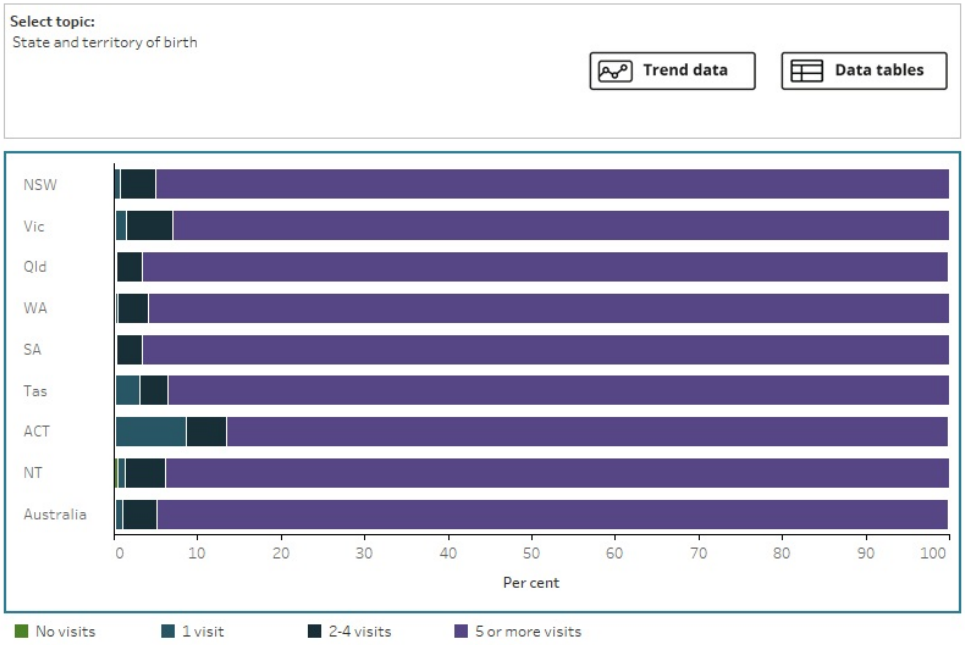
The Australian Pregnancy Care Guidelines (Department of Health and Aged Care 2020) recommend that first-time mothers with an uncomplicated pregnancy have 10 antenatal care visits during pregnancy (7 visits for subsequent uncomplicated pregnancies). In 2021, 83% of women who have previously given birth attended 7 or more antenatal care visits and 58% of first-time mothers attended 10 or more antenatal care visits.

Figure 3 presents data on the number of antenatal care visits of women who gave birth, by selected maternal characteristics, for 2021. Select the trend button to see how data has changed over a 10-year period.

Figure 3: Proportion of women who gave birth, by number of antenatal visits and selected topic

Bar chart shows number of antenatal visits by selected topics and a line graph shows topic trends between 2012 and 2021.

Proportion of women who gave birth, by number of antenatal visits and state and territory of birth, 2021



Notes:
1. Based on women who gave birth at 32 weeks or more gestation (excluding unknown gestation).
2. Percentage calculated after excluding records with 'Not stated' values. Care must be taken when interpreting percentages.
3. For the ACT, in many cases, early antenatal care provided by the woman's general practitioner is not reported.
4. For NT, 'Not stated' includes antenatal care where attendance is evident by the availability of antenatal screening results, but the total number of antenatal visits is unknown.

Source: AIHW analysis of National Perinatal Data Collection
https://www.aihw.gov.au/

More than 9 in 10 (95%) mothers had at least 5 or more antenatal visits during their pregnancy. This proportion was slightly less among women who smoked in the first 20 weeks of pregnancy (89%) and after 20 weeks (87%), teenage mothers (aged under 20) (90%) and women who lived in *Very remote* areas (91%) and the most disadvantaged areas (95%).

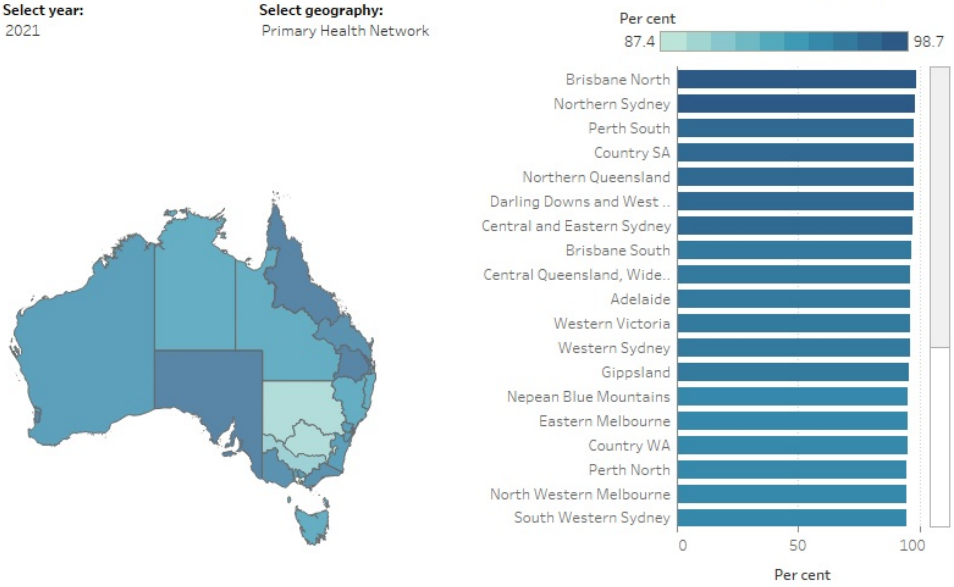
The proportion of mothers who had 5 or more antenatal visits decreased as the number of previous pregnancies increased (from 96% among first-time mothers to 87% among mothers who had had 4 or more previous pregnancies).

The proportion of mothers attending at least 5 or more antenatal visits varied across Primary Health Network (PHN) areas and Statistical Area Level 3 (SA3).

Figure 4 presents the number and proportion of women who had 5 or more antenatal care visits, by PHN area or SA3, in 2021.

Figure 4: Proportion of women who had 5 or more antenatal care visits, by selected geography

Proportion of women who had 5 or more antenatal care visits by Primary Health Network (PHN), 2021



Notes:
1. Based on women who gave birth at 32 weeks or more gestation (excluding unknown gestation).
2. Percentage calculated after excluding records with 'Not stated' values. Care must be taken when interpreting percentages.
3. Data are by place of mother's usual residence.
4. For the ACT, in many cases, early 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
https://www.aihw.gov.au/

In 2021, a high proportion of mothers attended 5 or more antenatal visits – ranging from 87% (in the Australian Capital Territory) to 99% (in Brisbane North) across PHN, and from 56% (in Frankston) to 99.6% (in Melville) across SA3.

For more information on number of antenatal visits see National Perinatal Data Collection annual update data table 2.12.

For more information on antenatal visits by Primary Health Network area or Statistical Area Level 3 see National Perinatal Data Collection annual update data tables 5.2 and 5.8, respectively.

References

Department of Health and Aged Care (2020) *Clinical practice guidelines: pregnancy care*, Department of Health and Aged Care, Australian Government, accessed 13 April 2021.

Antenatal period

Smoking during pregnancy is an important preventable risk factor for pregnancy complications. 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.

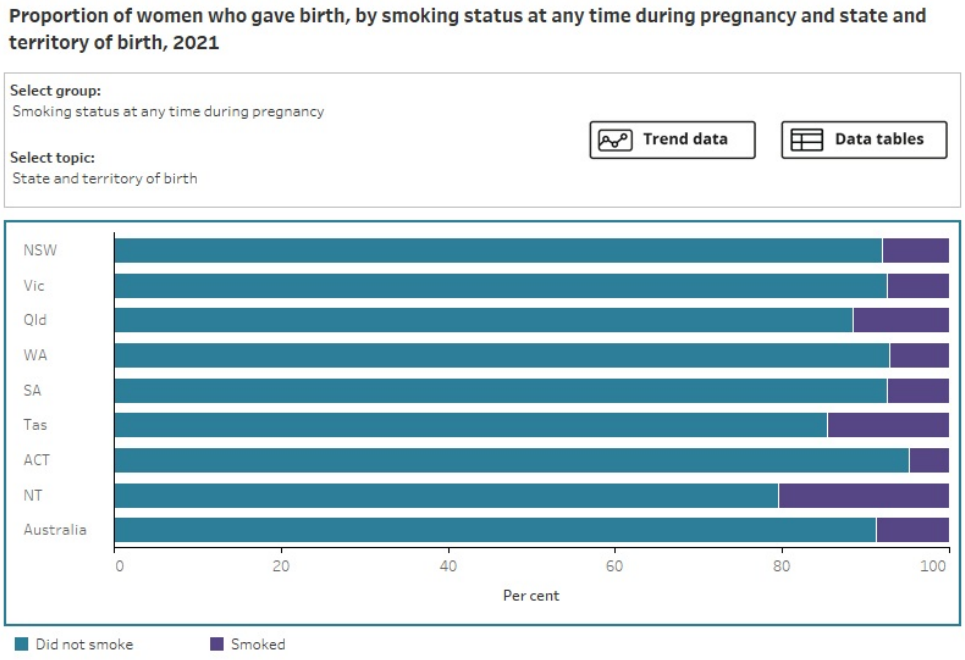
Support to stop smoking is widely available through antenatal clinics.

In 2021, almost 1 in 10 mothers (8.7%) reported smoking at any time during pregnancy, a rate that has been gradually falling since 2011 (13%). Higher smoking rates were observed among First Nations mothers (42%), teenage mothers (aged under 20) (33%) and mothers aged 20-24 (21%).

Figure 1 presents data on smoking status of women who gave birth at any time during pregnancy, in the first 20 weeks of pregnancy and after 20 weeks of pregnancy, by selected maternal characteristics, for 2021. Select the trend button to see how data has changed over an 11-year period.

Figure 1: Proportion of women who gave birth, by smoking status and selected topic

Bar chart shows smoking status by selected topics and a line graph shows topic trends between 2011 and 2021.



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
https://www.aihw.gov.au/

As the number of previous pregnancies increased, so did the proportion of mothers who smoked, with nearly 1 in 3 mothers (31%) who had 4 or more previous pregnancies reporting smoking during pregnancy.

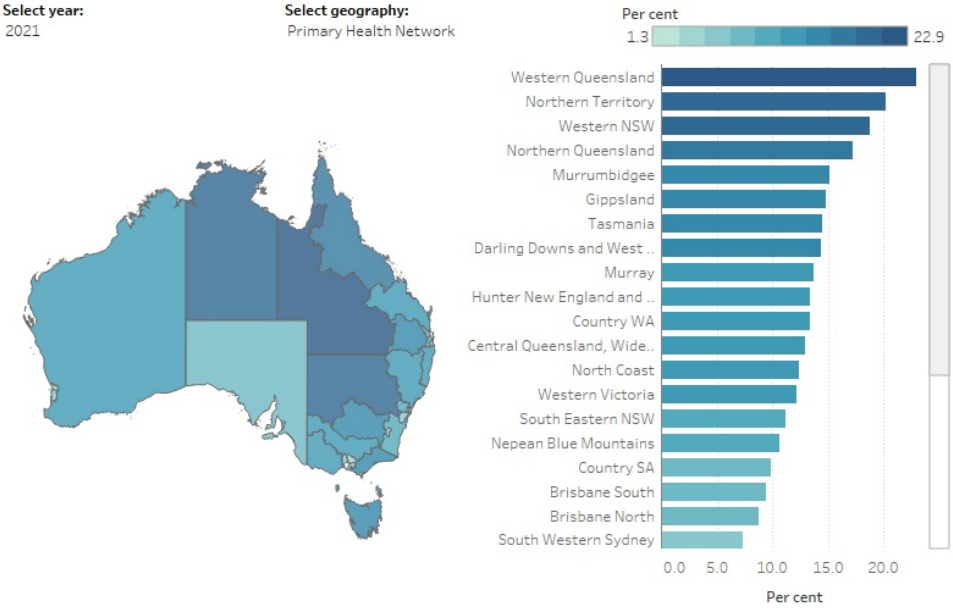
Mothers living in *Very remote* areas (36%) or in the most disadvantaged areas (17%) also had higher rates of smoking than mothers who lived in *Major cities* (6.4%) and or the least disadvantaged areas (2.5%). These differences were apparent even after adjusting for maternal age.

Figure 2 presents data on smoking status of women who gave birth at any time during pregnancy, by PHN area and SA3, in 2021.

Figure 2 - Proportion of women who smoked at any time during pregnancy, by selected geography

Map shows proportion of women who gave birth by smoking status and selected geographies and years.

Proportion of women who smoked at any time during pregnancy by Primary Health Network (PHN), 2021



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. 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'.
4. Data may not add to the total due to rounding.

Source: AIHW analysis of National Perinatal Data Collection
https://www.aihw.gov.au/

Around 1 in 4 (24%) 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).

For related information see National Core Maternity Indicator Smoking during pregnancy.

For more information on smoking during pregnancy see National Perinatal Data Collection annual update data tables 2.14, 2.15 and 2.16.

For more information on smoking during pregnancy by Primary Health Network area and Statistical Area Level 3 see National Perinatal Data Collection annual update data tables 5.3 and 5.9, respectively.

References

AIHW (Australian Institute of Health and Welfare) (2020) *National drug strategy household survey 2019*, AIHW, Australian Government, accessed 13 April 2021.

Antenatal period

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.

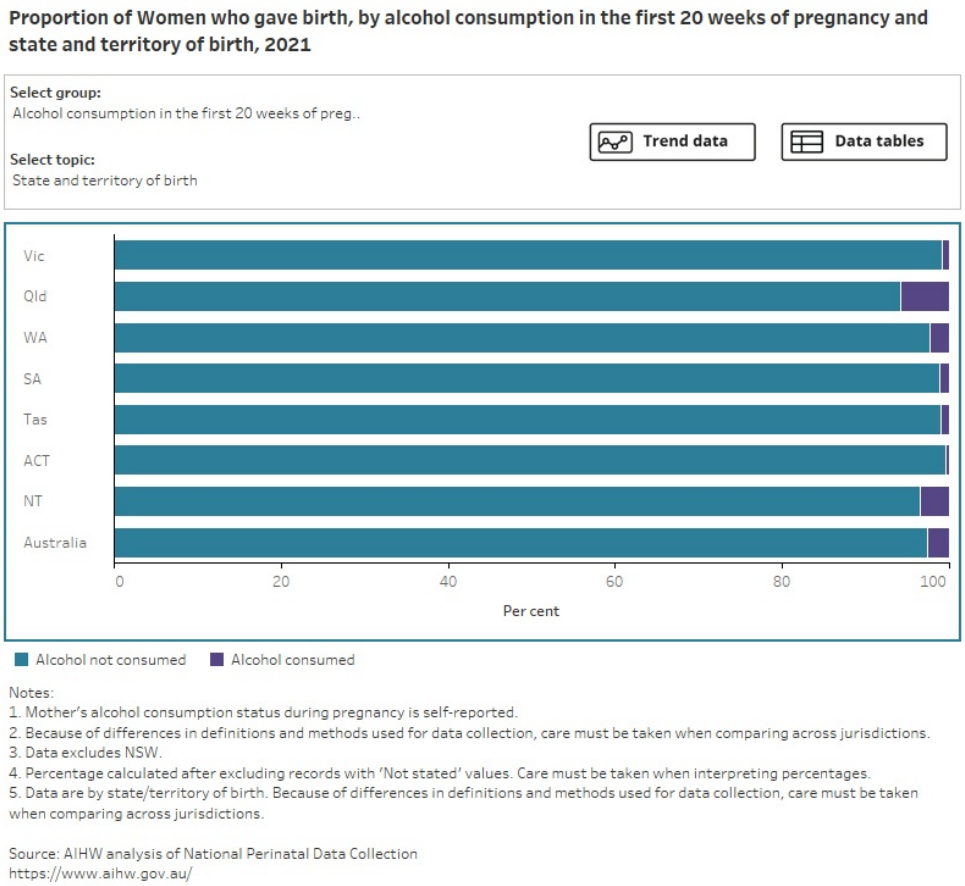
Data on maternal consumption of alcohol during pregnancy were available for the first time in 2019. Data exclude New South Wales between 2019 and 2021, and South Australia for 2019.

In 2021, over 97% of women did not consume alcohol in the first 20 weeks of pregnancy – ranging from 94% to 99.5% for 7 jurisdictions.

Figure 1 presents data on alcohol consumption status of women in the first 20 weeks of pregnancy and after 20 weeks of pregnancy, by selected maternal characteristics, for 2021. Select the trend button to see how data has changed over a 3-year period (where available).

Figure 1: Proportion of women who gave birth, by alcohol consumption and selected topic

Bar chart shows alcohol consumption status by selected topics and a line graph shows topic trends between 2019 and 2021.



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.
4. Percentage calculated after excluding records with 'Not stated' values. Care must be taken when interpreting percentages.
5. 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: AIHW analysis of National Perinatal Data Collection
https://www.aihw.gov.au/

The proportion of women who consumed alcohol in the first 20 weeks decreased after 20 weeks of pregnancy (from a range of 0.5% to 5.9% in the first 20 weeks, down to a range of 0.2% to 1.6% after 20 weeks).

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

- lived in *Remote* (4.6%) or *Very remote* (7.1%) areas
- were teenage mothers (aged under 20) (4.6%).

However, women from these population groups showed a decline in alcohol consumption after 20 weeks of pregnancy with:

- 1.6% of women who lived in *Remote* areas and 3.3% women who lived in *Very remote* areas consuming alcohol

- 0.8% of teenage mothers (aged under 20).

For more information on alcohol consumption during pregnancy see National Perinatal Data Collection annual update data tables 2.17 and 2.18.

References

NHMRC (National Health and Medical Research Council) (2020) *Australian guidelines to reduce health risks from drinking alcohol*, NHMRC, Australian Government, accessed 18 January 2021.

Antenatal period

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).

Body mass index (BMI) is a ratio of height and weight and is calculated by dividing a person's weight in kilograms by the square of their height in metres (kg/m^2). A healthy range of BMI for non-pregnant women is 18.5 to 24.9. While increases in BMI are expected during pregnancy, a BMI of 25 to 29.9 is defined as overweight in pregnancy and a BMI of 30 or more is defined as obesity in pregnancy. A BMI of less than 18.5 is defined as underweight.

BMI does not necessarily reflect body fat distribution or describe the same degree of fatness in different individuals. At a population level, however, it is a practical and useful measure to identify overweight and obesity (AIHW 2023).

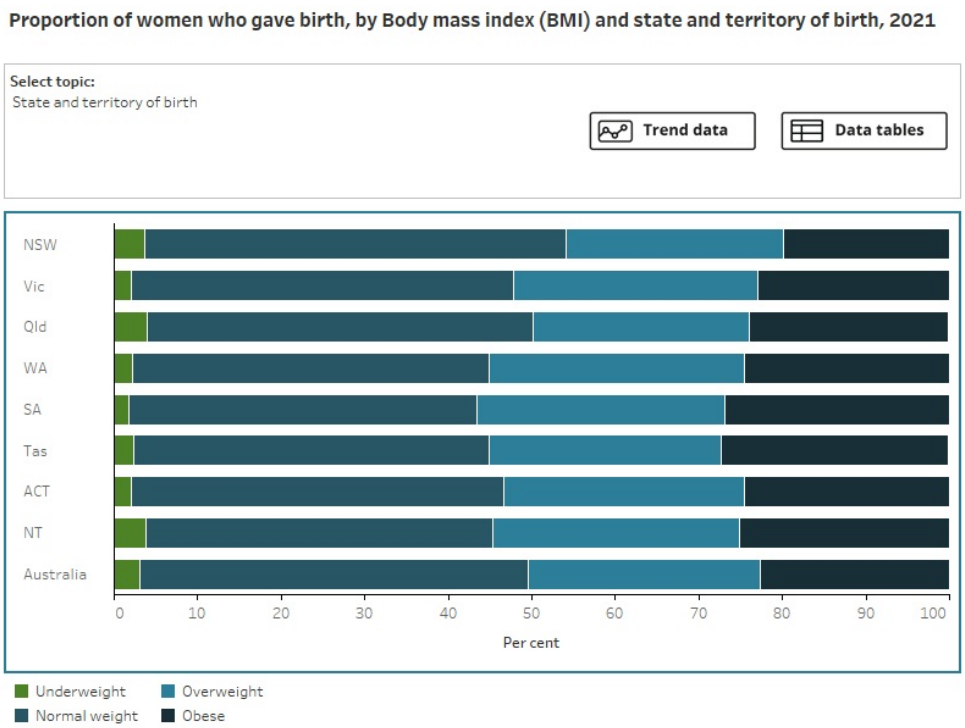
In the NPDC, maternal BMI refers to pre-pregnancy BMI. However, source data and methods used for data collection are not uniform nationally. For example, BMI can be calculated based on self-reported height and weight or on those measured at the first antenatal visit.

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

Figure 1 presents data on the BMI of women who gave birth, by selected maternal characteristics, for 2021. Select the trend button to see how data has changed over a 10-year period.

Figure 1: Proportion of women who gave birth, by body mass index (BMI) and selected topic

Bar chart shows body mass index (BMI) by selected topics and a line graph shows topic trends between 2012 and 2021.



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
https://www.aihw.gov.au/

In 2021, 28% of mothers were overweight and 23% were obese.

The proportion of mothers who were obese was highest amongst:

- women with a parity of 3 (36%) or 4 or more (42%)
- women who lived in *Very remote* areas (30%)

- women who lived in the most disadvantaged areas (31%)
- who had a caesarean section birth (29%).

In 2021, 2.7% of mothers were underweight. The proportion was highest amongst teenage mothers (aged under 20) (10%), women who lived in *Very remote* areas (4.0%) and First Nations mothers (5.7%).

For more information on Body mass index see National Perinatal Data Collection annual update data table 2.19.

References

AIHW (Australian Institute of Health and Welfare) (2023) Overweight and obesity, AIHW, Australian Government, accessed 8 June 2023.

RCOG (Royal College of Obstetricians and Gynaecologists) (2018) *Care of women with obesity in pregnancy*, green-top guideline number 72, RCOG, accessed 18 January 2021.

Antenatal period

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.

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

Diabetes

Diabetes affecting pregnancy can be pre-existing (that is, type 1 or type 2) or may arise because 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).

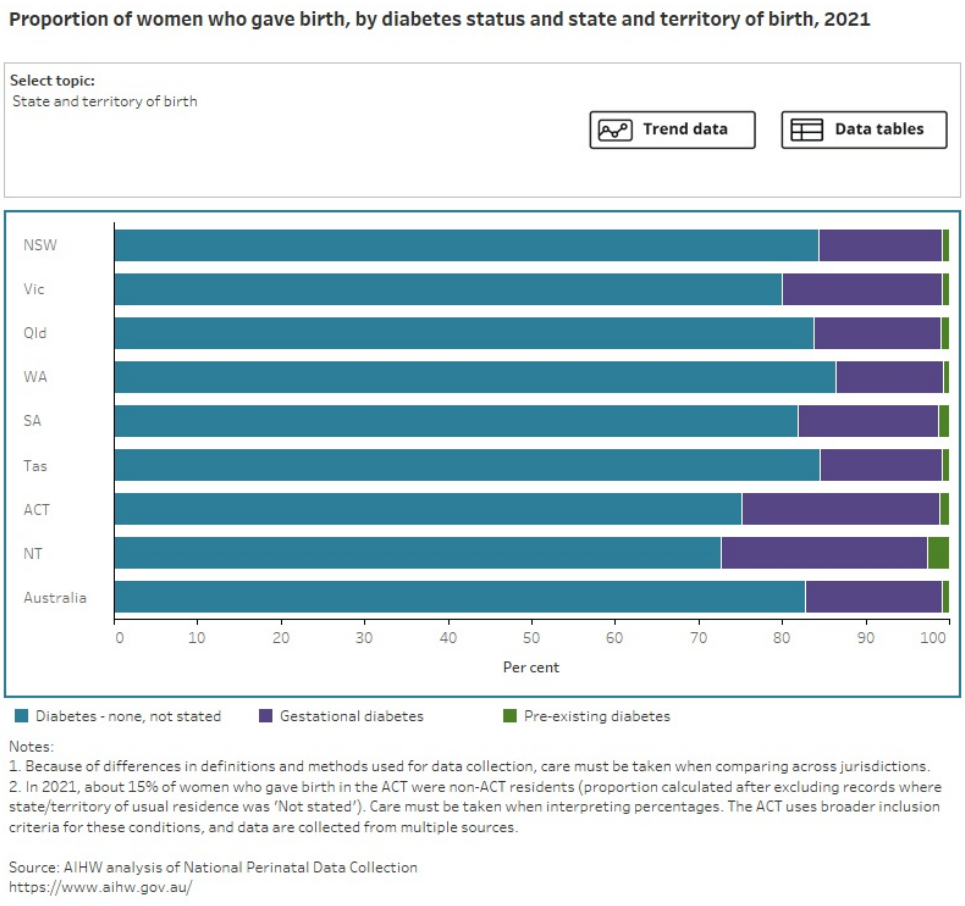
Monitoring diabetes during pregnancy is important as it provides information on the impact of diabetes during pregnancy and its complications, identifies groups at higher risk and assists with the planning, monitoring and provision of services (AIHW 2019).

Since 2014, the proportion of women with gestational diabetes has been increasing (8.3% in 2014 compared with 16.3% in 2021).

Figure 1 presents data on the diabetes status of women who gave birth, by selected maternal characteristics, for 2021. Select the trend button to see how data has changed over an 8-year period.

Figure 1: Proportion of women who gave birth, by diabetes status and selected topic

Bar chart shows diabetes status of women by selected topics and a line graph shows topic trends between 2014 and 2021.



Notes:
1. Because of differences in definitions and methods used for data collection, care must be taken when comparing across jurisdictions.
2. In 2021, about 15% 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
https://www.aihw.gov.au/

In 2021, mothers aged 40 or more (24%) and women who were born overseas (21%) had the highest proportions of gestational diabetes, and First Nations mothers (2.2%) and women with a parity of 4 or more (2.1%) had the highest proportions of pre-existing diabetes.

For more information on diabetes during pregnancy see National Perinatal Data Collection annual update data table 2.46.

Hypertension

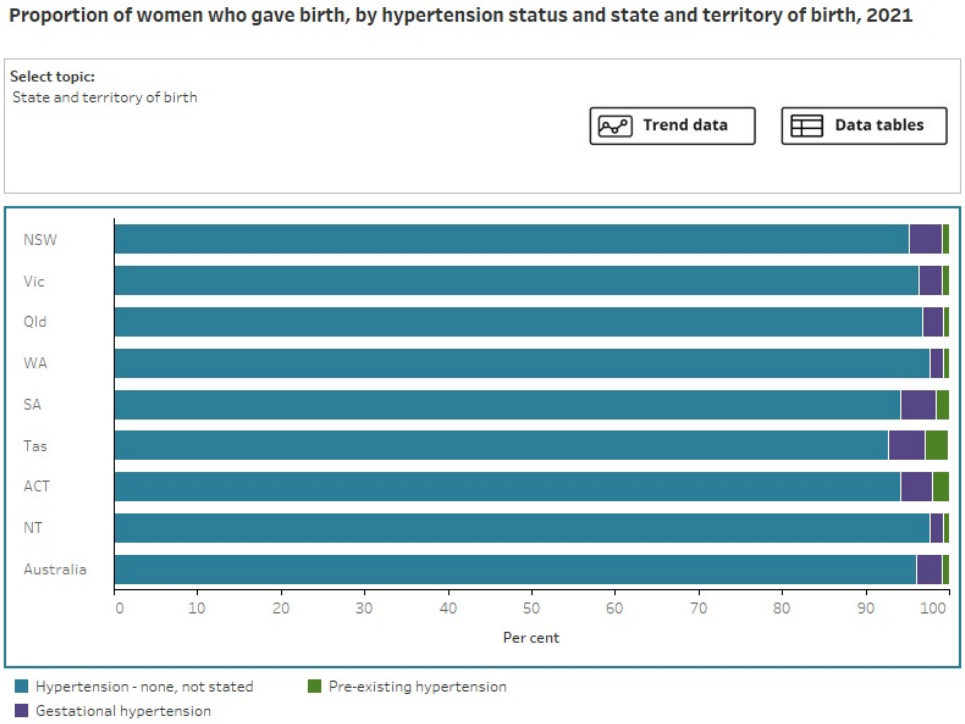
Hypertension is a leading cause of illness and death for mothers and babies (Queensland Health 2015). Complications of hypertension that can affect the mother include cerebral injury, liver and kidney failure. Those which can affect the baby include being born pre-term, being small for gestational age and being admitted to the special care nursery (Queensland Health 2015).

The proportion of women with gestational hypertension has remained stable at about 3–4% since 2014 (3.2% in 2021).

Figure 2 presents data on the hypertension status of women who gave birth, by selected maternal characteristics, for 2021. Select the trend button to see how data has changed over an 8-year period.

Figure 2: Proportion of women who gave birth, by hypertension status and selected topic

Bar chart shows hypertension status by selected topics and a line graph shows topic trends between 2014 and 2021.



Notes:
1. Because of differences in definitions and methods used for data collection, care must be taken when comparing across jurisdictions.
2. In 2021, about 15% 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
https://www.aihw.gov.au/

In 2021, mothers aged 40 or more (4%) and first-time mothers had the highest proportions of gestational hypertension (2.9%). Mothers aged 40 or more (2.5%) and women with a parity of 4 or more (1.7%) had the highest proportions of pre-existing hypertension.

For more information on hypertension during pregnancy see National Perinatal Data Collection annual update data table 2.46.

References

AIHW (Australian Institute of Health and Welfare) (2019) *Diabetes in pregnancy 2014-2015*, AIHW, Australian Government, accessed 17 June 2022.

Queensland Health (2021) *Hypertension and pregnancy*, document number MN15.13-V8-R26, Queensland Health, Queensland Government, accessed 31 May 2022.

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

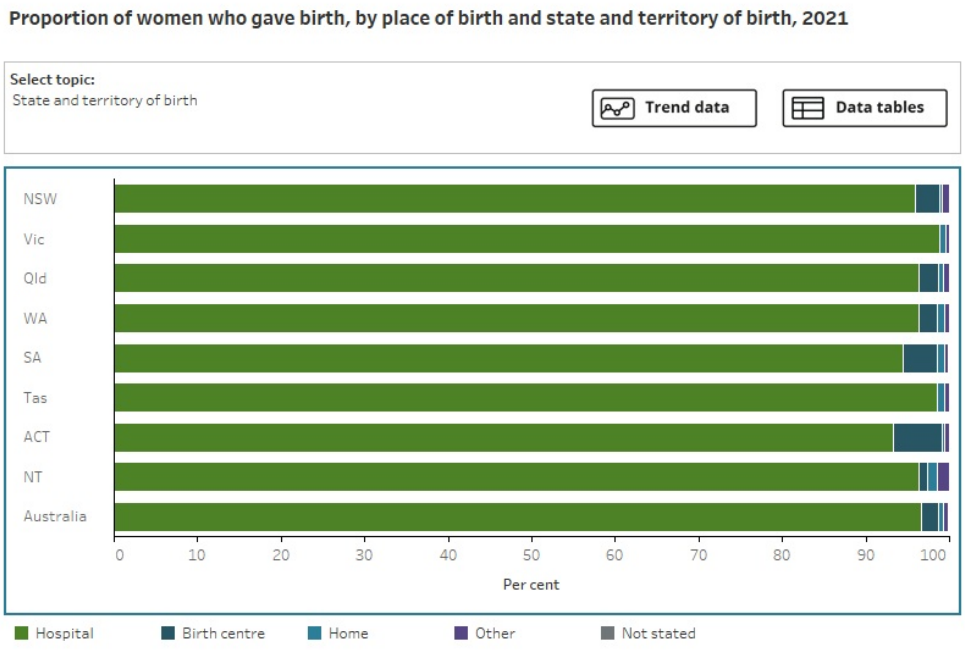
Labour and birth

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 (2.0%), at home (0.5%), or in other settings (such as before arrival at hospital) (0.7%).

Figure 1 presents data on the place of birth of women who gave birth, by selected maternal characteristics, for 2021. Select the trend button to see how data has changed over an 11-year period (where available).

Figure 1: Proportion of women who gave birth, by place of birth and selected topic

Bar chart shows place of birth by selected topics and a line graph shows topic trends between 2011 and 2021.



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.
2. For multiple births, the place of birth of the first-born baby was used.

Source: AIHW analysis of National Perinatal Data Collection
https://www.aihw.gov.au/

For more information on place of birth see National Perinatal Data Collection annual update data tables 2.20, 2.21 and 2.22.

Labour and birth

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

Induction of labour is performed for a number of reasons related to both the mother and the baby, such as maternal or baby medical conditions and post-term pregnancy (Coates et al. 2020). Whilst most women who have induced labour – and their babies – do well, induction of labour does increase the risk of emergency caesarean section, infection and bleeding, and a less positive birth experience when compared to spontaneous labour (Coates et al. 2020; Grivell et al. 2012).

In 2021, about 2 in 5 (41%) mothers who gave birth had a spontaneous labour, around 1 in 3 (34%) had induced labour and 1 in 4 had no labour (25%).

Figure 1 presents data on the onset of labour of women who gave birth, by selected maternal characteristics, for 2021. Select the trend button to see how data has changed over an 11-year period (where available).

Figure 1: Proportion of women who gave birth, by onset of labour and selected topic

Bar chart shows onset of labour by selected topics and a line graph shows topic trends between 2011 and 2021.

Labour onset varied by maternal age group. Teenage mothers (aged under 20) were the most likely to have spontaneous labour (53%), and mothers aged 40 or over were the most likely to have no labour onset (44%).

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 (58%) than women with a singleton pregnancy (24%).

The rate of spontaneous labour has fallen (from 55% in 2011 to 41% in 2021) with corresponding increases in the rates of induced labour (from 26% to 34%) and no labour (from 19% to 25%).

For related information see National Core Maternity Indicator Induction of labour.

For more information on onset of labour see National Perinatal Data Collection annual update data table 2.26.

Induction type and reason

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

In 2021, the main reasons for inducing labour were diabetes (15%), pre-labour rupture of membranes (10%) and prolonged pregnancy (9.9%).

For more information on induction type and reason see National Perinatal Data Collection annual update data tables 2.27 and 2.28.

Augmentation of labour

Once labour starts, it may be necessary to intervene to speed up or augment the labour. Labour was augmented for 15% of mothers in 2021 (28% of mothers with spontaneous onset of labour). The augmentation rate was higher among first-time mothers, at 39% of those with spontaneous labour onset, compared with 20% of mothers who had given birth previously. Data excludes Western Australia.

For more information on augmentation of labour see National Perinatal Data Collection annual update data table 2.25.

References

Coates D, Makris A, Catling C, Henry A, Scarf V, Watts N, Fox D, Thirukumar P, Wong V, Russell H and Homer C (2020) 'A systematic scoping review of clinical indications for induction of labour', *PLOS One*, 15(1):e0228196, doi:10.1371/journal.pone.0228196.

Grivell RM, Reilly AJ, Oakey H, Chan A and Dodd JM (2012) 'Maternal and neonatal outcomes following induction of labor: a cohort study', *ACTA Obstetricia et Gynecologica Scandinavica*, 91(2):198–203, doi:10.1111/j.1600-0412.2011.01298.x.

Labour and birth

Method of birth refers to how the baby was born, which may be vaginally or by caesarean section. When compared with non-instrumental vaginal births, instrumental vaginal births (vacuum or forceps) and caesarean section births can carry additional risks for mothers and babies, such as infection and physical trauma. Although each method carries risks, they are chosen by women and their healthcare providers to minimise complications and increase the likelihood of positive pregnancy outcomes (Victorian Department of Health and Human Services 2017).

For multiple births, women are categorised by the method of birth of the first-born baby.

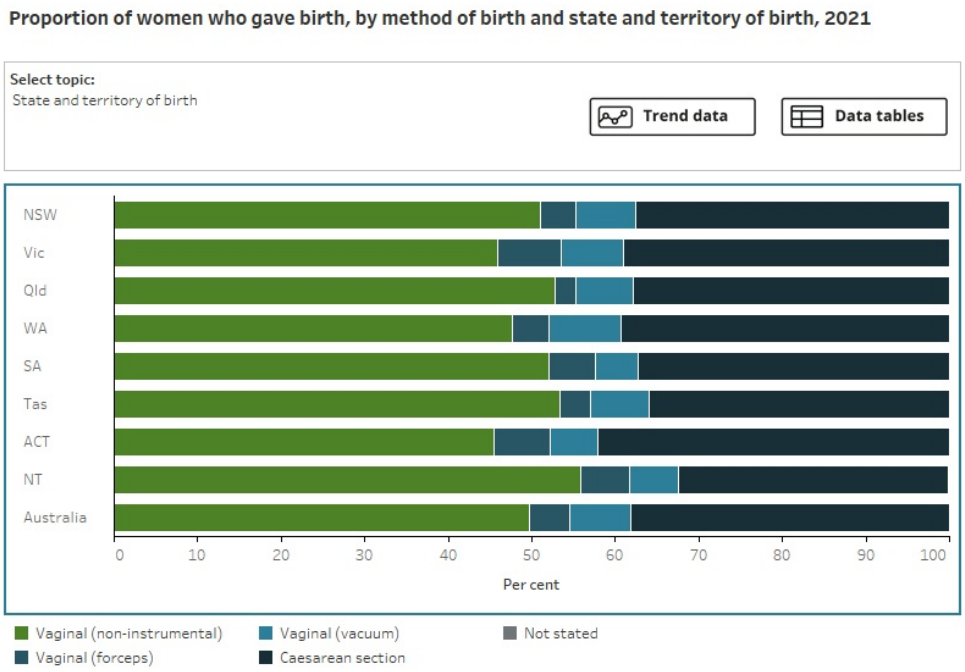
Over time, the proportion of women who had a vaginal non-instrumental birth has decreased, and the proportion of women who had a caesarean section birth has increased. Vaginal birth assisted by vacuum or forceps have remained relatively stable. In 2021:

- 50% of women had a non-instrumental vaginal birth (compared with 56% in 2011)
- 7.2% of women had a vaginal birth assisted by vacuum (compared with 7.9% in 2011)
- 4.9% of women had a vaginal birth assisted by forceps (compared with 4.2% in 2011)
- 38% of women had a caesarean section birth (compared with 32% in 2011).

Figure 1 presents data on the method of birth of women who gave birth, by selected maternal characteristics, for 2021. Select the trend button to see how data has changed over an 11-year period (where available).

Figure 1: Proportion of women who gave birth, by method of birth and selected topic

Bar chart shows method of birth by selected topics and a line graph shows topic trends between 2011 and 2021.



Notes:
1. For multiple births, the method of birth of the first-born baby was used.
2. Not stated may include other methods of birth not categorised elsewhere.
3. 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.
4. In 2021, about 15% 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, 37.4% of ACT resident women had a caesarean section in 2020 compared with 45.4% of non-ACT residents who gave birth in the ACT.
5. 'Not stated' may include other methods of birth not categorised elsewhere.

Source: AIHW analysis of National Perinatal Data Collection
https://www.aihw.gov.au/

For more information on vaginal births and caesarean section births, expand the sections below.

Vaginal births

In 2021, almost 2 in 3 women (62%) who gave birth in Australia had a vaginal birth. Non-instrumental vaginal births were more common for women whose babies were born at term (50%) or post-term (47%), who were teenage mothers (aged under 20) (65%) and who were underweight (56%) or normal weight (52%).

Instrumental vaginal birth (which includes both forceps and vacuum extraction) decreased with increasing parity and was much more common among women who had not previously given birth (9.5% for forceps and 12% for vacuum extraction) compared with women with a parity of 4 or more (0.5% for forceps and 1.8% for vacuum extraction).

The proportion of instrumental vaginal births assisted by forceps decreased with increasing remoteness (from 5.3% for *Major cities* to 3.2% for *Very remote* areas) and were more common among mothers whose babies were born post-term (8.4%, compared to 5.0% for mothers whose babies were born at term) and mothers who lived in the least disadvantaged areas (5.6%, compared to 4.0% for mothers who lived in the most disadvantaged areas).

The proportion of instrumental vaginal births assisted by vacuum extraction was higher for women who gave birth in private hospitals (9.2%, compared with 6.6% for public hospitals) and mothers who lived in the least disadvantaged areas (8.3%, compared to 5.8% for mothers who lived in the most disadvantaged areas).

For related information see National Core Maternity Indicators:

- Non-instrumental vaginal birth
- Instrumental vaginal birth

For more information on vaginal births see National Perinatal Data Collection annual update data table 2.35.

Caesarean section births

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 birth is likely to pose a risk to the health of the mother or baby, or in scenarios such as stalled labour or unsuccessful vaginal birth.

While caesarean section is the safest and the most appropriate method of birth 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 for planned caesarean section at less than 39 weeks' gestation can include increased rates of neonatal respiratory issues, asthma, obesity and developmental issues (ACSQHC 2018).

In 2021, more than 1 in 3 mothers (38%) had a caesarean section birth. This is an increase from 32% in 2011. Mothers who had caesarean sections include all those who had no labour onset (64%) as well as those who required a caesarean section after labour started (36%).

Caesarean sections were more common among women whose babies were pre-term (51%), who were aged 40 and over (56%) and who were overweight (40%) and obese (46%).

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).

1 in 4 (27%) 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 (40%) and lower for mothers who had previously given birth (13%).

For related information see National Core Maternity Indicator Caesarean section

For more information on caesarean section births see National Perinatal Data Collection annual update data tables 2.36 and 2.37.

Previous caesarean section

Having had a previous caesarean section can be associated with an increased risk of adverse outcomes for women and their babies during subsequent pregnancies, most often due to uterine scarring (Chauhan et al. 2003; Jamshed et al. 2022). However, many women who choose to give birth vaginally after having had a previous caesarean section are successful (RANZCOG 2022).

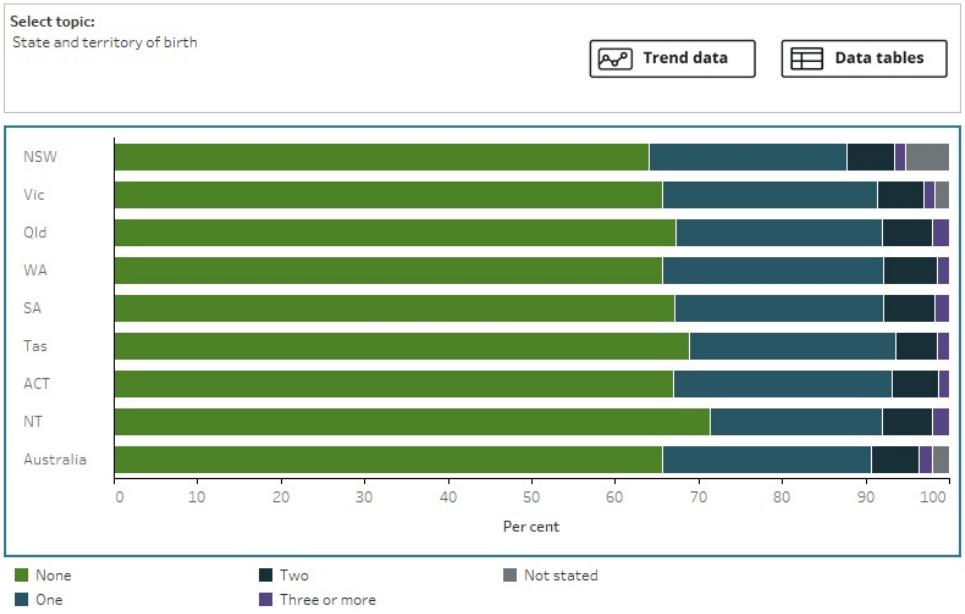
Most mothers who had a previous caesarean section had a repeat caesarean section (87%). Having had a previous caesarean section was the most common main reason for having a caesarean section.

Figure 2 presents data on the history of caesarean section birth for women who have previously given birth, by selected maternal characteristics, for 2021. Select the trend button to see how data has changed over a 10-year period.

Figure 2: Proportion of women who gave birth, by previous caesarean section and selected topic

Bar chart shows previous caesarean sections by selected topics and a line graph shows topic trends between 2012 and 2021.

Proportion of multiparous women who gave birth by previous caesarean section and state and territory of birth, 2021



Source: AIHW analysis of National Perinatal Data Collection
https://www.aihw.gov.au/

Of mothers who have previously given birth and had a caesarean section, 25% had one previous caesarean section, 5.8% had two previous caesarean sections, and 1.5% 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

For more information on previous caesarean sections see National Perinatal Data Collection annual update data table 2.42.

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 SRH 2015).

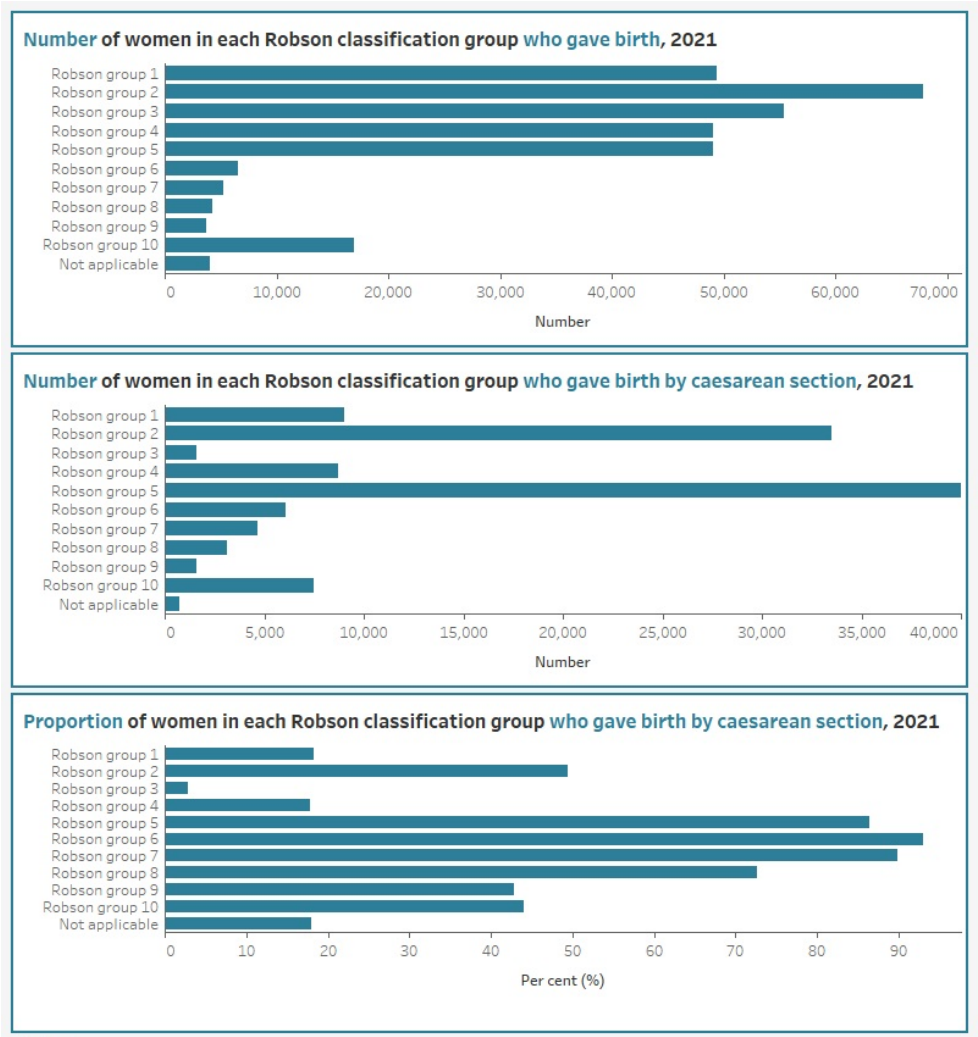
The Robson classification allocates women into 10 mutually exclusive groups based on obstetric characteristics, such as the number of previous pregnancies, onset of labour, whether there has been a previous caesarean section, and the baby's gestational age (WHO 2018; WHO SRH 2015). This can provide a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

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 (90%, Robson group 7) and those with singleton pregnancies near term who had had one or more previous caesarean sections (86%, Robson group 5).

Figure 3 presents data on the number and proportion of women who gave birth, by Robson group, in 2021.

Figure 3: Number of women in each Robson classification group

3 bar charts showing number and proportion of women who gave birth by caesarean section and Robson classification group.



Notes:
1. The 'Not applicable' category includes women who had 'Not stated' values for one or more of the following data elements: parity, previous caesarean section, onset of labour, birth plurality, gestational age or presentation at birth, which are used to derive the Robson groups.
2. For further information on the Robson classification groups, refer to WHO 2017.

Source: AIHW analysis of National Perinatal Data Collection
https://www.aihw.gov.au/

For more information on the Robson classification of caesarean sections see National Perinatal Data Collection annual update data table 2.44.

References

ACSQHC (Australian Commission on Safety and Quality in Health Care) (2018) *The second Australian atlas of healthcare variation*, ACSQHC, accessed 3 January 2018.

Chauhan SP, Martin JN, Henrichs CE, Morrison JC and Magann EF (2003) 'Maternal and perinatal complications with uterine rupture in 142,075 patients who attempted vaginal birth after cesarean delivery: a review of the literature', *American Journal of Obstetrics Gynecology*, 189(2):408–417, doi:10.1067/s0002-9378(03)00675-6.

Jamshed S, Chien SC, Tanweer A, Asdary RN, Hardhantyo M, Greenfield D, Chien CH, Weng SF, Jian WS and Iqbal U (2022) 'Correlation between previous caesarean section and adverse maternal outcomes accordingly with Robson classification: systematic review and meta-analysis', *Frontiers in Medicine*, 10(8):740000, doi:10.3389/fmed.2021.740000.

OECD (Organisation for Economic Co-operation and Development) (2019) *Health at a glance 2019: OECD indicators*, OECD, accessed 13 April 2021.

RANZCOG (Royal Australian and New Zealand College of Obstetricians and Gynaecologists) (2019) *Birth after previous caesarean section*, RANZCOG, accessed 11 May 2022.

Victorian Department of Health and Human Services (2017) *Caesarean section*, Victorian Department of Health and Human Services, Victorian Government, accessed 31 May 2022.

WHO (World Health Organization) (2017) *Robson classification: implementation manual*, WHO, accessed 10 May 2018.

WHO SRH (World Health Organization Sexual and Reproductive Health and Research) (2015) *WHO statement on caesarean section rates*, reference number WHO/RHR/15.02, WHO SRH, accessed 21 November 2018.

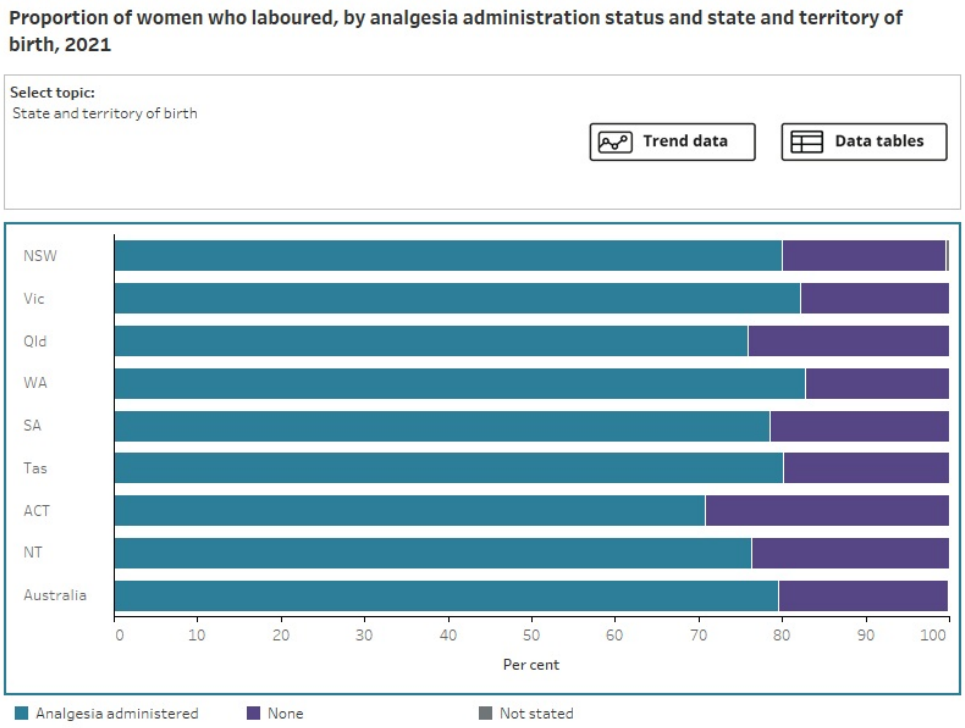
Labour and birth

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 data visualisation (Figure 1) presents data on the analgesia administration status of women who laboured, by selected maternal characteristics, for 2021. Select the trend button to see how data has changed over an 11-year period (where available).

Figure 1: Proportion of women who laboured, by analgesia administration status and selected topic

Bar chart shows analgesia administration status by selected topics and a line graph shows topic trends between 2011 and 2021.



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

Source: AIHW analysis of National Perinatal Data Collection
https://www.aihw.gov.au/

Around 4 in 5 (80%) women who had labour in Australia received pain relief. In 2021, the most common types were nitrous oxide (inhaled) (52%), followed by epidural or caudal analgesic (42%) and systemic opioids (11%).

More than 9 in 10 women who had an instrumental vaginal birth received pain relief (97% for vaginal births assisted with forceps and 93% for vaginal births assisted with vacuum extraction). Additionally, women who gave birth in a private hospital were more likely to receive pain relief (85%) than women who gave birth in a public hospital (81%).

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

- be aged 40 or more (25%)
- have given birth before (from 25% for mothers with one previous pregnancy to 38% for mothers with 4 or more previous pregnancies)
- be First Nations (22%).

For more information on analgesia see National Perinatal Data Collection annual update data tables 2.29 and 2.30.

Labour and birth

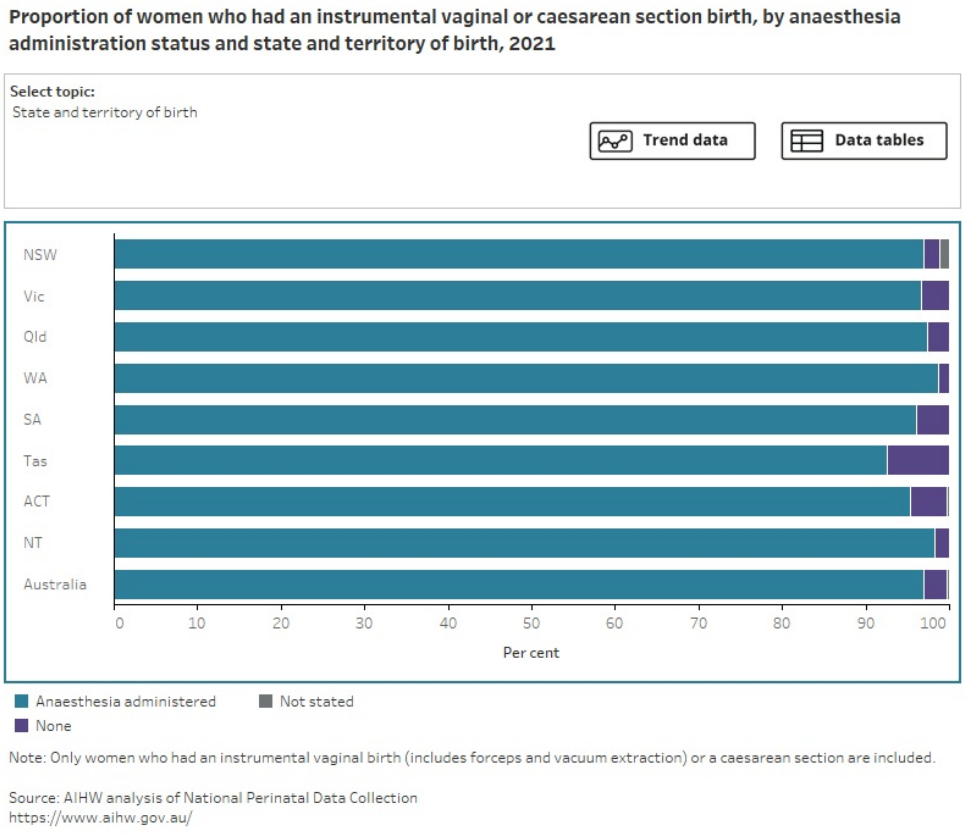
Anaesthesia is used to relieve pain during a caesarean section or instrumental vaginal birth. All women who have a caesarean section receive anaesthesia, except in the rare case of post-mortem delivery. More than one type of anaesthetic can be administered.

In 2021, most mothers who had a caesarean section had a regional anaesthetic (70% spinal, 19% epidural or caudal; noting that some mothers had both) and 5.3% had a general anaesthetic.

Figure 1 presents data on the anaesthesia administration status of women who gave birth and had a caesarean section or instrumental vaginal birth, by selected maternal characteristics, for 2021. Select the trend button to see how data has changed over an 11-year period (where available).

Figure 1: Proportion of women who had an instrumental vaginal or caesarean section birth, by anaesthesia administration status and selected topic

Bar chart shows anaesthesia administration status by selected topics and a line graph shows topic trends between 2011 and 2021.



Most mothers who had an instrumental vaginal birth had an anaesthetic. A regional anaesthetic was most common (66% epidural or caudal and 3.8% spinal), followed by a local anaesthetic to the perineum (21%).

Women who had a vaginal instrumental birth using forceps (95%) were more likely to have anaesthesia administered than women who had a vacuum extraction (88%).

For related information see National Core Maternity Indicator General anaesthetic for women giving birth by caesarean section

For more information on anaesthesia see National Perinatal Data Collection annual update data tables 2.31, 2.32 and 2.33.

Labour and birth

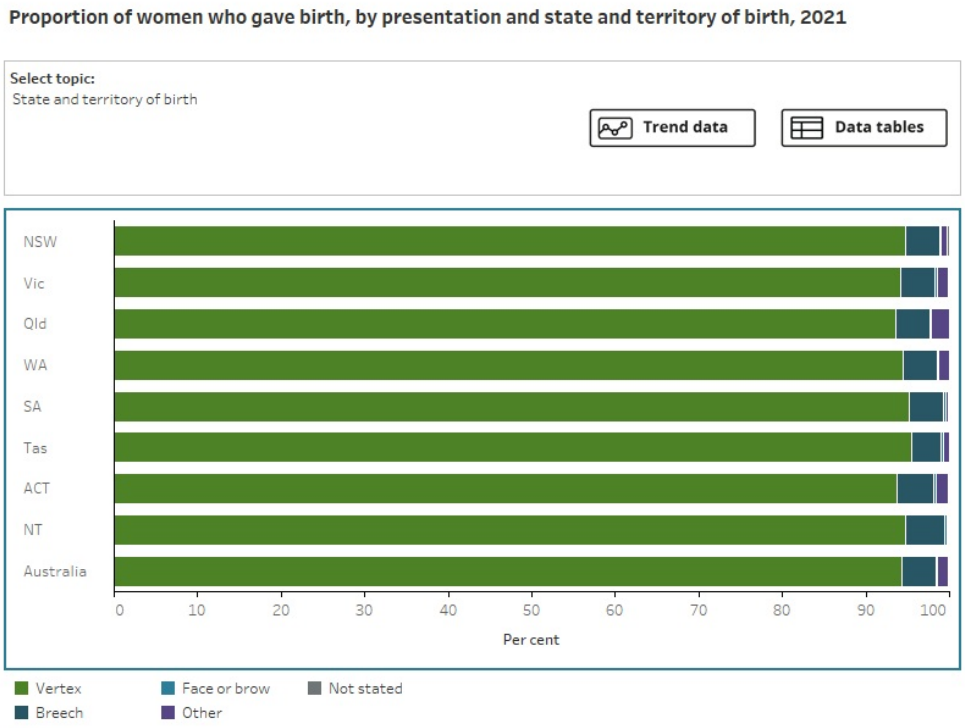
Presentation refers to the anatomical part of the baby that is facing down the birth canal at birth.

In 2021, more than 9 in 10 (94%) women gave birth to babies in a vertex (head first) presentation. Mothers with one, 2 and 3 previous pregnancies (95% for all groups) were slightly more likely to have a vertex presentation than first-time mothers (93%) and mothers with 4 or more previous pregnancies (94%).

Figure 1 presents data on baby presentation for women who gave birth, by selected maternal characteristics, for 2021. Select the trend button to see how data has changed over an 11-year period (where available).

Figure 1: Proportion of women who gave birth, by presentation and selected topic

Bar chart shows presentation of birth by selected topics and a line graph shows topic trends between 2011 and 2021.



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 2021, about 15% 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 4.0%, and 6.6% for non-ACT residents who gave birth in the ACT.

Source: AIHW analysis of National Perinatal Data Collection
https://www.aihw.gov.au/

Less than 1 in 20 (4.1%) mothers had a baby in the breech position (buttocks or feet first). A higher proportion of mothers aged 40 and over (6%) had babies in a breech presentation than did younger mothers (for example, 3.1% and 3.3%, respectively, for both mothers aged under 20 and those aged 20–24).

Only 0.6% of mothers who had a baby in the breech position had a non-instrumental vaginal birth, compared with 9.9% of mothers who had a caesarean section.

Women who had a multiple birth were more likely to have a baby in a breech presentation (24%, compared with 74% of mothers with a baby in the vertex presentation), based on the presentation of the first born baby.

For more information on presentation for babies see National Perinatal Data Collection annual update data table 2.34.

Labour and birth

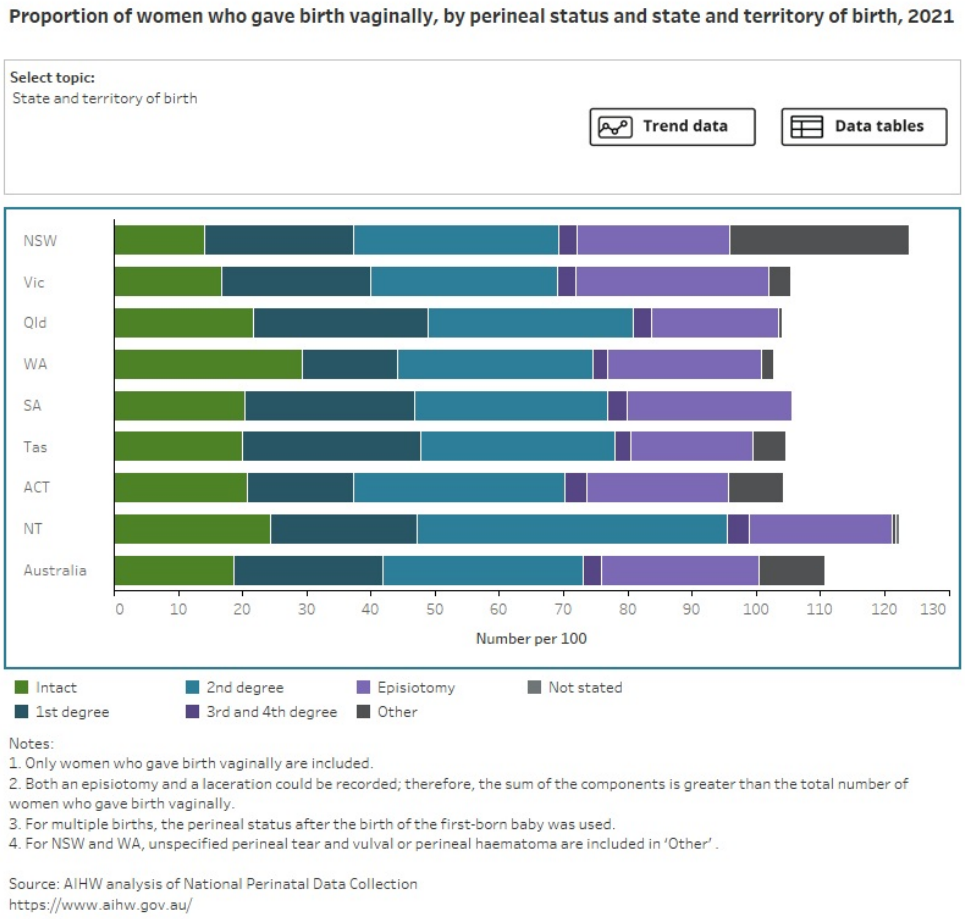
Perineal status refers to the state of the perineum after vaginal birth. Perineal status is categorised as intact, first degree laceration, second degree laceration, third or fourth degree laceration, episiotomy or other type of perineal laceration, rupture or tear. An episiotomy is an incision of the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

Nearly 1 in 5 (19%) mothers had an intact perineum. Where the perineum was not intact, second degree lacerations were most common (31%), followed by first degree lacerations (23%). Only a small proportion of women had a third or fourth degree laceration (less than 3%).

Figure 1 presents data on the perineal status of women who gave birth vaginally, by selected maternal characteristics, for 2021. Select the trend button to see how data has changed over an 8-year period.

Figure 1: Proportion of women who gave birth vaginally, by perineal status and selected topic

Bar chart shows perineal status by selected topics and a line graph shows topic trends between 2014 and 2021.



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
https://www.aihw.gov.au/

Around 1 in 4 (25%) 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 2019 or nearest year for both non-instrumental and instrumental vaginal births:

- 2.2 per 100 non-instrumental vaginal births compared with the OECD average of 1.4
- 5.7 per 100 instrumental vaginal births compared with the OECD average of 5.3 (OECD 2023).

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.

For more information on births by state and territory see National Perinatal Data Collection annual update data table 2.45.

References

ACSQHC (Australian Commission on Safety and Quality in Health Care) (2018) *The second Australian atlas of healthcare variation*, ACSQHC, accessed 3 January 2018.

OECD (Organisation for Economic Co-operation and Development) (2022) *Health at a glance 2021: OECD indicators* , OECD, accessed 9 June 2023.

Labour and birth

This section focuses on the maternal antenatal (prior to giving birth) and postnatal (after giving birth) length of stay in hospital, and is based on mothers who gave birth in hospital.

On this page:

Antenatal length of stay

Antenatal length of stay refers to the number of days between admission to hospital and giving birth.

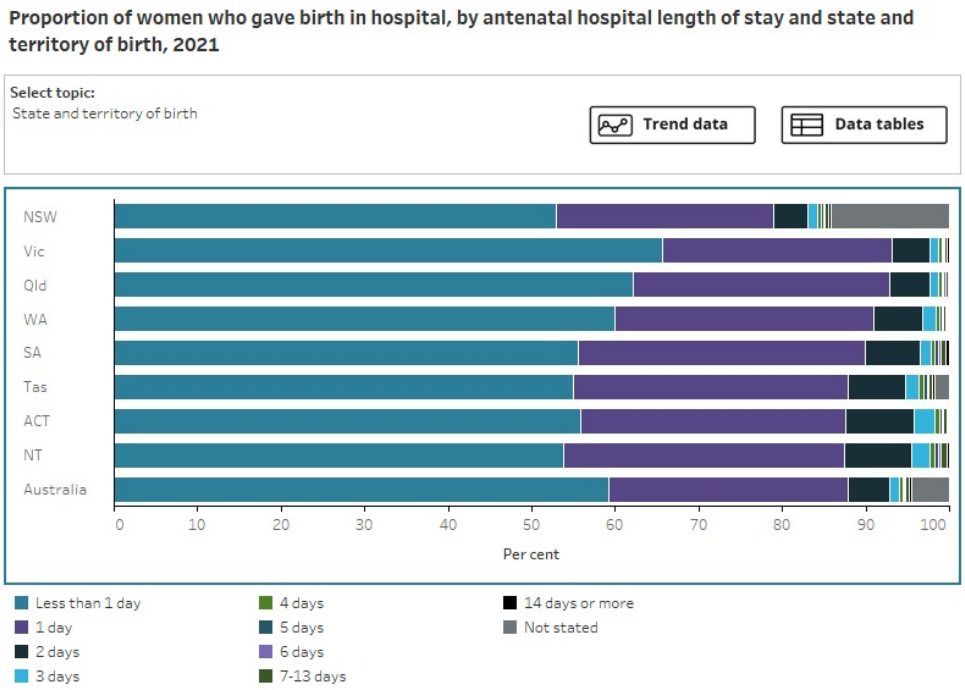
An antenatal stay of one day or less indicates that pregnant women were most likely admitted to hospital for routine labour and birth (ACT Health 2003). Women who are considered to be at high risk due to antenatal complications, such as diabetes or hypertension, are more likely to be admitted to hospital for an antenatal stay of more than one day (Western Australian Department of Health 2007).

Over time, the average number of days women spend in hospital prior to giving birth has remained relatively stable (from 0.5 days in 2011 to 0.6 days in 2021).

Figure 1 presents data on the antenatal length of hospital stay for women who gave birth in hospital, by selected maternal characteristics, for 2021. Select the trend button to see how data has changed over an 11-year period (where available).

Figure 1: Proportion of women who gave birth in hospital, by antenatal hospital length of stay and selected topic

Bar chart shows antenatal stay by selected topics and a line graph shows topic trends between 2011 and 2021.



Note: For multiple births, the place of birth of the first-born baby was used. Excludes women whose first-born baby was born in a birth centre attached to a hospital.

Source: AIHW analysis of National Perinatal Data Collection
https://www.aihw.gov.au/

In 2021, most mothers had an antenatal stay of less than one day (59%).

Some groups had lower proportions of antenatal stay of less than one day, including mothers who:

- had a baby who was born pre-term (49%) or post-term (36%)
- were aged under 20 years (49%)
- had an instrumental vaginal birth assisted by forceps (38%) or vacuum (45%)

- had induced labour (33%)
- were first-time mothers (46%).

For more information on antenatal length of stay see National Perinatal Data Collection annual update data table 2.51.

Postnatal length of stay

Postnatal length of stay refers to the number of days between giving birth and date of discharge or transfer from the hospital where birth occurred, or death. Data on postnatal length of stay are based on mothers who were discharged to home and excludes data from Western Australia.

A mother's postnatal length of stay is related to maternal factors, such as recovery after birth particularly for caesarean section birth, management of obstetric and maternal health conditions, management of conditions related to the baby and health system factors such as resourcing pressures (Rayner et al. 2008; Blumenfeld et al. 2015).

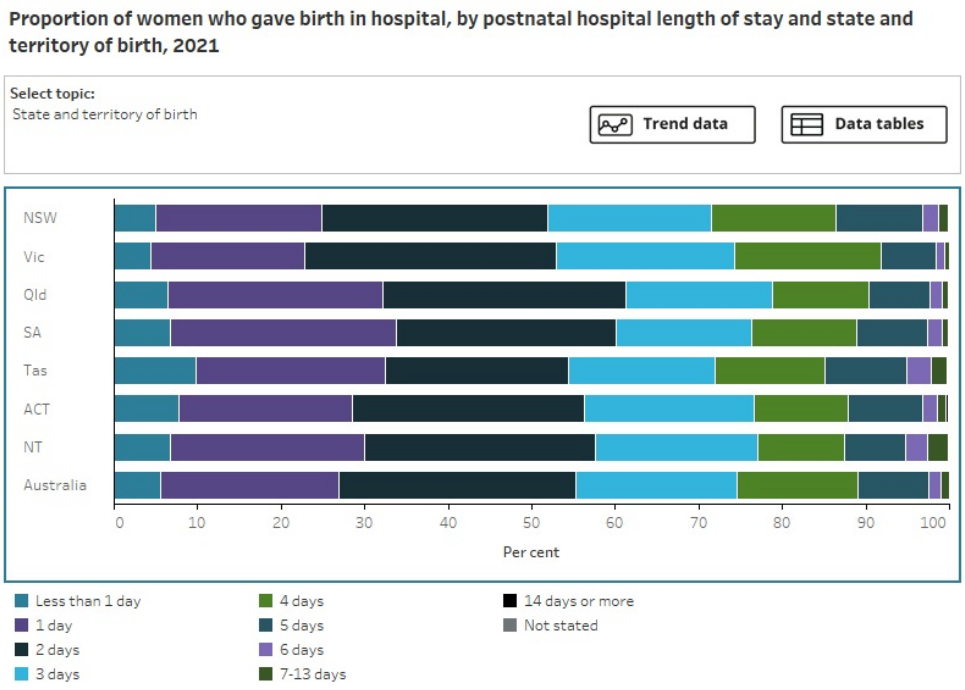
The World Health Organization (2022) recommends that after an uncomplicated vaginal birth in a health facility, healthy mothers and newborns should receive care in the facility for at least 24 hours after birth. The aims of postnatal care in hospital are to monitor the mother and baby after birth and to provide mothers and their partners and/or family with advice and support around physical recovery, breastfeeding, parenting skills and linking to supports in the community (Rayner et al. 2008; World Health Organization 2022).

The average number of days women spend in hospital following childbirth has steadily declined from 3.0 days in 2011 to 2.5 days in 2021.

Figure 2 presents data on the postnatal length of hospital stay for women who gave birth in hospital, by selected maternal characteristics, for 2021. Select the trend button to see how data has changed over an 11-year period (where available).

Figure 2: Proportion of women who gave birth in hospital, by postnatal hospital length of stay and selected topic

Bar chart shows postnatal length of stay by selected topics and a line graph show topic trends between 2011 and 2021.



Notes:
1. Data excludes WA.
2. For multiple births, the place of birth of the first-born baby was used. Excludes women whose first-born baby was born in a birth centre attached to a hospital.
3. Only includes women who were discharged home.

Source: AIHW analysis of National Perinatal Data Collection
https://www.aihw.gov.au/

In 2021, most mothers had a postnatal stay of 3 days or less (75%).

Higher proportions of postnatal stays of 3 days or less were seen among mothers who:

- had a baby who was born post-term (87%)
- were aged under 20 years (87%)
- had a non-instrumental vaginal birth (86%)
- had a parity of 3 (87%) or 4 or more (89%)
- had a singleton pregnancy (75%).

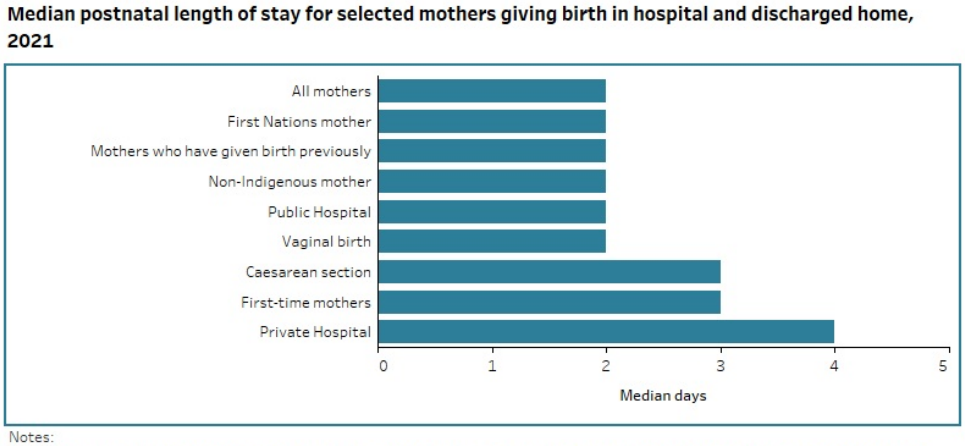
Higher proportions of postnatal stays of 4 days or more were seen among mothers who:

- had a baby who was born pre-term (41%)
- were aged 40 years and over (38%)
- had a caesarean section birth (39%)
- were first-time mothers (33%)
- had a multiple pregnancy (51%).

Some groups of mothers also have a longer median length of postnatal stay in hospital, which is reflected in Figure 3.

Figure 3: Median postnatal length of stay for selected mothers giving birth in hospital and discharged home

Bar chart shows median postnatal length of stay for mother who gave birth in hospitals and were discharged home.



Notes:
1. Includes women whose first-born baby was born in hospital (excludes birth centres attached to hospitals) and discharged home only.
2. Excludes data where maternal length of postnatal hospital stay was 'Not stated'.
3. Data excludes WA.

Source: AIHW analysis of National Perinatal Data Collection
https://www.aihw.gov.au/

There was a trend toward shorter postnatal stays between 2011 and 2021: 27% of mothers were discharged less than 2 days after giving birth in 2021 (17% in 2011), and 11% of mothers stayed 5 or more days (18% in 2011).

Mothers were most likely to be discharged between 2 and 4 days after giving birth (66% in 2011 and 62% in 2021).

For more information on postnatal length of stay see National Perinatal Data Collection annual update data tables 2.52 and 2.53.

References

ACT Health (2003) *Maternal and Perinatal Health in the ACT 1999*, ACT Health, ACT Government, accessed 26 July 2022.

Blumenfeld YJ, El-Sayed YY, Lyell DJ, Nelson LM and Butwick AJ (2015). Risk Factors for Prolonged Postpartum Length of Stay Following Cesarean Delivery, *American Journal of Perinatology* 32(9), doi:10.1055/s-0034-1543953

Rayner J, Forster D, McLachlan H, Yelland J and Davey M (2008). 'A state-wide review of hospital postnatal care in Victoria, Australia: The views and experiences of midwives', *BMC Pregnancy and Childbirth*, 24, doi:10.1016/j.midw.2006.10.008

Western Australian Department of Health (2007) *Models of maternity care: updated review of the evidence*, Western Australian Department of Health, Western Australian Government, accessed 26 July 2022.

WHO (World Health Organization) (2022) *WHO recommendations on maternal and newborn care for a positive postnatal experience*, WHO, accessed 25 July 2022.

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

Preliminary perinatal deaths

Perinatal deaths include both stillbirth and neonatal deaths. The data presented in this section are from the National Perinatal Data Collection, and are preliminary data only

Baby outcomes

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:

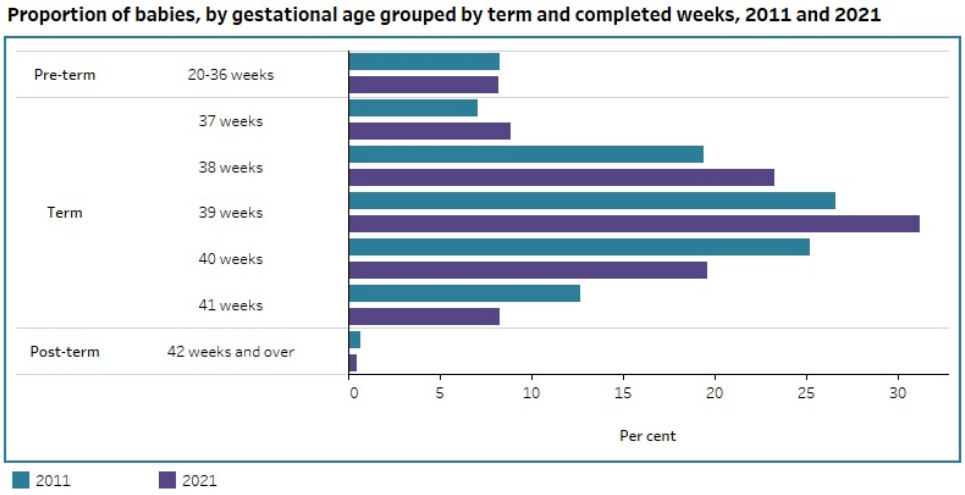
- pre-term (less than 37 weeks' gestation)
- term (37 to 41 weeks)
- post-term (42 weeks and over).

The proportion of babies born between 20 and 36 weeks remained steady between 2011 (8.3%) and 2021 (8.2%) with a peak of 8.7% reached most recently in 2018, while the proportion born between 37 and 39 weeks increased (for example, babies born at 38 weeks increased from 19% in 2011 to 23% in 2021) and the proportion born from 40 weeks onwards decreased (for example, babies born at 40 weeks decreased from 25% in 2011 to 20% in 2021).

Figure 1 presents data on the grouped gestational age of pre-term and post-term babies and the individual completed weeks for term babies, for 2011 and 2021.

Figure 1: Proportion of babies, by gestational age grouped by term and completed weeks

Bar chart of proportion of babies by gestational age grouped by term and completed weeks between 2011 and 2021.



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

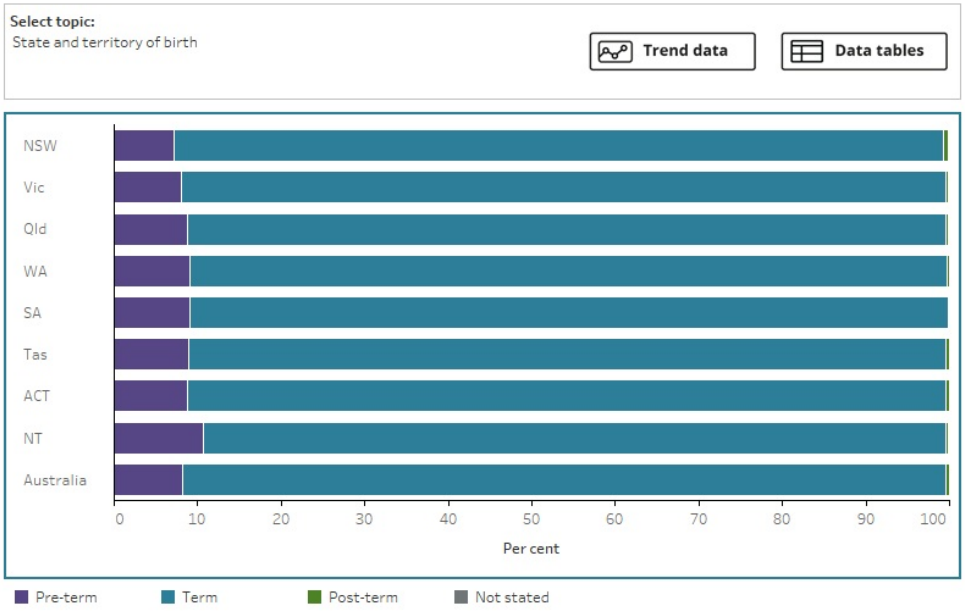
Source: AIHW analysis of National Perinatal Data Collection

Figure 2 presents data on the gestational age of babies, by selected maternal and baby characteristics, for 2021. Select the trend button to see how data has changed over an 11-year period (where available).

Figure 2: Proportion of babies, by gestational age group and selected topic

Bar chart shows gestational age group by selected topics and a line graph shows topic trends between 2011 and 2021.

Proportion of babies, by gestational age group and state and territory of birth, 2021



Notes:
1. Pre-term births may include a small number of births of less than 20 weeks gestation.
2. Births in Vic, Qld and WA may include late termination of pregnancy.
3. In 2021, about 15% 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 pre-term births among babies of ACT residents who gave birth in the ACT was 7.4% compared with 17.0% of non-ACT residents who gave birth in the ACT.

Source: AIHW analysis of National Perinatal Data Collection
https://www.aihw.gov.au/

Most babies (92%) in Australia are born at term (37–41 weeks), with 32% at early term (37 or 38 weeks) and 60% at full term (39–41 weeks). This is similar across the states and territories and has been stable over time.

Almost 1 in 10 babies (8.2%) 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 (13%) than babies born to mothers who had not smoked (7.6%).

Most singleton babies were born at term (93%), while twins and babies of other multiple births were more likely to be born pre-term (57% for twins and 100% for other multiples).

For more information on gestational age see National Perinatal Data Collection annual update data table 3.5.

Baby outcomes

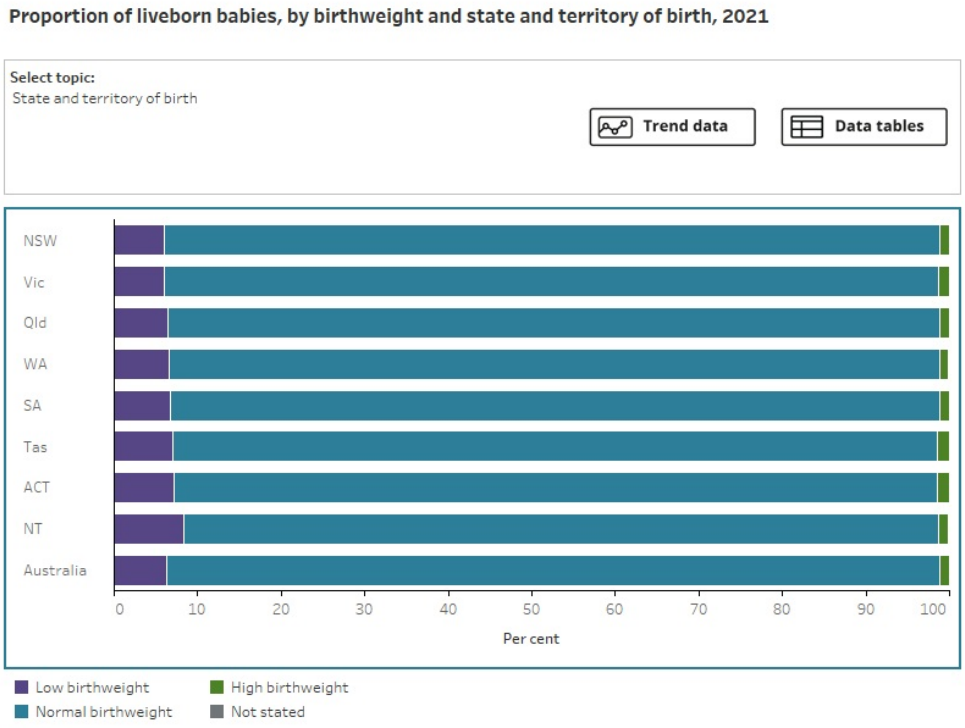
Birthweight is an important indicator of an infant's health. In 2021, over 9 in 10 babies (92%) were born with a normal birthweight (birthweight between 2,500 and 4,499 grams); also referred to as 'healthy birthweight'. Around 1.2% of babies were high birthweight (birthweight of 4,500 grams or more).

Low birthweight (birthweight less than 2,500 grams) has been associated with an increased risk of illness and death in infancy and into adulthood. In 2021, 6.8% of all babies were low birthweight – 6.3% of liveborn babies and 82% of stillborn babies.

Figure 1 presents data on the birthweight of liveborn babies, by selected maternal and baby characteristics, for 2021. Select the trend button to see how data has changed over an 11-year period (where available).

Figure 1: Proportion of liveborn babies, by birthweight and selected topic

Bar chart shows birthweight by selected topics and a line graph shows topic trends between 2011 and 2021.



Notes:
1. Includes liveborn babies only.
2. In 2021, about 15% 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
https://www.aihw.gov.au/

Over 1 in 7 (15%) liveborn low birthweight babies weighed less than 1,500 grams and 6.5% of liveborn low birthweight babies weighed less than 1,000 grams.

Pre-term birth is closely linked with low birthweight – over two thirds (71%) of liveborn low birthweight babies were pre-term (gestational age before 37 completed weeks) and more than half (56%) 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 most disadvantaged areas (7.5%) than babies born to mothers who lived in the least disadvantaged areas (5.2%).

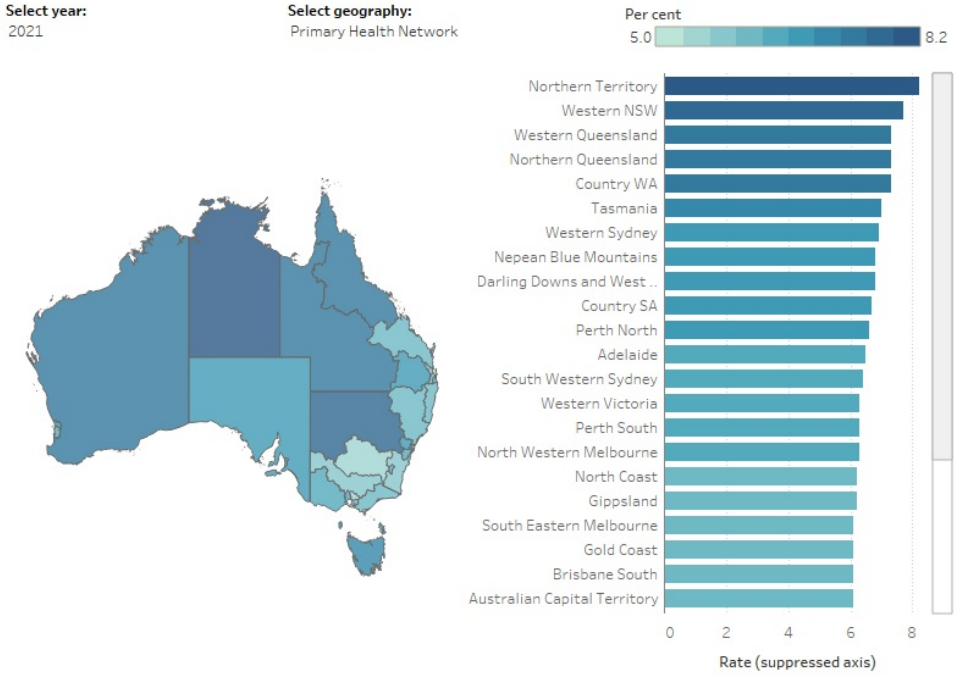
Internationally, the proportion of low birthweight babies in Australia in 2018 or nearest year (6.7%), was slightly higher than the OECD average (6.6%) (OECD 2019).

Figure 2 presents the number and proportion of liveborn babies who were low birthweight, by PHN area and SA3, in 2021.

Figure 2: Proportion of liveborn babies who had a low birthweight, by selected geography

Map shows proportion of low birthweight babies by selected geographies and years.

Proportion of liveborn babies who had a low birthweight by Primary Health Network (PHN), 2021



Notes:
1. Includes liveborn babies only.
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
https://www.aihw.gov.au/

For related information see National Core Maternity Indicator Small babies among births at or after 40 weeks of gestation.

For more information on birthweight see National Perinatal Data Collection annual update data table 3.9.

For more information on liveborn babies who were low birthweight by Primary Health Network area and Statistical Area Level 3 see National Perinatal Data Collection annual update data tables 5.5 and 5.11, respectively.

References

OECD (Organisation for Economic Co-operation and Development) (2019) *Health at a glance 2019: OECD indicators*, OECD, accessed 13 April 2021.

Baby outcomes

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 considered when examining their health at birth.

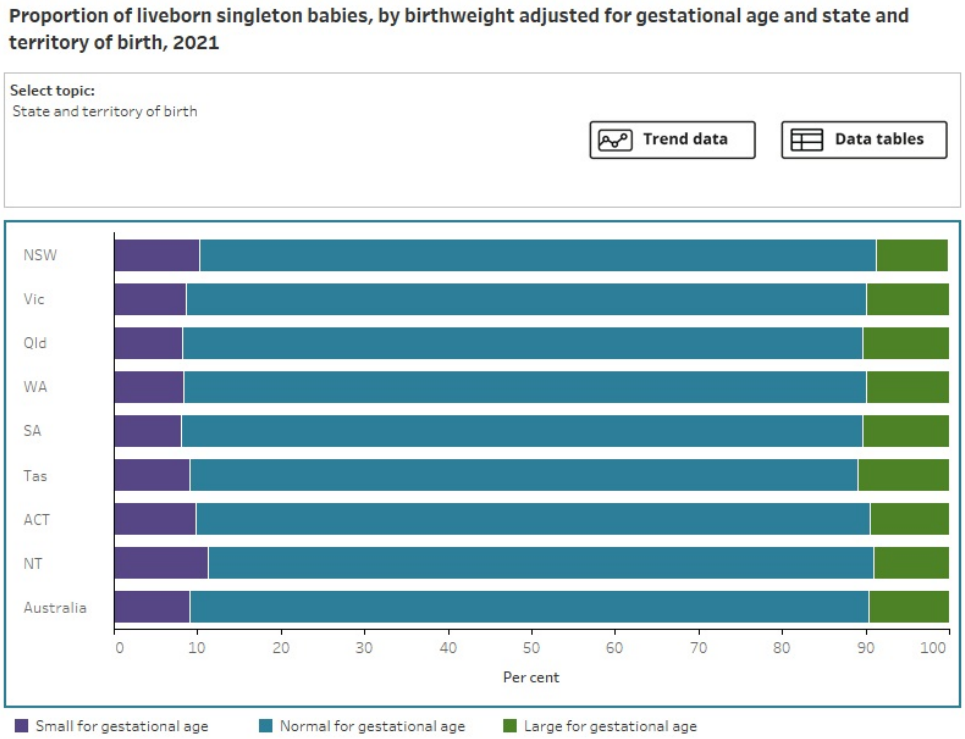
Babies are defined as being small for gestational age if their birthweight is below the 10th percentile for their gestational age and sex, and babies are defined as large for gestational age if their birthweight is above the 90th percentile for their gestational age and sex, as determined by national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

Data on birthweight adjusted for gestational age is limited to liveborn singleton babies.

Figure 1 presents data on the birthweight adjusted for gestational age of liveborn singleton babies, by selected maternal and baby characteristics, for 2021. Select the trend button to see how data has changed over a 9-year period.

Figure 1: Proportion of liveborn singleton babies, by birthweight adjusted for gestational age and selected topic

Bar chart shows birthweight adjusted for gestational age by selected topics and a line graph shows topic trends between 2013 and 2021.



Notes:
1. Includes liveborn singleton babies only. Excludes those with not stated values for gestational age, birthweight or sex.
2. In 2021, about 15% 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
https://www.aihw.gov.au/

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

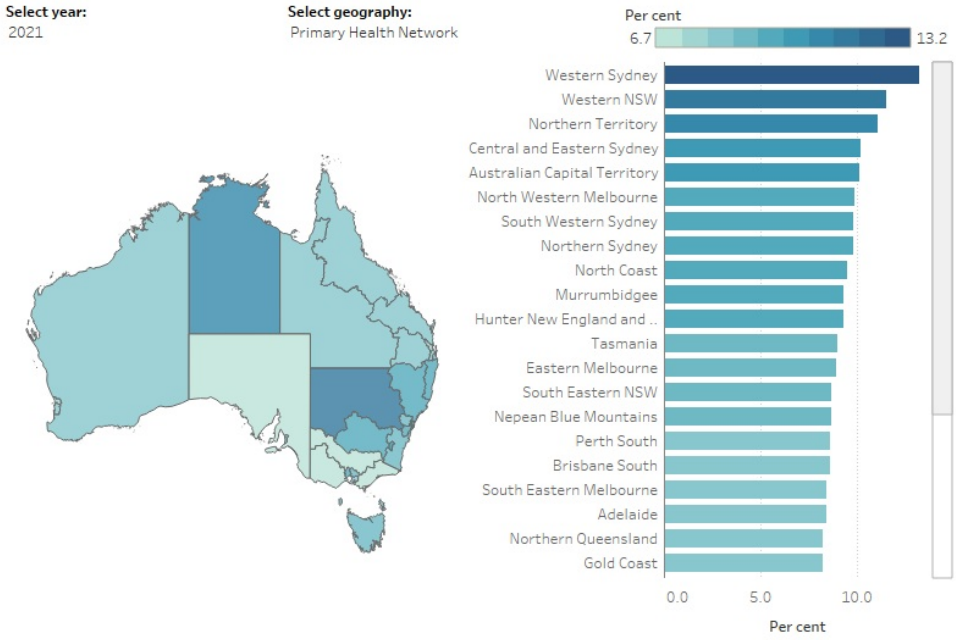
- born to mothers who live in *Very remote* areas (11%)
- born to underweight mothers (19%)
- born to teenage mothers (aged under 20) (15%)
- born to mothers who smoked (16%)
- born to mothers who lived in the lowest socioeconomic areas (10%).

Figure 2 presents the number and proportion of liveborn singleton babies who were small for gestational age, by PHN area and SA3, in 2021.

Figure 2: Proportion of liveborn singleton babies who were small for gestational age, by selected geography

Map shows babies that were small for gestational age by selected geographies and years,

Proportion of liveborn singleton babies who were small for gestational age by Primary Health Network (PHN), 2021



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
https://www.aihw.gov.au/

For related information see National Core Maternity Indicator Small babies among births at or after 40 weeks of gestation.

For more information on Australian birthweight percentiles for liveborn singleton babies see National Perinatal Data Collection annual update data table 6.1.

For more information on liveborn babies who were small for gestational age by Primary Health Network area and Statistical Area Level 3 see National Perinatal Data Collection annual update data tables 5.6 and 5.12, respectively.

Baby outcomes

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.

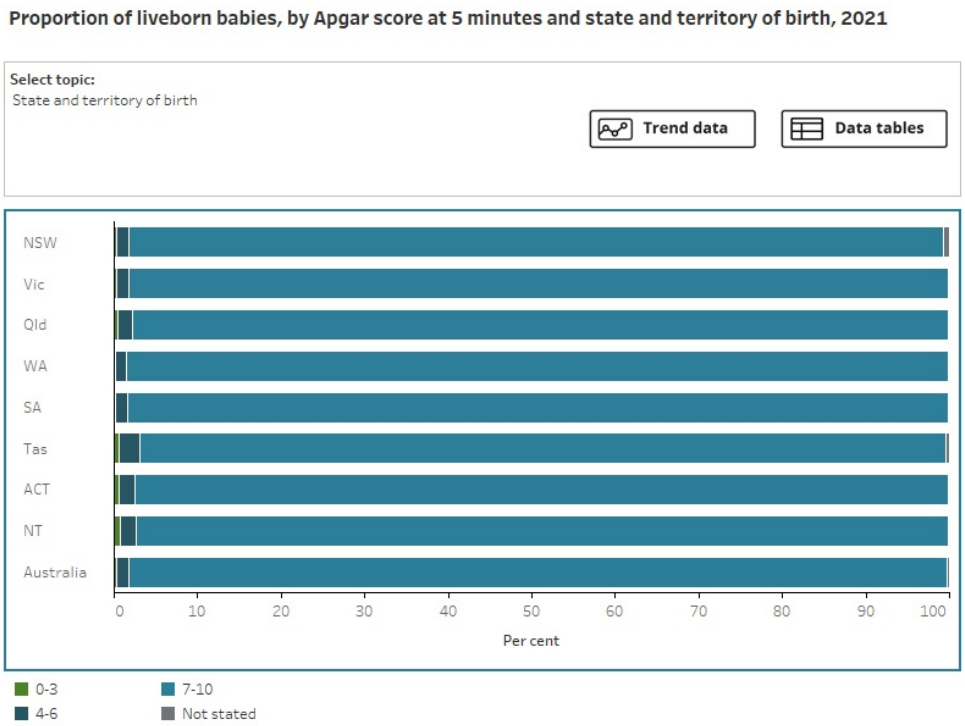
An Apgar score of 7 or more at 5 minutes after birth indicates that the baby is adapting well to the environment, while a score of less than 7 indicates complications for the baby. Data on Apgar scores is limited to liveborn babies.

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

Figure 1 presents data on the Apgar score at 5 minutes of liveborn babies, by selected maternal and baby characteristics, for 2021. Select the trend button to see how data has changed over an 11-year period (where available).

Figure 1: Proportion of liveborn babies, by Apgar score at 5 minutes and selected topic

Bar chart shows Apgar score by selected topics and a line graph shows topic trends between 2011 and 2021.



Notes:
1. Includes liveborn babies only.
2. In 2021, about 15% 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
https://www.aihw.gov.au/

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

- low birthweight babies (8.2%)
- pre-term babies (8.1%)
- babies with a breech presentation (5.3%).

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.

For more information on Apgar score at 5 minutes see National Perinatal Data Collection annual update data table 3.17.

Baby outcomes

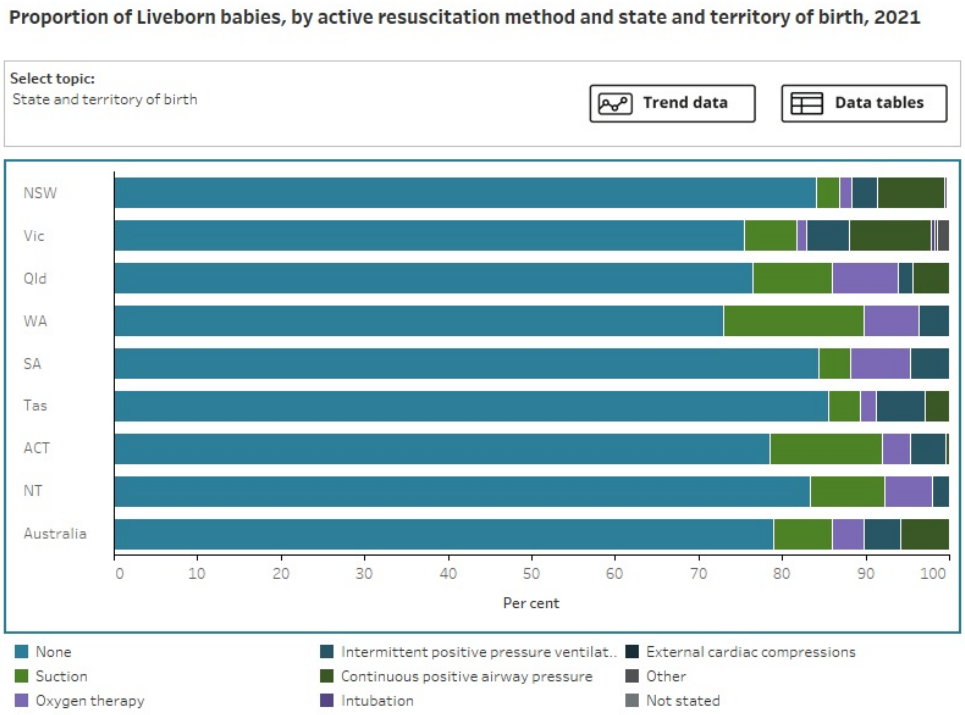
Resuscitation is undertaken to establish independent breathing and heartbeat or to treat depressed respiratory effect and to correct metabolic disturbances. Active resuscitation methods range from less advanced methods like suction or oxygen therapy to more advanced methods, such as external cardiac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

Data are for liveborn babies only. Due to a change in collection of data on resuscitation method, data are available from 2019.

Figure 1 presents data on the active resuscitation status of liveborn babies, by selected maternal and baby characteristics, for 2021. Select the trend button to see how data has changed over a 3-year period (where available).

Figure 1: Proportion of liveborn babies, by active resuscitation method and selected topic

Bar charts shows active resuscitation method by selected topics and a line graph shows topic trends between 2019 and 2021.



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. In 2021, about 15% of women who gave birth in the ACT were non-ACT residents. Care must be taken when interpreting percentages.
4. 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%.
n.p. Not publishable due to small numbers, confidentiality or for reliability reasons.

Source: AIHW analysis of National Perinatal Data Collection
https://www.aihw.gov.au/

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

Babies who required resuscitation were more likely to:

- have an Apgar score of less than 7 (69%)
- be of low birthweight (87%)
- be born pre-term (90%)
- be born as part of a multiple birth (82%).

For more information on active resuscitation method see National Perinatal Data Collection annual update data table 3.18.

Baby outcomes

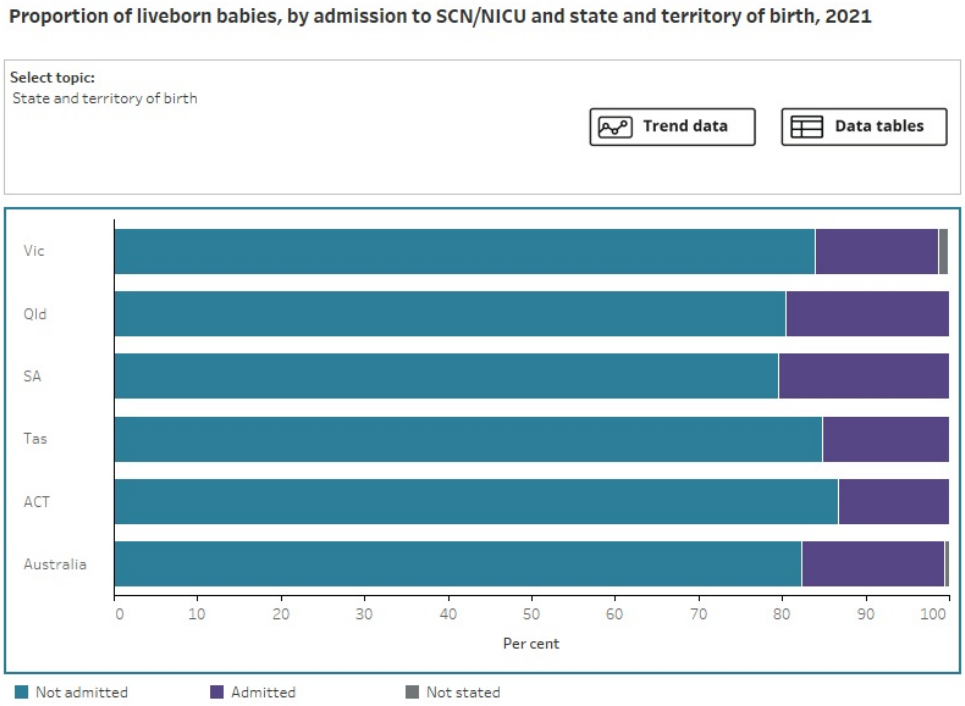
Babies are admitted to a special care nursery (SCN) or neonatal intensive care unit (NICU) if they require more specialised medical care and treatment than is available on the postnatal ward. Data are limited to liveborn babies who were born in hospital and discharged home and may not include babies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

Almost 1 in 5 (17%) babies required admission to SCN or NICU. Babies were more likely to require admission if they were born pre-term (77%), First Nations (25%), of low birthweight (76%) or born as a twin (64%).

Figure 1 presents data on the admission to SCN or NICU status of liveborn babies, by selected maternal and baby characteristics, for 2021. Select the trend button to see how data has changed over an 11-year period (where available).

Figure 1: Proportion of liveborn babies, by admission to SCN/NICU and selected topic

Bar chart shows admission to SCN/NICU by selected topics and a line graph shows topic trends between 2011 and 2021.



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. Data excludes NSW, WA and NT.
4. In 2021, about 15% 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
https://www.aihw.gov.au/

Mothers were more likely to have a baby admitted to SCN or NICU if they were aged under 20 (24%), or 40 or older (19%), were First Nations (26%), smoked during pregnancy (25%) or gave birth by caesarean section (23%).

The admission rate was also slightly higher among babies whose mothers lived in the most disadvantaged areas (19%) compared with those whose mothers lived in the least disadvantaged areas (14%).

For more information on admission to SCN or NICU see National Perinatal Data Collection annual update data table 3.19.

Baby outcomes

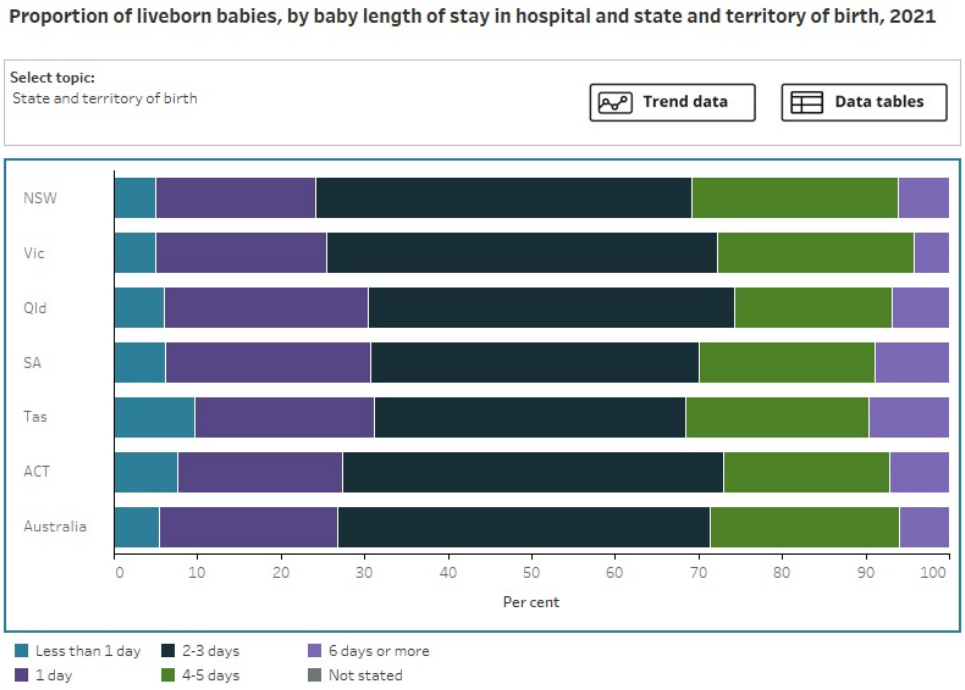
Baby length of stay refers to the number of days between giving birth and the date of discharge or transfer from the hospital where birth occurred, or death. Over time, babies' length of stay in hospital after birth has generally been getting shorter. The proportion of stays of 3 days or less has risen and stays of 4 days or more has fallen (for example, stays of 1 day have increased from 13% in 2011 to 21% in 2021, whereas stays of 4 to 5 days have decreased from 33% in 2011 to 23% in 2021).

Data are for liveborn babies only and exclude Western Australia.

Figure 1 presents data on the length of hospital stay for liveborn babies born in hospital, by selected maternal and baby characteristics, for 2021. Select the trend button to see how data has changed over an 11-year period (where available).

Figure 1: Proportion of liveborn babies, by baby length of stay in hospital and selected topic

Bar chart shows baby length of stay by selected topics and a line graph shows topic trends between 2011 and 2021.



Notes:
1. Includes liveborn babies born in hospital only (excludes birth centres attached to hospitals).
2. Only babies who were discharged home are included.
3. Data excludes WA and NT.
4. In 2021, about 15% 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
https://www.aihw.gov.au/

Many 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 were much more likely to stay in hospital for 6 days or more (both 56%), compared with normal birthweight babies (3.6%) and babies born at term (3.0%).

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

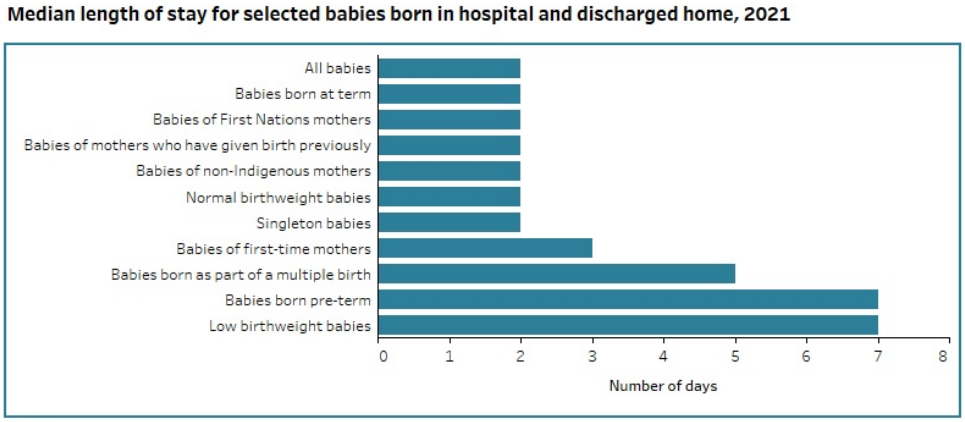
- born in a private hospital (7.9%)
- born to mothers aged 40 and over (8.8%)
- born to mothers who smoked (9.6%)
- born by caesarean section (9.5%)
- part of a twin birth (45%)
- born to mothers from *Very remote* areas (8%)
- babies who had an Apgar score of less than 7 (35% for an Apgar score of 0–3 and 24% for a score of 4–6).

It is important to note that many of these factors are potentially interrelated, for example, mothers aged 40 and over 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 shown in Figure 2.

Figure 2: Median length of stay for selected babies born in hospital and discharged home

Bar chart shows median postnatal length of stay for mothers who gave birth in hospitals in 2021.



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
https://www.aihw.gov.au/

For more information on baby length of stay see National Perinatal Data Collection annual update data tables 3.22.

Baby outcomes

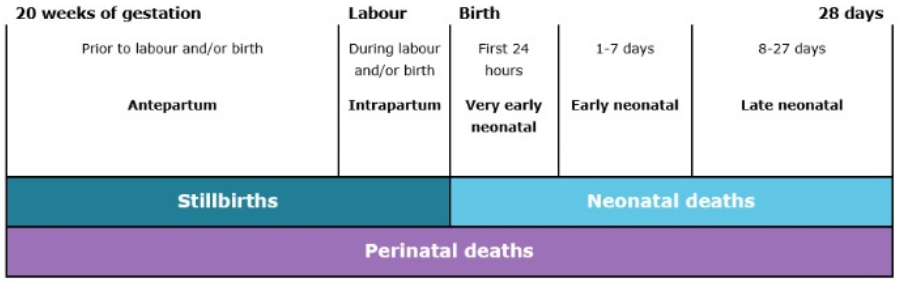
The data presented in this section are from the National Perinatal Data Collection, and are preliminary data only. Neonatal deaths may not be included for babies transferred to another hospital, re-admitted to hospital after discharge or who died at home after discharge. The AIHW has established a separate 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.

In 2021, the stillbirth rate was 7.2 per 1,000 births and the neonatal mortality rate was 2.3 per 1,000 live births. Over time, stillbirth and neonatal mortality rates have remained between 7 and 8 in 1,000 births and between 2 and 3 in 1,000 live births, respectively.

Figure 1: Definitions of perinatal deaths



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

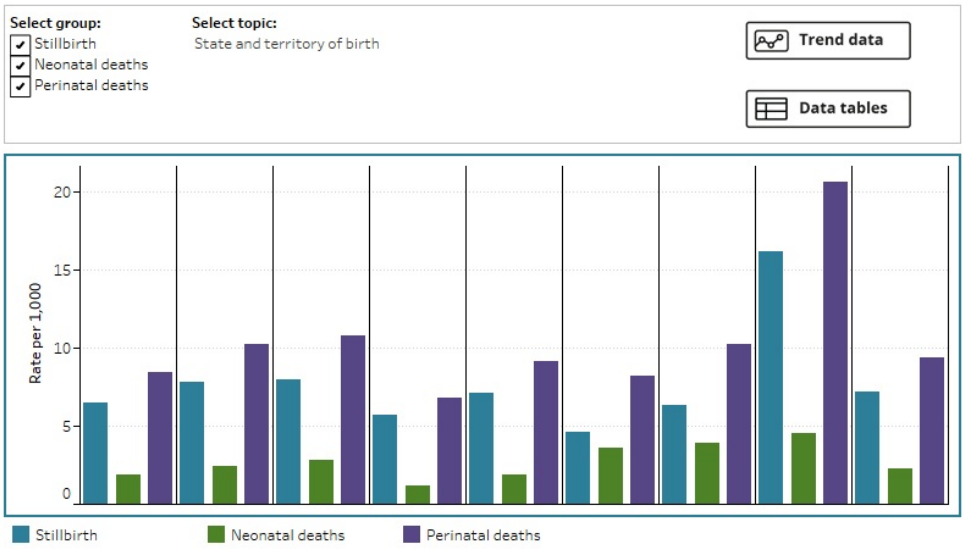
Chart: aihw.gov.au

Figure 2 presents data on stillbirths and neonatal mortality rates for state and territory of birth, First Nations babies and babies born to First Nations mothers, for 2021. Select the trend button to see how data has changed over an 11-year period (where available).

Figure 2: Perinatal mortality rates, by selected topic

Bar chart shows perinatal mortality rates by selected topics and a line graph shows topic trends between 2010 and 2021.

Perinatal mortality rates, by state and territory of birth, 2021



Notes:
1. The data presented in this section are from the National Perinatal Data Collection, and are preliminary data only. The AIHW has established a separate National Perinatal Mortality Data Collection to obtain complete information on these deaths.
2. Stillbirths and neonatal deaths may include late termination of pregnancy. Neonatal deaths may exclude deaths within 28 days of birth for babies transferred to another hospital or readmitted to hospital and those dying at home.
3. Stillbirth and perinatal mortality rates calculated using all births. Neonatal mortality rates calculated using live births.
4. In 2021, about 15% 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, for ACT residents who gave birth in the ACT, there were 5.6 fetal deaths per 1,000 births, 2.7 neonatal deaths per 1,000 live births and 8.3 perinatal deaths per 1,000 births.

Source: AIHW analysis of National Perinatal Data Collection
https://www.aihw.gov.au/

For more preliminary information on perinatal deaths see National Perinatal Data Collection annual update data table 4.1.

Focus population groups

This section explores key statistics for specific population groups – First Nations mothers and babies, mothers aged under 20 and their babies, mothers aged 35 and over and their babies, 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.

First Nations mothers and babies

First Nations status of the mother, babies born to First Nations mothers and First Nations status of the baby

Mothers aged under 20 and their babies

Mothers who were aged under 20 at the time of birth, and their babies

Mothers aged 35 and over and their babies

Mothers who were aged 35 and over at the time of birth, and their babies

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

Focus population groups

Although a range of data by First Nations status (those who self-reported as Aboriginal and/or Torres Strait Islander) has been presented in other sections, this section provides more in-depth information on First Nations mothers, babies born to First Nations mothers and First Nations babies.

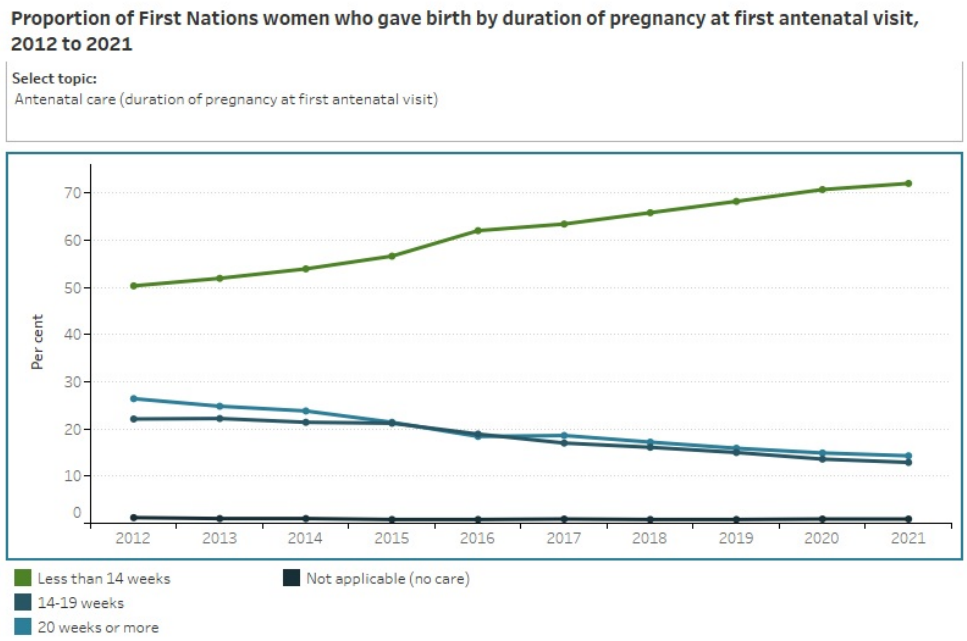
First Nations mothers

In 2021, First Nations mothers accounted for 5.0% (15,437) of women who gave birth.

Figure 1 presents data for First Nations women who gave birth, by selected maternal characteristics over an 11-year period (where available).

Figure 1: Proportion of First Nations women who gave birth, by selected topic

Line graph of First Nations women who gave birth by selected topics between 2012 and 2021.



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

Source: AIHW analysis of National Perinatal Data Collection
https://www.aihw.gov.au/

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

- a notable increase in the proportion of First Nations mothers attending an antenatal visit in the first trimester (from 50% in 2012 to 72% in 2021)
- an increase in the proportion of First Nations mothers attending 5 or more antenatal visits (from 85% in 2012 to 88% in 2021)
- a decrease in the proportion of First Nations mothers who reported smoking in the first 20 weeks of pregnancy (from 50% in 2011 to 40% in 2021) and after 20 weeks of pregnancy (from 45% in 2011 to 36% in 2021).

The proportion of First Nations mothers who report smoking at any time during pregnancy has also fallen (from 50% in 2011 to 42% in 2021), and of those who smoked, the rate of smoking cessation during pregnancy was around 1 in 8. This is based on First Nations mothers who reported smoking in the first 20 weeks of pregnancy and not smoking after 20 weeks of pregnancy.

The proportion of First Nations teenage mothers (aged under 20) who gave birth has been gradually decreasing from 19% in 2011 to 10% in 2021.

Around 3 in 5 (60%) First Nations mothers had a non-instrumental vaginal birth, and around 1 in 3 (33%) gave birth by caesarean section. Most First Nations mothers had 5 or more antenatal visits (almost 9 in 10 or 87%).

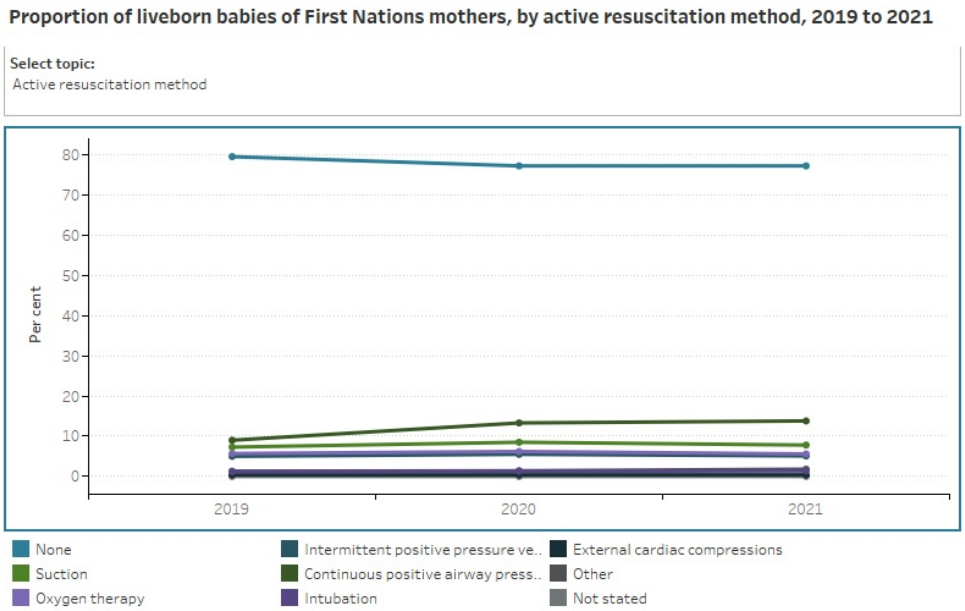
Babies of First Nations mothers

In 2021, babies born to First Nations mothers accounted for 5.0% (15,689) of all births.

Figure 2 presents data for babies of First Nations mothers, by selected maternal and baby characteristics over an 11-year period (where available).

Figure 2: Proportion of liveborn babies of First Nations mothers, by selected topic

Line graph shows babies of First Nations mother by selected topics between 2019 and 2021.



Notes:
1. Includes liveborn babies only.
2. Data excludes Vic.
3. Because of differences in definitions and methods used for data collection, care must be taken when comparing across jurisdictions.
4. 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%.

Source: AIHW analysis of National Perinatal Data Collection
https://www.aihw.gov.au/

Most babies of First Nations mothers were born at term (born from 37 to 41 weeks) and with a normal birthweight (86% and 87%, respectively). A high proportion of babies of First Nations mothers had a normal birthweight adjusted for gestational age (77%), with 13% of babies born to First Nations mothers being small for gestational age.

In 2021, 87% of babies of First Nations mothers had a normal birthweight (birthweight between 2,500 and 4,499 grams; also referred to as 'healthy birthweight'). Increasing the proportion of First Nations babies with a healthy birthweight to 91% by 2031, is one of the targets in the National Agreement on Closing the Gap.

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

Babies of First Nations mothers most commonly had a hospital stay of 2–3 days (42%), with 30% having a stay of 1 day and 9.7% having a stay of 6 days or more.

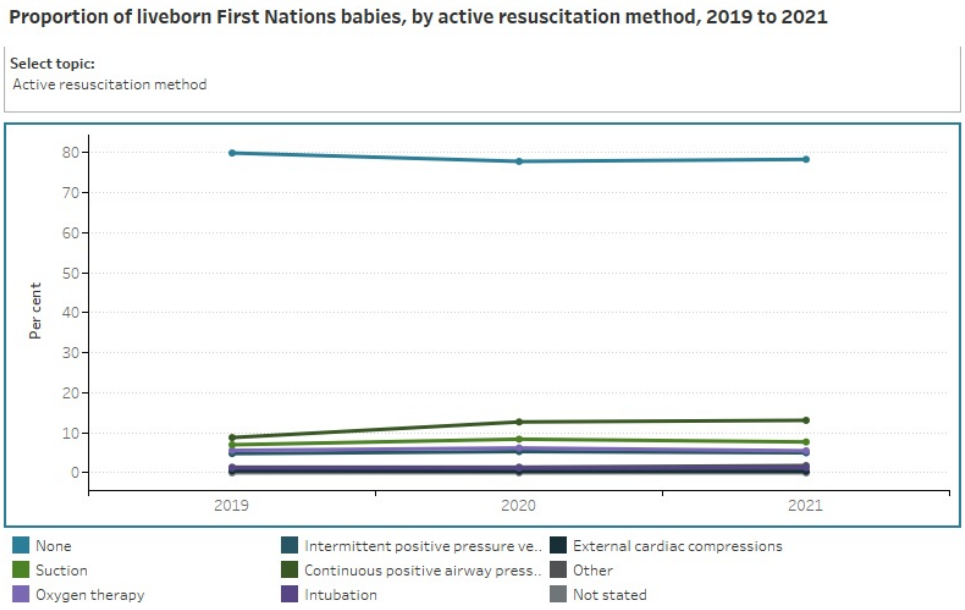
First Nations babies

First Nations babies are those whose mother or father (or both parents) are First Nations. In 2021, First Nations babies accounted for 6.1% (19,155) of all births. A high proportion of First Nations babies were born at term (87%) and with a normal birthweight (88%).

The outcomes for First Nations babies and babies of First Nations mothers are very similar. Figure 3 presents data for First Nations babies, by selected maternal and baby characteristics over a 9-year period (where available).

Figure 3: Proportion of liveborn First Nations babies, by selected topic

Line graph of First Nations babies by selected topics between 2019 and 2021.



Notes:
1. Data excludes Vic.
2. Includes liveborn babies only.
3. Data for active resuscitation method are shown for 2020 only as the data are not comparable with earlier years.
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%.

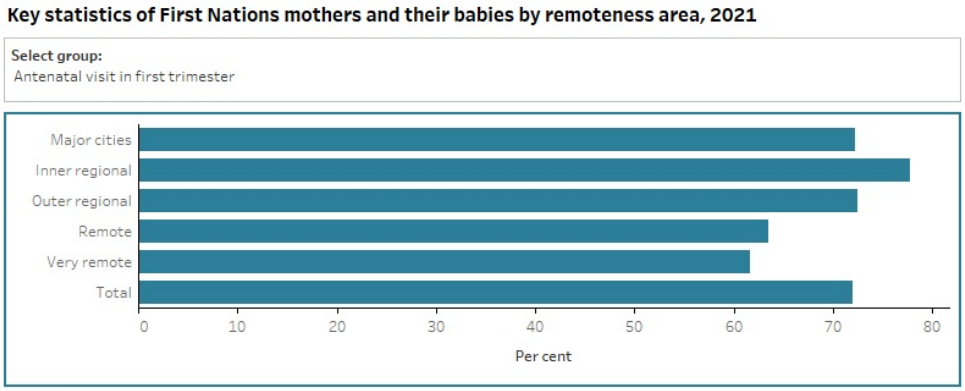
Source: AIHW analysis of National Perinatal Data Collection
https://www.aihw.gov.au/

Remoteness area

Remoteness area can influence several key statistics for First Nations mothers and babies. For example, First Nations mothers who live in *Very remote* areas are more likely to smoke. These and other statistics can be explored in Figure 4.

Figure 4: Key statistics of First Nations mothers and their babies by remoteness area

Bar chart of First Nations mothers and babies of key statistics by remoteness area in 2021.



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
https://www.aihw.gov.au/

It is important to note that despite improvements, First Nations 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 First Nations babies and babies born to First Nations mothers see National Perinatal Data Collection annual update data tables 3.4 and 3.12.

Focus population groups

This section focuses on teenage mothers (women who gave birth when they were aged under 20) and their babies.

For many young people, becoming a parent can be a positive and maturing experience (AIHW 2020). However, teenage mothers are more likely to experience broader disadvantage, and can have higher rates of behavioural risk factors, such as smoking during pregnancy (AIHW 2018). While most babies born to teenage mothers have positive health outcomes, they are more likely to be pre-term, low birthweight and experience higher morbidity and mortality (AIHW 2018).

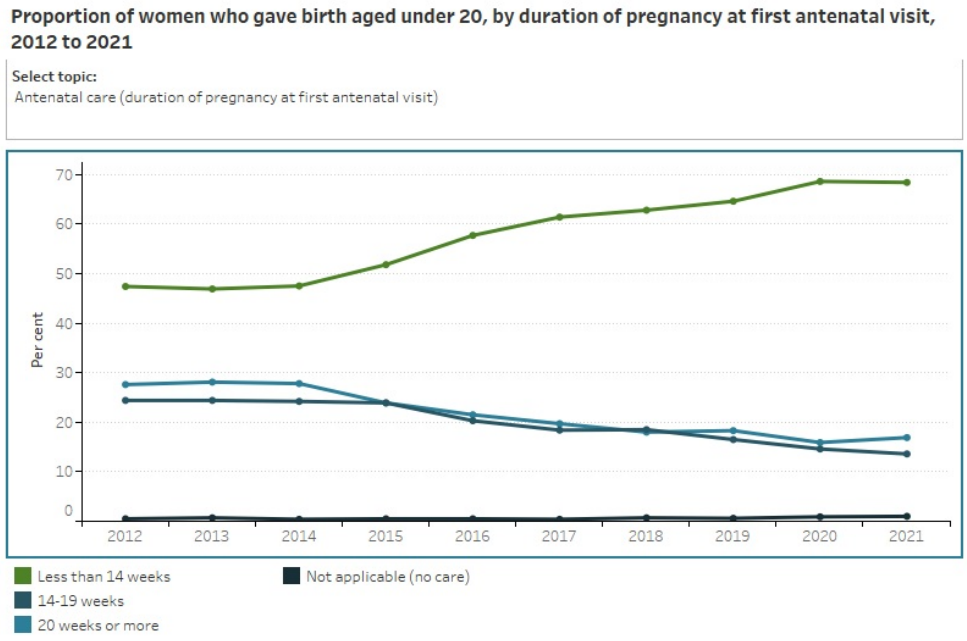
Mothers who gave birth aged under 20

In 2021, women who gave birth aged under 20 accounted for 1.5% (4,769) of all mothers. The number of teenage mothers giving birth has more than halved since 2011 (11,016) and the proportion has fallen from 3.7%.

Figure 1 presents data for women who gave birth aged under 20, by selected maternal characteristics over an 11-year period (where available).

Figure 1: Proportion of women who gave birth aged under 20, by selected topic

Line graph of proportion of mothers aged under 20 by selected topics between 2012 and 2021.



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

Source: AIHW analysis of National Perinatal Data Collection
https://www.aihw.gov.au/

Many teenage mothers access antenatal care in the first trimester (68%) 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 1 in 3 (33%) smoking during pregnancy in 2021, however this rate has fallen over time (from 36% in 2011).

Although teenage mothers are more likely to have spontaneous onset of labour, this rate has fallen over time (from 68% in 2011 to 53% in 2021) with a corresponding increase in induced labour onset (from 27% in 2011 to 40% in 2021). Because spontaneous and induced labour are most commonly associated with vaginal birth, 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.

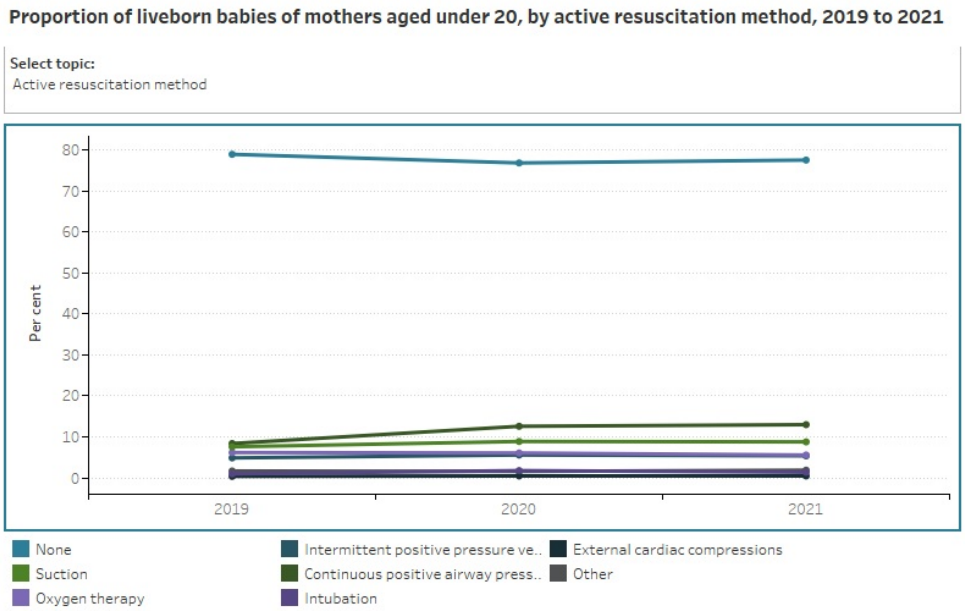
Babies born to mothers aged under 20

In 2021, babies born to mothers aged under 207 accounted for 1.5% (4,754) of all births.

Figure 2 presents data for babies born to women who gave birth aged under 20, by selected baby characteristics over an 11-year period (where available).

Figure 2: Proportion of liveborn babies of mothers aged under 20, but selected topic

Line graph of babies of mothers aged under 20 by selected topics between 2019 and 2021.



Notes:
1. Data excludes Vic.
2. Includes liveborn babies only.
3. Because of differences in definitions and methods used for data collection, care must be taken when comparing across jurisdictions.
4. 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%.

Source: AIHW analysis of National Perinatal Data Collection
https://www.aihw.gov.au/

In 2021, most babies born to mothers aged under 20 were born at term and had a normal birthweight (88% and 89%, respectively). The majority of babies had a hospital stay of 3 days or less (82%).

Around 1 in 4 babies born to mothers aged under 20 required active resuscitation or admission to SCN/NICU (23% and 24%, respectively).

References

AIHW (Australian Institute of Health and Welfare) (2018) *Teenage mothers in Australia 2015*, AIHW, Australian Government, accessed 15 June 2022.

AIHW (Australian Institute of Health and Welfare) (2020) *Australia's children*, AIHW, Australian Government, accessed 20 June 2022.

Focus population groups

This section focuses on mothers who gave birth when they were aged 35 and over and their babies. With appropriate medical care, most older mothers have healthy pregnancies and babies. However, older mothers remain at higher risk of developing some conditions such as gestational diabetes mellitus or preeclampsia (Li et al. 2020; Marozio et al. 2017). Babies born to older mothers can have a higher risk of preterm birth, fetal distress or poor fetal growth (Cavazos-Rehg et al. 2015; Fuchs et al. 2018). In many cases, medical supervision and regular antenatal visits can safely manage or prevent these conditions (Dietl et al. 2015).

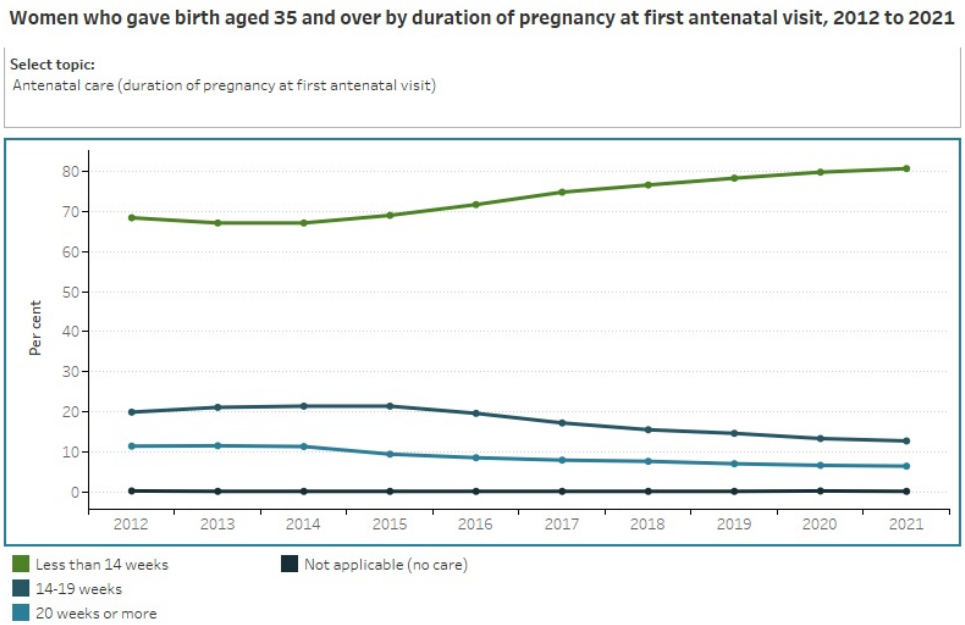
Mothers who gave birth aged 35 and over

In 2021, women who gave birth aged 35 and over accounted for 26% (81,871) of all mothers. This proportion has remained between 22% and 26% since 2011 (23% and 67,359 in 2011).

Figure 1 presents data for women who gave birth aged 35 and over, by selected maternal characteristics over an 11-year period (where available).

Figure 1: Proportion of women who gave birth aged 35 and over, by selected topic

Line graph of proportion of mothers aged 35 and over by selected topics between 2011 and 2021.



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

Source: AIHW analysis of National Perinatal Data Collection
https://www.aihw.gov.au/

Most mothers aged 35 and over accessed antenatal care in the first trimester (81%) and the majority had 5 or more antenatal visits (96%).

Over time, the most common onset of labour type for mothers aged 35 and over has become no labour (36% in 2021, up from 30% in 2011 when spontaneous was the most common onset of labour), with a corresponding caesarean section rate of almost 1 in 2 (48% in 2021).

Mothers aged 35 and over are unlikely to smoke during pregnancy, with 5.5% reporting that they smoked at any time during pregnancy in 2021. This rate has fallen over time (8.5% in 2011).

It is important to note that mothers aged 35 and over experience 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.

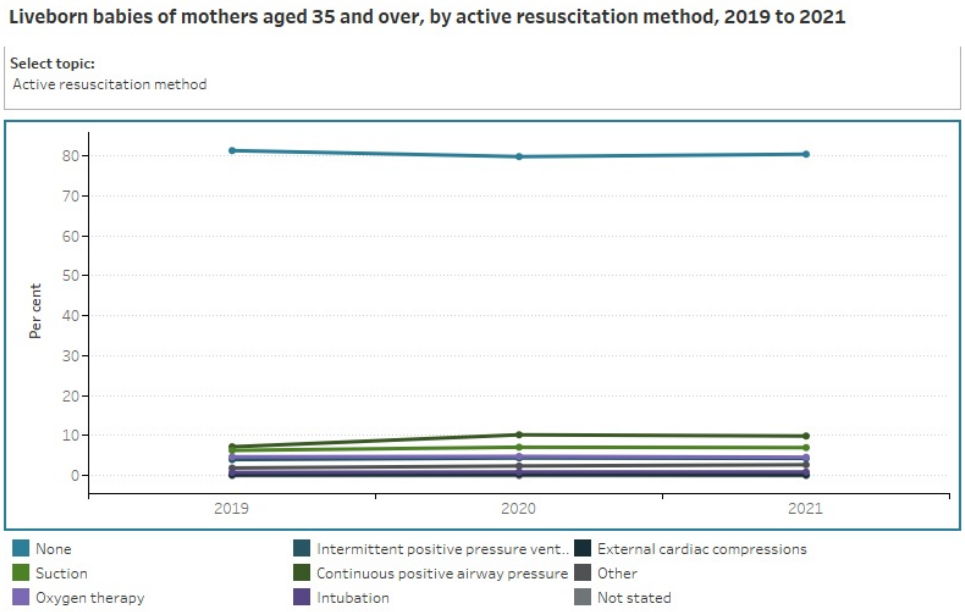
Babies born to mothers aged 35 and over

In 2021, babies born to mothers aged 35 and over accounted for 4.5% (14,113) of all births.

Figure 2 presents data for babies born to women who gave birth aged 35 and over, by selected baby characteristics over an 11-year period (where available).

Figure 2: Proportion of liveborn babies of mothers aged 35 and over, by selected topic

Line graph of babies of mother aged 35 and over by selected topics between 2019 and 2021.



1. Data excludes Vic.
2. Includes liveborn babies only.
3. Because of differences in definitions and methods used for data collection, care must be taken when comparing across jurisdictions.
4. 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%.

Source: AIHW analysis of National Perinatal Data Collection
https://www.aihw.gov.au/

In 2021, most babies born to mothers aged 35 and over were born at term and had a normal birthweight (91% and 92%, respectively).

Over 1 in 5 babies born to mothers aged 35 and over required active resuscitation or admission to SCN/NICU (20% and 17%, respectively), and 37% had a hospital stay of 4 days or more.

References

Cavazos-Rehg PA, Krauss MJ, Spitznagel EL, Bommarito K, Madden T, Olsen MA, Subramaniam H, Peipert JF and Bierut LJ (2015) 'Maternal age and risk of labor and delivery complications', *Maternal and Child Health Journal*, 19(6):1202–1211, doi:10.1007/s10995-014-1624-7.

Dietl A, Cupisti S, Beckmann MW, Schwab M and Zollner U (2015) 'Pregnancy and obstetrical outcomes in women over 40 years of age', *Geburtshilfe und Frauenheilkunde*, 75(8):827–832, doi:10.1055/s-0035-1546109.

Fuchs F, Monet B, Ducruet T, Chaillet N and Audibert F (2018) 'Effect of maternal age on the risk of preterm birth: a large cohort study', *PLOS One*, 13(1):e0191002, doi:10.1371/journal.pone.0191002.

Li Y, Ren X, He L, Li J, Zhang S and Chen W (2020) 'Maternal age and the risk of gestational diabetes mellitus: a systematic review and meta-analysis of over 120 million participants', *Diabetes Research and Clinical Practice*, 162:108044, doi:10.1016/j.diabres.2020.108044.

Marozio L, Picardo E, Filippini C, Mainolfi E, Berchialla P, Cavallo F, Tancredi A and Benedetto C (2019) 'Maternal age over 40 years and pregnancy outcome: a hospital-based survey', *Journal of Maternal-Fetal and Neonatal Medicine*, 32(10):1602–1608, doi:10.1080/14767058.2017.1410793.

Focus population groups

Multiple births are births of more than one baby from a single pregnancy, and include twins, triplets and higher order multiples. This section focuses on mothers who had a multiple birth and babies born as part of a multiple birth.

While considered higher risk, most multiple pregnancies have positive outcomes for mothers and babies. However, women who have multiple births, and their babies, are at increased risk of certain conditions, including preeclampsia, anaemia, gestational diabetes, post-partum haemorrhage, pre-term birth, low birthweight, twin–twin transfusion syndrome and developmental delay. Families with multiple births may also experience financial stress, social isolation, and difficulties in accessing appropriate education (TRA 2019).

Additional care for families who have twins or other multiples is essential to eliminate or manage complications associated with multiple pregnancies. Appropriate support is important from early pregnancy through to the early years of the babies' lives, including frequent antenatal care visits, access to specialist obstetric and paediatric care and access to services to support child development (TRA 2019).

The number of multiple births in Australia each year is small and has remained relatively stable at around 2-3% of all births (from 3.1% (9,288) of births in 2011 to 2.7% (8,625) of births in 2021).

In 2021, of this small proportion, almost all multiple births (98%) were twins, while the remaining 2% were other multiples (that is, triplets, quadruplets or higher).

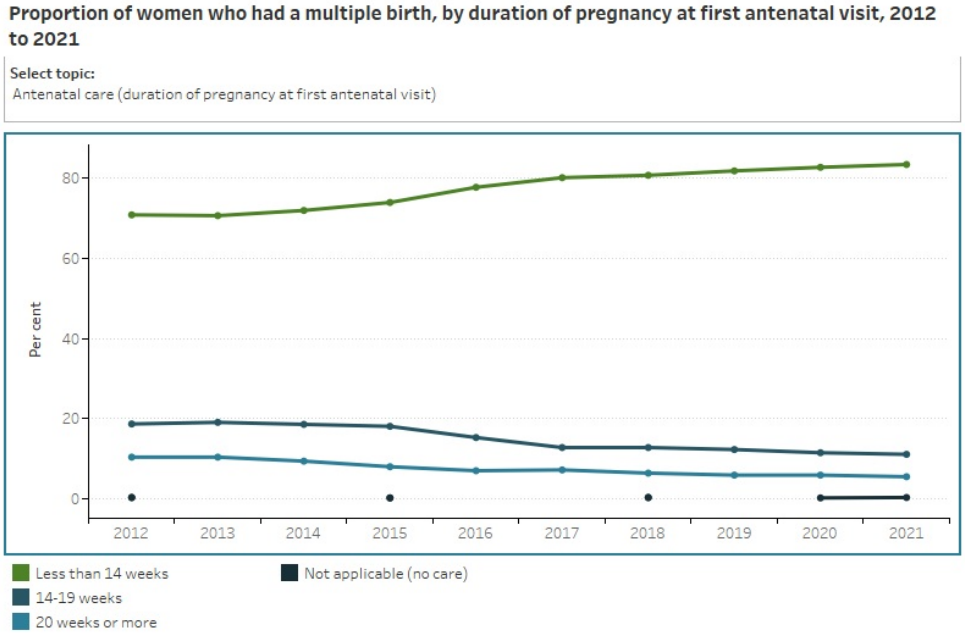
Mothers who had a multiple birth

In 2021, mothers who had a multiple pregnancy accounted for 1.4% (4,218) of all women who gave birth.

Figure 1 presents data for women who had a multiple birth gave birth, by selected maternal characteristics over an 11-year period (where available).

Figure 1: Proportion of women who had a multiple birth, by selected topic

Line graph of proportion of women who had a multiple birth by selected topics between 2011 and 2021.



Note: Percentage calculated after excluding records with 'Not stated' values. Care must be taken when interpreting percentages.
n.p. Not publishable due to small numbers, confidentiality or for reliability reasons.

Source: AIHW analysis of National Perinatal Data Collection
https://www.aihw.gov.au/

Most mothers of multiples attended an antenatal visit in the first trimester (84%) and had 5 or more antenatal visits (96%).

Over half of mothers had no labour, and this proportion has increased over time (50% in 2011 compared with 58% in 2021). Mothers of multiples therefore had a high rate of caesarean sections (75%).

For more information on mother who had a multiple birth see National Perinatal Data Collection annual update data table 2.24.

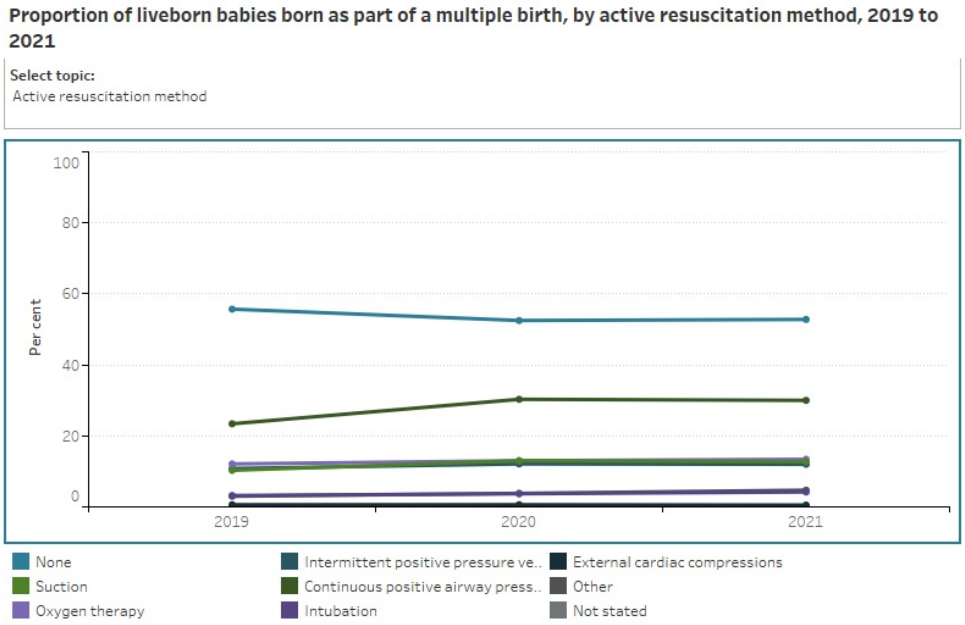
Babies born as part of a multiple birth

In 2021, babies born as part of a multiple pregnancy accounted for 2.7% (8,625) of all births.

Figure 2 presents data for babies born as part of a multiple birth, by selected baby characteristics over an 11-year period (where available).

Figure 2: Proportion of liveborn babies born as part of a multiple birth, by selected topic

Line graph of babies born as part of a multiple birth by selected topics between 2019 and 2021.



Notes:
1. Data excludes Vic.
2. Includes liveborn babies only.
3. Because of differences in definitions and methods used for data collection, care must be taken when comparing across jurisdictions.
4. 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%.

Source: AIHW analysis of National Perinatal Data Collection
https://www.aihw.gov.au/

Most 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 (54%) or pre-term (66%), including babies who were both low birthweight and pre-term. As a result, 65% of multiple births were admitted to SCN or NICU, and 45% had hospital stays of 6 days or more.

References

TRA (Twins Research Australia) (2019) *Multiple perspectives: what support do multiple birth families need to live happy and healthy lives*, TRA, The University of Melbourne, Melbourne, accessed 21 June 2022.

Technical notes

Technical notes

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

Sex and gender terminology

This report uses the terms ‘woman’ and ‘women’ to mean ‘female' when referring to data collected in the National Perinatal Data Collection (NPDC) and the National Maternal Mortality Data Collection (NMMDC) as these data sources are based on sex. Information on gender is not recorded in these data collections. ‘Woman’ and ‘women’ typically refers to groups of people aged 18 years and over; however in this report, people who were pregnant or gave birth aged less than 18 are included.

The terms ‘mother’ and ‘mothers’ refers to females who were pregnant and within the scope of these data collections.

It is acknowledged that this report includes people who do not identify as women or mothers, and that individual parents and families may use different words to those used in this report. This may include women, transgender men, intersex people, non-binary and gender diverse people.

First Nations terminology

The AIHW uses ‘First Nations people’ to refer to Aboriginal and/or Torres Strait Islander people in this report.

Technical notes

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.

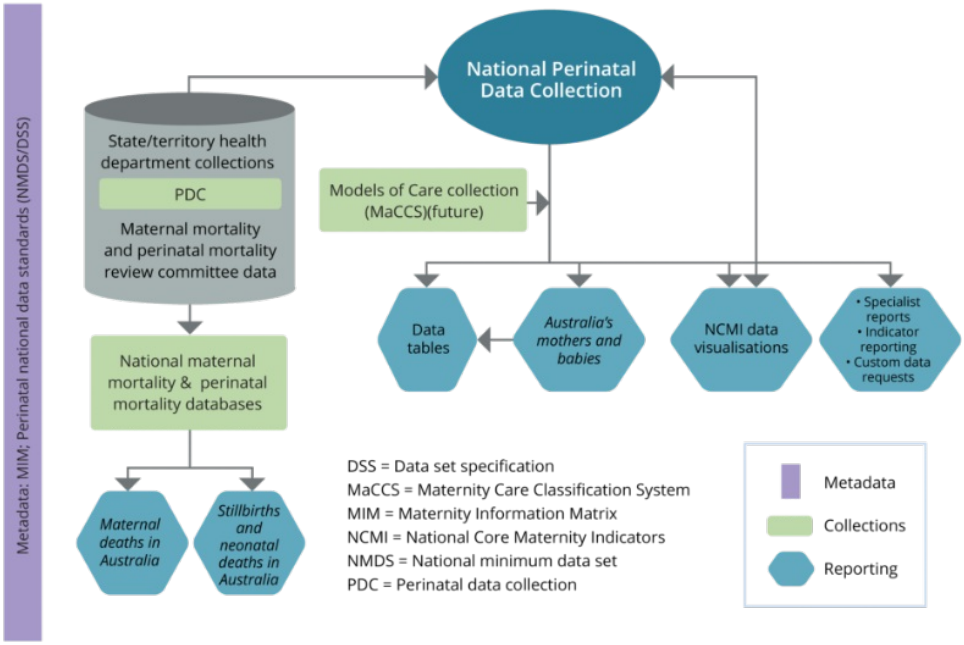
Collection of perinatal data by states and territories

Perinatal data are collected after each birth, usually by midwives or other birth attendants using information obtained from the 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.

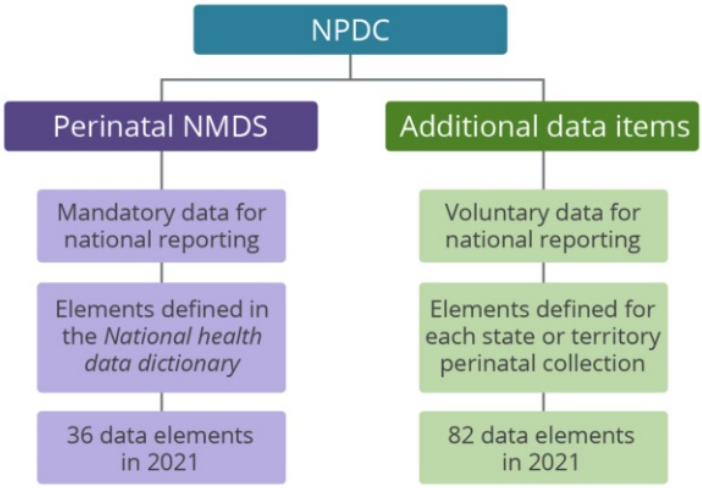
Figure 1: Overview of maternal and perinatal data collections and national reporting outputs



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.

Figure 2: 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.

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

The National Maternal Mortality Data Collection (NMMDC) is a population-based cross-sectional collection of data on the deaths of women reported to have died while pregnant or within 42 days of the end of pregnancy. Data are provided by the states and territories.

Due to its health and privacy legislation, only limited summary data on maternal deaths from 2006 to 2021 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 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.

Technical notes

Table 1: Perinatal NMDS 2020–21 data items

Data element name	METEOR identifier
Birth event—actual setting of birth, code N	695103
Birth event—anaesthesia administered indicator, yes/no/not stated/inadequately described code N	695188
Birth event—analgesia administered indicator, yes/no/not stated/inadequately described code N	695200
Birth event—birth method, code N	695372
Birth event—birth presentation, code N	695418
Birth event—labour onset type, code N	695339
Birth event—state/territory of birth, code N	718242
Birth event—type of anaesthesia administered, code N[N]	695530
Birth event—type of analgesia administered, code N[N]	695545
Birth event—labour induction method, code N[N]	695355
Product of birth—Apgar score at 5 minutes, code NN	695281
Product of birth —birth order, code N	695293
Product of birth—birth status, code N	695437
Product of birth—birthweight, total grams N[NNN]	716139
Episode of admitted patient care—separation date, DDMMYYYY	270025
Establishment—organisation identifier (Australian), NNX[X]NNNNN	269973
Female—postpartum perineal status, code N[N]	717924
Female—number of tobacco cigarettes smoked per day after 20 weeks of pregnancy, total N[NN]	695382
Female—tobacco smoking indicator after 20 weeks of pregnancy, yes/no/not stated/inadequately described code N	695447
Female—tobacco smoking indicator in the first 20 weeks of pregnancy, yes/no/not stated/inadequately described code N	695487
Female—caesarean section at most recent previous birth indicator, yes/no/not stated/inadequately described code N	695328
Female—number of antenatal care visits, total N[N]	717735
Female—parity, total pregnancies N[N]	696262
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 of pregnancy at the first antenatal care visit, total completed weeks N[N]	695410

Pregnancy—birth plurality, code N	695308
Product of conception—gestational age, total completed weeks N[N]	695332
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
Female—diabetes mellitus during pregnancy indicator, yes/no/not stated/inadequately described code N	716227
Female—hypertensive disorder during pregnancy indicator, yes/no/not stated/inadequately described code N	719256

Note: Implementation start date 1 July 2020; implementation end date 30 July 2021.

Source: METEOR.

Table 2: Perinatal NMDS 2021–22 data items

Data element name	**METEOR identifier**
Birth event—actual setting of birth, code N	732336
Birth event—anaesthesia administered indicator, yes/no/not stated/inadequately described code N	732332
Birth event—analgesia administered indicator, yes/no/not stated/inadequately described code N	732344
Birth event—birth method, code N	732352
Birth event—birth presentation, code N	695418
Birth event—labour onset type, code N	735046
Birth event—state/territory of birth, code N	718242
Birth event—type of anaesthesia administered, code N[N]	732614
Birth event—type of analgesia administered, code N[N]	732672
Birth event—labour induction method, code N[N]	732387
Product of birth—Apgar score at 5 minutes, code NN	733377
Product of birth—birth order, code N	733265
Product of birth—birth status, code N	732895
Product of birth—birthweight, total grams N[NNN]	733280
Episode of admitted patient care—separation date, DDMMYYYY	270025
Establishment—organisation identifier (Australian), NNX[X]NNNNN	269973
Female—postpartum perineal status, code N[N]	732864
Female—number of tobacco cigarettes smoked per day after 20 weeks of pregnancy, total N[NN]	695382
Female—tobacco smoking indicator after 20 weeks of pregnancy, yes/no/not stated/inadequately described code N	695447
Female—tobacco smoking indicator in the first 20 weeks of pregnancy, yes/no/not stated/inadequately described code N	695487
Female—caesarean section at most recent previous birth indicator, yes/no/not stated/inadequately described code N	732743
Female—number of antenatal care visits, total N[N]	717735
Female—parity, total pregnancies N[N]	733287
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 of pregnancy at the first antenatal care visit, total completed weeks N[N]	732908
Pregnancy—birth plurality, code N	732874
Product of conception—gestational age, total completed weeks N[N]	695332
Product of birth—active resuscitation indicator, yes/no/not stated/inadequately described code N	732880
Product of birth—active resuscitation method, code N[N]	732883
Female—diabetes mellitus during pregnancy indicator, yes/no/not stated/inadequately described code N	732748
Female—hypertensive disorder during pregnancy indicator, yes/no/not stated/inadequately described code N	732753

Note: Implementation start date 1 July 2021; implementation end date 30 July 2022.

Source: METEOR.

Technical notes

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Latest report

Centre for Epidemiology and Evidence (2022) *New South Wales mothers and babies 2020*, Sydney: New South Wales Ministry of Health, NSW Government.

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 (2022) *Victoria's mothers, babies and children 2020*, Safer Care Victoria, Victorian Government.

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Latest report

Queensland Department of Health (Statistical Services Branch) (2022) *Perinatal statistics Queensland 2020*, Brisbane: Queensland Health, Queensland Government.

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Latest reports

Ballestas T (on behalf of the Perinatal and Infant Mortality Committee of Western Australia) (2022) *The 16th report of the Perinatal and Infant Mortality Committee of Western Australia, 2014-2018*, Perth: Department of Health, Western Australia.

Hutchinson M, Joyce A & Bonner D (2021) *Western Australia's mothers and babies, 2016: 34th Annual report of the Western Australian Midwives' Notification System*. Perth: Department of Health, Western Australia.

Additional summary data from the WA Perinatal Data Collection are available at Western Australia's Mothers and Babies summary information.

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Latest reports

Pregnancy Outcome Unit, Wellbeing SA (2023). *Maternal and perinatal mortality in South Australia 2020*, Adelaide: Pregnancy Outcome Unit, Wellbeing SA.

Pregnancy Outcome Unit, Wellbeing SA (2023). *Termination of pregnancy in South Australia 2022*, Adelaide: Pregnancy Outcome Unit, Wellbeing SA.

Pregnancy Outcome Unit, Wellbeing SA (2022). *Pregnancy outcome in South Australia 2020*, Adelaide: Pregnancy Outcome Unit, Wellbeing SA.

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Latest report

Tasmania Council of Obstetric and Paediatric Mortality and Morbidity (2021) *Annual report 2020*, Tasmanian Department of Health, Tasmanian Government.

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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 (2023). *Northern Territory Midwives' Collection Mothers and Babies 2020*. Darwin: NT Health.

Technical notes

National Perinatal Data Collection

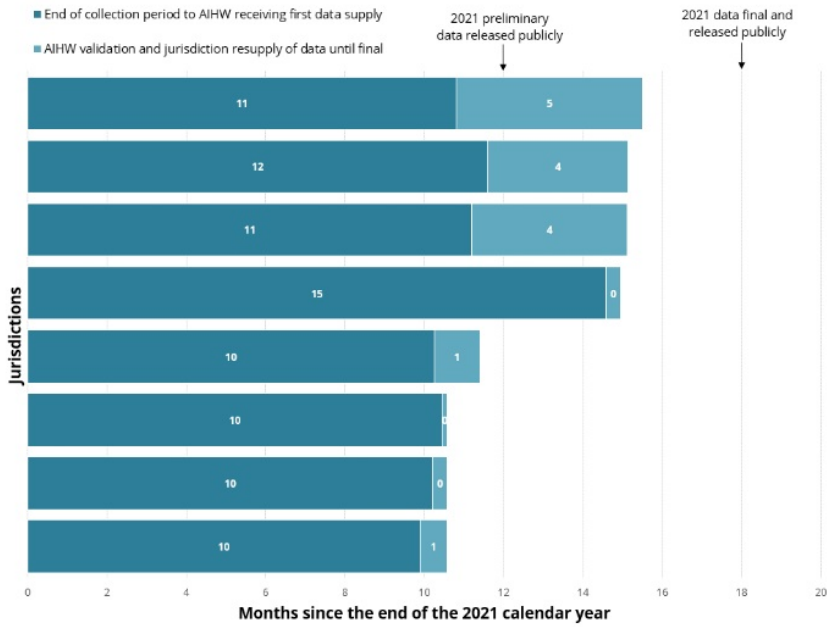
The NPDC has almost 120 data items and contains around 300,000 records per year for both mothers and babies. Data for all states and territories are checked for completeness, validity and logical errors before the NPDC is deemed final for a calendar year.

Some states and territories need 12 months or more to undertake data entry, validation and linking with hospitals data as required after the end of the data collection period. The process to finalise data for the national collection can then require multiple rounds of data validation by the AIHW and resupply of data from states and territories.

NPDC data for 2021 was requested from states and territories on 22 July 2022 for submission to the AIHW in a staged supply between 15 August 2022 and 19 December 2022. Data for 2021 were final for all states and territories by 17 April 2023 and were published on 29 June 2023.

Timelines for reporting 2021 NPDC data are outlined in Figure 1. Preliminary 2021 NPDC data (for 6 of 8 states and territories) was reported within 12 months of the end of the collection period and final data was reported within 18 months of the end of the collection period.

Figure 1: Months since the end of the 2021 calendar period and public reporting of data from the National Perinatal Data Collection, by state and territory

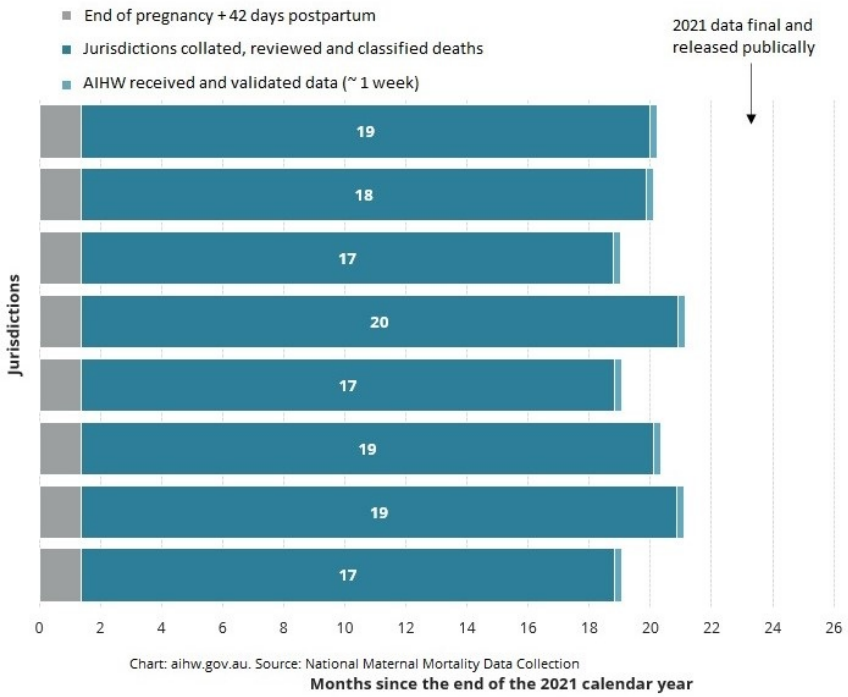


National Maternal Mortality Data Collection

NMMDC data are collected annually. Most states and territories 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 2021 maternal deaths data are outlined in Figure 2. These data were finalised and reported 23 months after the end of the collection period.

Figure 2: Months since the end of the 2021 calendar period and public reporting of data from the National Maternal Mortality Data Collection, by state and territory



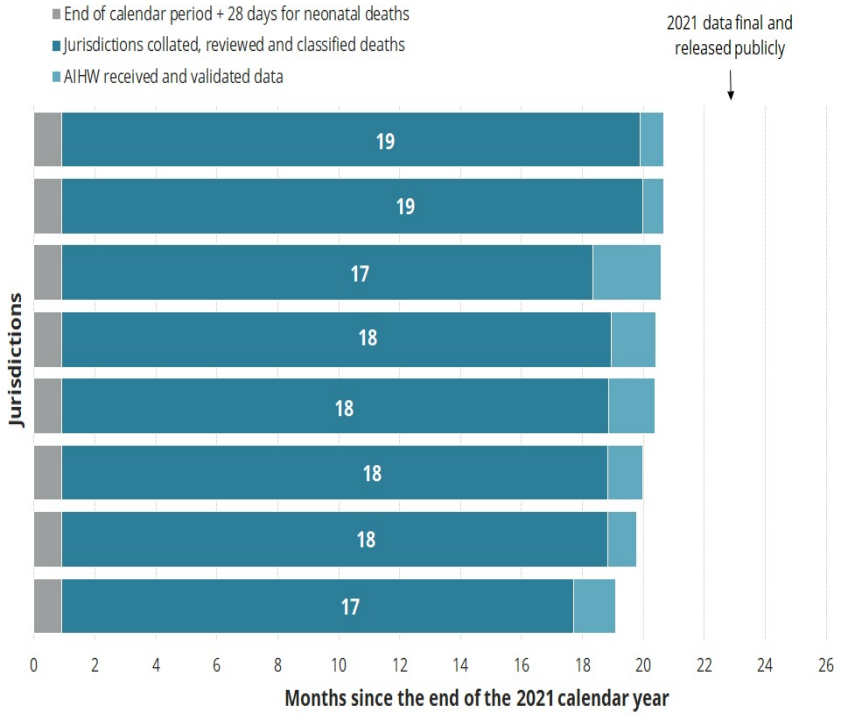
National Perinatal Mortality Data Collection

Data for the NPMDC are collected annually. The 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 2021 was requested from states and territories on 7 June 2023 for submission to the AIHW by 28 July 2023. Data from 5 jurisdictions were received 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 2021 data on perinatal deaths are outlined in Figure 3. The NPMDC data for 2021 was finalised and reported 22 months after the end of the collection period.

Figure 3: Months since the end of the 2021 calendar period and public reporting of data from the National Perinatal Mortality Data Collection, by state and territory



Technical notes

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 2021 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 2021, 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.

Quality of data for reporting First Nations status

First Nations status is a measure of whether a person identifies as being of First Nations origin. First Nations status of the mother has been a mandatory data item for the Perinatal NMDS since its inception in 1997. First Nations 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 First Nations status, is a better baseline measure of health for all First Nations children. However, the outcomes of babies of First Nations 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 First Nations status of the mother.

Table 1 shows the relationship between Indigenous status of the mother and Indigenous status of the baby in 2021. Most babies (96%) had the same Indigenous status as their mother while only a small proportion had a different Indigenous status recorded (3.9%). However, of the 19,155 babies reported as First Nations in the NPDC in 2021 (6.1% of all babies), one-quarter (27%) were born to non-Indigenous mothers.

Table 1: Births, by First Nations status of the baby and mother, 2021

First Nations status of the mother	First Nations baby	Non-Indigenous baby	Not stated baby	Total
First Nations mother	14,046 (4.4%)	1,390 (0.4%)	253 (0.1%)	15,689 (5.0%)
Non-Indigenous mother	5,092 (1.6%)	288,928 (91.5%)	4,571 (1.4%)	298,591 (94.6%)
Not stated mother	17 (0.0%)	1,001 (0.3%)	407 (0.1%)	1,425 (0.5%)

Total	**19,155 (6.1%)**	**291,319 (92.3%)**	**5,231 (1.7%)**	**315,705 (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 about 15% in 2021.

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

Definitions.

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

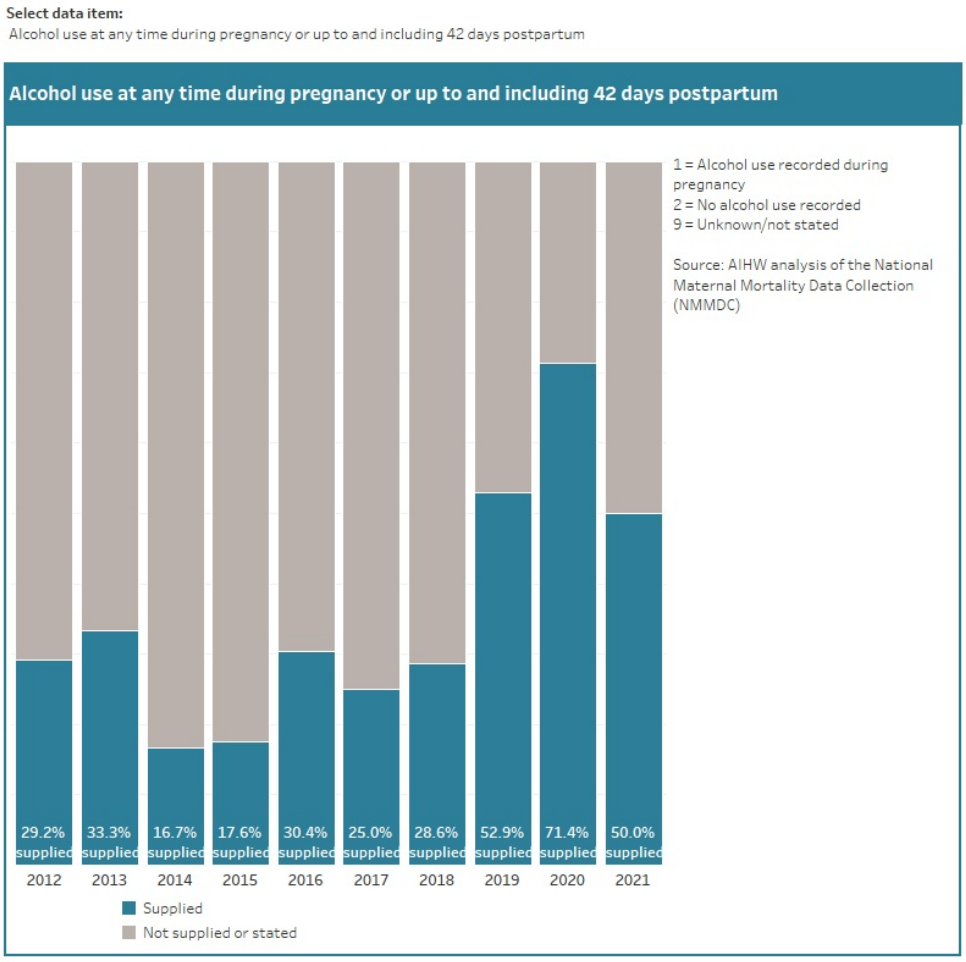
Not supplied or not stated: proportion of values supplied as not stated or missing, where a jurisdiction has either supplied appropriate values for a portion of records or did not supply any value for all records for the data item during the specified collection year/s.

Western Australia data provision

Due to its health and privacy legislation, only limited summary data on maternal deaths from 2006–2021 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 Figure 1, below. However, they are included in analysis where possible.

Figure 1: Quality and availability of data in the National Maternal Mortality Data Collection

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 2021.



National Perinatal Mortality Data Collection

Detailed information on completeness for all data items in the National Perinatal Mortality Data Collection (NPMDC) is available, at the national level, in the interactive data visualisation below for 2013 to 2019. The addition of data for 2020 and 2021 is planned for 2024.

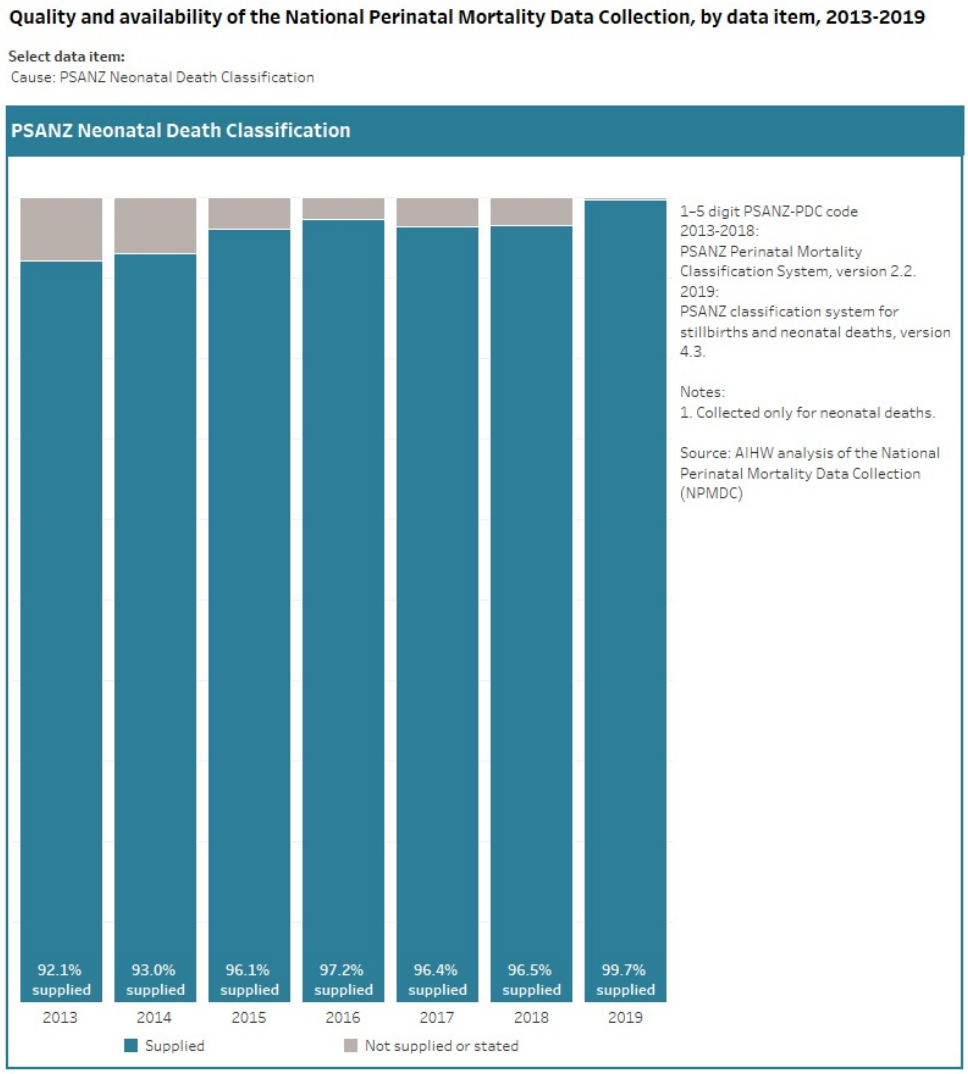
Definitions for the terms used to quantify completeness:

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

Not supplied or not 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.

Figure 2: Quality and availability of data in the National Perinatal Mortality Data Collection

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 2020.



Preliminary data on perinatal deaths

Preliminary data on perinatal deaths covered in this web report are 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 are not as comprehensive as those 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 First Nations 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 have historically differed to what are reported by the Victorian Consultative Council on Obstetric and Paediatric Mortality and Morbidity (CCOPMM). For example, for 2020, the NPMDC recorded 673 stillbirths and a rate of 8.7 stillbirths per 1,000 births, compared with the CCOPMM annual report that showed 492 stillbirths and an adjusted stillbirth rate of 6.4 per 1,000 births (CCOPMM 2021. Victoria's Mothers Babies and Children 2020. 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.

At the time of writing, CCOPMM had not published their 2021 data.

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; for example, the number of stillbirths based on the NPMDC is consistently and notably higher than reported by the ABS.

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 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 2: Number of perinatal deaths reported by Australian Bureau of Statistics and the National Perinatal Mortality Data Collection, Australia, 2013–2021

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
2020	2,273	1,784	731	706
2021	2,278	1,700	738	732

Note: ABS stillbirths and neonatal deaths are reported by the year in which the death occurred (ABS 2023, Causes of Death, Australia).

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

Technical notes

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:

Figure 1: Definitions of perinatal death

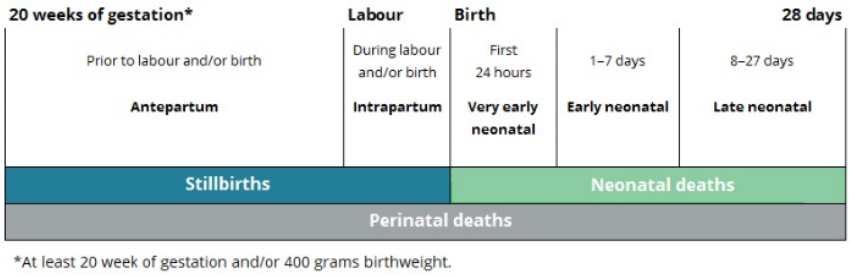


Chart: AIHW

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.

This differs from the standard definition used for stillbirths by the WHO, which is the loss of a baby during pregnancy at or after 22 completed weeks of gestation, or if gestational age is not available, with birthweight of 500 grams or more (WHO 2022).

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

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 (for example, diabetes) or a surgical condition (for example, 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.

Periviable 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.

References

WHO (World Health Organisation) (2022), International Classification of Diseases for Mortality and Morbidity Statistics, Eleventh Revision (ICD-11), Reference Guide, World Health Organisation, accessed 12 October 2023.

Technical notes

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.

MMR = (Number of direct and indirect maternal deaths[(a)]) / (Number of women who gave birth[(a)]) x 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.

Stillbirth rate = 1,000 x Number of stillbirths / 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.

Neonatal mortality rate = 1,000 x Number of neonatal deaths / 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.

Perinatal mortality rate = 1,000 x Number of perinatal deaths / 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, First Nations 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*
- *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.

Trend data

The methods below refer to National Perinatal Data Collection annual update data tables 1.2 and 1.3, and National Perinatal Mortality Data Collection annual update tables 1 and 5.

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% CI(x) = x ± 1.96 x 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.

Perinatal mortality trend

In the *Stillbirths and neonatal deaths* web article linear regression has been used to determine changes in the observed perinatal mortality rates over the period 2003–2021. In 2002 and 2009 data were not available from all jurisdictions so these years have been excluded from trend analysis. These data points are still presented in the accompanying National Perinatal Mortality Data Collection annual update supplementary data tables.

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.

For more information on data used to assign percentile see National Perinatal Data Collection annual update data table 6.1.

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 1: Robson 10 group classification system

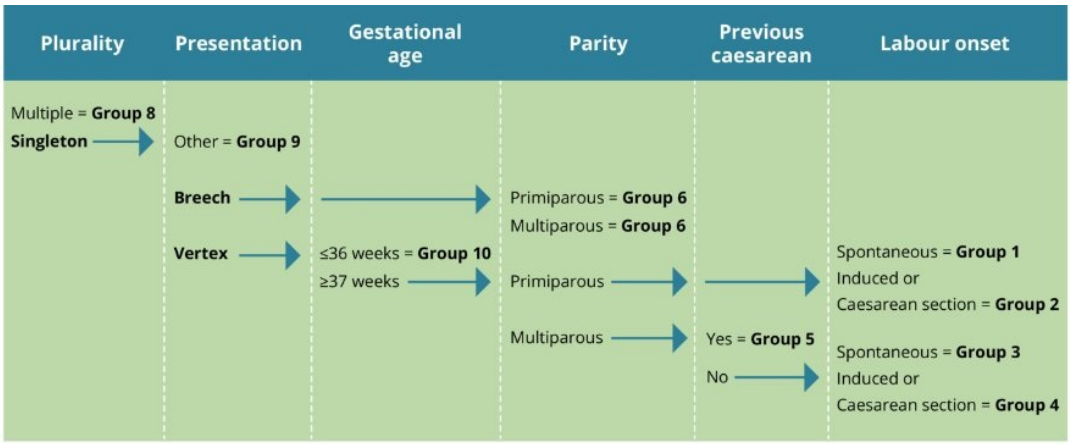
Group	Definition
1	First-time mother, singleton pregnancy, baby in cephalic (head first) presentation, ≥37 weeks gestation, spontaneous labour (not induced)
2	First-time mother, singleton pregnancy, baby in cephalic (head first) presentation, ≥37 weeks gestation, induced labour or caesarean section before 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 2021. 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.

Figure 1: Process flow of classification using the Robson 10 group classification system



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Technical notes

Term	Meaning
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

Notes

Amendments

24 July 2023 - The following content changes have been made to Australia's mothers and babies 2021:

- Footnote (a) has been revised in Table 3.20 in the 'Data Tables: National Perinatal Data Collection annual update 2021', and Table 5.1 in the 'Data Tables: National Perinatal Data Collection annual update data visualisations 2021' now consistently has "First Nations" within the Sub-group disaggregation column.

Text changes are as follows :

On the Summary page:

- There has been little change in the proportion of pre-term births ranging between 8.3% in 2011 and 8.2% in 2021 with a peak of 8.7% reached most recently in 2018, and low birthweight babies remained steady at 6.3% between 2011 and 2021.

On the Gestational age page:

- The proportion of babies born between 20 and 36 weeks remained steady between 2011 (8.3%) and 2021 (8.2%) with a peak of 8.7% reached most recently in 2018, while the proportion born between 37 and 39 weeks increased (for example, babies born at 38 weeks increased from 19% in 2011 to 23% in 2021) and the proportion born from 40 weeks onwards decreased (for example, babies born at 40 weeks decreased from 25% in 2011 to 20% in 2021).

16 Aug 2022 - About page and Summary page text: the number of babies was reported incorrectly as 295,796. The text has been updated to: *"In 2020, there were 295,976 babies born to 291,712 mothers in Australia"*.

22 July 2022 - Data tables containing preliminary data 2020 for Victoria (released 21 June 2022)& were superceded.

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".

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Data quality statement

National Perinatal Data Collection, 2021: Quality statement

National Maternal Mortality Data Collection, 2021: Quality statement

National Perinatal Mortality Data Collection, 2021: Quality statement

Data

Related material

Resources

Related topics

- Life expectancy & deaths
- Men & women

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.